

Vol. 17, no. 3. Winter 1998

Arpay

Communications of the ICMA

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ARRAY
Winter 1997
Volume 17
Issue No. 3

ARRAY is the triannual publication of the International Computer Music Association.

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ICMA News

ICMA News

Conferences—

With the final strains of Perry Cook singing The Former Apple Founder Formally Known as Jobs (see page 14) and the lingering tastes of octopus and fava beans on my tongue I am still relishing the experiences of ICMC '97 in Thessaloniki, Greece. A combination of encounters with the sacred and the profane included a sound pressure battle between the Friday evening ICMC concert and public harbor concert by the rock band, U2 (U2 won!) and negotiations with the Vatican to reschedule a visit by the Pope. A combination of excellent music, distinctive technical reports, fine food and friendly folks made this conference a peak experience for me. Many thanks goes out to Thanassis Rikakis - Conference director, Brad Garton - Music Chair, Perry Cook - Papers Chair, Alexandros Bakalagos - Technical Director, LEMONIA Tsekoura - Administrator, Mata Sakka - Assistant Administrator, Sakis Laios - Music Coordinator, Dimitris Kamarotos - Sound Manager, and the entire staff that made ICMC '97 an milestone success.

The annual "Swets & Zeitlinger Distinguished Paper Award" for the 1997 ICMC was presented by Roger Dannenberg and Paul Berg to Arcos, Mantaras, and Serra for their paper "SaxEx: a case-based reasoning system for generating expressive musical performances." In addition, the selection committee gave special mention to Yinong Ding and Xiaoshu Qian for "Sinusoidal and Residual Decomposition and Residual Modeling of Musical Tones Using the QUASAR Signal Model", Jean-Marc Jot for "Efficient models for reverberation and distance rendering in computer music and virtual audio reality", Daniel Pressnitzer and Stephen McAdams for "Influence of phase effects on roughness modeling" and Maarten van Walstijn and Vesa Valimaki for "Digital Waveguide Modeling of Flared Acoustical Tubes." Congratulations to all the authors, and I would like to thank the ICMC Paper Selection Panel for making

the first round of selections, and committee members Roger Dannenberg, Paul Berg and Shlomo Dubnov, for making the final selections.

The two ICMA Commission awards, *Chamber Concerto* for chamber ensemble and electronic sounds by Pablo Furman and *Lizzard Point* by Ludger Bruemmer (with video by Silke Brehmer), proved to be ICMC 97 concert highlights. Congratulations to these skilled artists - ICMA is honored to be able support work of proven quality. Thanks to Cort Lippe and the Commission Jury for their arduous work in making these quality selections.

On to ICMC '98 scheduled for October 1-6, 1998 at the University of Michigan, Ann Arbor. The city of Ann Arbor is small

NOTICE TO CONTRIBUTORS

The deadline for submissions for the next issue of ARRAY, Vol. 18, No. 1, is **February 1, 1998**. All submissions to ARRAY must be in machine-readable form. You must submit items using electronic mail or on a floppy disk (either Macintosh or PC). If you submit anything solely as hard copy, it will not be considered for publication in ARRAY. If you send a submission on floppy disk, please send two copies: one as a plain ASCII text-only file, and the other copy as the file that your word processor uses.

Please do not use any formatting other than italics and bold face. If you wish to include graphics with your submission, please do so in TIF or EPS format only. It is helpful if you can include a hard copy as well. If you would like your disk returned, please include a self-addressed, stamped return envelope.

Send ARRAY submissions to :

ARRAY-ed@notam.uio.no

enough to bike across in an afternoon yet diverse enough to attract performing artists from throughout the world and support a host of gourmet restaurants (and as we all know, great food is a top priority for a successful ICMC!.) Founded in 1817, the University of Michigan is constantly ranked as one of the top ten universities in the United States and one of the top five music performance institutions in America. In addition the university has the largest research program of any university in the nation in the areas of space physics, neuroscience, biophysics, and population studies. Conference chair, Mary Simoni, and her staff are organizing a prestigious series of seminars, workshops, concerts and technical presentations for what promises to be another landmark ICMC.

For information contact:

ICMC98 - Conference Management Services
600 E. Madison, Room G-121
University of Michigan
Ann Arbor, MI 48109-1372

Effective January 1, 1998:
vox +1 (734) 764-4276
fax +1 (734) 764-1557

Email: icmc98@umich.edu
WWW: <http://www.music.umich.edu/icma98/>

The International Computer Music Association has signed the 1999 conference contract with Beijing University in Peking, China and they will be the host of the 1999 International Computer Music Conference. The proposed dates are Thursday, October 22 to Tuesday, October 27. As the Capital of China, Beijing is the center of politics, culture and education. It is also one of the principal technological centers of China, being especially advanced in electronic technology. Zhong Cuancun Street, the district in which Peking University is located, is said to be the "Chinese Silicon Valley!" The proposed ICMC 99 represents the culmination of an initial period of modern development and will herald a new epoch in Chinese scientific and artistic circles. The International Computer Music Asso-

ciation is very proud to be an architect of this event.

Adieu—

This marks the end of my second term serving the ICMA as its president. As those who have served in this position before me can confirm, it is a potentially full-time effort and many other activities are often neglected. I now want to devote more time to my efforts as a composer and obligations to my family. I have asked not to be considered for another term as president and the election results are published below. As you will see, I may have only jumped out of the frying pan into the fire as I will now be assuming the duties of the Vice-President for Conferences! I accept this position with enthusiasm and honor. In comparison with the duties of the presidency, this Vice-President position will provide me with a well defined focus and I hope I can fulfill the duties with the same effectiveness and dignity as my predecessor, Stephen Arnold. As out-going president I wish to thank the current Officers and Board of Directors for their guidance and support over the past four years. Without their work the advances made by this organization would have not been possible. Thanks to Patte Wood for her work on the Board and I applaud her past and continuing efforts as the ICMA Secretary/Treasurer; to Stephen Arnold for his noble work as Conference Vice-President and I wish him well in his new position, be it a blessing or a burden, as ICMA President; to Katharine Norman who served as a Board Member and our first European Array Editor; and special recognition goes to Larry Austin, Paul Lansky and Roger Dannenberg. These gentlemen have served both as officers and board members for the ICMA for eight years! This is a lot of time and energy made on a purely volunteer basis. I feel I can speak for the entire ICMA membership, thank you all for devotion.

My final act a president is to bring continued recognition to the services of the ICMA Presidents. At the 1997 ICMA Board of Directors Annual Meeting we established what will be called the Presidential Advisory Council consisting of all past and future ICMA Presidents. This is a non-voting (in terms of Board matters) caucus which is recognized in honor of their achievements as ICMA Presidents. These people have experiences and insights which

are very valuable to the future efforts of the ICMA and to not recognize this wisdom would not be in the best interest of the evolution of the ICMA. The current ICMA Presidential Advisory Council consists of:

Thom Blum 1980-82
James Beauchamp 1982-84
William Buxton 1984-86
Craig Harris 1986-90
Larry Austin 1990-94
====

Elections —

In spite of a combatant relationship with both domestic and international postal services, the IMCA Membership has elected a new roster of the Board of Directors. This election marks the beginning of the newly reorganized ICMA Board of Directors which is now made up of 6 Regional Directors (2 each from the Americas, 2 each from Asia/Oceania, and 2 each from Europe) and 5 At-Large Directors (which can be from any region).

The ICMA Board hopes that this new international board will be able to address the concerns of all ICMA members world wide. The new board is listed below. The Regional Directors are charged with focusing their efforts in their regions. Please work with them so that particular concerns in your regions can be addressed and the ICMA can effectively represent you. The ICMA Board of Directors as of January 1, 1998 are:

At-Large

Perry R. Cook (USA) - continuing
Cort Lippe (USA) - re-elected
Larry Polansky (USA) - continuing
Miller Puckette (USA) - newly elected
Mary Simoni (USA) - continuing

Americas Regional

Mara Helmuth (USA) - newly elected
Russell Pinkston (USA) - newly elected

Asia/Oceania Regional

Lydia Ayers (HK) - newly elected
Keiji Hirata (JAPAN) - newly elected

Europe Regional

Stephen Arnold (UK) - newly elected
Joran Rudi (Norway) - newly elected
Libor Zajicek (Czech Republic) - newly appointed

[Note - as Stephen Arnold has been elected President of the ICMA he automatically assumes the position of Chairman of the Board of Directors. This, in essence, vacates his elected Board position and Board candidate Libor Zajicek will step into his place for the next two years.

At the ICMA Board Meeting in Thessaloniki, new officers were elected by the Board of Directors. The terms of office for the officers are two years. Listed below the new slate of officers.

Officers of ICMA (two year terms):
President: Stephen Arnold (UK)
Vice-President: Cort Lippe (USA)
Vice-President for Conferences: Allen Strange (USA)
Vice-President for the Americas: Conrado Silva (Brazil)
Vice-President for Asia/Oceania: Shuji Hashimoto (Japan)
Vice-President for Europe: Wolfgang Winkler (Germany)
Secretary-Treasure: Patte Wood (USA)
Recordings Coordinator: Larry Polansky (USA)

Research Coordinator: Keiji Hirata (Japan)
Publications Coordinator: Mary Simoni (USA)
Array Editors: Mara Helmuth (USA),
Joran Rudi (Norway)

Tremendous thanks goes to ICMA Secretary/Treasure Patte Wood for managing this election process.

Allen Strange, President
ICMA

SURROUNDWORKS

“the art of being there”™

Many years ago, the famous acoustician Wallace C. Sabine noted man's primal need to be enveloped by sound: “Since ancient times, man has been fascinated by the echoes and reverberations of cathedrals and caves.” Yesterday's cave is tomorrow's home theater. With the Digital Video Disc's (DVD) discrete multichannel audio specification due to arrive in 1997, surround sound will replace stereophony in the next millennium.

SurroundWorks archives acoustic and electroacoustic music AMBISONICALLY by means of the Nagra 4-channel, 24-bit digital recorder. In order to sample a space ambisonically, a special microphone called the “Soundfield” is employed which contains a tetrahedral array of 4 capsules whose respective outputs are matrixed to produce the following polar responses: an omni pattern, a forward-facing figure-eight pattern, a side-facing figure-eight pattern and an upward-facing figure-eight pattern. Both incidents of sound- pressure and velocity (in 3 dimensions)- are sampled at a single point (A stereo mixdown can be had from the ambisonic master while archiving the 360 degree soundfield until the day when it is commercially practicable to release it in its full surround glory via the DVD). By means of no less than 4 loudspeakers positioned in a symmetrical layout, the full 360 degree horizontal soundfield can be reproduced; however, ambisonic decoders can accommodate any loudspeaker array, eg., pentagon, hexagon, octagon, etc. in this respect, ambisonics differs from all other multichannel systems designed to employ a fixed number of loudspeakers, eg., Dolby 5. 1. Digital and analog decoders are currently available for use in virtual reality presentations, museum exhibits, live sound reproduction, and theme parks.

Though ambisonics is not quite like the real thing, it's close enough to pretend! To quote its principal inventor, mathematician Michael Gerzon, “as it is the first system design based on a complete mathematical analysis of both system theory and human psychoacoustics it is possible to say with some confidence that no system appreciably different from it can exceed its performance in optimal surround-sound decoding, so that no further system change is ever likely to be needed for horizontal encoding.” In short, ambisonic technology provides the most convincing and palpable illusion of “being there.”

Please contact me should you desire further information about ambisonic production or reproduction. I welcome all surround sound enthusiasts to join an internet listserv called “sursound.” Please e-mail me to receive the subscription information.

Jeffrey Silberman
21 Millay Place
Mill Valley, California 94941
(415)-380-8273 FAX: (415)-380-9414
ambisonx@surroundworks.com

Announcements

ICMC 98

CONTACT INFORMATION:

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Fax: +1 (313) 764-1557

Address:

ICMC98 - Conference Management Services

600 E. Madison, , Room G-121

University of Michigan

Ann Arbor, MI

48109-1372

USA

Conference Chair:

Mary Simoni <msimoni@umich.edu>

Current members should have received booklets on the upcoming conference — contact icmc98 for further information.

ICMC COMMISSIONS

—Cort Lippe

Each year the ICMA commissions one or two composers to create works for premiere at the annual ICMC. Following the commissioning guidelines, an international panel of 25 ICMA members was each asked to nominate one or two composers for consideration. An international panel of four judges was then chosen to review works by the final 25 nominated composers. This year's selection of nominated composers was of exceptional quality. The ICMA is proud to announce that the 1998 ICMA Commissions have been awarded to Celso Aguiar of Brazil/USA and Natasha Barrett of the United Kingdom. They have been commissioned to compose works to be premiered at the 1998 ICMC which will take place at the University of Michigan, in Ann Arbor. The ICMA would like to thank the 25 nominators for their contributions, and we are especially grateful to the judges this year who took great time and care in reviewing all of the submitted works: Barry Moon of Australia, Dirk Reith of Germany, Robert Rowe of the USA, and Greg Taylor of the USA.

Celso Aguiar was born in Palo Alto, California, and grew up in Brazil in the town of Salvador, Bahia, where he studied composition with Swiss-Brazilian composer, Ernst Widmer. After his studies he became interested in electronic music and went on to develop a computer-controlled digital synthesizer in Brazil. He is currently a DMA candidate in Composition at the Center for Computer Research in Music and Acoustics where he has been developing software tools for composition with spectral modeling, granular synthesis and sound spatialization. His compositions have been performed in the Americas, Europe and Asia. For ICMC'98, Celso is writing a piece for six instruments (flute, clarinet, percussion, piano, violin and cello) and 4-channel tape.

Natasha Barrett's electroacoustic composition explores acousmatic music, live instrumental performance, dance, film and installation works. Fundamental to her work is a primary concern for musical structure, and in works involving live electronics, a thorough integration of performance and sound resources. Her work has been recognised in international competitions and concerts, and she recently completing a Ph.D in composition at City University, London. The composition Natasha is writing for ICMC'98 is for three instrumental performers and acousmatic sound triggered in real-time by the players.

ICMA BOARD OF DIRECTORS ELECTION

—Patte Wood

Dear Colleagues:

It is with pleasure that I inform you of the results of the recent ICMA Board of Directors election. I would like to thank everyone for taking the time to vote and to thank the candidates for running. We had a very strong slate of candidates and the voting was very close. If you found anything problematic about the election procedure, please let me know. We would like to make this process smoother in the future.

Board members are elected for four year terms every two years. That means that every two years approximately half the board is up for election or re-election. Board members can serve up to two consecutive four year terms.

This election marks the beginning of the newly reorganized ICMA Board of Directors which is now made up of 6 Regional Directors (2 each from the Americas, 2 each from Asia/Oceania, and 2 each from Europe) and 5 At-Large Directors (can be from any region).

The ICMA Board hopes that this new international board will be able to address the concerns of all ICMA members world wide. The new board is listed below. The Regional Directors are charged with focusing their efforts in their regions. Please work with them so that particular concerns in your regions can be addressed and the ICMA can effectively represent you.

At the ICMA Board Meeting in Thessaloniki, new officers were elected by the Board of Directors. The terms of office for the officers are two years. Listed below are the new board, the new slate of officers, and the election results.

If you have any questions or concerns, please let us know. Only by hearing from you can we strive to make ICMA a better organization to serve you. You can reach the ICMA Board by emailing to the following address:

icmabd@sndart.cemi.unt.edu

Best regards,
Patte Wood
Secretary/Treasurer

ICMA Board of Directors as of January 1, 1998

At-Large Directors
Perry R. Cook (USA) - continuing
Cort Lippe (USA) - re-elected
Larry Polansky (USA) - continuing
Miller Puckette (USA) - newly elected
Mary Simoni (USA) - continuing

Americas Regional Directors
Mara Helmuth (USA) - newly elected
Russell Pinkston (USA) - newly elected

Asia/Oceana Regional Directors
Lydia Ayers (HK) - newly elected
Keiji Hirata (JAPAN) - newly elected

Europe Regional Directors
Stephen Arnold - newly elected
Joran Rudi - newly elected
Libor Zajicek - newly appointed
[Note - as Stephen Arnold has been elected
President of the Board of Directors for the
next two years, Libor Zajicek will step into
his place for the next two years.]

Officers of the Board of Directors of ICMA
(two year terms)
President: Stephen Arnold (UK)
Vice-President: Cort Lippe (USA)
Vice-President for Conferences: Allen
Strange (USA)
Vice-President for the Americas: Conrado
Silva (Brazil)
Vice-President for Asia/Oceana: Shuji
Hashimoto (Japan)
Vice-President for Europe: Wolfgang
Winkler (Germany)
Secretary-Treasurer: Patte Wood (USA)
Recordings Coordinator: Larry Polansky
(USA)
Research Coordinator: Keiji Hirata (Ja-
pan)
Publications Coordinator: Mary Simoni
(USA)
Array Editors: Mara Helmuth (USA), Joran
Rudi (Norway)

ICMA Election Results - These are all four
year terms beginning January
1998.

At-Large Directors (two elected)
141 voting

*Cort Lippe 48
*Miller Puckette 36
Ricardo Dal Farra 33
Joel Chadabe 31
David Jaffe 26
Jon Appleton 24
Joann Kuchera-Morin 22
Kristine Burns 19
David Hirst 18
Paul Koonce 16
Chris Koenigsberg 8

Americas Regional (two elected)
78 voting

*Mara Helmuth 38
*Russell Pinkston 28
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Larry Austin 25
Alicyn Warren 24
Fernando Lopez-Lezcano 24
Juan Reyes 16

Asia/Oceana Regional (two elected)

*Keiji Hirata 18
*Lydia Ayers 15
Andrew Brown 12

Europe Regional (two elected)

*Joran Rudi 27
*Stephen Arnold 23
*Libor Zajicek 19

[Note: As Stephen Arnold has been elected
President of the ICMA by the Board for the
next two years, Libor Zajicek will step into
his place as European Regional Director for
those two years.]

NEW EDITORS (AND EMAIL AD- DRESS!!!!!!) FOR ARRAY

A big welcome to the new editors of Array,
from the next issue onwards, Mara Helmuth
and Joran Rudi.

THE NEW EMAIL ADDRESS FOR AR-
RAY IS:

ARRAY-ed@notam.uio.no

Please note that all submissions and queries
regarding Array, and all CD submissions,
should be made via this address.

Weekend Tutorial and Conference on Sound Synthesis and Processing:

Focus on SuperCollider

27 February - 1 March 1998
Santa Barbara, California USA

Sponsored by the
Center for Research in Electronic Art Tech-
nology (CREATE)
Department of Music
University of California, Santa Barbara

SuperCollider is a flexible software envi-
ronment for the synthesis and processing of
sound and the generation of computer graph-
ics. It can be driven by a score, or operate in
real-time on Power Macintosh computers
under graphical, mouse, or MIDI control.
SuperCollider can also be used for algorithm-

Winter 1997

mic composition with real-time synthesis
or for real-time effects processing. The
system contains its own interface builder.

CREATE is sponsoring a weekend tutorial
and conference on Sound Synthesis and
Processing with SuperCollider. The pro-
gram will begin with an optional tutorial
day on Friday 27 February, taught by
Stephen T. Pope and based on his book
"Sound and Music Processing in
SuperCollider." Saturday and Sunday ses-
sions (28 February and 1 March) will fea-
ture presentations by CREATE staff as well
as contributed papers. Ample opportunity
for exchange of information will be pro-
vided, and computers will be available for
demonstrations.

The special invited guest is James
McCartney, inventor of the SuperCollider
program. Mr. McCartney will speak about
the history of SuperCollider, plans for its
future evolution, and will field questions
about SuperCollider techniques.

We invite participation by attendees and
presenters. Please send abstracts on any
topic related to synthesis and sound pro-
cessing with SuperCollider, including:
musical applications, synthesis techniques,
graphics and sound, control strategies, al-
gorithmic composition, novel interfaces,
and pedagogical applications. We will ac-
cept abstracts by email, fax, or the post.

—The deadline for abstracts to be received
is Friday 9 January 1998—

Notification of acceptance will be sent via
email within two weeks of the deadline.

Those interested in participating as attend-
ees (not presenters) should contact us to
register and receive an information pack.
Registration at the door will be accepted.

Registration fees:
Tutorial + conference US\$ 160
Conference only US\$ 90
Tutorial only US\$ 90

Make checks payable to "Regents of the
University of California, CREATE"

Organizers: JoAnn Kuchera-Morin,
Stephen T. Pope, Curtis Roads

Contact:
CREATE, Department of Music

Announcements, cont.

University of California, Santa Barbara CA
93106 USA
Telephone (805) 893-8352
Fax (805) 893-7194
Email: create@create.ucsb.edu

Announcing GENERATOR, a new real-time modular software synthesiser

From: Michael Kurz <kurz@gigant.kgw.tu-berlin.de>

What is GENERATOR ?

A polyphonic modular synthesiser
A synthesizer construction kit
A virtual analog synthesiser
A digital synthesizer
An evolving, upgradable system
A professional sound design system
An easy-to-use environment for learning about synthesis
A cost effective software solution
All this and more.

GENERATOR runs on the Windows 95 platform and is powerful tool for those interested in experimenting with audio algorithms in real time.

A demo version of GENERATOR is now available for downloading from <http://www.native-instruments.de>. It requires a Windows 95 PC with a fast Pentium CPU and a standard multimedia soundcard.

Here's a summary of what GENERATOR is all about:

Using GENERATOR's powerful graphical editor, basic modules can be interconnected freely to form complex sound generation architectures. In this way both familiar subtractive or FM synthesis as well as experimental methods can be realised. Among the accompanying preset files are emulations of analogue synths and experimental sound processors. The built-in module library contains everything from common oscillators and resonant filters to esoteric kinds of distortion. Whereas conventional synthesizers only let the user change the parameter settings that the manufacturer has made available for editing, in GENERATOR any part of the sound generator can be rewired by the user. For example, any parameter can be set to be

modulated by any MIDI event, giving unprecedented control. All sound generation is in real time so you immediately hear the result of any changes you make. GENERATOR is both polyphonic and multitimbral and sound output is through a high-quality low-latency DA-converter card which is included with the software. It is also possible to import WAV-files for processing in GENERATOR and any produced sound can be recorded and exported to a WAV-file.

Full details are available on the web-site at <http://www.native-instruments.de>

Contact:

Native Instruments, Tel/Fax: 0049 30 691 49 66
E-mail: info@native-instruments.de

Please mail me with any comments or questions.

—Michael

Michael Kurz (kurz@gigant.kgw.tu-berlin.de) */
Sound synthesis developer, Native Instruments */

NEW BOOK ON MIDI

MIT Press published "Beyond MIDI: The Handbook of Musical Codes" on August 11 1997. The book is a compendium of methods of representing music for applications in sound, analysis, notation, and musical interchange. The contributions of more than 40 authors are based on a common set of musical examples.

Beyond MIDI has its own Web page:
<http://mitpress.mit.edu/book-home.tcl?isbn=0262193949>

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<http://ccrma-www.stanford.edu/CCARH>

NEW EDITOR FOR COMPUTER
Winter 1997

MUSIC JOURNAL

From Stephen Pope
stp@create.ucsb.edu

Starting with issue 21.3, "Computer Music Journal" has a new name at the top of its masthead. After eight challenging and rewarding years, I am passing the editorial baton to Douglas Keislar. Associate editors Anne Deane and Curtis Roads will assist him in putting the Journal together. I will remain involved as the editor of the Computer Music Journal Web site, and look forward to having the time to contribute articles and reviews in the future.

I would like to thank all those members of the community who enabled me to succeed in this role, and have contributed to make "Computer Music Journal" the central voice of our community. I must also express my deepest gratitude to Janet Fisher and June McCaull of MIT Press Journals management, and to Sally Gregg and Laura Horton of the production staff, for putting so much energy (and patience) into making the Journal a success and maintaining the quality standard that was set under the leadership of my predecessor Curtis Roads. Lastly, I must thank Curtis for entrusting this job to me, and for his constant and constructive guidance and collaboration since we started working together as editors in 1988.

The past eight years have seen many changes in our field (for a demonstration, just have a look at any issue from Computer Music Journal Volume 13), and the Journal's editors have worked to ensure that the Journal's format and delivery medium keep pace with this change. My main projects in this area have been the increase in page count of the Journal, the Computer Music Journal site on the World-Wide Web and the annual Computer Music Journal compact discs.

The new editor is Douglas Keislar, who has been an associate editor since 1994. To the position, Doug brings a keen editorial craftsmanship, as well as a thorough understanding of the diverse musical and technical facets of our field. While his undergraduate training focused on composition, he delved into computer programming and psychoacoustics to obtain his Ph.D. in Music from Stanford University's Center for Computer Research in Music and Acoustics (CCRMA). Doug has worked as a guest co-editor for Perspectives of New Music, and
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as a software engineer and technical writer for NeXT, Yamaha, and Muscle Fish, where he is a founding partner. I am delighted to be placing the Journal under his capable leadership.

Anne Deane is our new associate editor; she holds degrees from Oberlin Conservatory and the University of California at Santa Barbara (UCSB), where she received her PhD in composition and has taught computer music courses. Her acoustic and computer music works are performed worldwide, such as at the International Computer Music Conference in Hong Kong. Her tasks at Computer Music Journal include overseeing manuscript processing and our new development program, Friends of CMJ. In spearheading this new initiative, Anne brings more than ten years experience in public relations and development to the Journal, including her current position as Vice President of The Walden School for young composers.

Associate editor Curtis Roads will continue in his role as review and product announcement editor. In closing, I would like again to thank all of the authors, referees, readers, and collaborators who have made Computer Music Journal so interesting to edit since 1988, and to wish the best to the new editors!

Stephen Pope
Associate Editor, Computer Music Journal

“MikroPolyphonie” Issue 3, January to June 1997
(Potpourri)

<http://farben.latrobe.edu.au/mikropol>

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ric Humbertclaude
The Challenge of Tristan Murail's Work
(Translated by Jacqueline Rose)

Review
Review by Carlos Palombini.
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Electroacoustic Music: Histories and Aesthetics.

Floralvaldo Menezes, editor

Exhibit
The Bandt Exhibition.
Material provided by Ros Bandt

The theme of issue 4 will be “Theories on Theories”

MikroPolyphonie is a refereed online journal published on the World Wide Web. It aims to encourage scholarly analysis and discussion in any genre of contemporary music making and research.

The journal is a continuous publication in that articles are published when they are received and reviewed. Each Issue presents a target topic as a discussion thread. Threads will last for a period of six months with articles contributed and published over this period. Feedback on articles can be emailed from readers, and then published quickly in proximity to the target articles.

contact:
Joseph Giovinazzo
(J.Giovinazzo@latrobe.edu.au)

**FINALLY AVAILABLE: THE *
VIRTUREAL TON 1.0 ***

Info from “sha”
(a877107@uniet.univie.ac.at)

ONLINE-FORUM OF DISCUSSION
CONCERNING ‘VIRTUALACOUSTICS
/ ACOUSTIC VIRTUALITY’ AND ITS
REGULAR DISTRIBUTION IN THE
PRINTED MEDIA

The ‘Virtureal Ton’ is a Collection of different Approaches, Ideas and Subject Matter concerning “Akustische Virtualitt”.

The Music Magazine ‘TON’ has been published in print quarterly since 1992 (by the ISCM - the Austrian Section of the International Society for Contemporary Music). 1996 the ‘VIRTUREAL TON’ was published in Print as well as Online for the first time in Cooperation with the ORF-kunstradio WWW-Team. Thus an open and expandable Forum of Discussion was established, which is to be continually updated with new Subject Matter. In Addition to that, the Essence of the current Discussion is going to be published in Print annually.

Winter 1997

Composers, Sound Architects and Designers, Sound Installation Engineers, Acoustic Science Researchers, Music Theorists, Software and Hardware Designers from all over the World were - and still are - called to transmit their Contributions, Comments and Links!

There are 4 main Sections: Art Works, Auditory Perception, Sound Technology, Swimming Pool.

You can find the basic Ideas, the worldwide Response and the current State of Discussion at

http://www.thing.at/thing/orfkunstradio/VR_TON/

* sha. *
aka andreas rodler
new e-mail-address:
<a8771079@unet.univie.ac.at>

THE VIRTUAL COLONY

The Concept

The concept was simple, yet brilliant. How to best utilize the World Wide Web to offer an advertisement-free colony for artists to congregate and share their respective works. Instead of focusing on a particular medium, the idea was to bring together artists (many of whom only consider their work an important pastime in which they may enrich their own lives, rather than a quest for outside recognition) which offers a variety of endeavors designed to please and enrich the visitor, be it music to the ears, words from the mouths of wise babes, visual feasts designed to take the view beyond their own world and eyes, or handicrafts to be held and cherished, a single strand consistently appears. A gesture of honesty and the search for simple truths seem to bind artists together, regardless of form of expression.

The Result

The result is The Virtual Colony (<http://www.virtualcolony.com>), an elegantly crafted web site designed to offer visitors a feast for all of their senses. All original works from artists of varying renown, come enjoy high quality images, Real Audio music, poetry, and much more. In merely a few months, contributors to the Colony have grown from four individual artists to well over a dozen artists. And as word

Announcements, cont.

spreads of the existence of this burgeoning melting pot of artistry, remember to bookmark this site, one of the premiere and fastest evolving spots on the Internet!

(info: duane@creative.net)

6th. ANNUAL FLORIDA ELECTROACOUSTIC MUSIC FESTIVAL

Reported by Martin Alejandro Fumarola
maralefu@goedel.filosofia.uncor.edu

During April 10, 11, and 12, 1997 the "VI Annual Florida Electroacoustic Music Festival" was held in the city of Gainesville (USA) organized by the Department of Music of the University of Florida in Gainesville. The Director of the Florida Electroacoustic Music Studios (FEMS), Dr. James Paul Sain, was the Festival Chairman.

As usual in previous editions of the AFEMF there was a guest "Composer-in-Residence", and this year's was Jon Appleton, one of the leading proponents in the field of electroacoustic and computer music and Director of the Graduate Program in Electroacoustic Music at the Dartmouth College (USA).

In previous years, some of the guest composers were: Hubert Howe Jr., Cort Lippe, and Gary Lee Nelson.

There were five concerts realized in the University of Florida's Center for the Performing Arts, which is the hub for cultural events in North-Central Florida. Several "monsters" of the ea/cm community like Cort Lippe, Jon Appleton, Allen Strange, Larry Austin, Ricardo Dal Farra, Robert Normandeau, and Gary Lee Nelson had their music performed. One concert was devoted to FEMS Students, in which the piece "Unraveling Taffeta" by Neil Flory was interesting. Most of the music selected belonged to composers of the United States, including to some important ones such as James Paul Sain, Elizabeth Hinkle-Turner, and Paul Rudy. Some of the Non-North American composers who were selected include: Adrian Moore, Javier Garavaglia, Martin Fumarola, and Kim Hedas.

Jon Appleton presented two excellent pieces: *Newark Airport Rock*"(1969) and *San Francisco Airport Rock*"(1996), both based on recordings of answers to questions made by him to his fellow passengers about their impressions and knowledge of electronic music in the two aforementioned airports. In the earliest piece the electronic part was produced by a Moog synthesizer whereas in the latest one there is a MIDI based accompaniment. Something unusual in ea/cm concerts was the work "Yamagata" by Marc Shahboz, a graduate student at the University of Florida's College of Fine Arts Electronic Intermedia Program. In that work, two Samurais fight using Japanese swords. The sensors located inside the shinai (bamboo practice sword) measure multi-axis acceleration. The data from the shinai is then translated using Max to create sound. The sword was accompanied by a rich mixture of live vocals, tape, and video.

There was one paper session, which included the following 3 papers: "Score Following with a CD ROM Drive" by Allen Strange, "As I Understand it: Group Psychology (Felix Guattari) and Technological Isolation (Electro-Acoustic Music Composition and the Unabomber)" by Mary Lee A. Roberts, and "New Studio Report: The Music Technology Center of the Florida International University School of Music" by Elizabeth Hinkle-Turner

The Home Page of the 6th. Festival can be browsed in the following URL:
<http://nervm.nerdc.ufl.edu/~fems/emufest6.html>
or <http://emu.music.ufl.edu/emufest6.html>

There is also a Home Page of its predecessor, the 5th. Festival, whose URL is: <http://www.nerdc.ufl.edu/~fems/emufest.html>

Jon Appleton's Home Page can be found at: <http://onyx.dartmouth.edu/~appleton/appleton.html>

ICMA European email address:

The email address for Europe is now
icma.europe@aec.at
Postal address:
AEC -ICMA. europe
c/o Wolfgang Winkler
Hauptstr. 2
A - 4040 Linz
Austria, Europe

Email will be forwarded also to Wolfgang Winkler's personal address:
wowi@ping.at.

News about the ars electronica festival and the prix ars electronica is available at
<http://www.aec.at>

Wolfgang Winkler, A- 4040 LINZ Austria,
Jahnstrae 9/II
Phone and Fax 0732 730446

A CCRMA CONCERT IN BUENOS AIRES: REPORT BY CARLOS CERANA

reported by Carlos Cerana
(ccerana@mail.retina.ar)

A concert with works composed at Stanford was held on October 24 in the Recoleta Cultural Center of the City of Buenos Aires, as part of the XIII National Meeting of Electroacoustic Music and Media, organized by the Argentine Federation of Electroacoustic Music (FARME) with the cooperation of LIPM and the FMyT Foundation. The visiting team of CCRMA was integrated by its director, Chris Chafe, and by two Argentine composers and members of FARME presently working at Stanford: Fernando Lopez Lezcano and Juan Pampin.

House of Mirrors by Fernando Lopez Lezcano, is a poetical piece, sometimes evocative and with specially dramatic moments. It was performed by the author at the radio baton, using PadMaster -a real time improvisation environment developed by himself- for controlling MIDI instruments, sound files playback and quadrasonic specialization. Chris Chafe played his *Push Pull*, for cello and computer. It is an expressive piece in which the computer dialogues with the performer and "amplifies" his instrumental gestures.

Other works presented were: *You lan*, by Kui Dong, for computer generated tape obtained by manipulation of the sounds of ancient Chinese instruments; *All blue, I write with a blue pencil, on a blue sky* by Celso Aguiar, a tape piece with inharmonic transformation of cello sounds; and Andre Serre's "Couleurs de Sable" for cello and four channel tape, an evocation of the sand paintings of the Navajo Indians that was played by Chris Chafe. The end of the evening was the intense *Metal Hurlant*. In this piece Pampin expresses the quintes-

ICMA ARRAY V17, N3

sence of metal, with the interaction of a percussionist (Fabian Keoroglanian) playing metal instruments, and of computer generated sounds. The careful blend of both parts shows the deep insight of metal sounds achieved by the author by their spectral analysis.

CCRMA's VISIT TO ARGENTINA . (II)

Report by Fernando Lopez-Lezcano and Juan Pampin (CCRMA)

Last October composers Chris Chafe, Fernando Lopez-Lezcano and Juan Pampin - from CCRMA, Stanford University - visited Argentina invited by LIPM (Music Research and Production Laboratory) and took active part in the Electroacoustic Music Week. Within the XIII National Meeting for Electronic Music and Media, the Electroacoustic Music Week takes place in the Centro Cultural Recoleta, Buenos Aires, Argentina. This event, organized by FARME (Argentine Federation of Electroacoustic Music) with the collaboration of LIPM and the FMyT Foundation, serves as a forum for concerts and technical presentations by composers and researchers from all over Argentina.

The events included five evening concerts, two special afternoon concerts with winning pieces from the 1996 SonoClip Contest and student pieces from the Electroacoustic Music Composition program of the University of Quilmes, and four sessions of technical presentations.

The concerts included works by: Monday: Edgardo Martinez *Ciudades Espectrales*, Ricardo Ventura *Neuquen*, Eduardo Checchi *Soplosop*, Martin Fumarola *Argos*, Teodoro Cromberg *A-noranza de lo dionisiaco*, Gustavo Alcaraz *Vidrios*, and the participation of the improvisation group "Compañia de Musica Imaginaria", Cecilia Candia, Ana Foutel, Alejandro Labastia, Miguel Luchilo, Javier Mariani and Marcelo Cavalli Real time composition. Tuesday: Hugo Druetta *Setenta Noches*, Jorge Villar *Blue Diamond*, Jorge Rapp *Tiempos Virtuales*, Martin Liut *Estudio No.1, Homenaje a los cortadores de cinta*, Pablo Cetta *...y sin embargo te quiero* and Jorge Sad / Marcelo Moguilevsky *Raiz cuadrada*. Wednesday: Ricardo Dal Farra *Ashram*, Eleazar Garzon *Sin titulo*, Francisco Kropfl *Winds*, Daniel ICMA ARRAY V17, N3

Schachter *...raices lejanas, tal vez*, Carlos Cerana *A mano alzada* and Gonzalo Biffarella *Estudios y arpeggios*; Nora Garcia, piano. Thursday: Jose Mataloni *Coralian II*, Raul Lauret Pereyra *Song for care*, Daniel Cervantes *Intangibles visiones*, Luis Maria Rojas *Iluminado por la duda*, Patricia Rabiossi *Recuerdos*, Claudio Garbolino *Canon gitano*, Sergio Poblete Barbero *Los pliegues del cielo* and David Horta *Cuatro a babor*; Paralelo 33 percussion ensemble.

On Friday, a special concert with works by CCRMA composers included works by: Kui Dong *Youlan*, Fernando Lopez-Lezcano *House of Mirrors*, Andre Serre *Couleurs de Sable*; Chris Chafe, cello, Celso Aguiar *All blue, I write with a blue pencil on a blue sky*, Chris Chafe *Push Pull* and Juan Pampin *Metal Hurlant*; Fabian Keoroglanian, percussion.

Technical papers were presented by Patricia San Martin (Artistic Education and Technology), Luis Maria Rojas (Textures 3.0), Carlos Cerana (Lightning and Max, gestural control of MIDI instruments) and Gonzalo Biffarella (presentation of his new CD, *Mestizaje*).

During this visit, the CCRMA team also gave a couple of lecture presentations in the University of Quilmes and University of Moron (readers beware, "Moron" is a city right next to Buenos Aires! :-). The lectures included "Algorithmic Performance" by Chris Chafe, "Interactive Improvisation" by Fernando Lopez-Lezcano and "Spectral Modelling and Composition" by Juan Pampin.

Lectures and concerts were followed by late night (and by now traditional) pizza dinners with beer enhanced digressions into the state of tango, electronic music and digital media, rounding up an already memorable visit.

The CCRMA Team

Chris Chafe (cc@ccrma.stanford.edu),
Fernando Lopez-Lezcano
(nando@ccrma.stanford.edu),
Juan Pampin (juan@ccrma.stanford.edu)

StochGran for SGI

A new version of Mara Helmuth's granular synthesis software is available at <http://meowing.ccm.uc.edu/> under music software.

NEW CDs

Second ICMA Commission Awards CD Released

CDCM: Consortium to Distribute Computer Music and the ICMA announce the recent release on Centaur Records compact disc (CRC 2347) of Vol. 25 in the CDCM Computer Music Series, "ICMA Commission Awards—1994-96". This is the second compact disc release of ICMA commissioned works in the Series, the first being Vol. 21 of the CDCM Series, featuring works commissioned in 1992-93.

The new CDCM cd includes works by five composers: Jonty Harrison (UK), Ricardo Dal Farra (Argentina), Michael Matthews (Canada), Stephen Montague (UK), and Frances White (USA). Specifics of the composers, works, performers, recording venues, and producers follow:

1 Stephen Montague, "*Silence: John, Yvar and Tim*" (1994), for prepared string quartet, prepared piano, real-time sound processing and antiphonal DAT tapes; performed by the Smith Quartet with Philip Mead, prepared piano, and David Sheppard, live-electronics and sound diffusion. Recorded, January 1996 at the the Performance Space Recording Studio, The City University, London, England; Montague, producer; David Sheppard, Sound Intermedia, London, editor and sound engineer.

2 Jonty Harrison, *Unsound Objects* (1995/ rev., 1996), computer music on tape. Realized in the composer's studio and the Electroacoustic Music Studios of The University of Birmingham, England.

3 Michael Matthews, *In Emptiness, Over Emptiness* (1994), for soprano and computer music on tape; performed by Theres Costes, soprano. Recorded, January, 1997, at St. John's College Chapel, University of Manitoba, Winnipeg; Matthews, producer; Clive Perry, sound engineer.

4 Ricardo Dal Farra, *Tierra y Sol* (1996), computer music on tape. Realized in the composer's studio, Buenos Aires, Argentina.

5 Frances White, *Birdwing* (1996), for shakuhachi and computer music on tape; performed by Tomie Hahn, shakuhachi.

Announcements, cont.

Recorded, November, 1996, at Taplin Auditorium, Princeton University. Tape realized at the Winham Laboratory, Princeton University; White and James Pritchett, producers; James Moses, recording engineer; Robert Ferretti, assistant engineer.

The producers of the cd were Larry Austin and Paul Lansky. The cover art, Music Reflection, was rendered by Sachiko Murata, Sonology Department, Kunitachi College of Music, Tokyo. The recording was sponsored and supported by a recording grant from the International Computer Music Association, Inc., Allen Strange, President, and Paul Lansky, Recordings Coordinator. (Please see the CDCM advertisement in this issue for orders or email cdcm@sndart.cemi.unt.edu)

NEWS AND INFORMATION FROM O. O. DISCS

O. O. DISCS, INC. is pleased to announce the release of OO#32, WALLS OF SOUND with music by John Cage, James Tenney, Joseph Celli and Phill Niblock, performed by saxophonist/composer Ulrich Krieger. The disc features 64:00 minutes of very thick textural music with dense, multi-layered over-lays of sound. Krieger feels that, "... this is a kind of music that is truly American. It started with composers like LaMonte Young with a profound devotion to sound, putting texture and sound as the primary compositional interest in contrast to the traditional European concern for basic compositional parameters of rhythm, melody, harmony, structure...."

Cage's FOUR5 is recorded here so that there are 20 layers of saxophone resulting in a work that is "... humming and throbbing as a result of the minute pitch differences...." James Tenney's SAXONY and Joseph Celli's VIDEO SAX use the complete sax family and Niblock's DIDJIRIDOOS AND DON'TS has the didjeridoo with tape.

James Pritchett's provocative essay accompanying the disc begins with, "Sounds that are continuous: refrigerators, power transformers, computer fans, fluorescent lights; the heat pump, the attic fan, the neighbor's air conditioner; the spring peepers; distant traffic, tornado sirens, high-flying jets; a

tree full of grackles, another full of starlings, and another full of house sparrows; lawn mowers and leaf blowers. A continuous sound defines the space that it occupies; it is not just an acoustic phenomenon. It has a center and a radius and intensity curve that peaks at the center and trails off to the edges. Place two drones into a space and then you have the interpenetration of their domains."

We hope you will also visit the new open dialogue FORUM we have added to our web site and an updated NEWS section all located at:

<http://www.hear.com/o.o/>

O. O. DISCS, INC. is an independent sound-art organization, striving to release 'sound art' for the home listener. We work hard to develop good graphics and intelligent writing to accompany the music. Visit us at our world wide web site and get information about the complete catalog of over thirty releases of new music, composers' biographical information, video releases, late breaking news and updates.

O. O. DISCS, INC. 261 GROOVERS AVE., BLACK ROCK, CT. 06605-3452 USA
voice: 203-367-7917 fax: 203-333-0603
e-mail: Cellioo5@aol.com

NEW CD BY ALISTAIR RIDDELL

The prize for the most retro-trendy CD goes to the new CD by Australian composer AMR (Alistair Riddell) whose latest offering comes packaged as a 5.5 inch floppy disk wearing designer black.

A variety of pieces, some familiar from previous ICMCS. More information from

<http://www.alphalink.com.au/~amr/42/>

SONIC CIRCUITS V CD

A new CD of electroacoustic music

(Innova 114 - American Composers Forum)

"Each year the American Composers Forum curates a program of electro-acoustic music by composers around the world. The audio part of the program is reproduced on CD and then sent out to venues and radio

stations to supply ready-made programming materials. In this way composers, performers and listeners alike catch an up-to-date glimpse of what is being done at the edges where music, minds and electronics meet"

CD produced by Philip Blackburn

Works selected:

Lawrence Fritts *Minute Variations* Robert Normandeau *Le renard et la rose* Eirik Lie 112 Par Sko Colby Leider *Veni Creator Spiritus* Mike Olson *Office Furniture from Outer Space* Orchid Spangiafora *Radios Silent* Michael Schell *Jerry Hunt: Song Drape 2* Beatriz Ferreyra *Soufle d'un petit Dieu distrait* Katharine Norman *Hard Cash (and small dreams of change)*

For further information on buying the CD, and on the ACF:

<http://www.composersforum.org>

DIFFUSION i MeDIA

DIFFUSION i MeDIA's site has been vastly updated: new CDs, new books; sound excerpts in RealAudio; graphic scores, program notes->

<http://www.cam.org/~dim/>

CDs from CEC

The following CDs, PRESENCE (2CDs) and DISContact! II (2CDs) are now available at the CEC.

PRESENCE is a compilation of 23 electroacoustic works, by composers from around the world.

DISContact! II is a second pressing of the compilation of works by CEC members, initially released in 1995. It contains 51 pieces, each no longer than 3 minutes, fine examples of the electroacoustic music of CEC members.

Each set is available for \$15 Cdn inside Canada, or \$15 US each outside Canada. Prices include postage. Please make check or postal order payable to the CEC.

For more informations on the CDs, the composers, the works, visit the Website at: http://www-fofa.concordia.ca/cec/CD_order.html

Yves Gigon Administrateur / Administrator
CEC ygigon@microtec.net

<http://www-fofa.concordia.ca/cec/home.html> 1908 Panet #302, Montreal QC
Canada H2L 3A2

NEW CD BY WAYNE SIEGEL

DEVIL'S GOLFCOURSE and other works
for musicians and computers New CD with
four works by Wayne Siegel

"A strong selection of work - recommended
for those who enjoy Michael Nyman,
Michael Torke, and the range of
minimalism." FANFARE MAGAZINE
(October, 1997)

[http://www.daimi.aau.dk/~wsiegel/
CD97.html](http://www.daimi.aau.dk/~wsiegel/CD97.html)

1) *Devil's Golf Course* The Aarhus Sym-
phony, for orchestra, synthesizers & drums,
Gregory Rose, conductor

2) *Jackdaw* Harry Sparnaay, for bass clari-
net & computer bass clarinet

3) *Eclipse* Singcircle (London) for four
voices & electronics, Gregory Rose, con-
ductor

4) *Tracking* The Smith Quartet (London),
for string quartet & computer

Available internationally through Marco
Polo Distribution and Naxos Records Inc.
Da Capo Records, 1997 (release no.
8.224069)

For further information contact:
dacapo@image.dk or see:
[http://www.daimi.aau.dk/~wsiegel/
CD97.html](http://www.daimi.aau.dk/~wsiegel/CD97.html)

International Computer Music Associa- tion CD-ROM Anthology

Call for Works

The International Computer Music Asso-
ciation is seeking innovative intermedia
works for inclusion on a CD-ROM anthol-
ogy. The CD-ROM will be distributed by
the ICMA and guest-curated by composer/
sound artist Brenda Hutchinson in collabo-
ration with ICMA Recordings
Coordinatory.
ICMA ARRAY V17, N3

For this project, the ICMA is interested in
works of about 100 Megabytes or less, for
the Macintosh platform. Submitted works
must be complete and executable.

Deadline for submission is February 1,
1998.

The ICMA plans to release the CD-ROM at
ICMC '98, in Ann Arbor, Michigan, where
it will be given to all conference registrants.
It will later be distributed by the ICMA.

Please send CDs of submitted works to:

Larry Polansky
ICMA Recordings Coordinator
Department. of Music
Dartmouth College, Hanover, NH 03755
USA

Composer/artists must be ICMA members
to be included on the anthology (but not to
submit works). For further information, see
the ICMA Website at:

<http://music.dartmouth.edu/~icma>

Musica Nova Radio Show

from Andrew Czink

Musica Nova is a one hour weekly radio
show dedicated to new acoustic and electro-
acoustic music on CFRO 102.7, Vancouver
Co-op Radio. I'd like to reach out further
than the local scene and feature works from
all over the world. I can accept DATs,
analog cassettes and CDs/CD-Rs. Please
also send a program note and perhaps some-
thing about yourself so that I can say some-
thing useful about you. The listeners seem
to be more interested in insights into your
creative process than what awards and com-
missions you've received so if you have
something written along those lines, that
would be most excellent.

I do also occasionally get calls from con-
cert producers looking for interesting mate-
rial. I'm assuming that everyone would be
happy if I passed along a phone number
and/or contact address if that were to
happen, but if not, then please let me know.

Address all packages to:

Andrew Czink
Musica Nova
Vancouver
Co-op Radio
337 Carrall St.
Vancouver BC
V6B-2J4

Winter 1997

CANADA

I'd also be happy and interested in meeting
anyone who comes out to Vancouver, espe-
cially if it's in conjunction with a concert or
tour. Put me on your mailing list and I can
promote the concert on my show and if
you're available we could do an on-air
interview while you're out here.

Looking forward to your submissions,
Andrew Czink (Andrew_Czink@sfu.ca)

RADIO SHOW: FRONERAS DEL SILENCIO

The Argentinian composer Alejandro
Iglesias-Rossi is curating a new radio pro-
gram called "Fronteras del Silencio" (Bor-
ders of Silence), which is broadcasted once
a week at the radio of the city of Buenos
Aires(Argentina).

All kind of contemporary music related to
spirituality is welcome (the subtitle of the
radio program is "spirituality and contem-
porary music").

Send DATs, CDs or high quality cassette
recordings to:

FRONTERAS DEL SILENCIO
c/o Alejandro Iglesias-Rossi
14 de Julio 1212
RA-1427 Buenos Aires
ARGENTINA

Alejandro Iglesias-Rossi is one of the most
salient composers in the young generations
in Argentina. His electroacoustic piece
Angelus won the first prize in the Interna-
tional Rostrum of Electroacoustic Music in
1996. He was member of the jury of the
1992 World Music Days organized by the
ISCM. He has been very skillful in produc-
ing electroacoustic music combining Asian
instruments with live electronics.

Information submitted by:
Martin Alejandro Fumarola
maralefu@goedel.filosofia.uncor.edu

CALL FOR SUGGESTIONS/PIECES- DARTMOUTH COLLEGE (USA)

I am compiling a catalogue of electro-acous-
tic compositions that in some way use ele-
ments (samples, structure, instrumentation,
etc.) from Renaissance, medieval, or pre-
medieval music (e.g., Ingram Marshall's

Announcements, cont.

Gradual Requiem and Neil Rolnick's *Sanctus*). I would greatly appreciate your suggestions and comments. If you have a piece that fits this category and would like to send a recording and program notes for inclusion in the catalogue, it would be permanently housed in the Dartmouth College Electro-Acoustic Music Library and catalogued as part of the collection.

Thank you,

Colby Leider
Bregman Electronic Music Studio
Dartmouth College
(Colby.N.Leider@Dartmouth.edu)

CALL FOR PIECES - UNIVERSITY OF GLASGOW

from:
Stephen Arnold,
Director of the Computer Music Studios,
Department of Music,
University of Glasgow,
14 University Gardens,
Glasgow G12 8QH,
Scotland - UK
Tel.: +44 141 330 5509
FAX: +44 141 330 3518
email: s.arnold@music.glasgow.ac.uk

I am running a short series of tape concerts using a small but high-quality diffusion system (8-channel, based on ATC monitors). I would like to invite you to send us any recent tape works which you have made so that we can include them.

The concert series is a public part of a course on sound diffusion which I run for students who study Electronics and Music. The aim of the course is to get them to engage directly with as wide a range of electroacoustic music as possible, and to learn the whole process of staging concerts, including designing and documenting diffusion strategies suitable to the individual works which they have selected for their programmes.

We have been running this course for 3 years, and it seems to work pretty well. From a purely audio point of view, the standard of presentation is often higher

than what one encounters in allegedly professional concerts.

The concerts are short - maximum of 35 minutes playing time. The programmes need to consist of at least two works, but preferably three, yet not more than 5 works. This means that very long works are not easy to accommodate. Distinctive short works are very welcome - for some reason they are hard to come by! We are hoping to have predominantly works composed over the last three years. As we have no money to put into these concerts, we have reluctantly had to rule out works involving live performers.

If you have some things you think would be suitable, please send me a DAT with them on (see contact details below). If you could include a short biography and programme note, all the better. (That could come via email.)

SONICARTSNETWORK (UK) SEEKS SUGGESTIONS

Sonic Arts Network is planning a National Centre for the Sonic Arts in the UK. The directors would like to draw on the experience and expertise of practitioners worldwide, since it is not intended that the Centre be a UK-only resource, but that it might have an International profile.

Areas which the Centre intends to support:

education
creation
research
networking
publishing
archiving
performance

So what facilities should the Centre have; what projects should be possible; what would YOU like to be able to do at or with the help of such a Centre; what research would you commission; what net-based information and other resources would you find most useful?

What are the most reliable formats for transferring to for long term storage and, just as importantly, for remounting performances? (these latter may be 2 different formats for any given number of tracks)

Alistair McDonald

Winter 1997

Director and Company Secretary, Sonic Arts Network
<http://www.demon.co.uk/sonicart>

email: alistair@rsamd.ac.uk

GLISSANDO - new radio programme

With evosonic-radio there is a new broadcasting-channel for new Electronic Music, transmitting 365 days a year via satellite (Astra 1A) over Europe! With Glissando we, Robert Babicz (Rob Acid) and Yvonne Brogi, have a special weekly programme, every wednesday!

The emphasis of GLISSANDO is to create a vivid, evolving room between all sorts of experimental electronic music playgrounds like New(classical) Music, Avantgarde, Musique Concrete and acustic arts. In consequence we are always looking for some interesting new music to play. As we are very interested in your publications.

For further information:

GLISSANDO
Robert Babicz und Yvonne Brogi
Grembergerstr. 253
51105 Koln
Germany
Tel.: 0049 (0)221-9833506, Fax: 0049 (0)221-9833507
email: Robert.Babicz@koeln.netsurf.de

CALL FOR INFORMATION

>From Patte Wood
(patte@ccrma.Stanford.EDU>)

I'm working on a project and would like your help. I am interested in what resources you find essential to have in your personal library for your research, composition, or teaching. If it is convenient, please send me a list of 5 to 10 resources (books, papers, periodicals, manuals, netsites or recordings) you could not work without. Please include author, title, and publisher. Once I have the results, I'll post them to the icma list for those that are interested.

Thanks very much

CALL FOR WORKS —
'SOUND BOX' Web Broadcast Project
November 1997

The Museum of Contemporary Art in Helsinki, Finland, is seeking works for possible inclusion for the upcoming web project.

SOUND BOX is a RealAudio based experimental broadcast, opening its virtual doors on Friday March 27th 1998. Web broadcast will be online for a period of two months at the following address:

<<http://www.kiasma.fng.fi/soundbox/>>. SOUND BOX is a countdown project for KIASMA, the new building of The Museum of Contemporary Art, keeping its opening ceremony on Friday May 29th 1998 in Helsinki.

SOUND BOX will introduce different kind of works and aesthetics concerning electronic music. SOUND BOX is looking for fresh ideas, works in which sounds and electronic means are used in imaginary and interesting ways. SOUND BOX will give the web audience a versatile vision about the diversity and richness of international sonic art in the 90's.

At least 20 works will be selected for SOUND BOX broadcasting. The selected works are broadcasted as a nonstop stream,

including text information about every composer and work. Each selected composer will receive a fee of 500 FIM (= ca. 95 USD = 167 DEM = 555 FRF = 57 GBP). Please be sure that you own the copyright of the piece before submitting it. There will also be a possibility that The Museum of Contemporary Art will buy a few of these works for its collection.

SOUND BOX project is curated by composer Petri Kuljuntausta: (<http://muu.autono.net/artists/kuljuntausta/>), chairman of the Charm of Sound association.

Formats for submission:

- DAT, CD/CD-R, Minidisc.

Please include:

- Written artistic statement about the submitted work and bio about yourself and your previous work in diskette (PC/Macintosh).

DEADLINE for submissions is January 30th 1998.

Submit your work and diskette to:

SOUND BOX

The Museum of Contemporary Art
Kaivokatu 2

FIN-00100 Helsinki

Finland.

<<http://www.kiasma.fng.fi/soundbox/>>

The Charm of Sound association (Aanen Lumory) is collaborating on this project, so there will be an opportunity for your work to be performed in an electronic music concert in Helsinki. After the SOUND BOX web broadcasting period we will return all submitted sound material, but if you would like your work to be performed in a live concert we will forward your material to Charm of Sound's collection for consideration of future projects. Please mention if you prefer that possibility.

For further information about SOUNDBOX or the Charm of Sound association, contact:

Petri Kuljuntausta
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ICMC Reviews

REPORTS AND NEWS FROM ICMC 1997

To start on a serious note....

The Former Apple Founder Formally Known as Jobs (FAFFKnAJ)

by Perry R. Cook, January 1997
Copyright 1997, Perry R. Cook

Sung to the tune of (*What if God was One of Us?*)

by Eric Bazilian of the Hooters
(no, Joan Osborne did NOT write this song)

First performed live by Perry Cook, voice and Luke DuBois, guitar at the Palataki, Thessaloniki, Greece Sept. 30, 1997
** = additional lyrics by Luke DuBois
Studio produced version (Jan. 1997) available at:
<http://www.cs.princeton.edu/~prc/Jobs.html>

He wasn't just a geek.
Sure, he made blue boxes,
phone boxes to phreak.
Sell 'em to 'em cheap.
Then he met another Steve
who was a bigger dweeb then he was.

Yea, Yea, Jobs is good(great).
Yea, Yea, Jobs is great(good).
Yea, Yea, ...
What if Jobs was one of us?
Just a clod like one of us?
Not making gobs, but one of us?
Tryin to find his way home.

They took a little glue
some wire, a keyboard,
and a 6502,
an old T.V. and by the
time those Steves were through.
They'd made a Vax for you and me, cuz.

Bridge and Chorus:
And Yea, Yea,
What if Jobs was one of us?
Not a slob like one of us?
**Coding Perl and C++
Trying to find his way home

They sold Apples I and II.
Then the Mac came out,
the stock went through the roof.
But then the Lisa made 'em
give old Steve the boot.
He was a Jobs with no job.

NeXT came next and NeXT was cool.
With Objects, PostScript, Sound and
black to make you drool.
Next color, HP, Intel, Sun then
Jobs got cruel.
Layoff until the profit comes.

Bridge and Chorus:
Yea, Yea,
What if Jobs was one of us?
Not a slob like one of us?
**Filing Taxes without fuss.
Trying to find his way home.

Then a cartoon cowboy doll.
Showed Steve wasn't just a one shot
guy at all.
Start with a Unicycle, lamp, and a ball
PIXAR makes millions of bucks.

Apple needs a new attack.
Gates and Grove winning,
clobbering the Mac.
Apple's sorry they
gave Steve Jobs the sack.
Next, Apple hires Steve back again!!!

Bridge and Chorus:
Yea, Yea,
What if Jobs was one of us?
Not a slob like one of us?
Not making gobs, but one of us.
Trying to find his way home.
No one to call up on the phone.
'Cept maybe Gasse, Skully, whoever

CONCERT REVIEWS

Concert 27/9/97 21.00

All the works in this concert involve ensemble and tape or computer generated sound. The first work, 'Allegories' composed by Tristan Murail for mixed ensemble and TX816 sound module was the

oldest work in the concert. Despite a feeling I have that this work is slightly too long, compared to all but the final work in the concert, its subtlety of timbral fusion stood out as being mastered in both composition and performance. Acoustic events and structural articulations are extended by the TX816 sound-source, and the listener, who is unable to see an explicit action-response connection with this method of sound production, perceives a unified musical experience.

Following the Murail was the two movement work by Richard Boulanger, 'Virtual Encounters' - (a) 'Reflections' and (b) 'Transfigurations', for acoustic and 'virtual' instruments, performed on stage via the Mathews Radio Baton. The programme note describes the relationship between real and virtual instruments as involving duets and lyrical collages. As the work progressed so did my disappointment in what was an unimaginative application of a potentially musical idea. The material replayed by use the Radio Baton consisted of pre-programmed instrumental pitch sequences, not only uninteresting, but also baffling to the live performance integration. One was left with a feeling that the Baton was used for show, and not for its enhancement to the music.

In the programme note for 'Paradigms', the composer Joshua Fineberg writes that the work uses an acoustic model based on the analysis of several recorded passages for instrumental ensemble, which were analysed to extract qualities subsequently creating a new second order model, in which each instrument fuses in one global timbre. Some beautiful moments involving an ambiguity between tape and live material were let down by the content and perceived role of the tape part.

The penultimate work, 'The voice within a Hammer', by Jonathan Berger uses sounds derived from the opening chords and coughs in the 1939 Toscanini recording of the Eroica Symphony. Despite the unusual idea and some interesting tape articulations cutting across the instrumental ensemble, disappointment was felt with both instrumental and tape material.

The final work in the concert, 'Chamber Concerto' by Pablo Furman was an ICMA commission. This work was worth waiting for! Written for ensemble and electronic
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sounds, the two parts are presented through a series of transforming events, set in five contrasting sections. The ensemble interacts with the electronics through contrapuntal textures and semi-static planes, extending the normal limitations of the instruments - an idea projected in a coherent and musical way. The tape part was as sonically interesting as the skilled instrumental writing and the use of apparent solos in tape and instruments articulated the interesting structure in an enjoyable fashion.

Evening Concert IV
Ceremonies hall 21:00
Submitted by Emil Auslander

The fourth evening concert of the ICMC 97 in Thessaloniki Greece featured four works for soloists and ensembles with a mix of tape and live computer processing. In each work the computer took on a different role; the tape parts varied from providing a largely supportive and atmospheric presence in one, to functioning as an equal member of the ensemble in another, and acting as a pervasive form-defining foundation in a third. The only work using live computer processing treated sound spatialization as an occasional extension of the texture.

Six Japanese Gardens by Kaija Saariaho for percussion and tape falls into the first category. It is comprised of six brief sections, each one differentiated by an individual timbral focus in the instrumental part (such as skins, gongs, metals, woods), and a different approach to inflecting the passage of time. From the environmental use of tape juxtaposed with a slow and deliberate pulse in the live part in the first movement, the piece progressed through a variety of "time states" contrasting pulsed time with gestural/musical time, and oceanic spatial time: a slow ebbing and flowing and sense of alternation and carefully conceived subtle contrasts pervaded the work. Each movement also tended to center on a different sonic reference: natural soundscapes, monks chanting, a suggestion of a gamelan, and temple bells. The sonic references never intruded by seeming too obvious, forced, or facile, but rather created a beautiful sense of a world vibrating just below the surface of the music. The fluidity and interchange of these varying references and varying "time-keeping" roles throughout the work kept the listener engaged with a subtly evolving invention.

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The overall meditative effect was enhanced by Steve Schick's wonderfully focused and nuanced playing of the solo part.

The music of Edmund Campion's *Mathematica* for solo flutes and quadraphonic tape bears a somewhat obscure relationship to its title—in this case the tape was a consuming presence within itself, and formed the foundation of the work. The piece was painted in broad formal strokes, with a patient explication of textural, timbral and pitch material, convincingly drawn out by flautist Beata Iwona Glinka. The work begins with a long build and ends with an extended cadential section, both based on droning breathy sounds and percussive key-clicks. This material gives way in the center of the piece to an extended and charming quadraphonic racket section that plays out pitched material between the flute and tape. The piece really stuck to its guns, making admirable use of a limited timbral palate in the tape part to considerable formal effect, but the limited range of the flute line in the long builds became a slight limitation, creating a slightly constrained feeling and detracting from the building tension that was clearly intended.

Cruelties: a catalogue of grotesque events with real-life examples, by Ian Wilcock was a blistering 17 minutes of nasty, bright, buzzy, clangorous, and often painfully loud outbursts. The players displayed dazzling virtuosity and endurance, as their parts were blended with the grainy tape part as equal partners, often drawn in as supporters of taped gestures, or triggered to new agitation by a taped swirl or blast. All of this is overlaid with a fragmented text drawn from newspaper clippings assembled by the composer. Raucous multiphonics, zurna-style lips-off-the-reed playing from the oboe, squeaks and screams, wonderful ridiculously spastic licks, viola crunches, and signpost clarinet glissandi all set up a dense weave of interruption and interjection so thick that the wandering vocal part, even though amplified, could scarcely assert itself intelligibly. The demanding vocal part, performed by Brenda Mitchell, veered between speaking, whispering, sliding, and drawing out long held single notes with slowly changing vowels that disintegrated into nonsensical stuttering or isolated consonants. It wasn't possible to determine whether this obscuring of the voice was an intentional aesthetic choice or a simple balance problem; in either case the vocal

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aspect of the work added little to the power of the piece. The great seething instrumental froth of the piece was, however, quite impressive for short periods, and created an extremely powerful affect, a highly charged texture that shows a very confident compositional hand. The effect was initially exhilarating, but by the end of a long 17 minutes, comes across as slightly abusive and eventually unfulfilling, even given the stated expressive goal of the piece.

James Avery and his group, Peter Vale, Erich Wagner, Bodo Friedrich, and Olaf Tschoppe, as well as Ms. Mitchell, threw themselves into the fray with tremendous energy, and deserve great credit for bringing off such a difficult work with so much conviction.

Also beautifully supported and paced by James Avery and the Ensemble Sur Plus was *Watershed III*, by Roger Reynolds. Perhaps the centerpiece of the evening's concert by dint of instrumental forces and its orchestral breadth, this thirty minute work comprised the second half of the program. The real-time computer sound-spatialization functioned as an occasional extension of the sonic canvas, most apparently in solo percussion sections where individual attacks were moved through the space. The work is framed by large instrumental sweeps combining annunciatory brass figures parsed by gongs and a single crotale, long-lined two-part counterpoint in the strings, and arpeggiated piano figures. These massive surges give way to a more delicate interior; a series of percussion cadenzas alternate with more muted and supportive instrumental sections. As in the Saariaho, each cadenza zeros in on a particular group of instruments or a playing technique—this device of defining groups of instruments and specific timbres in terms of consistent and developing musical functions and dramatic characters was most effective here, and gave the large form an immediate, transparent quality. The percussion part, at first athletic and ponderous, and later beautifully tender, always had a melodic quality that was taken to great heights by Schick, who created an astonishing vocabulary of varied attack, timbral shading and phrasing, even handling awkward stick changes in grand pauses with a sense of musical gesture. His many moments of frankly astonishing sensitivity included delicious, artfully inflected finger percussion ostinati, and one breathless moment near the turning

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point of the work when he took a seamless triple-piano roll on the bongo to niente almost imperceptibly. This was a powerful work, given a stunning performance, and capped off one of the most consistently rewarding concerts of the conference.

Review of ICMC 97 Afternoon concert 4
on September 29 at 6PM at Olympion
by Mari Kimura

This concert featured the combination of a solo performer and electronics. Among the six pieces on the program, there were two interactive works; others were for solo instrument and recorded tape.

Kagami for zephyros and computer (the title means Mirror in Japanese) by Shigenobu NAKAMURA is written for a trumpet-like instrument called zephyros, which interacts with an infrared drum by the performer swinging the instrument around. The musical materials were rather simple and the thrill of true interaction between the performer and machine was somewhat diminished by the fact that the composer, who was sitting by the stage, was changing the scenes by pressing keys on the computer. However, the use of interactive system and the idea of controlling the computer by the movement of the performer is very interesting.

MYR-S for cello and tape by Horacio VAGGIONE was an excellent example of integrating tape and solo instrument, successfully achieving the interactive effect. The tape part was very impressive and powerful; almost to the point that one wondered if the presence of the live cello performer was really necessary. The masterful tape part was so well coordinated with the live cello part that it sounded almost as if the cello was processed realtime instead of playing along with the tape.

Mist of Rainbow for sho and tape by Toru IWATAKE is written for sho, a Japanese Gagaku instrument, and tape. The piece was dedicated to the victims of the Kobe earthquake, and to all the victims of catastrophes. Mr. Iwatake created a solemn and

tranquil, yet intense soundscape combining this ancient instrument and the tape part which was carefully crafted. Therefore, the sho was able to sing freely making us almost forget that it still had to synchronize with the tape. Overall, what really came across was not the compositional technique; it was the soul of music as it should be.

Cregg's Pipe for mandolin and tape by Terence PENDER uses the transcription of traditional Irish tunes played by the mandolin, combined with a tape part. There was no display of power nor pretense in Mr. Pender's music. He simply sat there with his mandolin, and gave us ten minutes of endearing music from his heart. And what a heart-warming ten minutes it was! For once at ICMC concerts, we heard no neurotic academic energy; his music was created in order to look into oneself, not to impress people. It made us forget the technical facts that the tape part was carefully created and that Mandolin had to be played with slightly different phase from the tape part. Again, technique didn't matter.

Of the Lugubrious Game for violin and tape, Mr. Thomas HUMMEL writes in his program note that the tape part is an "idealized violin", and that "perfection is the main subject" of this piece. The virtuosic tape part was accompanied by the live violinist who hardly had to play anything. Although I understand the point Mr. Hummel made, computers replacing people (the violinist walks off from the stage at the end while the tape was still playing), it came across as a statement of rather negative and demeaning nature. The audience were to be impressed by the "perfect" and "idealized" recorded violin, while watching a live violinist on stage being completely impotent.

In *Shells* for tarogato and interactive computer systems by Robert ROWE, a cello instead of taragato was used as the solo instrument. The composer's own interactive software Cypher was listening to the solo performer and sometimes improvised in counterpoint with the performer. The potential of this media, improvisation between human and machines, seems to be one of the most exciting possibilities for the future of computer music. Then, there is also an exciting challenge for the human musician as well. The cellist of this concert could have used more time to get to know

Cypher. Such interactive systems have a potential to become highly sophisticated partner; it also requires the performer a flexible and high-level skill to develop it into a truly interesting musical being.

I noticed throughout this concert and others given at the conference that there are more composers using recorded tapes rather than live interactive systems, achieving safer (no computer crashes, you know), tighter synchronization with the performer; the results sound more interactive than the real realtime interactive systems. The live performer and tape is a media in which the composer achieves the satisfaction of relatively safe results at the expense of performers who have to sacrifice some of their natural musicality. If composers are going back to using tape, that might mean that interactive systems are not mature enough for serious performance purposes. We need to make interactive systems more usable, rather than to keep developing systems that gives people a substitute for their musical ability.

Evening Concert V Compositions/Choreographies for interactive movement/sound systems

The hall where this program took place was not ideal for a presentation of choreographed work: The stage was open from all sides so that the dancers had to do a long walk before they reached the stage. The lighting was insufficient for illuminating the five pieces on the programme. Probably because of this and because of the short time which was available for lighting set-up all five pieces were lacking in a more specific lighting design.

First of all the question should be asked 'what is dance'? Or since I am judging the pieces 'what do I consider to be dance': Dancing can be an abstraction of reality. Unlike music, dance does not have to be an abstraction - if presenting movements out of their natural circumstances is not considered an abstraction. Following these thoughts further: what is the motivation to put a movement on stage?

Martha Graham and Pina Bausch might show one concept of movement: expressiveness. John Forsyth cares more about the formal aspect of dancing and creates his

movement-elements out of constructive ideas. - Movements may represent elements of an artistic puzzle which can be combined and lined up in various ways to create new pictures out of the given elements, or may leave it as it is. As in music time is an important part of the language of movement. The other important element in dance is space which is performed by the human body moving from point A to B in a more-or-less complex polyphony of motions of the limbs. So the basic questions which I ask myself while watching dance are:

Is what I see effective, or is it only there because it was not thrown out? How is the use of space and speed? How are arms and legs used? Do the performed movements serve the recognizable intention? Does a movement give the impression of decoration or does it add to the 'story layout' or dramaturgical line? Which relation between music and the choreography is detectable? How convincing is the dancer's performance? What part does the technology play and what does it do to the piece?

One should further ask oneself if the word dance is either obsolete or used most of the time in a wrong way. 'Artist for movements' would more likely describe what modern choreographers think about. But what is a person who is playing music with the help of his body and some controllers? In some cases he is a player, whose movements serve to create the music, in other cases it is his movement that deserves the main focus, and some cases it is both at the same time.

Memory of absence [12 min] from Russell Pinkston was the first piece on the program. Jose Bustamante was choreographer and dancer in this piece. The music started with a long prologue for guitar and a voice with a narrative text. The recordings were of excellent quality and the voice of the speakers was very convincing - very professional. The timing of voice and music was done with great feeling. It never created the impression of 'too much' or 'not enough'.

The dancer started after a long time of total darkness. The costume was made out of white textile and was inspired by a 'Harlequin' costume of the Commedia del Arte. The movements of the dancer created an impression of a clown with much variation in speed using the space of the stage extensively. This made the choreography very
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vivid, sometimes even too much so, especially when the movements were not essential.

The use of the light was quite effective considering the available hardware and it was obviously done by someone with lighting experience. There was an intriguing moment when 'blindners' were shone from the back of the stage through the costume of the dancer. It looked like an x-ray through the body of the dancer.

The climax of the piece was a scene of sleep and dreaming leading to a forceful jump and an effective event trigger from pressure controllers inside the mattress the dancer was jumping on. This worked pretty well compared to the other use of ground-mounted pressure controllers - the dancer walking, with a stick in hand. Using this controller the dancer did not develop a variety of movements at all - it seemed that he was just walking. This was not well integrated into the rest of the piece. Beside the fact that this was one of the best pieces of the evening the choreography was lacking in simplicity and sometime depth. Sometimes the artistic translation was missing.

Movement Study I [12'] by Wayne Siegel, dancer [in this case I would prefer to say 'player'] Pernille Fynne

The dancer's costume did serve the purpose of showing off the controllers. I think this does not help the piece in any sense since it is obvious for the viewer that there is a correlation between the music and the movements of the dancer. It would have been more interesting to perceive the quality of the movements of the dancer. It might enjoy the eye of a controller freak but than I don't know what purpose this cute human being on stage was serving. Just a black costume covering the body would have done a better job.

Is this a piece for an instrument played by the whole body so that the movement is simply the means to create sounds and musical structure? In this case the procedure used to create the music is not really important. What counts is simply the music and the dance. The program notes may explain the rest. Or is it a choreography where the movement creates sounds which might not be intended as music - sound as a side-effect? Or is it a choreography creating a piece of music? In the latter case the

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composition and the choreography have to be judged on the same level. In this context the intention of displaying the controllers at the joints seems to be obvious: the attention should focus on the technical aspect of the piece. The movements are supposed to be seen as a process to create music or to cause specific movements.

But what happens if the music does not convince as well? The composer/choreographer might have been conscious of this - they called it "movement study I" and this title fits exactly what the piece shows - not more and not less. This is no artwork but it is interesting to watch and listen too which is quite something.

Ping Bang [10:00] Saburo Hirano, performance [good, they did not call it 'dance'] Otani Hanachi, visual program Shinsuke Ina.

Otani Hanachi who is not even a dancer was the only 'choreographer' in this concert to seriously take on the fact that her movements were limited by the controllers. This meant that she had to be creative inside this limitations. It seemed that she gained strength out of these limitations and evoked them so that her movements created a very unusual and interesting expression.

This piece gave the impression that every detail - costume, music, video and movement - were carefully chosen to enhance each other, to serve the artistic idea of the piece. It is funny that these movements, which were closer to a mime than to a dance, controlled not only the music but the structure of a video displaying nuclear explosions. The sounds were created by a physical model synthesizer called 'Mibure'. This piece was impressive for its simplicity in the use of expressive elements and with its complexity of movement, video and music. And it even succeeded as an entertaining work - it was the peak of the evening.

Vaccum[10:00] by Dimitris Kamarotos, performer Sofia Karakantza

Vacuum was performed by an actor not a dancer. The piece started with a person illuminating her own face with a flashlight. Later the light pointed into the viewers eyes - I have to confess that we all had an idea like this in the first theatre piece we did as we were 16. - After finishing the lamp-part the sleeping part started. The actor jumped

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into a sleeping bag and showed us how revolutionary and exciting sleeping on stage can be. Maybe the video controller needed a cool-down from the lamp scene. Suddenly she jumped out of the sleeping bag did something else and it was like she wanted to express that 'if you don't think sleeping one time in a sleeping-bag on stage is revolutionary you might never before have seen an actor sleeping in a sleeping bag twice in between 3 minutes.' And I must confess she was absolutely right in her thoughts. Following this revolutionary example maybe future multi-media pieces will contain at least three sleeping-in-sleeping-bag-scenes. The excitement will be unthinkable ...

The third part in the acting plot was a big cube containing a lot of fun things to grab, look and throw away. And, can you imagine, all of this sleeping-bag and finding-in-the-box scenes created data by a video imaging program, sent to a synthesizer to create even more exciting music!

The climax was the use of a vacuum cleaner as the source of noise. —mhhh. I can understand that idea somehow. So it was a logical consequence of this idea that the actress started to clean the stage with the vacuum cleaner while the video image detector went mad. This was topped by the way the piece ended: the light was dimmed down while the vacuum cleaner was still audible - and we all know what interesting structured musical patterns vacuum cleaners usually create. Oh boy, I have never listened to a vacuum cleaner in total darkness before and only in this moment I could realize what a rich musical structure the descending glissando of a switched-off (this was the end of the piece) vacuum cleaner has. Do I have to talk about the musical content of this piece? But after all maybe I missed something and it was supposed to be funny. Another mhhh! In that case I would think it is as funny as getting a fancy birthday-cake-box and finding a rotten bone inside.

cRoSs LiNeS [6:00] by Katerina Tzedaki, Irina Mintya, Dimitris Daskopoulos.

Yes it was a nice costume ... and all the music was not left to be created out of the

movement detecting camera. A tape created one layer of the sound while the live sounds were triggered by the movement detector. 'Between these elements a constant dialog-conflict created crossing lines and junction points' explained the author. Sorry, that was a formal concept that was not working at all in practice. The three elements seemed to create a random combination and the dance was only 'move, move, move' without a 'why?' There were some nice moments where the dancer created expressive gestures but these moments were connected by 'exercises' and did not show a dramaturgical outline.

As in nearly all of the pieces of the evening I missed clear definitions in the composer's or choreographer's intention. A lot of movements seem to be randomly distributed over the time of the dance. A lot of other movements seem to serve a decorative purpose which is not enough to leave them in the piece. And a lot of movements seem to make no sense at all. All of these problems would not occur if the composer/choreographer was conscious of the formal layout of the piece. For the composers and choreographers of this concert, with the two exceptions *Memory of Absence* and *Ping Bang*, I wish there had been more consciousness about what they wanted and how to get it both in music and performance.

Maybe too critically observed and written down by Ludger Bruemmer.

Friday Afternoon Concert of September 26
Reviewed by Larry Fritts

This concert featured music by Kapuscinski, Babbitt, Harvey, May, and Manoury for piano and flute with tape, video, and live processing. Aleck Karis was the pianist and Elizabeth McNutt performed on the flute.

The concert opened with a beautiful piece by Jaroslaw Kapuscinski. Written in 1993, *Catch the Tiger* integrated piano, tape, and video in a surprisingly direct, yet deeply affecting way. Like the nursery rhyme that inspired the piece, the diatonic piano part is playfully simple and repetitive. Constructed primarily of scale patterns in equal durations, the music's real interest lies in the inventive contrapuntal and registral treatment of this basic material. The emo-

tional and structural shape of the work was provided by a video counterpoint created by numbers and letters that variously appeared to represent fingerings, scale degrees, and figuration. As these symbols became increasingly independent—sometimes appearing to notate an unheard melody or cross hands—the emotional effect was both amusing and touching. This symbolic play was in turn given an expressive voice by Aleck Karis's responsive and sensitive performance.

Like his compositional style, Milton Babbitt's music tends to permute rather than evolve. It is not surprising, then, that the timbral and gestural worlds of the synthesized tape part of *Reflections* from 1975 recall (and sometimes even mimic) his groundbreaking electronic pieces from the early 1960s. As in other of Babbitt's twelve-tone works, different row transformations seemed to unfold within various compositional levels differentiated by timbre, register, dynamics, texture, and physical space. By connecting events with each layer across time spans in this rhythmically and formally challenging work, Karis's spirited performance revealed a deep appreciation of the structural principles underlying Babbitt's music.

Karis's sensitivity as a listener was clearly evident in Jonathan Harvey's compelling *Tombeau de Messiaen* as he skillfully wove the piano in and out of the taped accompaniment. Consisting of twelve synthesized pianos, each tuned to a harmonic series on a different pitch, the tape acted to extend the piano rather than compete with it. This helped give the music an elastic quality that was especially effective when seemingly expanding and contracting harmonics appeared to envelop the acoustic piano. When the sharp attacks were removed from these sounds during the work's climax, the aural effect of what seemed like a piano playing inside a piano was stunning.

Andrew May's *Twittering Machine* was composed for flutist Elizabeth McNutt who performed the work this afternoon. The piece opened dramatically with a flurry of pre-recorded and amplified flute key clicks, attacks, breaths, flutters, and trills flying off the stage before settling into a witty and energetic interplay among the flute, delay-processed flute, and pre-recorded material. McNutt's brilliant tone and clean articulation kept the flute in focus despite all efforts

by the electronics to command attention. The overall phrasing of the piece was greatly enhanced by the performer's skillful use of a footpedal to control computer playback.

McNutt ably met a very different set of challenges posed by Philippe Manoury's *Jupiter*. Written in 1987 for flute and IRCAM's 4X machine, the electronics of the work had been ported to an SGI O2 by Miller Puckette for this performance. During the course of this multi-layered composition, McNutt's live sound was recorded for playback and transformation that would occur up to several minutes later, while a pitch-tracker controlled the playback of the original 4X soundfiles. The flute part was beautifully written, drawing from a seemingly inexhaustible supply of rich and inventive melodic material. The electronics reinforced the solo flute by shaping, punctuating, and occasionally interrupting the instrument's lyrical, Impressionistic phrases.

Review of ICMC 97 Concert - Friday Night by Mara Helmuth

Friday night's concert presented music for soloist and computer. Jean-Claude Risset's *Contre Nature* (1996), for computer-generated tape and percussion opened the concert in Ceremonies Hall. Plays on rhythmic paradoxes were written to expose the listener's habits of perception, according to the composer. The first section's rhythmic figures distinguished themselves from regular beats, while in the second seemingly regular beats speed up by a factor of two. While I was not always aware of the technical concerns on a first listening, the driving intensity and intersecting continuities of the piece were engaging, and the computer and steady live performance by Nicolas Piguel were well-integrated. Particularly effective were sudden color runs and splashes which broke out and climaxed at the end in the cymbals.

Steve Duke blistered and quasi-scatted through a virtuosic alto sax part controlled by tape in Luigi Ceccarelli's *Neuromante*. The tape part, based on alto and bass sax sounds, "confronts" the live performer, creating an energetic, intertwined synthesis of electronic and live sound. Delays and syn-copations transformed into a wide range of textures, including unexpectedly accented
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events of fast riffs and high repeated notes which converged at the end. I enjoyed the offbeat energy.

Eduardo Resina Bertran played the flamenco guitar skillfully and dazzlingly in his *Ace Amaron* for guitar and computer-realized sound, dedicated to flamenco singer Camaron de la Isla. His intention was to combine his flamenco guitar performance and computer music composition in a piece which is, for him, "flamenco", in the sense that it expresses one's most irrational aspects. This piece held a much more relaxed world of sound than others on this concert, with delays and repetitions, energized by the performance, and where I was convinced the composer played intelligently with the flamenco style.

Mari Kimura's violin and electronics piece showed off her virtuosic electronic violin playing, especially in the solo opening section of *Carrefour*. The integrated nature of her playing and the performance-generated electronic part, created with Max, is one of the exciting aspects of her work. Of course there is also the sense of being on the edge as one wonders, as one does with live electronic performance, if the program will actually start the computer part when expected! While some of the Max MIDI sounds were not innovative, the sweet sustained colors were entrancing, particularly when heard with some delicate and even agonizingly beautiful violin slides down, stepping up and sliding down again. Kimura drew us into her music and made spirited sense of it.

BluesAx, by Larry Austin, is a great piece. Steve Duke has now performed the piece numerous times, and it is fluid and tight. The seven movements contain tributes to great jazz saxophonists such as Sidney Becket, John Coltrane, and Charlie Parker, interspersed with several blues choruses. Concrete sounds provide changing international contexts for this very American music, including crickets from African rainforests, the "BluesHum" orchestra, and city sounds of New York and London. Delays of the sinewy, pulsing lines created textures with depth and resonance, shining forth within the reverberations of the large concert hall.

Review of ICMC concert Midnight Caba- Winter 1997

ret on Saturday night, September 28, 1997
Teresa Marrin

The participants at ICMC and members of the general public were treated to an extremely novel and exciting concert at midnight on Sunday, the 28th of September 1997. The style was definitively cabaret, as was the setting — the funky-chic bar, MYLOS, a renovated mill. This (as well as the cabaret concert the previous night) was the only computer music event this author has ever witnessed which not only drew a wide and varied audience from the general public, but also there were many people lined up outside, clamoring to get in! That this was possible was a wonderful revelation, and great fun to experience. Once inside, the mood was relaxed and happy, and the bar in the back of the long room seemed to be doing excellent business.

The first piece on the program was *House of Mirrors*, which was composed and performed by Fernando Lopez Lezcano on the Radio Drum. Lezcano, a lecturer and system administrator at CCRMA, is well known for his compositions and performances with the Radio Drum. Clearly, he is experienced and comfortable with this instrument; his gestures appeared calm and thoughtful, and he was able to give the whole work a good sense of flow. The piece began with soft entrances of nature-sounds, played with caressing gestures, as if inviting the listener to enter the House of Mirrors. This was followed by strong, punctuated attacks and the sound of a large door laboredly opening and shutting on squeaky hinges. The door sounds appeared periodically afterwards, as a kind of mantra, indicating the beginnings of each successive musical section. During the course of the work, Lezcano created some very lovely atmospheres: the songs and sounds of birds, rain, wind, children and ethereal synthesized sounds. At one point, even the stage lights seemed to be controlled by his actions — this author and my neighbors wondered if this was true, but determined that it could not be so. Overall, there were some sections of stasis, but the ethereal effect was pleasant. One aspect of the Radio Drum which was slightly disappointing was that some of the sounds didn't always seem consistent with the gestures which created them; however, this is a problem which is endemic to most sensor-based instruments and which presumably remains an open research question in the field of computer music.

The following work was Roberto Doati's *Pigra giornata*, for solo voice and tape. It was performed by soprano Brenda Mitchell, a formidable talent with a strong and unusual technique. The piece is a reworking of a few early jazz sources, most notably Billie Holiday's "Don't Explain," by means of a computer program. The program created sound events and fragments from original recordings, which were then transcribed by Doati and combined with text collages. In addition, there is a tape which runs for the duration of the piece with a cymbal roll; it sounded like a soft, continuous hi-hat percussion sound with some processing, and seemed to function as a drone-like accompanimental layer. At beginning, the piece demonstrated a great deal of promise and wit — it sounded like a devolved and fragmented 40's pop song which had been sent through a noisy, entropic filter. At moments, one caught a clear image of Billie Holiday, and then she was gone, as if her voice had formed itself out of thin air and then returned to the spirit-world. Had the work convinced the audience that it was a dedicated interpretation of African-American music from a European perspective, it may have succeeded. However, the audience reacted negatively, and dismissed it with hisses, catcalls, and small laser-light shows. Perhaps this was not warranted, given the cultural context of the composer. Brenda Mitchell was extremely polished and versatile, and this author thinks that perhaps there was a cultural misunderstanding regarding the tastefulness of the interpretation of the work of Billie Holiday. The performance of this work certainly highlighted the problematic nature of appropriating and reworking historical material from other cultures.

The third piece on the program was "Improvisations," for the dynamic electronic duo of Curtis Bahn on electric violin and Dan Trueman on string bass. This strong, Princeton-based collaboration was very much in the idiom of modern instrumental art-music, with strong references to free-style jazz and other improvisatory traditions. The piece began in flautando style — very fast, fluttery, and completely unprocessed except for amplification. Then, the

bass began to show a processed sound, followed by the violin a minute or so later. A kind of shapeless chaos ensued while both of them hacked around a bit; this was followed by a second section which featured sampled vocal syllables. The third section was chirpy and insect-like, followed by a fourth section which was very rhythmic and contained mansounds of tapped wood. The fifth section was a very fast flautando with quick accents, completed by a very eloquent and musical ending, which the crowd liked a lot. Highlights of the performance included some nice real-time audio processing and vocal sounds, but particularly the fine, 'analog' musicianship of both Trueman and Bahn. Bahn's instrument was very interesting and clearly he was very close to it; he played it with authority and dedication. Trueman has a very novel bass technique, lots of slapping wood, slapping strings. They have an excellent vibe together and put across a polished-sounding improvisation.

After a comfortable intermission, Don Buchla started off the second half with *Greased Lightning*, featuring electric piano, trombone, and, of course, Buchla's "Lightning" MIDI controller. George Lewis' unannounced appearance on the trombone was a welcome surprise and gave the audience a sense of expectancy. Don Buchla rose to the occasion nicely and performed well with the Lightning. During the first section, Buchla triggered ethereal sounds and effects — birdsongs and bells — while Lewis played slow riffs in the upper register. Then, Lewis and Buchla switched places and Lightning triggered trombone samples, while Lewis played some wacked-out technique with the slide against his lips. The crowd went wild with this, and continued cheering through the end of the piece. Another mapping featured Buchla on drums and Lewis in an active melody which then morphed into a very fast and loud passage with a lot of phat electronic sounds, ending with a nice rise and fall of tubular bells. The finale consisted of a blues piano bass line laid down by a woman on keyboards, with George Lewis doing bluesy trombone, while Buchla triggered drum sounds on the Lightning. Then, Buchla took a solo — he was not very rhythmic, but he really went for it and made it work to the surprise and delight of the audience. A couple of transitions later, the ensemble arrived at a nice ending. This performance fulfilled its mission and even

featured some unexpected touches like spatialization in the two hands of the Lightning controller, which was appropriate for a two-handed instrument!

This was followed by *Elemental Vamp*, a cabaret for theaterist and electronic sound, written by Allen Strange. Performed elegantly and exceptionally by dancer Poly Voikoy, it was the musical highlight of the evening. The piece, based on a poem by James S. Dorr, is about a space-age vampire who is trying to cope with the problems of life in the 20th century. Unexpectedly (and in some ways refreshingly), there were no sensors on the stage at all; just one dancer with a tape. It featured a strong powerful rhythm, great dynamic contrast, and clearly articulated vocal samples, both pitched and worded. Poly Voikoy is a dancer with tremendous talent and a joy to watch; she is clearly highly trained and executes her gestures perfectly. She was exactly in time with the tape and has a very flexible body as well as a great character as the vamp/ire. Her dancing gestures were extremely musical and interesting to watch.

The finale for the evening's entertainment was presented by the hilarious and talented "Convolution Brothers," Cort Lippe and Zack Settel. Entitled *Gandy Bridge XI*, this improvisation was the comedy highlight of the evening, and was the funniest computer music this author has ever seen. Billed as an "ISDN" performance, the premise was that Zack Settel was in Florida and was to perform in real-time with Cort Lippe, and that they were not completely set up or ready when it was time for them to perform. Thus, the first few minutes were spent while they presumably fiddled around with the network, Settel nervously and periodically querying, "Did you get the ping?" Cort was also testing out his microphone and would whisper into it while furiously setting levels, until an enormous burst of noise erupted from his equipment, leaving him spluttering and frantically reaching for knobs. After a few minutes of this sort of thing, Settel's video feed over "ISDN" showed smoke pouring out of his equipment and filling up the room. Simultaneously, from offstage, a cloud of smoke was gathering. Shortly, Settel came coughing and staggering from the wings, without pants. Needless to say, the remainder of the performance was equally wacky, with bizarre voice processing of sentences such as "preference is to be given to compositions in a major key" and

“the double bass is to be played only with a bow,” as well as the judicious use of a PlaySkool PS-468 toy vocoder. The audience seemed to truly enjoy this gem of a performance; it was a rare moment of humor expressed in a crowd of folks who are known for their seriousness. The ICMC should continue to encourage this sort of activity, because it allowed the audience to laugh at itself via the performers onstage and (if temporarily) drop the seriousness of attitude in the conference setting. Certainly, the gags of the Convolution Brothers hit home, and everyone in the crowd seemed to enjoy the opportunity to laugh together.

Overall, the Midnight Cabaret concert on September 28 was a terrific success and this author hopes to see many more like it. Perhaps because of implicit expectations of being entertained, the audience was quite demanding. The normal bounds of propriety were eschewed in this context, and if the audience didn't approve of a work, they were surprisingly vocal about it — grumbling, hooting, heckling, and talking. While there were situations in which this created some inappropriate behavior, it was an amazing inversion for computer music, which has in the past developed much of the technology upon which the major commercial music styles are based, but which has not benefited from the success of those forms. Here we were presented with a glimpse of a possible future in which thoughtful, computer-based music might be refreshingly normalized to an “entertainment” environment, instead of its usual place in a concert-hall.

The concert progressed nicely from a very quiet and introspective beginning to a rather raucous and hilarious conclusion. None of the pieces had more than two people on stage, which, although it made sense given the constraints of transporting equipment, seemed a shame in retrospect. Many of the great live performances (particularly in improvisational genres) do best when there are at least three people on stage whom to trade ideas off of. Perhaps this is an area that could be useful for computer music — filling up the space on stage with human beings to facilitate more interesting live performances.

One last comment, which deserves some attention:

Some of the sound levels were too loud, although it wasn't as bad as in some other ICMC concerts during the same week. Apparently, many frequent attendees of ICMC concerts have grown accustomed to bringing earplugs. This is unnecessary, and it seems as if there should be some way to correct this problem in future by regulating the total number of dBs allowed at an ICMC event.

Thessaloniki, ICMC '97
Thursday September 25th
Evening Concert I

After some introductory speeches by conference director, Thanassis Rikakis and Aristotle University Rector, A. J. Mantis, Roger Reynolds delivered Xenakis's absent apologies for not being able to attend due to his health, and his best wishes for a successful conference. Evening Concert I thus began with Xenakis's *Bohor* (1962) for multitrack tape. Its 21 minute procession of clanking phantoms and saturated chimes evoked a mystery outdone only by that of the unimaginably bad sound in the hall — let's call it the “overloud AM radio mix”. Still, I was taken into *Bohors's* stormy march-of-the-ghost-bells trance and didn't start thinking it was getting “a little long” until after 15 minutes. I would say it was the highlight of “Evening Concert I”.

The second piece was *Hilbert's Caverns* [9] by Michael Theodore, for percussion (David Shively), live electronics and soundfile playback. It's “energetic” and somewhat aggressive use of gongs, cymbals, snares and bass drums didn't really stand a chance given the excessively loud and mid-range favoring amplification. For this reason it's difficult to give the piece a fair criticism (covering one's ears, though useful for preserving hearing does not add to one's appreciation of a new work!). Part 1 (*sounding out the labyrinth...*) began with a deafening gong crash and sizzled down to subtle snare and cymbal “glides” before passing through a foot bass drum, snare and cymbal frenzy. Part 2 (*conjuring symbols from darkness*) opened with a bowed cymbal “solo” of screeches over drones in the electronics part. After a crescendo and thickening of the cymbal texture the mallet struck bass drum enters and when a higher high is reached it all drops down like pulling the stop in the drain — only to rise back up like a circular saw. It all trickles slowly down to almost perfect si-

lence and the last gong. Although it ENDED quietly, after the piece someone in the audience yelled out, “It was too loud!” and unanimous grunts of approval ensued.

Following this was *Shouyoh-san 2* [17] by Kazuo Uehara, a “multi-media theatre piece for saxophone, computer sounds, Sound Beam and also visual images” with Ryo Noda on saxophone and the composer on keyboard and ultra-Sound Beam. The opening psychedelic kaleidoscope green-becomes-white video set the tone for the wash of eclectic clichés to come — from wafty new-age “whooshing” sounds to standing-wave video superimposed on images of the saxophonist, to gongy samples triggered by the ultra-sound beam, to computer generated runners, to a turning space station, to robot voices, to harpy crystalline sparks over lofty saxophone, to fluttering keys turning to screeches, to breathy pops, to a nice harpy gliss on the Sound Beam, back to new-age blur and the same kaleidoscope green over a dripping color chord and saxophonic breathing. Fade to black while Macintalk “Zarvox” speaks. Gee, put this way it sounds like fun, but I didn't think so at the time.

...And then a well-deserved intermission happened.

Enter: *Incipits* [11] by Brian Ferneyhough for viola, obbligato percussion and six instruments (flute, clarinet, 2 violins, cello and double bass) — performed by the Ensemble SurPlus, conducted by James Avery and apparently composed with the aid of a computer (as none was involved in the performance and as the composer is known to use Ircam's “Patchwork” - though this use was not mentioned in the program notes). It was intricate, sparse, precise, delicate, and complicated. The structure revolved around the viola and percussion “duets” (wood blocks, marimba, tambourine, and rainstick to name a few) with the viola scratching, tapping, and plucking its way through harmonics and glissandi. This contrasted with contrapuntal sections of strings and winds. The work was not really criticizeable, and the performance was good. Perhaps it is best summed up in the sporadic comments from the person next to me such as, “Are they finished warming up?”, “Very nice *real* viola sound”, and “I wonder what two grades of sandpaper they used.”

The last (AND final) piece was the long-awaited *Music for Nine and Computer* [17'] by Rick Basset for flute, clarinet, trumpet, drum-set, marimba, piano, violin, cello, double bass and computer (also performed by the Ensemble SurPlus with James Avery conducting). It consisted of a well-played 7/8 rhythm, big-band, jazzy swing ditty with distracting electronic sounds that kept coming out of the left speaker. In the composer's words, "The computer part only occasionally rises to oppose or dominate the acoustic players." Also of note were the little spacey echoes of tunneling harmonizers with badly adjusted windows, "...it functions as a highlighter, coloring and bringing a specific element in the texture to attention."

I did overhear one person say as we all left the hall, "Wow! Finally, computer music that's fun. That was great!"

- reviewed by Tom Mays

Afternoon Concert 3
Sunday 28/9/97, 18:00
Olympion Theatre

The concerts at the Thessaloniki ICMC ran the full gamut from unlistenable (the opening concert) to thought-provoking (the Friday afternoon concert with Kapuscinski's *Catch the Tiger* for piano, video and tape). The Sunday afternoon concert, primarily for piano and tape music, fell somewhere in the middle. Although there were many nice moments, this listener, at least, left the concert with the general impression of having spent an hour contemplating different hues of grey.

The concert started with Andre Ruschowski's *Karabontara* [11']. The piece started with a piano solo - an ostinato around the note *do*. The opening section brought to mind Bartok's *Ostinato* from *Mikrokosmos*, Book VI. The tape entered with electric-piano-sounding notes emanating from this predominant central *do*. The tape then took the predominant role — the notes' attacks slowly became modified and the timbres on tape continued to developed, finally arriving at bowed metallic sounds, at which point the piano reentered. The central sec-

tion, an interplay between piano and tape, introduced sounds more abstract in character and led to a short tape solo which crescendoed into the piano's second re-entrance, once again on the same *do*. It was in this final section that the ever-present *do* pedal finally moved to *la* for a short while before returning to an alternating *do-ti* pedal near the end. In general, the tutti sections contained a nicely used mix of piano-resonance-like sounds creating a coherent blend between instrument and tape. Pianist Petros Bakalakos' rather stoic performance lent itself well to the atmosphere of the piece.

The second piece on the concert was David Prior's five-movement *Somewhere Submarine* [16'] (for piano and tape). After some initial electronic sounds in the tape, the piano entered immediately, setting the overall tone of the piece with a series of rather jazzy fourth-fifth and triadic chords, with some dissonant "licks" thrown in once and a while for good measure. Even if the tape couldn't seem to make up its proverbial mind whether it was trying to be "pop" or "Schaeffer", there was still a nice coherence between the electronic sounds and the piano. The second movement was more dissonant and jumpy, and overall had a full sound, although it contained some sampled vocal-like sounds which did come across as being a bit "cheesy" from time to time (the usual problem of transposing vocal sounds too high or low). The slow third contained some resonant filter sweeps and filtered piano chords which did remind one vaguely of Reich's *Music for Mallet Instruments, Voices and Organ*. The fourth movement tried to escape these sweeter sonorities through more dissonant piano writing and percussive sounds in the tape; a good portion of the middle part of the movement contained a high, screeching pedal of which one grew tired rather quickly. The fifth and final movement, a slow movement, featured pointillistic notes in the piano and resonances in the tape — almost a piano solo. Still, there was often a nice interplay between the live instrument and the ambience in the tape. Sadly, pianist Sven Thomas Keibler's unnecessary "pianistic" gestures and "over the top" performance made watching the performance rather difficult.

After the intermission came *Around Midnight* [07'], by Marc Ainger, performed by pianist Lorenda Ramou. This was a rather non-tonal piece densely populated with

notes played in seemingly random rhythms. The tape contained reverberated piano and harp-like sounds which sounded almost as if they were made with a DX7 or toy piano, although the program notes cite them as being made with Csound. One can but wonder why the composer did not use simpler means to achieve the same effect. Often, the rhythms in the piece became energetic and jazzy; otherwise known as the "funky bassline effect", this technique has been known to save the day in many an uneventful contemporary composition. In general, the tape part was nothing too special and the piece probably could have worked equally well as a piano duo.

Also performed by Lorenda Ramou was *Something Else Again* [14'] by Alicyn Warren. The tape part consisted mainly of larger-than-life sounds with that crisp, clean digital quality. The first section featured primarily rattling sounds from objects large and small which creating some nice "acousmatique" imagery (the vision of falling bottle caps came to mind at one point). The second movement was mostly piano with some percussive crashing sounds in the tape at the end of the movement. The third movement introduced the sound of marbles or ball-bearings colliding in bowls, accompanied by sweet, intimate piano writing. Crinkling paper and squeezed styrofoam were seemingly the principal sound objects of the fourth movement, with interjections from the piano permeating this texture. The fifth and last section began with a piano chords in the extreme registers of the keyboard, progressing to tremolos on dominant (and extended-dominant) chords — a piano solo section with an impressionistic feel. The tape solo which followed contained "hollow" tubular sounds mixed with various reminiscences of the previous sound material. The piece ended with a gong-like bell toll. Overall there was some very nice music in the piano but one generally felt that it had little to do with what was going on in the tape.

The final piece on the concert was *PanForm* [09'] (for prehispanic flutes and tape) by Joaquin Medina Villena, and performed by the composer. The piece started with the notes of the harmonic series produced by overblowing on the panpipes — an almost-primordial atmosphere to which the tape joined in. A tape solo containing clusters of FM-bell-like glissando sounds then provided a rather cliché atmosphere which

lasted for quite a while, even after the panpipes had reappeared. A second tape solo with less-hectic sounds gave the performer some time to catch his breath, before the piece ended with quiet whistling tones and harmonic effects in the panpipes.

—Richard Dudas

ICMC97 PAPER REVIEWS

Paper Session on Music Analysis Saturday September 27th.

Review by Cort Lippe

The Music Analysis paper session began with the paper "Analysis-by-Synthesis of the Expressive Intentions of Music Performance" by Sergio Canazza, Giovanni De Poli, Antonio Roda, and Alvis Vidolin of the University of Padua. Their research into musicians' expressive intentions in performance situations was two-fold: perceptual and sonological. Multi-dimensional scaling analyses of listener judgements of a section of a piece performed in varying ways were developed, and then detailed sonological analyses of these same performances were made. Using physical models, an attempt was made to resynthesize performances with expressive characteristics based on the pre-defined perceptual models which has been developed. Although the authors admitted to some disappointment with the timbral quality, the sound examples of resynthesis were fairly convincing. This reviewer was impressed with the completeness of their research from perceptual model, through sonological analysis, to resynthesis. One of the aims of this research is to develop models for "humanizing" synthesized music. Although the

sonological analysis was not done in real-time, one would like to imagine a future version of this kind of work with real-time analysis of performer input, not unlike some of Roger Dannenberg's recent work in performer tracking via musical expression analysis.

The second paper of the session was "A Structural Analysis Tool for Expressive Performance" by Yuichi Uwabu, Haruhiro Katayose, and Seiji Inokuchi of Osaka and Wakayama Universities. The research involved developing tools for representing musical surface and structure. Lerdahl and Jackendoff's "A Generative Theory of Tonal Music" (GTTM) was a starting point for developing tools in which certain structural ambiguities of GTTM are resolved via an accumulation of co-occurrence relations. The frequency of co-occurrence relations between two events offers quantitative resolution to structural ambiguities, allowing them to formulate an analytical model.

The third paper, "Classification in Music: A Computational Model for Paradigmatic Analysis" by Christina Anagnostopoulou and Gert Westermann describes a formal model for paradigmatic analysis (PA) of music (which has been criticized as being too intuitive and inconsistent). The first step in PA is segmentation of the music under analysis. J. J. Nattiez' segmentation in his seminal PA of Debussy's "Syrinx" was used. A formal list of 40 binary features was drawn up to describe each segment. A unsupervised neural network (Growing Neural Gas) was trained on the musical feature vectors and the subsequent PA was surprisingly close to Nattiez' original analysis. Future work will attempt to

allow for different weightings of features, and implement incorporation of the segmentation process into the classification process (rather than relying on a given segmentation of a composition).

The final paper of this session was entitled "Neural Net Architectures in Modeling Compositional Syntax: Prediction and Perception of Continuity in Minimalist Works by Philip Glass & Louis Andriessen" by Yayoi Uno and Michael C. Mozer of the University of Colorado. In this research, a set of neural nets was trained to learn aspects of compositional syntax in works of Glass and Andriessen. In an imaginative use of neural nets, the authors trained twelve networks, each with different parameter values (for instance, the number of notes used to predict the next note), the predictions were averaged, and this average was compared with the original. Prediction errors (PDEs) were calculated for pitch, articulation, and a combination of the two. It was found that predictable processes had low PDE values, while disruption or new patterns in the music produced high PDEs. In addition, the aural perception of continuity seemed to be directly correlated to PDEs: high PDEs corresponded with discontinuity and low PDEs corresponded with continuity. In the future, the authors plan to extend this work to music based on stochastic and chance procedures.

It was clear from these four papers that researchers in both music cognition and theory are using sophisticated computational processes to further their work, and that the computer is a non-trivial tool in their hands.

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The Aesthetic and Social Issues session was chaired by Mara Helmuth of the Cincinnati Conservatory of Music, USA. Thomas Gerwin was not in attendance for the paper, *On Acoustic Ecology and "Integral Art."* Unfortunately, I could not use 20 minutes allocated to Mr. Gerwin's presentation to read his paper as the first page of the paper, pg. 59 in the Proceedings, was not printed. I later learned that some but not all of the Proceedings had production errors.

The second paper, *Towards a critical theory of (music) technology. Computer music and subversive rationalization* by Agostino Di Scipio put forth many interesting observations including the use of "tools and consolidated technical methods in a degenerated way" which Di Scipio refers to as subversive rationalization. From this observation, Di Scipio implicated technology as a decentralized, autonomous domain contributing to a theory of technological determinism. Regretfully, Mr. Di Scipio was not in attendance at ICMC97, so delegates could not engage in the lively discussion that would have no doubt resulted from his theory. Mr. Di Scipio's paper included a reference to another paper by the author on a similar topic to appear in *Sonus* in Fall, 1997.

The next paper presented by Alex Igoudin, *Impact of MIDI on Electroacoustic Art Music*, was essentially a summary of the author's dissertation (CCRMA-Stanford University). The research methodology consisted exclusively of surveying 45 composers in 13 countries who were active in electroacoustic music composition before and after the MIDI 1.0 specification. Based solely on this data, Mr. Igoudin generalized his findings to all electroacoustic composers. During the presentation, I felt myself slip into the mode of doctoral committee member, wanting to challenge the methodology, the interpretation of the findings, and even make remarks about the transparencies used to support the presentation. Nonetheless, Mr. Igoudin should be congratulated for his attempt to quantify the effect of MIDI and these efforts may be useful in the design of a more rigorous longitudinal social study.

The next presentation had a very personal approach by the presenter, Karen Eliot-Kahn. In the paper, *Computer Music Compositional Style Variation Between Genders and the Role of Education*, the author offers personal insight into the question of the difference between male and female compositional practice and style in computer music composition. The basis for Ms. Eliot-Kahn's work consisted of e-mail interviews with female computer music composers and a handful of articles on gender differences in mathematics and science. Surprisingly, a major reference in the pa-

per, *Crossing the Line: Women Composers and Technology in the United States* by Elizabeth Hinkle-Turner, was not cited in the bibliography. The paper presentation following this session was cancelled, which gave delegates an opportunity to discuss the gender issues in greater detail. Many interesting topics were raised during this part of the presentation including gender identity, sexual orientation, and the dangers of applying gender labels to the classification of compositional style. Several delegates remarked afterward about the need for additional forums to discuss these issues more fully.

The last paper of the session was *http://Web.La.Radia: Comments of the Social, Economic, and Political Aspects of Media Arts and Art Technology* by Stephen Travis Pope. Although there seemed to be technical problems in displaying images from Mr. Pope's laptop, he forged ahead with a well-conceived exposition of the breadth of issues facing the World-Wide Web, drawing upon the history of the Futurists accompanied by interpretation of the history of technologies on society. Mr. Pope referenced articles in the Computer Music Journal and the New Yorker, as well as publications by Marshall McLuhan, Heinz-Klaus Metzger and Andrew Shapiro. Given the breadth of issues raised by Mr. Pope, I was disappointed that the Proceedings did not include a bibliography. Mr. Pope's paper is available on the WWW at <http://www.create.ucsb.edu/~stp/>.

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The 1997 International Ernest Borgnine Look-alike Contest

Thessaloniki, Greece

By
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The moussaka chef from Perskavopouli Street should have been the winner of the Ernest Borgnine look-alike contest. I voted for him. Unfortunately, more votes went to the owner of a local hardware shop. I've been to quite a few Ernie look-alike contests over the years, and each time the winner was not the most qualified person.

Thessaloniki was the site for this year's world renown competition devoted to the persona of Ernest Borgnine. Previous contests had been held in Hong Kong, Canada, Denmark, Tokyo, and San Jose, California.

First things first. Every year the panel of judges gets progressively more inconsistent in its choosing of the finalists, and, in turn, the winner. One must call into question the criterion used to determine the chap who most resembles Ernest Borgnine. Should we base our decision solely on facial features? Physical attributes? Sexual prowess? Maybe we should have a junior or student Ernie look-alike category. On the other hand, categorization might be more detrimental than helpful. I don't know, but obviously the choices are entirely objective, so the solution may never be found. All was not lost, however, as this year's event ended up being quite satisfactory and the positives did indeed outweigh the negatives.

Although my staunch supporters will undoubtedly wipe me off the slate for pandering to the party line and not whole-heartedly blasting the things that I really *should* blast, I never-the-less stand my ground in saying that I seriously had a hell of a time at this year's Ernie look-alike contest. Of course, this is only because it was in Greece.

An event of this nature is always a grand scale affair and this time was no exception. Borgnine aficionados from over twenty countries made their way to Thessaloniki
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and all of the hotels were maxed out. For nearly two years, the event organizers had been promising that this year's contest would be the best one ever and most of the attendees were enveloped in a blanket of anticipation upon arrival.

In a commendable attempt to iron out certain idiosyncrasies of past Ernie look-alike contests, the organizers structured the event more like a festival than a formal gathering. This makes sense, as in Thessaloniki life is a festival to begin with. Making the Ernie Borgnine battle an integral part of Thessaloniki life was a key factor in the success of this year's hoe-down on the Greek mainland. In due course, one immediately realized the puerile faults of previous Borgnine conferences.

The previous years' events had been cluttered with problems. The San Jose and Denmark competitions were both organizational and administrative disasters. Neither of them ever got it together. In both cases the initial first rounds of the competition were messed up, the judges were biased, the accommodations were overbooked, and nothing happened on time. Worst of all, the organizers of both these events disallowed alcohol consumption in all hotel rooms. Although the San Jose and Denmark contests were plagued with tragedy, a few admirable Ernie Borgnine look-alikes did indeed surface.

They surfaced again in Thessaloniki. Each year at our beloved look-alike challenge, one sees the same exact Ernie look-alikes, the same ideas, the same personas, and the whole scene is so incestuous that it quickly becomes more irritating than a tape music concert. If this year's Borgnine look-alike endeavor can be deemed successful for any reason at all, that reason would be the fact that it was opened up to the general public.

Although the Ernie contest is not entirely closed to the outside world, it usually dominated by a particular circle of Ernie fans and imitators: the International Ernest Borgnine Look-alike Association. IECLA is a cadre of professionals who research, among many other things, a relevant up and coming computer science called, "Ernie to Speech Recognition."

This community of Ernie look-alikes, as well as the group of Borgnine fans who always show up, is commendable due to its

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vastly international scope, but it can get mildly insular at times. Opening the competition to the commercial world was a long awaited relief. Many new faces appeared on the horizon. I was relieved to see that folks who, knowing nothing about Ernie Borgnine, were still willing to travel across continents just for the occasion.

Since Thessaloniki is fertile ground for Ernie Borgnine look-alikes, the cosmopolitan city was a perfect choice to host this year's battle. Two of the previous competitions, Hong Kong and Tokyo, were significantly more difficult because nobody in either of those two cities looks anything like Ernest Borgnine. Don't get me wrong—these contests were both flawlessly organized—however, the lack of true Ernie faces made both the Tokyo and Hong Kong bouts rather disappointing.

In Thessaloniki, all of this fell into place. Everywhere I journeyed—everywhere my mind took me—I saw Ernie. He was everywhere. And this helped the conference organizers as well. They seemed to be completely literate in Borgnine trivia. (I plan to make a recommendation to the International Ed Asner Look-alike Association that Thessaloniki might be a suitable target for a future plans).

The first round in the Ernie Borgnine look-alike contest is the swimsuit competition. This is always a crowd pleaser, as Ernie himself was never known for having a stellar figure. As the contestant walks out onto the stage, he removes his t-shirt and bares his chest while the panel of judges begin to scope out his physique. The contestant struts around the stage for a few minutes and then exits at the opposite side from where he came in. The judges then jot down their respective scores and the next contestant enters.

This year in Thessaloniki a record seventy-five Borgnine look-alikes were signed up and ready to go. The most impressive showing in the swimsuit competition, in my opinion, came from Dimitris Poppogondropolou, a professor of computer music composition at the Diogenes University of Thessaloniki.

Dimitris was nearing fifty and vaguely resembled Borgnine around the time of his landmark performance in *The Poseidon Adventure*. Poppogondropolou walked out

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onto the stage wearing a tight lime green shirt that showed off his impressive pectorals. Written across the front of the shirt, like a five year-old had written them, were the words, *Tape Music Forever*. He turned around so his back was facing the audience and flexed his biceps. The back of his shirt said, *I love tape pieces with water sounds*.

With the obstinate folly of a Chippendale's dancer, he slowly peeled the shirt off his weathered torso. The females in the audience filled the room with a sonic ocean of howls and whistles. Since the sound system featured four thousand and thirty-seven hi-fi speakers surrounding the audience, these howls and whistles seemed completely musical.

Dimitris didn't look exactly like Ernie Borgnine, but in comparison to the 1971 swimsuit picture of Borgnine that served as the model for this particular round of the contest, he fared quite well. His body was rugged and gritty, as if he had been working in the sun for twenty years. There was a rhythmic motif about the way he moved, supple and flowing, but aggressive and unrelenting at the same time. His path across the stage began with a low-level saunter that blossomed into a high-level stride. Oversized beige bathing trunks adorned his waist and they looked more like they should be worn by Archie Bunker instead of Ernest Borgnine. But they worked and the judges were impressed.

None of the other contestants really did anything for me at all. There were lots of amateur student Borgnine impersonators and they all had no imagination. They had no rhythm to their stage walk and most of them lacked the experience to properly exude the Ernie Borgnine savoir-faire. I left halfway through the swimsuit competition and went down the street to a local Taverna. After putting a 200 Drachma coin in the jukebox and playing "Highway to HelExpo," I slowly put away a jug of wine and left. Thessaloniki is full of places to get drunk—another reason for hosting the show this year.

One and a half hours later, while staggering down Tsimsiki Street, I happened to notice an old run-down hardware shop on the corner. Boxes of old faucets, light switches, scrap metal parts, screws, and nuts and bolts were strewn about the front of the place and the windows were all dusty with soot. A stray dog was asleep on the sidewalk and to the right of the doorway, upon a broken metal fold-up chair, sat a plump old Greek man smoking a hand-rolled cigarette. He looked exactly like Ernest Borgnine. In fact, he looked more like Ernie than any of the contestants I had seen earlier that day. I went down to the shop and tried to communicate with the man, but he couldn't speak English and I couldn't speak Greek. I gave up and went back to my hotel.

The swimsuit competition usually took a few days to finish, especially this year since there were more competitors than usual. Contrary to my opinion, Dimitris Poppogondropolou didn't come out ahead. A seventy-five year-old DSP engineer named Iannis Jatbakis took first. It was a travesty of justice—he looked nothing at all like Ernie. Albeit his face did have a remote similarity to Borgnine in *Ice Station Zebra*, it wasn't enough to warrant a first prize. The only memorable attribute about him was his black T-shirt advertising the new Ernest Borgnine movie, *Godzilla Versus the Physical Model*.

I began to think of the fellow in the hardware shop. He should be in this contest. In fact, he'd probably win. My best alternative was to go back and find him. If I could only speak Greek I'd be able to convince him to sign up. It would probably be too late since the event had already begun, but it was worth a shot. If these guys voted Iannis as the winner of the swimsuit competition, they had to be screwed up. Where do these judges come from? This was only the beginning of the competition, so my hopes were still up for Dimitris winning the whole thing. After the final day of the swimsuit competition, I went back to the hardware shop with a photo of Ernest Borgnine in my pocket.

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Towards a Taxonomy of Latin American Electroacoustic and Computer Music

Towards a Taxonomy of Latin American Electroacoustic and Computer Music

by
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The main objective of this text is to outline a classification for systematizing the study of the electroacoustic and computer music production by Latin Americans. It is known that there is very little written material about the history of electroacoustic and computer music in the Latin American region. Some people have been working systematically for that purpose, but there is still a big gap.

Composers have been grouped below according to aesthetical, musical, technological, geographical, and chronological considerations.

1. Chile, so far the pioneer country:

Juan Amenabar, Jose Vicente Asuar, Leon Schidlovsky, and Samuel Claro.

2. Pioneer composers in other countries:

Peru (a very important pioneer country): Jose Pinilla, Edgard Valcarcel, and Cesar Bolanos; Columbia: Jacqueline Nova; Argentina: Francisco Kropfl;

Guatemala: Joaquin Orellana; Brazil: Jose

Maria Neves: Uruguay: Hector Tosar; and Cuba: Juan Blanco.

3. "Pure Latin American contemporary music":

Coriun Aharonian, Graciela Paraskevaidis, Eduardo Bertola, Oscar Bazan, Jose Maria Neves, Conrado Silva, and Cergio Prudencio.

4. Individual tendencies:

Ariel Martinez, Dante Grela, Jose Ramon Maranzano, Jose Augusto Mannis, Rodolfo Caesar, and Jorge Antunes.

5. Non-Latin American approaches:

Mauricio Kagel, Hector Tosar, Mario Davidovsky

6. The computer music group:

Ricardo Dal Farra, Roberto Morales, Aluizio Arcela, Rodrigo Segnini-Sequera, Juan Reyes, Martin Fumarola, Eduardo Miranda, Manuel Rocha-Iturbide, Rajmil Fischman, and Anselmo Guerra.

7. Nonresidents of Latin America:

Horacio Vaggione, Ricardo Mandolini, Mario Davidovsky, Mauricio Kagel, Julio Estrada, Mesias Maiguashca, Javier Alvarez, Alejandro Vinao, Ezequiel Vinao, and Gabriel Brncic.

Some typical features of Latin American contemporary music were considered as a framework of reference: the sense of time, discursiveness and non-discursiveness, use of reiterative elements, austerity, violence and taste for "little things," employment of silence, presence of the "primitive," cultural identity, use of technology, and "rupture of the borders" (i.e., producing music beyond the conventional). These analytical axes follow the framework expressed by Uruguayan musicologist Coriun Aharonian in his research article "Breaking Through Borders - An Approach to Compositional Trends in Latin America."

Some of the conclusions come from my papers: "An Approach to a Latin American Computer Music" (presented past year at the ICMC in Hong Kong); "Change and Permanence in Latin American Electroacoustic and Computer Music" (my article about the basic discography of Latin American electroacoustic music, which appeared in *Computer Music Journal* 20:4); and some other articles published in *Array* and *Contact!* Certain composers and musicologists have made very valuable contributions: Coriun Aharonian, Graciela Paraskevaidis, Dante Grela, Ricardo Dal Farra, and Juan Amenabar.

I am aware that names might be missing, but this is a risk for anyone interested in electroacoustic and computer music by Latin Americans. All omissions are unintentional.

This text is based on the tutorial project presented to the Fourth Brazilian Symposium on Computer Music.

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Objectivity in Music: An Impossible Fantasy

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Abstract

This paper proposes that there are no objective aspects of music at all. To support this claim, the author uses the latest research from neuroscience, cognitive psychology, and neo-Darwinism. This paper also points out why the computer represents an inadequate means for Artificial Intelligence when used to emulate the workings of the brain. Furthermore, it addresses the cultural issues regarding the survival of computer music.

Introduction

Recently I came across people arguing about objective and subjective aspects of music. I thought that the argument was not worth pursuing because I tend to believe that the very concept of objectivity is subjective, and that there are no objective aspects of music at all. My assumption is that everything we know is a matter of interpretation, and there are as many interpretations as there are conscious organisms. To support this point of view I have to start with the study of the headquarters of subjectivity—the human mind.

For a long time the human mind and consciousness fell under the province of metaphysics and were generally considered as topics improper for scientific investigation. Even today, there is an enormous reluctance of scientists to deal with such subjective phenomena. Those who dare to wrestle with these slippery issues, often address the complexity of the mind via the Darwinian theory of evolution and cognitive psychology; or, as neuroscientists do, focus their interest on the structure and workings of brain and its functions. The best results will probably come from a marriage of these two strategies.

There are lots of theories, particularly in AI and cognitive psychology, that try to parallel computer and the brain, but when doing so we have to be extremely careful. The most important point to make is, that human brain developed over a period of more than 500 million years under the pressures of natural selection. This development certainly cannot be compared to a deliberate design of computer technology by the engineers. Old computer hardware and the software are often being completely scrapped and redesigned from scratch, to reflect totally new fresh ideas and approaches. The only obstacle to this progress is market's requirement for backwards compatibility. I like to be able to run my old software on new hardware. On the other hand the human brain is entirely designed by evolution-forced backwards compatibility. We have a reptilian, paleomammalian, and neomammalian brains layered on top of each other, all running at the same time.

If we remove the cerebral cortex—that part of our brain that has evolved over the past two million years or so—we essentially eliminate our humanity. Beneath the cortex is a brain that is not far different from that of a Bengal tiger, a French poodle, or an Arctic fox. We could, if we wish, remove even more to approximate the brain of a salamander or a rattlesnake. [Restak, 1984]

Our brain has an archaic multilevel design comprised of several brains each developed in different periods of evolution for different purposes and priorities. There is no way of going back, as in case of computers, to improve the design and rewire it for higher efficiency—we simply got stuck with our reptilian part of the brain.

Let me use an example from technological evolution to illustrate this point. The very computer keyboard that I'm using in writing this article, known as QWERTY keyboard for its letter layout, was designed at the time when fast typing on mechanical typewriters caused letters to jam. To remedy the problem and slow down the typing speed typewriter manufacturers came up with the most speed-inefficient layout of letters—known as QWERTY. This is the

keyboard we use today on the computer which does not have any letters to jam. But, can we go back and redesign the keyboard to achieve the most efficient and application appropriate letter layout. The answer is NO. Considering the number of people that today use QWERTY keyboards trying to improve their typing speed, it is near to impossible to make the change. Through technological evolution we got stuck with QWERTY, just as through biological evolution we got stuck with our limbic part of the brain, which guides our emotional responses and behavior. [Dennett 1995].

Another important point is that computer works very fast crunching numbers serially, one after another, operating at the speed of more than 10 million transactions per second. The human brain fires at much slower rate of a hundred spikes per second but makes up the speed loss with its massive parallelism. For example, more than million axons go from each eye to the brain, all working simultaneously. Now we know for sure that the brain is built as a massive complexity of parallel-interacting neurons which lack a hierarchical order and central organizer, but do produce an emergent property—consciousness, which is mainly serial subjective) in its nature. [Crick 1994] This is the reason why we have a sense of subjective unity regardless of the multi-level and multi-component make-up of the neurons involved. [Restak 1994]

Thinking and Logic

With the idea of developing machine intelligence additional problems arise when making the analogy between thinking and logic. Computer software is a written set of logical (this includes fuzzy logic too) instructions that conform to a specific syntactical structure which depends on the programming language in use. It is totally inadequate to think that syntax produces semantics. Semantic contents involve meanings, and syntax does not in itself deal with meanings.

In the computer, the meaning is assigned by a human programmer. There is no ambiguity in the interpretation of physical states as symbols because the symbols are represented digitally according to rules in a syntax. The system is designed to jump quickly between defined states and to avoid transition regions between them; electronically, each component always goes to a zero' or a

'one.' [Edelman, 1992]

Putting it simply: logic, as well as mathematics, operate in the abstract and, let me use that word here, 'objective' realms; while semantics consider meanings which are subjective by default.

Here is an example that illustrates this point. Biological objects under evolutionary time have functional properties that are different from, for example, those of electrons. We cannot speak of the abnormal function of an electron as a physical object. On the other hand a proper function of a biological device depends on its evolutionary history. A human ear has a proper function to transduce a sound into a bio-electrical signal. There is also an evolutionary explanation for the construction of such a component (an ear) in a species, and this justifies the correspondence of this organ to 'normal' ears in that species. Human ears work well or not; badly functioning ones, like Beethoven's, are abnormal and may need a hearing aid. In contrast, atomic particles do whatever they do, and whatever they do is part of their 'working.'

Within the evolutionary context, functions that propel the survival of the fittest are labeled as 'normal' functions. Thus, each set of functions may be recognized as 'normal' in relation how the system redundantly manages to perform that function. Since we know that the neural making of every human brain is different, as well as the environmental and historical context in which each brain develops, we may consider our brain/minds to be quite different systems. Different systems have different contexts that render all kinds of different 'normals.'

Meaning derives from embodiment and function, understanding arises when concepts are meaningful in this sense, and truth is considered to arise when the understanding of a statement fits one's understanding of a situation closely enough for one's own purposes. (Notice the pragmatism!) Thus, there is no absolute truth or God's-eye view. [Edelman, 1992]

Meaning, Genetics, and Environment

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To come up with a meaning it is necessary to have a conscious human being interacting with environment. This kind of being, unless raised in a deprivation chamber, is going to be loaded with myriads of subjective life experiences. Humans categorize 'good' and 'bad' experiences based on their interactions with the environment and the ability to detect, memorize, and compare exponentially growing repertoire of new good and bad things. Most of the human intentions are based on these subjective experiences and computers have neither intentions nor experiences.

The home of our conscious subjectivity is cerebral cortex—the last part of the brain to evolve. This is the part that produces consciousness and that we are the most proud of; because it can make complex decisions, create language, write music, play chess, and think of the black holes—which no other animal can do. Unlike other animals, humans are born with only 25% of its adult brain weight, and brain's final development has to be finished after birth. Though human genome specifies in great detail construction of a human body, vast number of the brain circuits are not preset by the genes and ought to be finished later in life. Since every human's being history and circumstances are different, every brain's wiring is going to be quite unique. Humans come to life having a brain endowed with automatic survival mechanisms which work adaptively in an array of socially permissible decision-making strategies. These nurturing conditions under which brain finishes its development are shaped by a certain culture that conforms to 'socially agreed' set of values.

Educating the brain within such a system of social organization should guarantee the survival of that cultural group (species) within the given environment.

Hypothetically, if the mores of the cultural environment do not prescribe the practice of music, these survival mechanisms would certainly guide one to become non-musical. If Mozart was born in this kind of environment, in spite of his genome outline, he might prefer being a carpenter rather than a musician.

The Matter of the Mind

Humans categorize on culturally adopted
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set of values. Computers cannot do that, their values are specified in advance and imposed on the system by a human operator as a set of algorithms that define what to do under appropriate conditions and with appropriate error feedback. [Edelman 1992] It would be nice if we could talk about mind, as some psychologists do, only in terms of algorithms. Looking at different brains as if they were replicable machines or black boxes which can be understood solely in terms of inputs and outputs is an oversimplification. Neuroscientists are going inside the 'black box' and trying to figure out the mechanisms which operate our brains. The tissue organization and composition of the brain in form of groups of interacting neurons may be doing this job.

These groups compete with each other in an effort to create effective representation, or maps, of the infinite variety of stimuli entering from the world. Groups that form successful maps grow still stronger, while other groups wither. [Horgan, 1996]

It is not by chance that brain of a person musically gifted possesses a thickened area that processes sound—the auditory cortex, while a person with photographic memory has more neurons in its visual cortex. [Restak 1991] This is the feature that we call talent and it is genetically predisposed. The precise structure of a certain neural tissue of the brain exposed to a certain external environment will allow that tissue to develop, for example, a musical talent. For that reason it is wrong to believe that human brain of the youngster is an empty book that experience will write its story on. [Gazzaniga, 1992] If the neural circuits are not receptive to the environmental pressures the experiences 'written' in the brain will be faint.

Brain's Age

So far I have dealt with two conditions required for design of another Mozart: a) genetic predisposition, and b) stimulating environment for that predisposition. There is yet another very important aspect in this picture to be considered and that is the age of the brain. When the brain is young it displays a neural plasticity which is capable of developing more and more neural connections required for a particular talent. This plasticity diminishes as the brain ages and may be one of the reasons why we get

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no musical talents suddenly erupted at the age of fifty. Even if the person had a thickened auditory cortex but the environment did not externally stimulate it at the most appropriate time—no Midori will be produced.

Some circuits are remodeled over and over throughout the life span, according to the changes an organism undergoes. Other circuits remain mostly stable and form the backbone of the notions we have constructed about the world within, and about the world outside. The idea that all circuits are evanescent makes little sense. Wholesale modifiability would have created individuals incapable of recognizing one another and lacking a sense of their own biography. That would not be adaptive, and clearly does not happen. [Damasio, 1994]

Generally speaking, development of neural mappings for the 'talents' that involve some kind of intensive body coordination, such as playing a violin or a game of basketball, tend to be locked-in very early in life. Other, more 'disembodied' talents retain their neural circuit plasticity for much longer period of life. A famous pianist said to me, about forgetting a familiar piece of music, 'Muscle memory is the last to go,' meaning by that term playing the piece automatically and without thinking about it. [Crick, 1994]

Emotion and Feeling

Let me now try to explain why the embodiment is so important for our understanding of the mind. The human body, as represented in the brain, provides a fundamental frame of reference for the neural processes that we experience as the mind. We use the physical state of our very organism as the ground reference for the mental constructions which we make about the environment we live in. [Damasio 1994] It is extremely important to understand that the human body and the brain constitute an inseparable interconnection that produces our consciousness. Everything we do, is derived from the structural and functional ensemble of these two, rather than from brain alone.

Can one fancy the state of rage and picture no ebullition of the chest, no flushing of the face, no dilatation of the nostrils, no clenching of the teeth, no impulse to vigorous action, but in their stead limp muscles, calm

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breathing, and placid face. [James, 1950]

In short, the background state of our body landscape provides a rather neutral 'mood,' against which we can judge any changes shaken by emotions. When the brain consciously appraises emotional changes in that equilibrium, we are having an emotional response—a feeling. Pretty much like being aware of the goose bumps while listening an effective piece of music. Conscious feeling of these goose bumps creates in your brain a memorized history of your body state under the given circumstances. Feeling depends on the juxtaposition of an image of the body, correlated to an image of something else; such as the auditory image of a piece of music. Damasio 1994! Thus, later on in life, under the similar listening conditions, your brain may recreate this correlation of the images, and you may experience the feeling of goose bumps again.

Our individual identity of selfhood is firmly grounded on this illusion of living sameness, against which we can be aware of the infinite changes in our environment and consequently in our body. For this reason the sheer fact of a change in a room temperature, while listening to piece of music, may dramatically affect you emotional responses. Here it lies one of the central problems of the western medicine which subspecializes in treating diseased organs and system throughout the body but rarely addresses its most precious product—the mind. [Damasio 1994] Needless to say, that computers are not only disembodied; but cannot by themselves provide a meaningful relation between symbols and world entities. This applies even to the most advanced achievements in robotics.

Attention and Memory

We also have to be aware that not all operations of the brain correspond to consciousness, as I mentioned earlier in the case of the background body feeling. Awareness starts when we consciously focus on a point of interest. Here, I would like to concentrate on consciousness which involves very short term of memory and it is closely associated with attention. Attention is, as William James said, 'withdrawal from some things in order to deal effectively with others.' In general, there is a loose agreement that attention and primary consciousness involve some kind of a bottleneck. At first, the brain is processing the vast amounts

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of incoming information in parallel. Then the selective attention of hearing, for example, concentrates on one or a few objects at the time using the serial processing of the bottleneck—attending to one object after another. This is done by temporarily focusing on the objects of our interest while filtering out unattended information. [Crick 1994] Pretty much like listening to Bach's fugue while focusing our attention to the thematic workings of the dux and comes.

We may assume that primary consciousness of short-term memory deals with attention which is value-free perceptual categorization. This takes place before perceptual events contribute further to the alteration of neuronally structured and experience shaped value-dominated long-term memory. When short-term memory starts to contribute to the modification of a subjective long-term memory (this could be called a learning process) events are no longer in the remembered present, that is, they are no longer in primary consciousness. [Edelman 1992]

Primary consciousness is required for the evolution of higher-order consciousness. But limited to a small memorial interval around a time chunk I call the present. It lacks an explicit notion or a concept of personal self, and it does not afford the ability to model the past or the future as part of correlated scene. [Edelman, 1992]

Musical Experiences

Now, just for the sake of experiment, let's assume for a moment that under the same external environmental circumstances, for me to perceive a middle C, certain groups of neurons and molecules in my head must behave in a very specific way. If the neural correlate of middle C in your head is exactly the same as in mine, which we know is probably not true, we may conclude that you hear middle C the same way I do. Stating this, we inevitably run into a problem with 'exactly.' The word 'exactly' functions properly only in mathematics $1 + 1 = 2$. On the abstract level 'exactly' makes perfect sense but in practical world of everyday's living, nothing is exactly precise. Moving further on, to consider a major scale, things get indeed considerably obscure. When the brain receives sequences of musical tones, it does what it does with other patterns: it attempts to 'interpret' them by using the information stored in its long-

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term memory about previous, similar experiences. This information may allow some aspects of a future signal to be anticipated—as it happens when we hear the first line of a familiar song. This ability to extrapolate forwards on the basis of past experience is one form of that ability that we call intelligence; it can dramatically enhance an organism's chances of survival. Thus, if my neural correlate of middle C depends on my past experiences, which we assume is true, then my neural correlate for major scale is going to have totally different wiring than yours. My past musical experiences had grossly influenced my neural mapping which correlate in my brain with a concept of major scale. ... we constantly judge by comparison, and our judgment of any item depends upon what we are comparing it to at that moment. [Ornstein, 1986]

Different parts of brain handle specific mental processes but even this changes with our experiences. Comparing the brain activities while listening to music by trained musicians and people who have no specialized musical training shows very interesting results. Researchers discovered that musicians process music in their left hemisphere which is concerned with analyzing and comparing, for example the musical form and structure. Non-musicians' brains reacted to music with the right hemisphere in a more holistic way '—I like this but not that'—which does not involve too much analysis. When non-musicians became more involved with appreciating music the PET (positron emission tomography) scan pattern of their brains showed a shift towards the left hemisphere because now they were equipped with new musical knowledge which enabled them to analyze. [Restak 1991]

Addressing the past experiences we have to also consider the way our brain handles the long-term memory. These memories are not stored in the brain photographically as intact individual events; and there are no stores of audio tapes, or albums of pictures. This is completely unlike computer-based memory which deals with exact reproductions. Human brain operates with a reconstructed version of the original—an interpretation. In order to compile a musical

tune, the brain has to fire a certain set of neural mappings as a means to paraphrase 'the music.' These firing patterns trigger the momentary reconstruction of an approximate representation of the 'Star Spangled Banner,' for example. Your interpretation of music today, depends on: who you are, what are you doing at that moment, and your past experiences stored in the long-term memory. But, the next day, you are going to be different, what you will be doing is going to be different, and your past experiences in long-term memory will change as well.

The "mass of soothing sound" your mother made while singing lullabies to you in childhood, is reduced to Twinkle, Twinkle Little Star, later on in life. Our memory of a certain musical piece is influenced not only by previous knowledge but also by events that happen between the time an event is perceived and the time it is recalled. [Ornstein 1991] Furthermore, we can only recall memories that are related to our present situation—where you are and what are you doing. If you are composing an orchestral piece your brain more likely focuses on recalling memories related to the instrumental ranges, rather than memories of how to change a flat tire on your car.

So our memories, as exact, recorded, fixed images of the past, are an illusion. We believe we are stable, but this is one of the built-in illusions of the mental system. We believe we remember specific events, surely. Yet we don't. We make them up on fly. We change our minds all the time, from our estimate of the odds on a bet, to how we view our future. And we are unaware that the mind is doing this. [Ornstein, 1991]

Limitations of Artificial Intelligence

All this is pointing out that human mind deals exclusively with subjective phenomena and what we call objective is nothing but what most people agree to within a given socio-cultural context. Yes, we may listen to Beethoven's symphony in terms of air-pressure waves and on that level probably most people would have similar experiences. The question is, what is the use of doing that?

Herein lies the insurmountable problem of Artificial Intelligence—to emulate the human mind, science's final frontier. Holding that the brain is nothing more than a very

complicated machine whose properties can be duplicated with computers seems very implausible. Even the system like the Internet is absolutely trivial compared to a brain. If there is a computer model of the brain/mind to be manufactured, it would have to mimic the human development of going to kindergarten, playing around the house, listening to music, and being traumatized by your neighbor's dog. Marvin Minsky, one of the founders of AI, made a statement which essentially undermines the whole project of AI in human terms.

Minsky confessed that he would love to know what Yo-Yo Ma, the great Japanese cellist, felt like when playing a concerto, but Minsky doubted whether such an experience would be possible. To share Yo-Yo Ma's experience, Minsky explained, he would have to possess all Yo-Yo Ma's memories, he would have to become Yo-Yo Ma. But in becoming Yo-Yo Ma, Minsky suspected, he would have to cease to be Minsky. [Horgan, 1996]

This claim is the admittance that everything we know is nothing but a subjective interpretation shaped by person's biological make-up of the brain and neural correlates of the past experiences which define the self of that very person. Now, we are left with exclusively subjective properties of music to deal with, and in this dealing we may use the computers, because they are the most powerful heuristic tools we have in our attempt to understand the matter of the mind. [Edelman 1992]

Memetic Cultures

Intelligence and a culture are corequisites for each other. What makes the primary difference between our species and all others is; our reliance on cultural transmission of information, and hence on cultural evolution. Animals do interchange information within a biological rather than a cultural context. Bird mating calls certainly fall under the category of sonically transmitted information which is specific to a given species, but those species have limited intelligence and undoubtedly no bird-culture. This does not mean that animals have no minds, it simply means that by human standards those 'primitive' minds produce no cultural history.

Dawkin's' meme, has a peculiar but powerful role to play in our understanding of the

human culture. This is the way he defines it:

Examples of memes are tunes, ideas, catch-phrases, clothes fashions, ways of making pots or of building arches. Just as genes propagate themselves in the gene pool by leaping from body to body via sperm or eggs, so memes propagate themselves in the meme pool by leaping from brain to brain via process which, in the broadest sense, can be called imitation. If a scientist hears, or reads about, a good idea, he passes it on to his colleagues and students. He mentions it in his articles and his lectures. If the idea catches on, it can be said to propagate itself, spreading from brain to brain. [Dawkins 1976]

The important rule for memes, as for genes, is that they must constantly replicate. This replication is a mindless process not necessarily for the good of anything; replicators flourish that are good at replicating—for whatever reason. Meme X spread among the people because X is a good replicator. [Dennett 1995] Let's take a moment and look at one particular meme case—the success of a four-note meme at the beginning of the Beethoven's Fifth Symphony. It certainly has little to do with a pitch-set of its 'internal' design, i.e. the way a musical piece is compositionally structured, but much more to do with the design this meme presents to the world, its phenotype, the way it affects the minds and other memes in

a particular socio-cultural environment.

Conclusion: The Future of Computer Music

If we take all this into account, it is clear that as long as computer music composition is iconoclastically focused on its internal structure such as: fractals, fibonacci numbers, solar systems, palindromes, permutations, interpolations, pitch-sets, algorithms, etc. etc.; and less focused on how the cultural environment reacts to it; computer music memes are not going to replicate and spread themselves further beyond the narrow technically oriented facilitators. The question: Do we compose only for our idiosyncratic selves or for the audiences of our culture?

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Interviews

INTERVIEWS WITH
FERNEYHOUGH, PUCKETTE,
XENAKIS, LANSKY, LERDHAL,
TRAMO, REYNOLDS

The following interviews were conducted by Thanassis Lalas for the Greek newspaper VIMA in the week prior to ICMC97 and were published in VIMA on Sunday the 21st of September 1997. They are being reprinted here by permission of VIMA and the Lambrakis Press Foundation. The transcription of the interviews was made by Rachel Howard and the preparation and compilation by Thanassis Rikakis, except for the Roger Reynolds interview, which was translated by Myrtili Anagnostopoulos.

BRIAN FERNEYHOUGH

Thanassis Lalas: When did you first discover that you could solve problems of composition using a computer?

Brian Ferneyhough: I had been working for many years with what amounts in fact to a series of algorithmic procedures. I had been carrying out these operations by hand, during the act of composition itself; they had been part of my basic composition process. I had visited IRCAM in the early '80's to do some research on the generation of spectra, but I had not pursued that in my compositional work. However, in 1989-90 I went to IRCAM again. I said to Jean-Baptiste Barriere: "Wouldn't it be nice if some of the things that I'm doing in terms of algorithmic generational procedures could be modeled on the computer in such a way that I, as a non-computer technician, could begin with the image of musical notation, could apply various parametric transformations to that, and emerge at the other end with musical notation again?" And he said: "Well, we can more or less do that already - the program is called Patchwork." I had not been familiar with this at all. So I then arranged a longer visit and began working with Michael Mult?, who was then the resident Patchwork expert. We sat down and looked at some of the techniques which I had developed in the

last 15 years or so. We came up with ways of using Patchwork that I could do these same things, but both much more rapidly and undertaking many more experimental passes through the material, so that I could familiarize myself much more intuitively with what the algorithmic processes that I had developed were capable of doing.

TL: How do the pieces you composed before then differ from those you composed using the computer? Would an ordinary listener be able to discern these differences?

BF: I'm not sure about either of the two. Somewhere in between would probably be my answer. Someone not very familiar with my music would not be able to hear much difference. However, from my own point of view, I know that Patchwork has enabled me to dedicate myself once more to very large forms - pieces more than 20 minutes long, let's say. I wrote a string trio two years ago which utilizes Patchwork techniques extensively. As I say, I have been able to familiarize myself intuitively much better with the means at my disposal. My main concern at the beginning was that there be no real difference - no break - between the pieces I wrote before and the pieces I wrote using Patchwork. The important thing for me was to start using Patchwork in such a way that it modeled things in my own compositional repertoire with which I was already familiar. I was not interested in developing new techniques immediately. This has been very much a slow, incremental process of developing new techniques from old techniques. So my main concern really was that my basic musical idiom - the one I articulated to myself, at least - would remain constant. And this is exactly what we did on the basis of learning to use these various devices. Then, over the next few years, we greatly expanded the subtlety of the techniques involved and the number of techniques involved; so that I was speculatively able to expand my command, both in terms of detailed organization and large-scale formal architecture, in a way which had not been available to me before that.

TL: To what extent has the computer redefined the use of algorithms in music?

BF: Personally, I don't think that I have moved very far from the path that I was pursuing already. From piece to piece, I have experimented with different things; but by and large I have concentrated upon amplifying and making more consistent a basic library of patches, which I then modify from work to work in a rather minimal fashion. For instance, I have recently been developing an entire series of highly codified rhythmic generational patches. It's true that some of the things that come out as a result of utilizing these patches are not things that I necessarily would have written before. However, I think that there is a very strong relationship between the sort of quasi-algorithmic procedure I was using before, and what I hope are much more consistent and homogenized results which have emerged in the meantime.

TL: What musical need prompted you to use algorithms in composition, even before you began using computers?

BF: It was probably the need to develop the syntactical aspects of my musical language in a more consistent way. I began with rather neo-expressionistic compositions back in the early 1960's. Although I was using various sorts of serial technique, today I wouldn't say that utilization was particularly consistent, either technologically or aesthetically speaking. So one thing that concerned me in the mid 1970's, particularly when I was writing a number of large scale pieces, was to develop the grammatical aspect, as it were, of my own personal means of expression, so that it would be better able to support and contain the expressive dimension. Since I am pretty much an auto-didact as a composer, I felt it was necessary for me to really start back at basics and to develop an entire new toolbox of compositional techniques. For instance, you may know that many of my works are based on non-musical concepts taken from painting, philosophy or general aesthetic precepts. I wanted to balance that with a very strong and highly developed, internally coherent and cogent set of working procedures. So in the early 1970's, I began to concentrate much more on the mechanics of specific generational techniques. Although these techniques took their starting point from certain integral serial conventions, nevertheless, both aestheti-

cally and technically, they rapidly distanced themselves from that starting point.

TL: What do you mean by saying that you are an auto-didact as a composer?

BF: I did not start composing under the aegis of a composer of the older generation who was able to instruct me in the historical significance and the correct utilization of compositional techniques already extant. Being born in the British provinces, I had no access to this sort of transaction, so I was forced to acquire such information as I managed to accumulate in a rather unsystematic fashion. And so, at a relatively early age, I had become fairly independent spiritually - even though some of the techniques I was using were perhaps not particularly consistent in and of themselves. The collection of things that I made did not necessarily emerge from any sort of guiding aesthetic principle: it was just what I happened accidentally to have encountered when I first started composing. It's true that at a much later date I did study for two years in Basel, in the masterclass of Klaus Huber, but by then my own musical technique was already highly developed. So although our conversations and encounters were very important to me on a human level, I don't feel that the way I approached composing was changed during that course of study.

TL: Isn't it rather unusual for a child raised in the provinces without a mentor to show such an interest in music? How do you account for your fascination with composing from such a young age? Do you think it was a matter of passion or of innate talent?

BF: Why does anybody become an artist? I don't think that one becomes an artist necessarily because one has a good teacher. You have to have the basic drive. There has to be a sort of neurotic, claustrophobic compulsion which enables you to organize the impossibilities of life, whatever psychic pressures one feels oneself under, in such a way that they become productive. It's a strategy for survival.

TL: So do you believe that if you had been born under completely different circumstances you would not have become an artist? Did you turn to art simply as a means of coping with your environment?

BF: In my view, a non-tough environment can sometimes produce a far more alien-

ated individual than a society in which we are continually faced with various sorts of challenges. It seems to me that the environment into which I was born was a perfectly adequate one if you were a certain sort of person. Since I was clearly not that sort of person, there was no way I could fit into it. I think that will always be the case. At least, I hope that there will always be individuals who - because they do not find a way of organizing their internal self-image and their creative energies in a way which conforms with the prevailing social norm - will in consequence always seek some other way of expressing themselves. And it does seem very important to me that we continue to see in contemporary music a critical social dimension. If "serious" art were no longer to exist, I think there would be a grave danger of the images from popular and commercial culture in which we are drowning every day, really taking over our internal lives and biodegrading our individuality. So I think art does have a tremendous role to play, even in the most well-integrated - and perhaps especially in the most well-integrated societies. Each of us has to acquire an essential personal distance with respect to society, in order to remain reasonably healthy and aware of one's own personal identity.

TL: How would you sum up the need for art in society today?

BF: (Laughter) I think art is our last best hope for maintaining the validity of the individual subject. I think that even in a time of great affluence and reasonable social calm and progress, in a technological sense at least, there is a need for a different dimension, for a different sort of... The word I'm looking for, I think, is optimism. When I listen to a great piece of music - be it contemporary music or of any other period - the thing that most strikes me about the experience is a sort of energized exhilaration or optimism. In the world in which we live, in which most solutions are only seeming solutions to real problems - in which everything is cosmetic - I think that sort of experience of creative optimism and personal engagement is something that it would be a disaster to no longer have available.

TL: As a contemporary composer, would you consider yourself successful if your work continued to inspire this kind of optimism in an audience in 50 year's from

now?

BF: A piece of music has to define its own public: you can't define a public in advance, and then assess if the work has been successful in arriving there or not. It doesn't work like that. In my opinion, that amounts to the kind of statistical thinking which is prevalent in commercial society. I am content to let a work find its own level. If it speaks to ten people, but it says something essential to those ten people, that's fine. If it speaks to 500 people, that's even better. But I do not think there is a numerical quantitative relationship between quality, effectivity and the ultimate validity of the work. I do not think there is necessarily a direct connection between these things. Let me just clarify what I said earlier about optimism. I did not at any point intend to say that my music is optimistic. In fact, I would say that my music tends to be rather melancholic, in the sense that the stylistic ambiance of my works relates most closely to a late high modernist stance. I am trying to push even further and radicalize even more certain stylistic traits or precepts which were common currency after the second World War. However, I do feel that the observation and the sensation of any great, innovative, new cultural achievement, any new synthesis of means which seemed impossible before that experience, creates a sense of great energized optimism. That doesn't mean the work itself is expressing or incorporating an optimistic stance.

TL: What internal need drove you to create your own personal musical syntax?

BF: I suppose one of my basic needs was to define myself through the encouragement of a certain sense of freedom. I needed to free myself from certain oppressive cultural or social givens. In order to do that, there are two courses open to you. One is to explode everything into the air and destroy it, and to be left with a heap of rubble. This is expressive in its own right, at least in the short term. The other alternative is to create a counter-proposal - something which by means of an examination and critique uses systematic techniques to build a consistent compositional future.

TL: Do you think the fact that you chose and were able to realize the latter course is a question of personality, or a question of possibility?

BF: I haven't the faintest idea! History is necessarily a sort of benign fiction. If I were to give you an answer to that question with the best will in the world, it would still be a form of fiction. I would be making up a plausible answer. I'm probably the last person you ought to ask that. It would be better to ask people who are familiar with the development of my music over the years.

TL: But history has been shaped by both sorts of people - those who blow everything up and those who suggest new solutions in order to create freedom. Which of the two do you think has had a greater impact on the course of history?

BF: You have to judge it case by case. I don't think it is possible to make a direct comparison per se. It's like comparing apples and atom bombs! They both start with an 'A', right?

TL: You said earlier that you have often been inspired by other art forms. Could you define what you mean by "inspiration", and what you hope to achieve by entering into a dialogue with other art forms?

BF: I am very, very concerned by the conviction that no form of expression stands alone. The important thing is that we find ways of communicating between different forms of discourse. I have always been concerned not only with musical means but with trying to understand how music, as a relatively abstract form of art, is capable of absorbing, assimilating and reprojecting perceptions which originate in some other form of art, or in science or philosophy. These things are very important to me and always have been. Very often a work is born, conceptually speaking, at the moment in which I am influenced in some direct way by reading, or looking at a painting, or by thinking about some philosophical issue. Once I have understood what sort of field of discourse the new work might inhabit (and often have also found a title for the piece), I am able to reassess the technical means available to me with a view to creating a piece which deals with those issues in a creative fashion. I have developed a whole group of musical images

which are communally based on false or multiple perspective. What, for instance, does it mean to speak of musical perspective? What are we talking about? How does the concept of perspective, and the attached implications of realistic depiction, impinge upon a multi-leveled musical discourse?.

TL: Are there instances where your attempt to recreate something inspired by another art form has resulted in the creation of something totally original?

BF: But that's exactly what I'm trying to do! I assume that the original impulse will be subsumed by the incrementing creative drive of the work that I am trying to create. I have no intention of writing program music. I'm not interested in any way in directly depicting facts or images from any other form of communication whatsoever. It's a fact that nobody starts from nowhere. We all start with particular sets of cultural assumptions, with particular interests and tastes, particular criteria of quality, and so on. And of course, when brought into contact with external facts - be they cultural, political, social, or creative - these end up creating quite new and turbulent interactions. My main interest is simply in making sure that music remains in a dialectic, ambivalent and state; that is, whilst I recognize that no work of art can strive legitimately to be totally autonomous, nevertheless it is important that each work be so firmly in command of its own ground and the means at its disposition, that it is able to confront any images which it absorbs from the outside world very much on its own terms. That would be another answer to the question you asked me earlier about the reason for developing particular syntactic consistencies.

TL: When you listen to a composition by Mozart or Bach in the light of your own experience as a composer working today, do you think the role and function of the composer have changed?

BF: I think there are really two questions here. One is the social position and self-understanding of the composer at the present time. And the other is: in what way do the techniques that we use and the languages we employ as composers say something concrete about that social position? It's certainly true that in most other periods of classical music history, the composer has been embedded in a very rigid, hierarchical

framework. For many years, composers were considered as servants. It was only in the period of Beethoven at the very earliest - or perhaps Haydn at a later time in his career - that we see the sort of composer-entrepreneur, in an early capitalist sense, entering upon the world stage. If we look at the works of Bach and Mozart in particular, since these names were mentioned, we find that both of them were embedded in particular social frameworks. And I'm sure that in large part the techniques and conventions that they employed in their musical language reflect certain deeply embedded cultural assumptions, both in themselves and also on the part of their audience. However, it is also true that the contemporary composer has taken the absence, or the seeming absence, of a specifically embedded social rule for the contemporary artist very much as a sort of problematic - as something which in itself can be taken up and examined as one of the fundamental rules which music has to play in contemporary society. The music philosopher Theodore Adorno talked about the monadic alienation of works of art. He maintained that many of the works of Schoenberg, used a very closed musical language that alienated them from the capitalist society around them. But they were more relevant because of this alienation than they would have been if they had tried in some way to directly attack capitalist assumptions from within the capitalist system itself. Now let me address the second part of your question. It seems to me that this question deals with how compositional technique mirrors or reflects the social embedding of the composer at any given time. I think all of us - Beethoven, Mozart, or whoever - have in common one major fact: We are always in some way reacting to other compositions rather than to facts in the outside world. For instance, what is very, very interesting for me in Mozart was not his early period, but the period after he had discovered the works of Bach; because for the first time, we find sketchbooks in which he is directly confronting the specifically technical issues involved in Bach's polyphonic practice. This has nothing to do with Mozart's position in the world. This has to do with things which one can identify as being concretely present in the musical means themselves. So in a piece like the 'Jupiter Symphony', where you see many of these hard-won insights into Bach's techniques brought into and dialectically mixed in with Mozart's prior style, we find a whole new, innova-

tive, youthful, and very invigorating musical presence being established. This can happen just as much to any of us today. If one looks at the works of Ligeti, for instance, one sees that many of his most innovative and substantial pieces of the last twenty years are based upon his experiences with non-European music. Let me round up this question by saying that the lack of apparent social role for the contemporary composer at the present time seems to be not a disadvantage, but far more an opportunity for us to continually reinvent ourselves. We need, above all, not to fit ourselves in with some perceived market niche that hasn't been filled yet, but far more we need to reconsider what it is to renew and revivify the expression of meaning. How can new things still come into the world, in spite of the fact that the ruling post-modern ideology has it that there's nothing new to be discovered? What is it in things of the past that made them new? And above all, what is it that has kept them new? I think it was Ezra Pound who said that "Art is news which remains news." I want to discover what it is in art that keeps it news.

TL: Have you discovered the answer to this question?

BF: I have some elements, but I would be most reluctant at this point to talk about them.

TL: Why?

BF: Because what I'm trying to do is write music. I'm not a philosopher. It seems to me that an answer to that question can best be articulated by someone who approaches the works and attempts to reconfigure them for him or herself in terms that are meaningful to them. Looking at an abstract painting, people often say: "What does it mean?" That question is so difficult to answer because it seems a rational question; but in fact, it isn't a rational question. The same is true of any work of art: a work of art means, but it doesn't mean something in particular.

TL: When you are composing, to what extent are you influenced by the reaction of the audience?

BF: I certainly find myself thinking of individual people. I don't think I have an image of an audience - that's too abstract a concept for me, I can't deal with that. I can deal with my knowledge of a small group of

people whom I know well, maybe a dozen at the very most, whose opinions are important to me, and with whom I can discourse meaningfully about art. The opinion of these people is one that I value and pay attention to. So in composing, it is sometimes the case that I will imagine what they would think about what I am doing. I'm not sure I would put it in those terms, but at the back of my brain I'm sure I'm taking into account previous knowledge of how those people have reacted to my music. As I understand it, the second part of the question asks: do I react, or how do I react to the opinions of people who have listened to my music... You know, the people I have to deal with most are performers, not listeners. Some of the most interesting experiences of my professional life have been encounters with performers learning my music. I have been totally amazed on many occasions by the way a particular performer has developed an extremely idiomatic, highly personalized way of approaching the learning of certain sorts of music. Particularly 15 or 20 years ago, when I was first being professionally performed, I laid a great deal of store by long-term reactions to this particular sort of encounter. So in a sense, the performer was my audience in those days.

TL: Are there certain key events that have radically altered or influenced the course of your musical life?

BF: Do you mean in terms of the fact that I write music at all, or in terms of the sort of music that I write?

TL: Both.

BF: I can answer better the first part of the question rather than the second part. The reason for this is partly because I'm anxious not to rationalize myself too much to myself. In rationalizing, you very often make things seem clearer, whereas in fact they are simply more impoverished. That is, you eliminate certain not very well-formulated but nevertheless very potent issues, tendencies or aspects of your creative drive from the picture, by making the entire thing explainable to other people. So I try not to explain it too clearly - because I don't want to explain it to myself either. As for the first part of the question, I can tell you exactly when I decided to become a composer. One day, when I was searching through a pile of very old 33rpm records

with a wind-up gramophone, I accidentally came across a recording of two of the movements of Edgar Vareses Octandre. That was the first piece of music that I had ever heard in my life which seemed to me totally honest, to be possessed of a powerful, crystalline purity and lack of sentimentality. You know, I hesitate to say things about Britain, but there's so much about the character of the country in which I grew up that has powerfully influenced me... The British character is very controlled by a certain sort of sentimentality, a sort of late Romantic approach towards the understanding of artistic phenomena... I could not make a connection to that sort of thing at all. So it was only when I accidentally heard this piece - I think at the age of fifteen - that I understood that it was possible to write music, to imagine sounds, which were not fatally debilitated by that same sort of sentimentality. It was on that day that I knew that I was going to become a composer and nothing else.

TL: Are there any real dangers in the application of technology? Do you think people who fear the advance of technology are justified in any way?

BF: Well, when I first started using even such simple things as amplification, I had a rather negative - or perhaps I should say carefully ironic - approach towards the validity of the contribution of technology. For example, in 1976 I wrote a piece for cello and loop tapes and ring modulation and various sorts of things called "Time and Motion Study", which really called into question the positive potential of technology in the future of music. In many ways, I still hold to that particular viewpoint, in that I myself am not particularly interested in using technology to produce works which no longer rely upon the live performer for their realization. Whilst I am interested (because I have students who are interested) in the production of pure tape pieces or live performer-computer interaction, I feel myself to be somehow a little bit too old to enter into this sphere, without running the risk of causing a dangerous break in the continuity of my compositional thinking.

TL: Did your parents appreciate what you do? Do you think they ever understood your musical goals?

BF: No. My father was a shepherd. Neither he nor my mother had any extensive educa-

tion at all. So there was really no way I could communicate these things to them, although of course they supported me as best they knew how. They morally supported me in what I did, but there was no real understanding of what I was aiming at. They are both dead now, but when they were alive they certainly never listened to my music!. (Laughter)

TL: Thank you very much indeed.

BF: Thank you.

MILLER PUCKETTE

Thanassis Lalas: Forgive me if I seem unversed in the subjects we are about to discuss, but as you must appreciate the world of technology is a vast and complex universe. How does it feel to inhabit that universe?

Miller Puckette: (Laughter) That's a hard question!

TL: But surely an easy one for someone who lives in the technological world to answer...? (Laughter)

MP: That's probably right...I think that technology is taking us in many new directions... It's easy to imagine that a whole class of technologists are busy trying to determine what direction technology is actually taking the world in, and that the rest of us are just being swept along in its wake. But I have a feeling that the truth of the matter is that nobody is really in control of what direction the technological culture is moving in.

TL: Do you believe that the future of technology holds pitfalls or obstacles?

MP: I think that the advance of technology is making everyone's lives a lot more complicated. If there's any limit to what can happen in technology, it's probably the limit to how much complexity people can actually deal with in their lives.

TL: How much complexity do you think people can deal with today?

MP: I think it's remarkable how easily people can adopt new technologies. Probably one of the most affected areas in the world is in newspaper organizations; the changes in the last ten years in the way people deal with text and photographs in any newspaper room is simply baffling to me!

TL: Yet a decade ago people saw technology as something that would simplify, rather than complicate our lives. How has this change come about?

MP: I think that it's now possible to do many things that it would have been harder or impossible to do ten years ago. So I guess in that sense we really are seeing progress. But I do recognize that life around technology is getting more complicated. We need more time to learn how to do what is possible now.

TL: How did you become involved in technology? How did you get into computer music in the first place?

MP: Well, I was a mathematics student at MIT in Cambridge, Massachusetts. I guess I was always very interested in music, but never very interested in computers.

TL: So how did you get into computers?

MP: During my last year as an undergraduate, I just took a class in college from Professor Barry Verkow, who is now in the Media Laboratory at MIT. I was all prepared to continue a career in pure mathematics. But within about a year of taking this computer course, I realized that I was spending many more hours a day in front of my computer, having fun making sounds, than I was doing mathematics.

TL: What is the relationship between music and mathematics? Has there always been a correspondence between the two, or is it something that has only surfaced with the evolution of computer music?

MP: Well, it has certainly existed since the day of Pythagoras, who was the first to recognize the correlation between musical intervals and mathematical relations.

TL: How would you describe this relationship between mathematics and music? To use a simplistic analogy, is the composition of music equivalent to the solution of a

mathematical equation?

MP: That doesn't work. Nobody really seems to know what the relationship is between music and mathematics. People who have an affinity for music frequently have an affinity for mathematics, and vice versa - consider again the great example of Pythagoras. But nobody has figured out a clear relationship between the two things yet. That remains rather mysterious...

TL: So can we assume that Bach and Beethoven were good mathematicians?

MP: I don't actually know enough about the lives of the great European composers in the last two centuries to answer that one. I can think of a good modern example, of course: Iannis Xenakis, who is going to be the keynote composer of the International Computer Music Conference.

TL: Have you ever met Xenakis?

MP: I met him once in Paris.

TL: What impression did he make on you?

MP: It's hard for me to separate the impression he made on me personally from the impression his work makes on me. I have spent far more hours listening to his music and reading his writings than I ever spent sitting down talking to him. I think that on a professional level, he's certainly one of the half dozen most influential people in the whole field of electronic music. In other words, I would put him in a class with Stockhausen and Boulez and Berio... There are about a half dozen European composers who really have shaped what we now call electronic music. Of those people, Xenakis is the strangest and most mysterious... He's the one composer of that group who didn't start out studying music - he started out as an engineer, I believe, and later turned into an architect. But he also had a very strong interest in mathematics for his entire life. He's the only one of the great modern electronic composers who didn't seem to set out to be a composer at all. He's more of a thinker, or an inventor of links between different fields. I guess that's how I would think of Xenakis personally. He's the one person in the history of music who actually wrote a piece of music, and then used the same structure to design a building, the Philips Pavilion in the World Exposition. Xenakis is very celebrated for having cre-

ated this building. The building is no longer standing today - it was a temporary structure built specifically for this World Exposition. But it was based on drawings of a mathematical object which he was working on, called a hyperboloid of one sheet, which I think he also used as part of a piece called 'Metastasis'.

TL: Would you describe yourself as a composer or a programmer, someone who creates computer languages?

MP: I think the best description of me that you could come up with is that I am more of an inventor of computer music technique than anything else. I do a great deal of programming, but I'm not first and foremost a programmer. I think about and solve basic problems in real time, in the analysis of sounds, and in creating techniques for synthesizing new sounds. In this whole field, the computer is really the tool, it's not the medium, if that's understandable. In other words, we all use computers, but nobody uses a computer for its own sake - any more than you would. You use it because it's there, and it makes certain things possible that weren't otherwise, but the focus is on the new kinds of thinking that it makes possible and the new kinds of music it is possible to create.

TL: Would a composer who doesn't have your programming skills feel somehow "musically handicapped"? To what extent is the composer dependent on or influenced by the programmer?

MP: Let me answer those two questions separately. As to whether a composer who knows less about computers is at a disadvantage... I think that among older composers - those over about 40 years old - very few of them had the opportunity to learn to use computers when they were young enough to really spend time working with them. So among the older composers (again with only two exceptions, which would be Xenakis and Milton Babbitt in the US), most of them actually have to rely on scientists and engineers to help them realize their musical ideas. This isn't true of the younger composers - say, those under 30 - at least in the US. For instance, almost all of my students already know how to use a computer perfectly well. Some of them seem to be more naturally able to do complicated things with machinery than others, which is an advantage for them. But there's almost

no such thing in the US as a 20 year old student of composition who is not computer literate, who does not have electronic mail, and all the rest. And almost every 25 year old music student in the US has already at least experimented with using the computer to store and manipulate sounds, which is the basic capability which underlies computer music. So these days, what one sees is that composition students actually know more than composition teachers. So music departments sometimes hire scientists like myself to work with the students, to push them forward in ways which the composition teachers wouldn't know how to do.

TL: What about the second question: how much does the programmer influence the final composition?

MP: Mmmm... That's a hard question!... During certain projects that I have worked on, I have found that my work has influenced a piece of music that a composer was writing to a great extent. In some sets of circumstances, a composer will actually see an idea that a scientist or an inventor is developing and suddenly say: "Oh, that suggests this new musical idea to me!" When that happens, you can sometimes say that the scientist has in fact influenced the composition, simply by planting a seed that turned into a composition. But you would almost never find a situation where the scientist would actually influence the composer's choice of musical material or musical structure. In other words, I would never make compositional suggestions to a composer. When a composer is making those kinds of decisions, it's not the technology at all which determines them: the musical structure is entirely the composer's process.

TL: What inspired you to produce Max, a new language for computer music? What musical need were you trying to fulfill?

MP: I'll try to answer that pretty simply! (Laughter) I had finished working with the composer Philippe Manoury on a piece named 'Jupiter' which was premiered in Paris in 1987. It took two years for Philippe to write the music and for me to get the technology in place that allowed the piece to be realized. Afterwards, I went back and thought about the situation. Even in a center as large and renowned as IRCAM, you aren't often going to be able to find a

composer who is willing to work for two years on all sorts of technological issues surrounding the creation of a single new piece of music. Such opportunities are very rare. If the level of difficulty of creating a piece of live electronic music was this great, then I thought it was essential that the tools be changed, so that it became possible for composers to do a great deal more of the shaping of the technological part of the piece, and for it to be done much faster. So the imperative was the pragmatic one. Researchers knew all sorts of computer music techniques that were very hard for composers to get hold of because there wasn't a programming environment or language available which made the technology easily manipulable by composers and musicians. I guess that was the imperative. I just sat down and thought very hard about how to make that possible. (Laughter) And finally I came up with Max about a year later. The first version of Max was ready within IRCAM in 1988, but it wasn't actually commercialized until about 1990. It was roughly a 3-year project all told - taking my experience of working on 'Jupiter' and then trying to turn that into a piece of software which would make it possible to solve those problems more generally and more quickly. The problems in question are those of live electronic music. So my specific field of interest, and also Philippe Manoury's, is in the kind of electronic music where you mix players of live instruments with electronics in such a way that the electronics can react almost instantaneously to changes made by the instrument player. The electronics become in some way an enlargement of the instrument being played. This is usually called live interactive electronic music. That's the set of techniques that Max attempts to make widely available to composers. The specific problems are first of all synchronization - in other words, how to get the electronics to detect where the live player might be within a score, and when and how to respond to cues by the instrument player. The second aspect is to create techniques for analyzing and processing the sounds of the live player, so that their pitch or duration or spectra can be transformed.

TL: Would you classify computer music as a natural evolution in the continuum of musical history or as an altogether new form of musical expression - a complete revolution that changes everything?

Interviews, cont.

MP: I think that it is actually a continuous step. The evolutionary trend that the computer belongs to began with the onset of audio recording in the early part of this century. At the time, in order to be able to hear music, you had to be able to play it or you had to go to a concert. There was almost no such thing as listening to a recording of music. Gradually, over this century, we have been able to take sounds and store them, and later on to start to manipulate them - to mix them and produce them - and even later on, using computers to alter them in much more fundamental ways. So there has been a continuous evolution of technology. In my view, computers are the latest and best tool for doing these things.

TL: Do you feel that some of the compositional emotion is lost when acoustic instruments are removed? Or conversely, is something gained when sound is electronically produced?

MP: Even before the advent of computers, composers were used to the idea of having to write their music down on paper, sometimes a year or two years before they ever heard the music played. So good composers already know how to codify their music and still keep their emotional investment in it intact. Computers don't change that fact in any way. Computers open up new possibilities and new horizons for the composer. I don't think it's true that the computer in any way constrains the composer....

TL: Excuse me for interrupting you, but I think that in the past composers spent more time creating a composition. Today, the computer allows the composer to realize his or her vision automatically, leaving the end creation more vulnerable, less soulful, in a sense. Things are now happening so fast, that much of life's flavor is being lost because we don't have time to savor it...

MP: Music has always been very, very difficult to make. It has always been one of the hardest things to learn to do. If anything, computers have actually made the composer's job harder than it ever was before. There's more knowledge and skill required to create a piece of electronic music than there is to create a piece of piano

music, say. So it's not in any sense true that the computer removes difficulties or makes it too easy to make music. In fact, some people think that it's precisely because the computer introduces new difficulties and new obstacles that it makes it possible for interesting new musical opportunities to arise. In other words, it might be that the main thing that a composer really needs in order to be inspired and to make a successful piece of music is new and unexpected kinds of difficulties. If that's true, then I think the computer will be a great tool. So I don't think that the computer is in danger of taking the soul out of music, because the emotional content of music, the part of music that speaks to your soul, has something to do with the hard work of composing it. Music composition isn't just a matter of waiting for inspiration and then writing it down: the thing which makes music good is that you take ideas and develop them into a coherent whole. I don't think any composer ever receives a five-minute piece of music complete in a single inspiration. They might have specific ideas while they are working; but it's the long hours that you have to spend with pencil and paper or behind a computer that bring the inspiration out of your musical imagination.

TL: What is inspiration?

MP: I am not a composer myself, but for me inspiration is an idea which comes to you after you have been torturing yourself for hours to try to solve some problem. Frequently, you'll work at solving a problem, and for some unknown reason the answer to some other problem that you had worked on earlier, or had forgotten about, or had given up on, jumps into your head.

TL: Do you believe in talent?

MP: Oh yes.

TL: What is talent?

MP: (Laughter) I don't think there's a good definition of it. I think that...I don't really know...It might be that talent is a certain kind of capacity in your mind to let strange ideas come into your head from unexpected places. Or perhaps it's really the ability to spot the similarities between some situation that you are in and some other situation that you have seen before, that might be only similar in a very indirect way; so that you can come up with the very unexpected

solution to a very difficult problem sometimes - and frequently by accident. That might be what talent is... But I would say that's only half of what you need in order to be a good composer or a good mathematician. You also need to have the time and to be willing to use the time to solve your problems.

TL: Why did you choose to become a programmer rather than a composer?

MP: It's entirely a matter of training. I didn't have the musical training that I would need. To be a good composer or musician, you have to start very young. My skills in reading and writing music and in music theory are very weak. So I wouldn't have been able to have become a composer even if I had wanted to. On the other hand, I discovered quite early that many people were much better at composing music than I would ever be. That suggested to me that the fun thing to do would be to find and work with the very best composers possible, doing what I could do very well. What I have done up until now - and will probably continue to do - is to try to use a collaboration with a composer to give rise to new and interesting ideas in computer music.

TL: Who do you consider to be the best composers you have worked with to date?

MP: I have done a very small amount of work with Pierre Boulez, who is certainly the best composer whom I have ever met. Of the composers whom I've spent a lot of time with, certainly the best is Philippe Manoury. Philippe and I have actually worked together for something like ten years now, on a whole succession of musical projects which have in turn given birth to a whole succession of technological ideas.

TL: How would you define a "good" composer?

MP: Well, I guess you have to listen to their music and see if it's good music! (Laughter) That's the only definition I can give!

TL: I have difficulty understanding what people mean when they talk about "good" and "bad" music. How do you differentiate between the two?

MP: I think you should ask a composer that question! I think the distinction exists, but

disagreement also exists as to what the best pieces of our day are. That disagreement is healthy. I don't think you can say in any absolute sense that one piece is better than any other. You can certainly say that a piece is good in the sense that it's well made, well thought out, and serious. Another piece might be bad in the sense that the composer isn't in control of the musical material, or the composer doesn't know how to write for the instruments, or the piece has been written too quickly, is too repetitive, or imitative of other music that has come before it. So you can point to specific faults that music might have that would make you feel quite certain that it wasn't very good. But then, among the music that you know is good, it can be very hard to say which is better than another. That can be very subjective. One person will listen to a piece and simply be carried away by it, and another person will listen to the same piece and not take an interest in it at all. Although it is impossible to measure the difference between good and bad music, you know that the difference exists anyhow....

TL: Do you think the music you helped Manoury create would have been very different if he had collaborated with a different programmer?

MP: He would have had different constraints and different possibilities, so he would never have written exactly the same music. He simply wouldn't have had the same tools if he were working with someone else. On the other hand, if you listen to any piece of music that Philippe made during our collaboration, you can tell that it was written by Philippe, because you hear his musical ideas realized using a certain set of tools. Philippe has a musical style and a musical soul which are independent of the tools available to him.

TL: Was your decision to become a music programmer the fulfillment of a childhood dream or was it dictated by circumstance?

MP: Well, I was always curious about electronic music as a child. I listened to the early records that people made with synthesizers and was very excited by that whole field. But I was excited by other things as well - mathematics, for instance, and physics. So although of course I always dreamed of being able to play a synthesizer some day, that wasn't my only dream. I didn't feel predestined in any way to become part
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of the world of music. That's simply what ended up happening...It seemed to be the most fulfilling and most fun thing to do as life went on... So I always knew that it was a possibility, but I never really thought it was the direction I was headed in until rather late in life.

TL: Are your parents still alive?

MP: Yes they are.

TL: How do they feel about what you do?

MP: They are both mathematicians actually, and so is my sister. My father is a retired professor of mathematics, and my sister is now a professor too. I guess they think it's kind of surprising that after showing a lot of talent in mathematics as a youngster, I essentially gave up on mathematics and turned to music as my career. But they never said anything: they were probably wise enough to realize that no matter what they said, it wouldn't make any difference to what I chose to do! (Laughter)

TL: Do you feel that certain uses of technology could be considered insulting to the history of music?

MP: Personally, I would say yes. People who believe that some day the computer will be able to write music as well as a composer, or people who believe that the computer will be able to play music as well as an instrument player, are essentially either fooling themselves or insulting the composers and the instrument players. Because the fact is that the computer has no musical intelligence. Nobody who knows much about computers would dare say that the computer has ever exhibited any real intelligence. Only people who don't know very much about computers or about music would say that a computer could actually make music by itself, without a human music-maker who uses the computer as a tool.

TL: What is the most interesting or astonishing discovery you have made during your career in computer music?

MP: Hmm... (Long pause)...I ought to be able to think of something! (Laughter)...I guess I have kind of lost the sense of astonishment. Frequently, someone will come up with a piece of music that surprises you - but the surprise is not so much because it

was possible to create that piece of music, as in the way it affects you. Certainly, the most surprising piece of music I know of is a 17-minute piece for clarinet by Pierre Boulez which is simply magical. You can't sit down and watch this piece without being surprised. But it's very hard to transmit that kind of experience in words.

TL: What exactly is the nature and purpose of your work with Roger Reynolds regarding the spacialization of sound?

MP: You should probably talk to Roger about the musical aims of the piece. But the aim of the research is to try to create a system which is capable of taking live sounds - in this case, the sounds of a percussionist playing on stage - and to project them out into the concert hall so that they can surround the audience, come from behind the audience, and so on. This is what's known as sound spacialization. It's something that is done frequently in the studio, but hasn't been done very much in live concert situations.

TL: Do you feel that computer music is ultimately an art form? Is computer music part of the evolution of art history?

MP: That's a hard question to answer because that depends on the future. It isn't history yet - it's what's happening now, at the moment...We think and hope that what we are doing now in electronic music is a continuation of the music that has come before us, and will be continued by other people who come after us. But we don't know that yet. One cannot know how to evaluate the music or art of any given period until that period has already gone.

TL: Thank you very much.
Thank you.

IANNIS XENAKIS

Thanassis Lalas: How do you feel about the evolution of computer music? Do you consider yourself a sort of prophet in computer music?

Iannis Xenakis: I don't know. I'm not in a position to answer that question. I can't be both an evaluator and a critic of my own work...

Interviews, cont.

TL: Nevertheless, a lot of people have given you that title... You must have heard something along those lines...

IX: Who has said that?

TL: Reynolds, Lansky, and countless others... Everyone who is involved in computer music says that Xenakis is a revolutionary - perhaps even the instigator of this musical revolution along with Boulez

IX: (Smiling) Great... I'm glad to hear it!

TL: If I am not mistaken, during the 1950's and early '60's, when serialism was at its zenith, you were one of the first composers who declared it an outmoded compositional system..

IX: Yes, that's correct.

TL: What led you to this conclusion? It must have been a highly provocative and dangerous assumption at the time?

IX: I'm not sure whether it was a dangerous assumption at the time, but it was certainly an accurate one, because serialism was based on outdated concepts. By outdated, I mean that serialism always belonged to an order that could not see beyond the twelve gods: in other words, it belonged to an order which overlooked the extent of the possibilities of which the human mind is capable. Up to then, it was generally believed that the human mind was only capable of conceiving twelve numbers. Personally, I always believed that the mind was far richer than that. So I set about to prove this richness.

TL: What led you to believe that stochastic procedures were the basis of the music of the future?

IX: Probabilities are far more universal and far greater than anything specific that man can apprehend. Probabilities embrace dodecaphonic music, but their scope is also much broader. At the time, I was studying mathematical texts which confirmed this notion.

TL: Do you remember which mathemati-

cal works you based this theory upon?

IX: I was a voracious student of the works of Correl among others.

TL: What was your goal? Did this approach to music have more of an artistic or a scientific purpose?

IX: Both, because in music one cannot exist without the other.

TL: Did you always have a good relationship with mathematics?

IX: Yes. As a boy growing up in Spetses, I was the best mathematics student in school. I was unbeatable.

TL: Exactly what was it that inspired your interest in mathematics?

IX: I don't know... But later on I gave up mathematics. And as a result, I became less proficient at it. If you forsake something, it will forsake you too - whether it be a person, an idea or knowledge

TL: Why did you abandon something which held such a fascination for you?

IX: It was a reaction...A reaction to the fact that it was too easy for me. Mathematics was always something that came effortlessly to me. Things which are too easy are always problematic.

TL: Why?

IX: Because if something is easy, it doesn't require any effort. And it is only through effort that we acquire knowledge and understanding... When something is easy, the possibility of failure does not exist; therefore, we lose the motivation, the basic motivation to undertake a challenge

TL: Could you define exactly what excited you about mathematics?

IX: No.

TL: What provokes excitement in general?

IX: That question is virtually impossible to answer.

TL: Could you at least define the term "excitement"?

IX: Yes... it's one of the causes of movement.

TL: Did music always play an important role in your life?

IX: Yes. For as long as I can remember, music was an innermost passion of mine. But during the Resistance, it was practically impossible for anyone to make music. At that time, I was constantly in and out of jail.

TL: When and how did you discover the correlation between music and mathematics?

IX: It was a gradual process. It wasn't something that I took for granted from the start... But I wouldn't call it a discovery exactly. Mathematics and music have gone hand in hand for the last 300 years. There has always been a great passion between the two - even if we didn't think to interpret that relationship, that love.

TL: Since you mention it, what does love mean to you?

IX: A bolt of lightning. A bolt of lightning that strikes two people who until yesterday were complete strangers. Love is a discovery - that's why it's so fascinating. For me, the realization that music is based on mathematics was a similar kind of discovery.

TL: When your compositions were first performed, they provoked a great deal of sarcastic criticism. You were accused of committing a musical crime, rather than creating music. How deeply were you affected by public opinion?

IX: Let me tell you something... Public reaction wasn't the same everywhere. In France, there was a very strong reaction against my work, but less so in Germany. That's why my work was first performed in Germany, and somehow escaped the musical vortex that decides what is good and what is criminal in music.

TL: Today, your conception of stochastic procedures as against serialism is a widely accepted musical theory. So in a sense, could you say that you predicted the future of music?

IX: No. Because I believe that whether I had appeared or not, this would have been

a natural development for music.

TL: Do you think that certain people are able to predict the future? I don't mean metaphysically, but scientifically - or do events simply carry us along in their wake?

IX: Obviously, events and situations act as beacons, but a person must have his eyes open in order to see them. You must have hands in order to snatch the fruit hanging from the tree of the future. We have to feel the future in order to discover it.

TL: Do you believe that by studying the past and the present we can grasp the future?

IX: Yes and no, because everything is overshadowed by the present. However, if somebody has an idea which he truly believes in, because it is something he has thought up himself, he can sometimes overcome evolution and determine the future.

TL: Did you predict the evolution of computer music?

IX: Listen, this is all old hat. All I can say today is that I don't know where music is heading. It depends on the aspirations of composers and the type of audience who will listen to the music of the future.

TL: Could you be a little more specific?

IX: Let me explain. The audience depends on the orchestras and what actually makes up the music itself - the musical sounds. In considering these things, one should only be concerned with the technical difficulties involved. These difficulties should never be insuperable, and as a result there should always be an alternative outlet, an alternative means of expression.

TL: What concerns you most about the future of music?

IX: I can't answer that.

TL: Is there something that troubles you?

IX: Everything troubles me. And my very existence troubles me more than anything.

TL: Why?

IX: Because I don't know where I'm going, I don't know where we are going.

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TL: Do you mean that you don't know whether our lives have meaning? Whether our lives have a purpose? Is that one of your concerns?

IX: Of course it is! Life is short, and this is the only planet where supposedly intelligent people exist. That terrifies me.

TL: "Supposedly intelligent"? Was there a time when you believed that through stochastic music, you would be able to change society? Do you believe that music has the power to bring about social change?

IX: No I don't, because the evolution of man is dependent on a number of different factors. Music does contribute to that evolution, but I don't think it has the power to determine it. We don't live in a dictatorship. Only in a musical dictatorship could music control the evolution of man.

TL: After so many years as a composer, have you discovered what it is that man seeks in art? Not just in music, but in art in general...?

IX: I don't know... Perhaps it's just a way for each person to do what he is interested in. Perhaps art is a means of escaping destruction.

TL: Had you ever tried to apply your musical theories to architecture? Did you to ever try to "marry" these two distinct art forms?

IX: No. The two don't go together, they are not concurrent. Music contains certain problems which do not pertain to architecture, while architecture has other problems of its own. But the problems don't overlap, so it isn't possible to create solutions for both kinds of problem.

TL: Have you figured out why you chose to follow your particular path through life? Why do you think you chose to do certain things as opposed to others?

IX: That's a matter of the questions and answers that one applies to oneself from childhood. Sometimes, you are carried away by certain trite platitudes, and sometimes you aren't - and that's when you can achieve something which has not been achieved before. But nobody can know that at the time. I had to go through everything I've

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been through, but I don't know exactly where I've been. I can't describe my journey through life to you. But I can tell you with certainty that my path was determined by the questions I asked myself and the answers I came up with. The landscape of our journey through life is made up of questions and answers.

TL: Have you ever succumbed to the vanity of the artist who flatters his audience in order to win their adulation?

IX: No. The few people who appreciated what I did were always enough for me. I was never interested in trying to increase that number. What interests me is the quest. And the quest cannot coexist with the thirst for adulation and acclaim.

TL: In other words, you were interested in the quest and not the acceptance of that quest.

IX: Precisely!

TL: Do you enjoy listening to computer music?

IX: No, because when I listen to music all I think about are the sounds. I don't think about why the music was created. I am interested in what I hear, and consequently how that was created.

TL: But how can a composer with that attitude to listening create music that is intended for listeners?

IX: It's a well-known fact that every composer who seeks to create through composition is essentially proposing a new way of listening.

TL: I am very grateful to you for talking to me. One last question. Could describe your state of mind right now in a single image?

IX: A desert...An endless desert... where nothing can grow any longer... A desert with a powerful but unbearable past.

TL: Thank you

PAUL LANSKY

Thanassis Lalas: Have you always had a good relation with technology?

Paul Lansky: Yes, I've always had a good relation with technology. I've actually been using computers since the mid 1960's for musical purposes.

TL: How did you start using computers to compose music?

PL: Well, at that point computers had really only just come into American universities. Electronic music had been going on for a long time, but it was very difficult and cumbersome to do. With computers, however, it became much easier, because you didn't have to work with tape machines or awkward splicing blocks - you could do it all in the computer itself. It was still very difficult though, even at that point. So it was like being part of a revolution.

TL: And what was the objective of that revolution?

PL: It's hard to say. I think it was a combination of the search for new ways of creating sound, and for new ways of making very complicated kinds of rhythms and textures - things that people couldn't do on normal instruments.

TL: Was your personal goal to become a musician or did you initially begin using computers for some other purpose?

PL: I am totally a musician. I was trained as a musician and I've always been a musician. I don't consider myself a computer programmer in any way. But musicians in history have always had a good relation with mathematics and technology. Western music in particular reveals a history of constant technological innovation. If you look back to the 19th and even the 18th century, people were constantly inventing things in order to automate music. The advent of recording has also changed the whole nature of the relation between music and the listener.

TL: Do you feel that music is evolving through the use of computers?

PL: I really don't think that music is essentially going to change as a result of comput-

ers. There are a couple of important points here. First, I don't think that anyone has to worry that people will stop playing musical instruments. Playing musical instruments is just a natural part of being human. The second point is that I see music moving in several directions as a result of technology, which has more to do with distribution and with the ease with which people can make music. For example, computers and recording technologies have converged: the compact disc is essentially a computer device. What I see happening in the future is that there will be a wider variety of ways for people to engage music, to listen to music, and to make music as a result of computers.

TL: When did you first realize that you were a musician?

PL: When I was about 13 years old.

TL: How did that happen?

PL: That's when I first decided that I was going to become a professional musician. I went to a special music high school and decided that I was going to be a French horn player.

TL: How did your parents react to this decision?

PL: They were very pleased.

TL: Do you think that musical talent is something that a person is born with?

PL: I think that a large part of musical ability is inborn. If somebody is going to be a musician, they were probably born with something that helps them...

TL: Is it something that can also be lost along the way, if it's not properly explored or nurtured?

PL: I think there's a combination of things. What I see in students is that if they have talent, that's only part of the story: they also need the ability to concentrate and work very hard. Without that focus and the aspiration to become better, the talent is useless. So I don't think talent is all that counts.

TL: What is inspiration?

PL: My inspiration? It's just that I love music more than anything else!

TL: But what does the word inspiration mean to you?

PL: If somebody wants to be a writer, they love to read books and literature. If somebody wants to be a poet, they love poetry. If somebody wants to be a musician, they have to love music. It has to mean a lot to them.

TL: So this inclination, this passion for a particular art form precedes the actual expression of talent?

PL: Absolutely.

TL: Before you began using the computer, did you play any acoustic instruments?

PL: I was a French horn player. I also played the guitar.

TL: Wouldn't it have been more natural for a child like you to join a band, rather than engage in the solitary activity of composing music on a computer?

TL: How did this come about?

PL: There are two answers to that question. First of all, at the time we first started to work with computers there were a bunch of us working together, so I was part of a group. One of the really exciting things about that was to be able to play your music for other people as you were writing it. If, for example, you were writing a string quartet, you would have to wait until you had finished it and it had been performed in order to play it for people. But if you were working with electronic music, you were able to play the music for people at every stage. The second aspect of this question is that by actually making the sound yourself, you are more the sculptor of the sound. I often like to say that there are different kinds of composers. The traditional composer who writes notes on paper is analogous to a playwright: you write a script for people to follow and interpret. The role of the electronic music composer is more like that of the movie-maker: you are actually involved in sculpting the final result - you are involved in the performance as well as the creation. That's something that I like very much.

TL: Besides music, did you study anything else as a young man?

PL: Apart from music, I didn't do much else. Of course, I did things most children did - read books, played with my friends, played sports...

TL: How did you discover the relation between music and mathematics?

PL: That's an interesting question. When you first start to work with computers, you think that it's very easy. Then you discover that very often you actually have to build the sound from the ground up. So you discover very quickly that fundamental mathematics is a very palpable and salient aspect of the way in which you go about working: you have to understand how wave forms function and how sound is made. The more advanced mathematics you understand, the better you are. I'm not an advanced mathematician. I understand basic mathematics, but the more you understand, the more you are able to do. Computers are interesting in that the more you learn about a variety of things - like mathematics and acoustics - the better you become.

TL: Do you think it is reasonable or natural that many people are afraid of computers?

PL: No. Computers have become part of everyday life. It seems likely that in the future computers will become as easy to use as record players or CD players. I think people have more to fear from cars than computers.

TL: Is there anyone who has had a major influence on your life?

PL: My main influences have been some of the great composers like Mozart and Bach. My influences in the 20th Century have been all of my friends and colleagues who have been doing interesting things.

TL: Who is the most interesting person you have ever met?

PL: Oh, that's hard to say... I've met a lot of interesting people...

TL: Is it difficult for a person to communicate their emotions, their soul, through a computer?

PL: I think it's very hard. There's a mythology that computers somehow make it easy to make music. I think that computers make it easy to make sound, but to actually make

music is very difficult.

TL: Could you explain this distinction between making sounds and making music?

PL: Let me see... I interpret music itself as a communication between minds. When a composer writes a wonderful piece of music, he is essentially saying something interesting and complicated which somebody else then understands and absorbs. When somebody writes music which is not effective, what he is doing is imitating the sound of someone else's music. I don't think it makes any difference whether you are using computers or not - saying original and interesting things is always going to be extremely difficult. It's just as hard on the computer as it is anywhere else. But the computer does make it easy to make lots and lots of music and lots and lots of sound - so an illusion exists that somehow the computer makes it easier to make music. This is not true.

TL: Listening to a piece of music written by Bach 200 years ago, we can still hear a dialogue between the composer and the performers. Part of the beauty of music is that in any musical performance the same set of notes can be interpreted in a multitude of different ways. Do you think this will cease to exist in computer music? How do you see the role of the performer in the future?

PL: That's a very good question. I think about this concept every day. There are several answers to it. First, as I said, I don't think that people will ever stop playing instruments. In the future, many more instruments will incorporate computers, as, for example, electric guitars, violins and organs already do. That's one aspect of technology which is going to be increasingly involved in performance and interpretation. Now, you have to realize that there are two sorts of issue here. There are composers like myself who use computers to create sound on tape - like a film, as I said before. What we are doing is essentially becoming our own performer. So we're bypassing or foregoing the process you describe, which I think is very important for certain kinds of music. We're creating the same kind of experience that someone has when they listen to a recording. If you listen to a recording of The New York Philharmonic playing Beethoven, you're capturing a certain kind of experience. We are

basically creating recordings of pieces, which the audience can then listen to as if they were watching a film of it taking place. Your observation about Bach is true, but it's making a distinction between two kinds of music which I think are fundamentally different. One is music which is interpreted by others, and the other is music which technology makes possible - it is entirely the product of the composer.

TL: Is algorithmic composition a way of compensating for the absence of performers by creating multiple interpretations of the same piece of music?

PL: That's a very interesting question. I think that one of the ways in which computers can approximate the sense of interpretation or reinterpretation of a score is by interpreting algorithms in a variety of ways.

TL: Do you believe that emotion can be communicated as effectively in computer music as in other kinds of composition?

PL: I think the emotion of a composition is a measure of the effectiveness with which a composer conveys his ideas, or transfers his conceptual and mental vision. If you understand what a composer is saying in a particular composition, and if you are able to experience that, then I think that the emotion in the composition is projected in a very powerful and effective way.

TL: What did you hope to achieve when you became a professor at Princeton?

PL: Well, first of all my aim was never to become a professor - my aim was to become a composer. But I wanted to be able to write music without having to worry about producing income from the music itself. Becoming a teacher allowed me the flexibility and the time to compose, without the pressures of earning income from composing. The nice thing about teaching is that you are constantly with young people and it's a rejuvenating experience. So it's the best of all possible worlds.

TL: Do you agree with musical classifications like classical, pop, or rock which differentiate between various kinds of music?

PL: I don't like to make these distinctions. It may be easy, but I don't think it's useful to decide musical value as a result of these

distinctions. I don't think you can say that classical music is better than jazz or rock music. What I think you can say is that different kinds of music attempt to do different things, and that rock, jazz, or movie music all have individual functions in society, as does classical music. But any sensitive musician has got to be alert to the values of all different kinds of music. As a composer, you can't just decide that one kind of music isn't worthy of consideration. I have gotten a lot of inspiration from rock music and jazz. It's all equally part of our culture and equally exciting music.

TL: So do you think these distinctions are based more on social than artistic criteria?

PL: They are both artistic and social. I think it's unfortunate that people are forced to make distinctions which are largely imposed on us by the media and by record companies.

TL: Doesn't it seem strange to you that in order to compose a piece of music you are dependent on the assistance of a computer programmer? Doesn't the necessity of a middle man negate the whole concept of the independence of the composer of computer music?

PL: Well, imagine the following two situations. Let's say I write an orchestra piece. I sit in my studio and write out a score. It takes about a year to write the score. I wait another six months for an orchestra to rehearse it. The orchestra then performs the piece; if I'm lucky it's a good performance, and if I'm not, it's not a good performance. Maybe 1000 people will hear it, or maybe it'll be played on the radio. The other situation, which I like a lot better, is that I sit in my studio and I hear my music as I create it. When I've finished creating it, I send it to my record company, they put it on a compact disc, and people all over the world can listen to it. So to my mind, I've had a much more exciting and productive relation to my music than I would if I were writing for instruments. Of course, that's just the way I feel - other composers don't feel that way..

TL: My question refers more to the role of the musical programmer or the sound engi-

neer. Do you fulfill that role yourself? Do you create your own programs?

PL: That's a very sophisticated question. The composer who uses technology is much better off if he is his own engineer, if he writes his own programs, because writing a computer program is very much like designing an instrument. As a matter of fact, what you do is very often an analogous process, because you actually build a version of the instrument in the computer that you can play yourself. If you don't do this, you are essentially at the mercy of other people who have different ways of thinking about music.

TL: Is this one way of destroying the musical hierarchy?

PL: It's a rich and complicated process. You're never alone in doing these things-you're always working with other people in one way or another. One analogy you might make is if you are a racing car driver, it's very good to understand how a car works because otherwise you might get into big trouble! The more you understand about how your car works, the more effectively you are able to drive it.

TL: How much do you think is lost between the conception of a piece of music and the performance or recording of it?

PL: Well, that's a problem composers have always had to face. You're in a situation in which you have an idea, but actually being able to capture that idea is a very difficult and time-consuming thing. Sometimes you capture it and sometimes you don't. I don't think there's any inherent difference between what you capture when using a computer and what you capture when you're composing for instruments. It's always going to be chancy, and it's always going to depend on how quickly you can understand exactly what you are trying to do.

TL: As far as I know, you have been very instrumental in shattering preconceptions of the composer as someone special, someone who belongs to a cultural or social elite.

PL: The reason that I like to use the computer is because I want to teach people about the implicit music in the world around us. So I try to use the computer to look at things like the sound of traffic, the sound of people talking, the sounds of nature. I like

to use the computer in order to learn to hear the music of those sounds.

TL: Do you use those sounds in your work?

PL: Yes I do. I have written a number of pieces which include the sounds of people talking. For example, I love to hear the sound of the Greek language as you are translating now. Even though I don't understand what the sounds mean, to me it's a kind of music. I like to be able to listen to the sounds of conversation and hear the music in the way people talk.

TL: How is sound transformed into music?

PL: It's all in the way you listen. One person can listen to a sound and hear nothing but a sound, whereas another person can listen to the same sound and hear the most beautiful music. In a way, what I think some of my music is trying to do is to teach the listener how to hear the music of some sound. To me, one of the real beauties of using the computer is that it allows us to find music where we never knew that music existed.

TL: Does the fact that most people don't have access to high technology limit the number of people who can create computer music?

PL: Well, some people will always have greater access than others. However, computers are becoming much less expensive. When I first started to work with computers, there were things that only very wealthy institutions could afford. Later, only very wealthy people could afford them. Now, in some parts of the world, they're something that almost anybody can afford. I think that in the next ten years, computers will be as ubiquitous as cars are all over the world.

TL: Is that the main reason why you decided to create a computer language for the composition of music?

PL: I basically wrote that so that I could be my own programmer. The Cmix programs can be run on almost any computer.

TL: Is their distribution free?

PL: Yes. Anyone can get them through the network.

TL: Do you think the network is the future?

PL: The network is a very interesting development. The World Wide Web is a tremendously exciting thing. It's the first good thing we've gotten from the Cold War; the Internet was designed to be resistant to nuclear war. As a result, people all around the world are able to communicate more effectively.

TL: Do you think that the network helps generate a new kind of equality among people?

PL: Oh yes, absolutely. The exciting thing about it is that there is no hierarchy on the Internet.

TL: Is the Internet a kind of socialism?

PL: I hope not! (Laughter)

TL: Why do you think art exists? What is the role of art in our lives?

PL: I can only say that art is an essential part of being human. If you don't have access to art, you are missing out on part of what it means to be alive.

TL: If, say, Bach and Mozart had all the opportunities and facilities you have today, do you think that they would have created totally different music?

PL: Absolutely.

TL: How would their music have differed?

PL: The music that anybody writes is going to be a product of their environment. So the music that I write has a lot to do with the fact that I use computers, that I know rock, jazz, Bach, Mozart, Beethoven, Mendelsohn is an interesting case in point. Part of the reason Mendelsohn was successful so early is that he had a lot of very powerful influences. On the other hand, many early classical composers were very limited by their environment. They were very constrained by radical developments in style. Another thing to remember is that in the case of composers like Bach there was a very strong tendency to want to use technology. The organ in Bach's time was the king of technology. People reported that when Bach sat behind the keyboard of an organ, he could make worlds of sound and imitate all kinds of instruments on his own. So in a way, the organ was Bach's computer.

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TL: A famous Greek poet once said that mistakes are the key to the secrets of the soul. Do you think that mistakes can lead to art?

PL: There's a very fundamental assertion that I want to make here about the way I feel that art functions. There are two ways to think about this. One is that the work of art itself is an autonomous object, that is something that expresses itself and lives on its own and is its own world. The other way to think of art, which I take much more seriously, is that a work of art lives in the individual's experience of that work of art. I am interested in what the individual person receives. If what you're listening to is made by error, by mistake, or by fraud, as long as it moves you, then that's all that counts for me.

TL: Do you wish that you had met Bach or Mozart? Do you think that they would have been able to convey the secret of their genius to you?

PL: (Laughter) No, I don't think they had any idea why they were so good! Bach was fond of saying that he just worked harder than anybody else, and I think that there is probably a grain of truth in that.

TL: What makes a work of art survive through time? What makes it immortal?

PL: Well, I think if people can still listen to it as if it were written yesterday, if it still sounds as if it's new, then it's a successful work of art.

TL: Thank you very much.

PL: Thank you very much. Your questions were very interesting and have given me a lot to think about.

FRED LERDAHL

Thanassis Lalas: How would you classify your field of expertise? Would you call yourself a music theorist or a composer?

Fred Lerdahl: I do three things: I'm a composer, a music theorist, and a professor.

TL: How does one combine the role of the

composer and the theorist?

FL: I was trained as and have always been a composer. But I was concerned about how music is organized and perceived because of my needs as a composer. I became interested in music theory in order to try to understand how the musical mind works. Subsequently, in addition to developing my theory for its own sake, I've used this theory in my composing. And my intuitions as a composer are also guided by my ideas in music theory. So there's a rich intersection between the two areas.

TL: Does one have precedence over the other?

FL: Well, I think that's different for every person. For myself, I've tried to maintain a balance in my adult life - although at the moment the balance has not been very good because I'm finishing a book of music theory. But as soon as I have finished it, I will rectify that problem.

TL: Given that theory is based primarily on logic and composition more on inspiration, have your theoretical precepts ever been upset by the surprises that occur during composition?

FL: I don't use my theory in such a literal way that it would be an issue. For example, I don't use the theory as an algorithm to compose with. It's much more complicated and more interesting than that. But of course, when I compose I am always aware how much we don't know in terms of theory - how much our explicit knowledge is lacking.

TL: How did you first become involved in music? Did you start out as a composer and then become interested in musical theory? What did you hope to solve through your theoretical work?

FL: Around 1970, when I was a very young composer, there were many kinds of compositional styles and it wasn't easy to decide which musical path to follow. The whole trajectory of western music had become fragmented and reached a crisis around then. I saw that all these different composers were using all these different methods of composition, and virtually all of them were not perceivable. What really drove it home for me was studying with Milton Babbitt, who has this really crazy

system of composing which he thinks is intellectually serious. But nobody perceives the structures he composes with. This struck me as a very remarkable fact, but also a very problematic one. My response was that I wanted to understand how we process musical structures as listeners, so that I wouldn't be composing with an arbitrary, private code.

TL: Did music play an influential part in your life as a child and a teenager? When did you first realize that you wanted to become a composer?

FL: I started composing when I was 13 or 14. When I was in high school, I wrote a couple of orchestra pieces and I knew then that I wanted to be a composer.

TL: What stimulated you to become a composer, rather than an instrumentalist, for instance?

FL: I did play the piano and oboe. I was first oboist in the orchestra, and I was a moderately good pianist as well.

TL: What did your parents do? Were they involved with music in any way?

FL: My father ran an insurance company and my mother was a housewife, but they both loved music. My mother played the piano rather well, and my father listened to classical music, so we had a lot of music around.

TL: Have you always believed that what the listener actually hears is more important than what is in the mind of the composer?

FL: Possibly. I think that the gap between the compositional method and what people actually hear is very striking in the music of this century, especially around the period when I was growing up. I think many people have felt the same discomfort that I felt. The only difference is that I embarked on a program of research to try to provide another way of thinking about these things.

TL: Why do you think these two things were always so disparate? What inspired you to attempt your theoretical quest to

resolve this discrepancy?

FL: The reason that this gap developed was that the musical evolution occurred so fast in western culture in the late 19th and early 20th century, that pretty soon everything collapsed. Musical language evolved increasingly fast, so that what had initially been a cultural product became a product of any one mind. All the assumptions that people had always made fell apart. As a result, composers felt the need to develop new ideas of musical organization. The most famous example of this is Schoenberg, but other composers did the same, particularly after World War II - Boulez, Babitt, Stockhausen, Xenakis and so forth. These were all responses to the fact that the common assumptions had disappeared, so each different composer would come up with a new idea. The thing is that during this period, nobody had any knowledge whatsoever about how the musical mind works. So whatever composers invented evolved out of their own personal interests and was usually an idiosyncratic solution. If one seeks a general solution, then one needs to base it on scientific theory and experiment. To find out how the human animal behaves musically, that kind of knowledge, and indeed that kind of research, have only developed since around 1965 or 1970, and in a serious way only since about 1980.

TL: To what extent was your book 'A Generative Theory of Tonal Music' influenced by the work of Noam Chomsky? Could you draw a parallel between what you have done for music with what Noam Chomsky has done for language?

FL: Absolutely. In fact, Chomsky was my initial inspiration. I read his 'Language and Mind' in 1970, and suddenly that sparked my idea about how to embark on this project. I realized that one could indeed build a theory of the musical mind that shows what the propensities of listening are. I lived in the Boston area and I knew Chomsky. I collaborated with one of Chomsky's most prominent students, Ray Jackendorf, to build this theory. Ray remains a very good friend, although we have not collaborated again since then. I do still have a lot of connections with linguists, but I now work alone. The theory we built is not a linguistic theory, it's a music theory, but it was inspired by Chomsky's program of research.

TL: Could you outline the main points of

your musical theory? Have certain elements of your theory been either validated or refuted since it was first conceived?

FL: Well, let me put it this way: when a person listens to a piece of music, he hears a physical signal in one sense, but the listener also infers a great deal of musical structure. So the theory attempts to provide a set of rules that assign the structure that it predicts the listener will hear to the musical signal. That in a broad sense is what the theory does. Now, the kinds of structure that Ray and I attempted to predict are the hierarchical structures inherent in nature, which are both rhythmic structures and pitch structures. In explaining the different parts of musical hierarchies and developing rules that assign structure, we were able to motivate a lot of different psychological principles which have subsequently been very useful in guiding empirical research by music psychologists. The second big influence on me (the first one being Chomsky) has been my association with various music psychologists. The most striking of these has been the work of Carol Krumhansl and her development from empirical data of spatial models of pitches, chords and keys. To go back to your questions, what has happened in my development of the theory recently and in the book that I'm completing, is not so much that I have rejected earlier parts of the theory as that I have enlarged the whole theory. I have developed a whole theory of pitch space that models the data and shows how people take pitch space journeys. In a sense, people travel through pitch space when they listen to pieces, and I am able to predict quite accurately the patterns of tension and relaxation that people experience when they listen to a piece. I have also been able to show how the spaces change depending on the musical style - it's one kind of space if you're listening to Beethoven, but it would be another one if you're listening to Stravinsky.

TL: If we can monitor patterns of emotion in this way, is it not possible to create a standard code for the composition of musical masterpieces?

FL: (Laughter) I suppose that might be possible at a trivial level but I think that any theory, not only of music but of any kind, always abstracts away from the incredible richness of any particular thing. In physics too, the incredible variety of the physical

world is abstracted into general laws. I think that if one is able to show how a given piece induces feelings of tension and relaxation that is really important, because it has a lot to do with how music affects us as listeners. But this does not mean that one could make a tension graph, that in itself would be an abstraction of all the particulars that make a piece great or trivial. So the answer is no, I'm not even close to making a recipe of that kind, nor am I disappointed about that! (Laughter)

TL: As far as I understand, you are making a distinction between the feelings aroused by a real experience and the feelings created by an artificial experience... Between a primary, natural stimulus and a prefabricated, induced one...

FL: There are two very different and difficult questions there... I would say that the metaphor of tension and relaxation applies to many aspects of human life, like being on a roller coaster in an amusement park, for example. However, beyond that very general metaphor, I don't think that the experience is the same. I don't think anybody can explain at this point why music has the particular quality that it has, why it is so powerful, why it means so much to us...I don't think anybody knows the answer to that. But I do think I know enough by now to say that, along a number of dimensions, music provides an amazing number of distinctions in different kinds of tension and relaxation, displacement and closure and open-endedness...It has more distinctions of this kind than I can possibly imagine any language having. So it's extremely subtle... Could you please repeat the second question because I'm not sure that I quite follow your reasoning?

TL: If we can pinpoint a particular emotional stimulus, theoretically we can also recreate it. But if the stimulus is recreated artificially, does it inevitably lose some of its power to stimulate?

FL: Mmmm... This is not an easy question for me to answer, because I have built my musical theory around a different premise. Given a musical signal, I try to develop a formal means for assigning the different kinds of structure to it. So I have never tried to reconstitute the original musical signal from the rules - that's not how the theory works...So it's really impossible for me to address that question. But what I would say

is that if you have a lot of different structures that are perceptually viable to work with, and you know what makes them viable, it is very useful to have all these possibilities at your disposal in the form of computer programs. This offers you a complex, interactive tool to build new kinds of structure, so I regard it as a very rich platform for new kinds of composition.

TL: People usually call an artist who succeeds in surprising our expectations a genius. Do you think the emotional peaks that art provokes in a person arise from the element of surprise or expectation - or a combination of both?

FL: (Laughter) Well, surprise and expectation are two sides of the same coin. That is to say, if you expect something and then it comes, then you are not surprised; if you expect something and it doesn't come, then you are surprised. If you have no expectations then you have no surprise. There's a well-known theory by Leonard Meyer and Eugene Narmour which deals with trying to understand music in precisely these terms. I myself have recently shown in a more detailed way how all of that works (at least in terms of attractions of certain pitches to other pitches) through my pitch space theory... But I think that great works of art both provide expectations and fulfill them, and they also provide surprise. You can't really have one without the other.

TL: Which is more exciting: to compose a piece of music or to successfully analyze a very difficult piece of music?

FL: I personally find solving a theoretical question very satisfying. It's a kind of primitive satisfaction. Ultimately, though, I feel that composing is more completely satisfying, because it involves not just the intellect but the emotions and feelings and intuitions in a totally integrated way. When I am composing well, there's no conflict between what I feel and what I think. That's a very profoundly satisfying feeling. Also, when I am finished, the piece is performed and the players like it and I'm happy with what I've written, that's a more emotionally complete experience for me.

TL: If theory did not exist, would artists be able to compose more original works of art? Does theory perhaps limit artistic freedom of expression in some way?

FL: I agree with many people before me, like Stravinsky for example, that art is not possible without laws, without order. The idea of complete freedom is a myth. We all behave in certain ways and not others, whether consciously or unconsciously. An essential part of becoming an artist is to develop skills. As a musician, the things that one learns - whether it's playing the piano, or getting a good ear, learning how to make different patterns of notes and rhythms, or orchestration - all those different things are necessary. So the idea of a naive artist who is inspired in total freedom is a total myth. The question really is: are the kinds of things that we learn helping us or hindering us? Of course, we have to learn something, or else we can't do anything. What I have strived to do in my music theory work is to develop a theory that is in harmony with the nature of the musical mind. I do realize that this is a Utopian goal....In a sense, what I seek is not just an arbitrary theory, or one that is restrictive in some purely idiosyncratic or local way, but rather something that reflects natural human propensities. Regardless of whether I succeed in that, I think that art needs theory and that musicians have to learn skills. The fact that skills are inevitably related to theories is inescapable.

TL: Do you believe that by learning the skills and rules of another art form - the syntax of a poem for example - that it is possible to create a common 'syntax' that works for two different art forms?

FL: Yes I do. In the case of a poem I do, although I'm not sure about visual art. Phonology, or language like music, is a structured sound medium taking place over time. So the sounds of poetry, the phonology of poetry, form certain patterns of departure and return, various kinds of rhythmic structure, that are highly musical. So I think the relationship between music and the sounds of poetry - the rhythm and the contour and the recurrence or non-recurrence of sounds between music and language - is extremely deep. That's something that I've actually been working on recently.

TL: Can we then conclude that the differences between languages - German, Greek and English, say - have to do more with the syntax and sound of the language than with the actual grammar?

FL: No. I think languages differ in all these dimensions. Of course, they differ in the melody of speech, the phonology, as well as the syntax. Ultimately, all languages are different; so what is arguably more interesting is what they have in common. One of the main goals of generative linguistics is to uncover the principles that all these languages have in common.

MARK TRAMO

Thanassis Lalas: What gave you the idea to combine medical science with music? When did you first decide to introduce music into your scientific research?

Mark Tramo: I grew up as a musician and a songwriter. And also when I went to college at Yale, I became interested in the brain. So I spent some time in music and some time in science and rather than being forced to choose between the two, I decided to do both - to put them together.

TL: What sparked your interest in the function of the brain?

MT: The notion of mind and consciousness. The belief that all aspects of human conscious experience are generated by the brain.

TL: So do you think that the brain is the primary influence that shapes the individual personality of a person?

MT: Yes, but it's not that simple, because the brain does so in such a complex way that it may be very difficult for us to ever understand.

TL: Do you believe there is a distinction between the brain and the soul? And if so, how would you define this distinction?

MT: Well, this is an enormously important issue in the philosophy of the mind, and the Greeks have had such an important role in formulating ideas about the relationship between mind and body.

TL: What is your own opinion on this issue,

based on your research of it?

MT: We know that if a part of the brain known as the cerebral cortex is damaged, then we observe no evidence of intelligent behavior. So we conclude that the cerebral cortex is essential to normal consciousness, or to consciousness itself.

TL: What about the concept of genius? Is there a part of the brain responsible for genius?

MT: We have some very strong hypotheses that are well founded in experiments, or rather in empirical data. The kind of things you refer to as "soul", for example, may be what is called an emergent property of the brain that arises from very complex interactions that transcend our understanding of how the brain works, or in fact how biology, how life has come to be... But there are other aspects of brain function that we have been able to study that are irrefutable. For example, intelligence, abstract reasoning ability, a perception of communication sounds (which of course in humans takes its highest form in language and music) - those functions cannot survive without the portion of the brain known as the cerebral cortex.

TL: Let's go over that once more! I apologize if I am laboring the point here, but this is a very interesting and very complex issue.

MT: Not at all. It's a challenge to us as scientists to clearly communicate our work to the general public. And I think we have to try to improve on this. I am grateful to you for trying to help make a clear communication with the public.

TL: I am grateful for an opportunity to talk to someone who has entered and studied the workings of the brain. What impressed you most when you first entered the realm of the brain?

MT: I think the overriding impression is on the one hand how complicated it is, yet on the other how well organized it is.

TL: Does the complexity of the brain produce this organization, or vice versa?

MT: Let me think of an analogy... It's as if you had a billion billion people and yet you got them all to line up just right! It is estimated that there are ten to the twelfth neurons or cells that make up the brain, and

each of those cells makes connections with hundreds to thousands of other cells like a web, or a network. So when you talk about the number of connections, it's ten to the fourteenth. That's a huge number. But even though there is this huge number, they're broken down or organized into specialized populations that do special things. So you have this enormous number and all this complexity, yet you have a very clear structure. It's like a big organization, a big corporation: it seems huge, but it employ thousands of people. What's the biggest corporation in Greece? -

TL: I'd say it's probably OTE - the State Telecommunications Company.

MT: And how many people do they employ?

TL: 250,000.

MT: Okay. Maybe you'll agree that sometimes those 250,000 people all work well together, and at others something goes a little wrong, no? (Laughter) Imagine now that the brain has working for it a billion billion people, and they're all working all the time, but they almost never make an error.

TL: When and how did you first discover that we can better understand the function of the brain through the brain's ability to conceive music?

MT: That's a very interesting question, because there's a long history of trying to relate musical skills with intellectual skills in general. In fact, there are two particularly noteworthy authors who have dealt with this subject. One of course is Aristotle, who argued in 'Politics' that music should be a regular part of the curriculum in Greece. The second, modern author is Howard Gardner in the Education Department here at Harvard, who has argued that intelligence is not just measured by IQ scores; that in fact, in everyday life, there are a number of different types of intelligence, like social skills, maths skills, and also specifically musical skills. So those two authors have already addressed the relationship between music and intelligence. There are many different methods that we use to understand how the brain works. One that has been very important, that goes back to 19th century Europe, is what happens to someone when some part of the brain - the

front or back, the left or the right- gets damaged. What we have found is that a particular part of the brain, or I should say particular parts of the brain, are essential to hearing. And among those parts essential to hearing, the parts that are up in this special area called the great cerebral hemispheres are essential to language and music. So if they get damaged, if you have a stroke or a car accident, say, then you will have a variety of different problems processing language and/or music. In fact, it's one of the ways we've made a link between language and music, because some of the same kinds of damage that impair language also impair music. So we conclude that there are parts of the brain that are very specialized for hearing-related functions, especially for language and music. Now that's what happens with brain damage - stroke, Alzheimer's disease, multiple sclerosis, tumors, head trauma from a car accident or a wound, or whatever... There are other methods though. An exciting development in the field in the past twenty years or so has been the ability to actually look at the brain: to look at the brain's anatomy, at what happens, what it does, and how its blood flow changes when we listen to speech as opposed to music. That kind of science has really only been possible for the last quarter of this century. It's one of the greatest advances for science, but also for medicine, to actually be able to take a picture of a body part without having to do surgery to find out what's wrong. This technology pretty much started in hospitals, but it is being applied to science to discern things, like-what is the relationship between mind and brain.

TL: If speech is a kind of music, why not use speech rather than music to carry out this kind of research?

MT: I would modify that to voice, not speech, because voice includes things like laughing and crying and sighing and moaning and singing.

TL: What is the difference between voice and speech?

MT: Music is a kind of language. If we define language as a means of communication that incorporates rules for its use, I think music meets that criterion. It is a way of communicating emotions quite effectively - perhaps more effectively than speech. And it does communicate meaning. Interestingly, it does so principally through

the sense of hearing, so hearing is very important for the understanding of meanings. And music has rules: I mean the difference between music and noise is the difference between order and chaos. Music has a structure that is characteristic, whether it be in relation to tonal information like melody or harmony, or in relation to timing information like rhythm and tempo. It is very rich in structure, just like speech-related languages. I don't mean to say there is a perfect overlap - there are different parts that have to do different things. We know that the left hemisphere does certain things for speech that we have yet to prove that it does for music, but this exactly what is so exciting in our field. These questions are only now being asked because not that many scientists could converse in all of the disciplines - music, the brain, psychology, and so forth - that are related to what we are talking about. However, in the modern era, this multi-disciplinary training is growing. Many of the people who will be at the International Computer Music Conference in Thessaloniki have some kind of interdisciplinary background which allows them to try to understand things like the relation between music and language. But I want to make it clear that music and language are similar, yet different. They're similar in that they use rules in order to express complex ideas and emotions; and they're different in that some of the mechanisms are the same in the brain, and other parts of the brain do more for language or speech than for music. So it's half-empty, half-full as far as their similarity goes.

TL: Through your research, have you been able to explain with any certainty the brain's ability to learn? I refer not only to the ability to retain and comprehend information, but aesthetics as well.

MT: The brain never loses its ability to learn throughout one's lifetime. What is special about youth is the remarkable capacity of the brain to learn so much, so fast. Therefore, it is important to introduce a very structured form of information processing into the education of the young. Let's get very abstract about what we ask children to learn for a moment: we ask them to learn information and how to manipulate that information in everyday life. Whatever it is - math, language, religion - that's basically what we ask them to do. Now, music is also a kind of information and it is best learned early in life, when one acquires

the ability very quickly. It also allows the individual to exercise certain cognitive skills that apply to intelligent behavior in general. This is the concept of generalization. Then it helps in learning symbol abstraction and symbol manipulation in other areas, like learning another language. Some of the recent studies that have been done in the United States by Gordon Shaw and his colleagues suggest that music promotes not just linguistic, but also puzzle-solving skills. The IQ test involves puzzle-solving skills. So they decided to see if having piano lessons would help children improve performance on a puzzle-solving task. They tested very young children - most were about three years old. Lo and behold, if they did have piano lessons - not voice lessons or how to use the computer lessons, but piano lessons - they ended up doing better on the problem-solving task. Why? Because solving a puzzle, you have to figure out how pieces fit together in space. In music, with the keyboard you have to figure out how the keys fit together in space and time. They had to know how to place their hands, and how to do the transitions to move their hands, and what certain written notes meant in terms of their sound and where you put your hands... So there's evidence and there's good reason, as Aristotle put forward in 'Politics', to argue strongly that music should be included as part of the education of the young.

TL: Can a person be born with musical talent? Can a child have a natural musical ability, or must talent be cultivated and developed from a young age through musical education?

MT: It's much more the issue of cultivating something that all human beings have: that is the ability to appreciate, enjoy and apprehend music. In all cultures everywhere in the world, music and song go hand in hand with speech and language. Not all cultures have writing, not all cultures have pens or violins. But all cultures have some way to communicate through hearing, using the mouth and vocal chords. That's what's exciting about studying the biology of music - because when something is universal, it suggests it's natural; and if it's natural, then biology should include it.

TL: You referred earlier to a person's ability to enjoy music. How would you define "enjoyment"?

MT: I will answer that in the empirical. Have you ever been at any celebration, or for that matter any sacrament, that has not included music?

TL: Never. Especially not in Greece!

MT: You know, I've been trying to figure out exactly how Greek I am! I think I'm about 0.01% Greek! I'm mostly Italian, but my great-grandfather's name was Nicholas. Both Greeks and Italians love music - I think most people in the world love music. Anything that's important to people features music. I mean, gee, even in baseball games in the US we play the national anthem before every game! There's something about music that Freud referred to as the "collective ego". We have different forms of ego. We have the ego that we understand as ourselves, but the way that we are with our mothers is different to the way we are with our friends, and different from the way we are when we are one of thousands of people at a football game. If you acted at Christmas dinner like you acted at the football game, it would not go over very well in my family! That's the concept of the collective ego: when you are part of the group, of the audience at the football game, you take on the character of the group, not of Thanassis, or anyone else - you take on something of the personality of the group. Music has always played a role in group activities that through ritual reinforce group identity like nation, religion, or anything that we identify at the level of populations of humans. And what's of course beautiful also is that music can be a very personal thing, in the sense that you might hear a wedding song and it might always make you cry. Music is so universal and so powerful that there must be a biology to it.

TL: Until now, musical works have been written according to a tonal scale. Is this particular musical scale the only way that the human brain can conceive of harmony, melody, and so on? Why did these particular notes become the basis for all musical composition? Have you discovered any other musical scales which have not been used yet in the course of your research?

MT: Yes, it is possible. There are two rules that we think determine how you make a musical scale. Rule #1, which is true of all cultures (we learn this from musicologists and ethno-musicologists), is that all cultures order their scales in the octave. This structure, the octave, provides order for all of the individual notes in a scale. That is empirical. Rule #2 relates to general limitations on the information processing capacity of humans, which was studied by George Miller using sound, touch and light, with the same result. We can normally process seven plus or minus two elements. Those are the two rules. Within an octave, one can have seven plus or minus two elements. Now that's a general rule; there are variations on that rule and differences between whether those elements have to serve as anchors, or whether those elements aren't truly structural, but rather decorative. We're getting into more complex music theory here. But I think that the important points are that the octave is a universal structure within which notes are ordered. And that we can only process so many notes within the octave - it can't be an infinite number of notes. Most musics have about seven plus or minus two notes. Some musics have more; qualifications make that a simplistic statement, but the general idea holds. Now, you or I Thanassis could probably come up with seven plus or minus two notes that aren't in the Oxford Dictionary of Music; but we probably wouldn't want to put them all at the beginning or the end of the octave - we'd want to space them out. Those general rules of spacing hold. So we could come up with a scale but, like everyone else, we would be constrained by natural laws, which are partly biological.

TL: How much has your musical education influenced the way you think? During your extensive research on the brain and the way it perceives music, have you examined your own relationship to music from childhood?

MT: All scientific inquiry involves putting forth a hypothesis and trying to prove whether that hypothesis is true or false. So it's very important to be able to put forth reasonable hypotheses that one has a chance of proving true, rather than false. I think that by virtue of my music education, my formulation of those hypotheses has been better informed than it would have been otherwise. What's interesting (this is true of all the participants that I know of in the Music and Brain Symposium in

Thessaloniki) is that all of us in music science have had some training in music. I think it's the intuitions from that experience with music that allow us to formulate fruitful hypotheses about how the brain makes music.

TL: Tell me about your background and how you grew up. What was it that triggered your interest in music?

MT: I grew up in a culture that happened to be principally Italian. My great grandfather came to America from Naples, although as I mentioned earlier he must have been at least an eighth Greek. He played guitar and flute and he also had a nightingale. He would sing with the nightingale and play the flute; so music was part of the household that my grandmother and her sisters, and my mother and her sisters grew up in. My grandmother plays piano. My mother didn't have that opportunity, but my sister is a singer in suburban New York. So music was always a part of our family life. In America and Europe in particular, when I was six years old or so, Elvis Presley and The Beatles were at the peak of their popularity. So music was a very big part of my life as a child. My parents decided it was important enough that they gave me guitar lessons, starting when I was six. I took lessons for a number of years and started to write music. Musicologists would probably call it folk music. So eventually I became a songwriter, and when I was at Yale I studied some music and drama there. Then, oddly, I went to Medical School. But I was recording and playing music in New York City around the same time that I was applying to medical school. I decided to go into medicine for a variety of reasons - not least of which was lack of family means and wondering how long I could go on struggling as a musician. But immediately upon learning about how the brain works, it became apparent to me that there were certain brain mechanisms responsible for music perception, performance and cognition. The brain side really has to do with a philosophical interest in who we are. There may still be some scattered detractors around, but I think we all realize - and in fact, Hippocrates is quoted as the first to realize - that all emotion, all thought, everything that we enjoy existentially, is generated by the brain. So I think if you're interested in philosophy at many different levels, whether it be at the cognitive level of Descartes - "I think therefore I am", and if you think with

the brain, then "I have a brain therefore I am" - right down to more empirical types of approaches like York, it always comes back to the brain.

TL: As far as your research goes, what has been your primary concern? Is it a general concern to find out how music stimulates and effects the brain, or are you more interested in perception procedures like the perception of harmony and rhythm?

MT: Most of my research has addressed aspects of music perception such as the perception of pitch, harmony and melody, and which brain mechanisms really mediate those functions. It is remarkable how at both the cellular level - the level of individual nerve cells - and at the level of populations of cells, there is a specialization for processing sounds that is used to perceive music. To some extent, since music and speech are so closely related, this has implications for language and communication in general.

TL: From the study of the brain, is it now possible to define harmony? What is it that makes people able to distinguish a musical work of art from mere noise?

MT: That's an excellent question. Biology reflects physics. I believe very strongly that biology reflects the physical world. What is striking about the acoustics of harmony and the brain biology of harmony perception is how orderly, how well-structured acoustic energy is for harmonic stimuli on the one hand, and how orderly and structured neural activity is in representing harmony. So the common feature is that there is remarkable order in both the acoustic energy and the neural activity. This question has such depth that I want to take it to two more levels. One is that anatomically (in other words, where in the brain, what structures, cells and regions of the brain are responsible for bringing harmony perception to conscious experience), we've learnt a lot, especially from patients in neurology. If a patient has a stroke or a tumor, say, we find out where that tumor is and we say: 'Oh, that effected music and language'. So we've learnt a lot about what parts of the brain participate in music and speech perception. The third and last level is something that I think all of us have trouble understanding and I may have some trouble communicating. Maybe we all have trouble understanding it precisely because it is so hard to

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communicate! (Laughter)

TL: I have my fog lights on! Please go ahead.

MT: The brain has to use some code to represent sound. It isn't like the brain makes or echoes sound. It doesn't work that way. For nerve cells, that code takes a particular form that is very different from the reality of what you and I think a code is. This code is made up of bits of information over time. All a nerve cell does to make this code is either to fire a spark of electricity or not. So the code involves when the spark happens, how many sparks happen over a period of time, the pattern of how they happen over time, and whether the number of sparks goes up or down depending on what happens to us. The billions and billions of nerve cells in the brain all have to use this kind of code. It's remarkable how much we get out of such a simple system, isn't it?

TL: Yes, indeed.

MT: This is what I meant earlier when we spoke about simplicity on the one hand, and complexity on the other. It turns out that the way these billions and billions of nerve cells are organized, and how these codes are passed among them, is the basis of our sensory experience - in fact of all conscious experience.

TL: We often say that a person has a good ear for harmony. Let's assume that somebody doesn't have a good ear for harmony. Does this mean that they cannot appreciate music and if so, why not? Perhaps their brain is organized in such a way that although it is not very good at representing harmony, it can organize sound in other, equally important ways.

MT: Whenever I hear that phrase I always say: 'It's not having a good ear for harmony, it's having a good brain for harmony.'

TL: I fully understand what you are saying. If biology reflects physics, and therefore the brain has been structured in such a way that it can reflect what is happening outside, this makes sense. However, what really interests me is the following: we do know that there are some patterns of order like harmonics and periodicity in nature. But now, through chaos theories and so on, we know that there are also other physical

forces which are not as periodical or harmonious. Since they exist in nature, isn't it possible that the brain also has the ability to perceive and appreciate them? Perhaps we simply do not use this ability because for years we have been conditioned to appreciate the harmony of, say, Bach. So we do not push our brains to try and appreciate the harmony of other physical forces...

MT: We have a very difficult task you and I, when we go out and listen to the world. So we try to break it down in steps, in order to perceive the particular sounds we are interested in. Even at that superficial level, the brain has to be able to tell noise or non-periodic sounds from periodic sounds. Then the brain mechanisms that process periodic sounds can be activated and taken full advantage of. It's what some engineers might view as a decision process, where at each stage the decision analysis is straightforward: it's either this or that. It's a decision analysis approach to understanding periodic sounds in general. So first you know whether it's speech or not, and then you decide whether it's a vowel or not. Now there are two things that come into play when we start to talk about complex music such as Bach: the issues of primacy and salience. Given that we ourselves have to evolve as human beings from infant to adult, we consider primacy and salience to relate a lot to that experience. We know that at the earliest stage of human development, the most salient sounds are the mother's voice and one's own voice. Voices are composed for the most part of periodic sounds, so periodic sounds are of the greatest primacy and salience from very early on. This can then be generalized to other periodic sounds like music. So the brain mechanisms that evolved millions of years ago and were shaped from the very first moments of life by being used for voice perception, can and are used for other types of related perception, like music perception.

TL: Let me ask you a hypothetical question. There is a tendency to try and find out more and more about human perception, to understand exactly how the brain functions. Do you believe that we will ever be able to define and explain every single mechanism of the brain, or will there always be a dark side of the brain that we will not know about?

MT: Scientists question whether humans

could ever understand something as complex and miraculous as the brain, no matter how much we know. I'd just like to add a brief footnote to a previous comment about the voice versus speech versus music, specifically with respect to singing, since that's probably how music started. The first instrument was probably the singing voice. The general classification that covers all those things - voice, speech and singing - is vocalizations. For example, the crying of a baby is not speech. So one has a very special system for communication, like speech; one has a more general system like crying, that we don't learn but are born with; and another system that is highly evolved, that I think all of us as humans consider a zenith of human evolution from an intellectual and aesthetic point of view, such as Bach.

TL: I would like to ask you one last question. Do you believe that all this research into the brain and music perception will allow human beings to produce better music, and therefore allow human beings to listen to music in a better way? In other words, will our knowledge of the workings of the brain enable us to improve the technique of both the composer and the listener?

MT: That's an interesting question. I think that scientists learn how to formulate hypotheses about the brain based on aspects of everyday experience, like artistic experience for example. Or rather, I think they should, but I don't think that many of them do! (Laughter) Now, how that will in turn inspire art - namely music composition - is very hard to predict, because I think that in many ways what we consider to be a great achievement in the arts is by its nature creative and unexpected. I do think that for the "average" or "normal" listener, that what we learn about how the brain processes periodic sound in general, whether that be speech or music, does help language education. Perhaps of the greatest importance are the potential and actual contributions of this research in medicine: all of us will eventually be able to help people who have diseases which effect hearing, language and music perception.

TL: Can something that stimulates the brain have the dual ability to both cure and harm it?

MT: Not in such a direct way. For example, right now there are scientists and doctors who use electrical impulses to directly stimulate the brain when the ear doesn't work. As a result of understanding how the brain uses electrical impulses to understand sound, these devices can be engineered so that people who couldn't hear or understand speech can now do so. To get an idea of the magnitude of these kinds of language and hearing problems, one out of a thousand births in the US is associated with hearing loss. One out of ten children in the US have problems learning language, in addition to those with hearing problems from many other diseases. That's a lot of people! All of us who are coming to Thessaloniki from America would not be able to come unless the Department of Health recognized that this kind of work is essential. The magnitude of any national problem relates to what eventually becomes political motivation. All of us are funded by the federal government for this reason: we are trying to help to make the deaf hear. I should add that education also plays a major part in this effort.

TL: Thank you very much indeed.

MT: Thank you very much for involving me in your work.

ROGER REYNOLDS

Translator's note: Passages enclosed in brackets [.....] represent Reynolds' adjustments to bring the written text into line with the actual interview.

Thanássis Lálas: What is the difference between a composer who writes music for natural instruments and one who writes for computers?

Roger Reynolds: I think that the difference is the following: in the mid fifties, the idea emerged for the first time, of the possibility of creating sounds which would resemble the human voice or music through synthetic means. What was so interesting about that new discovery? Up to that moment in human history musicians would imagine sounds, but some of them could be repro-

duced while others would remain only in the composer's imagination. That is, there were no physical means by which certain sounds could be produced. Imagine the sounds of birds [singing] as they fly over a landscape. This might have been the composer's vision. [A performer on a violin or a trumpet can't fly.]. This is just one example that shows how the development of computers basically offered a radical readjustment of music, so that there was no longer a necessary boundary between the composer can imagine and what he can realize [as experience].

TL: So the intervention of computers into music was an historic moment. Right? Because essentially they could break down the former limitation on potential that existed if one used only the natural instruments.

RR: Certainly; it was an historic moment. The question - which is not so [agreeable] to answer - is what followed that historic opportunity that was given to humanity.

TL: This was going to be my next question. Because I imagine that it is much easier to compose having limits and much more difficult to compose without limits. This is where things become complicated. That is, how is it possible to compose in a world without limits?

RR: Good question. Instead of simply answering directly, let me tell you how I see, in general, what has happened. Before computers started being used widely in music, the people that were prominent in this field were exclusively concerned with research, with the problems, the limitations and the possibilities in applying certain programs. At least for the first 10-15 years there was little but that perspective which was based, though, on solid scientific principles. Those years were difficult and demanding and the work that was being done could not yet reach the public. So those who were concerned with computer music tended to be more expert in computers rather than in music. Slowly, of course, composers started showing an interest, but the first thing they noticed was how difficult it was to work directly with computers. The next step was for musicians and programmers to work together with the common goal of simplifying the interface with computers so that they could be more easily used in music. The problem that exists today, I think, is that there are numerous sophisticated spe-

cial purpose digital devices on the market, but they still offer only a very narrow portion of the enormous general potential. And often, the capabilities of these computers and the doors they have opened have reached only as far as we have already gone anyway with musical instruments, so the original potential [- of liberating imagination -] has not been achieved.

TL: How did the market reach that point? Is it because the market is not motivated by the same vision as a genuine composer? Is it because the market is more interested in making everyone feel that he can easily become a composer?

RR: It is very basic - and very natural of course - that business be motivated by profit and not by the imagination. Nor is its goal to break down barriers to human potential. It is significant - although it is a generalization - that those who design musical products for the wider market often were either themselves amateur musicians or were advised by musicians who had mass appeal. So their goal is to create products that will have large sales. These products must not be complicated to use and should not appeal only to specialists. They should be utilitarian and aimed at the general public.

TL: And they would probably aim to give the illusion to someone that he is actually a musician.

RR: Of course, without being concerned with the frustration and disappointment that comes with disillusionment. The second thing resulting from this situation is that others who might carry on the serious research are discouraged from continuing it. They see so many people around them playing with computers, and this can give the impression that computer music is already mature. Why, the casual observer might ask, do we need more research? Computer music is already here.

Earlier you said something very important. In order that one's way of composing be effective, there must be limitations. What computers permit us to do, in my opinion, is to expand the wealth of our imaginations, expand the conventions and the possibilities that we have had up to now. If instead of that we try to completely replace everything, then we will face problems, as you correctly said. In general when one is involved in a communicative activity, one

must observe boundaries and respect certain conventional rules.

TL: Isn't it interesting though sometimes to surpass the boundaries and see life beyond limits? To make my point clearer, let us suppose that we live in a house and the top floor of this house has a balcony, the balcony of our boundaries. What is more interesting then, the view from the balcony or what exists beyond that?

RR: But if we go "beyond," to an environment where there are things that we know nothing of, we are not able to understand because we lack the experience of interacting with these things. How would we be able to function in an environment [where we have no sense of the conventions]?

TL: Then you are saying that we must have complete knowledge of a certain environment in order to be touched by it?

RR: There is no need to have complete knowledge. That is after all, what gives us space for expansion and change. But there must be some common points, things that give us the sense of being recognizable, familiar. These will become the roads which enable us to move towards unknown areas so that at some point we arrive in new landscapes.

TL: If you had not encountered computers in your life, would you have still become a composer?

RR: Of course. I would continue to be a composer, but certain things which at this point function as a motivation and stimulate me musically would be missing. Their absence would function as a limitation and would restrict me.

TL: At what point in your life did you realize that you could compose music? And what is a composer after all? How do all these things come into his mind?

RR: Your question is very interesting but I think you will be surprised with the way I am going to answer. To me, being a composer means to have acoustic experience with sounds that do not offend me. The sounds do not disappoint, they do not deprive one - me, personally - of a sense of [fundamental] satisfaction.

TL: Could you be more specific?

RR: At the age of 25, I had just written my first compositions, small pieces which later on I heard being performed and which gave me great pleasure. But at one point I composed a piece for flute and piano. When I went to the first rehearsal, I felt that what the musicians did was something different, something more than, other than what I believed I had created. All these elements, that I had brought forth into the world through my composition, suddenly acquired new dimensions and, in a sense, a perfection I had not imagined. Something had happened, musically, that I had not foreseen but was able to accept absolutely. At that moment I knew that I would become a composer...

Being a composer involves designing the specifications of a musical experience, which in turn gives you satisfaction when you receive it - although this is not as simple as it sounds. That is, it is not only that you feel pleased. The problem that one in my position faces is that, when I listen to something, there are always things that [disturb] me. The thing is to be able to position something musically in a way that it will function in relation to the mind, the imagination, and the sensitivity of the listener. It is not enough then, not to offend but the music must offer a form of pleasure to the listener. This is what being a composer means to me. Let us take Mozart as an example. It is known that he was enthusiastic about new [resources] that became available. When the clarinet was offered, he used it right away. What makes Mozart stand apart from composers of our time - in addition, of course, to the fact that he was a genius - is that he lived at a time when the language of music seemed a more natural combination of better understood relationships than exists in our time. Now the composer has a tremendous range of choices to face. It tests human capacities.

TL: What do we mean when we say somebody is a genius?

RR: That he is able to do things that are completely out of the ordinary and which are very difficult to explain.

TL: Do you believe that with the widespread use of computer technology, as a method of composition, there will be a time when the role of the performer will become obsolete?

RR: No. And to be more precise, a computer is just another instrument, but it is a generic instrument, like the piano or the organ. This is the reason that all the familiar composers of the Western tradition - with the exception of Berlioz - were keyboard performers. That had been the medium. The computer today is even more general. And I believe that the time required to learn to control it completely will be much longer than the time during which it has been in existence so far.

TL: Until then is the composer of electronic music prey at the hands of the programmer, the person who knows how to use the computer expertly?

RR: Maybe not. Every musician must know up to a certain point how his instrument works and what its natural possibilities are. An oboist, for instance, knows how to [make reeds]. A flutist knows the way his instrument works. The same goes for a pianist. Although the pianist may know less about his own instrument as compared to others just because the piano is large and mechanically complicated. The same will happen, in time, with the computer. They will manage to create such a user-friendly operating system, that the user will not necessarily need to know how the computer operates in detail. The problem is to achieve a balance between the manipulative capabilities of the computer and a software environment that is friendly to the human condition.

TL: Do you remember which was the first musical experience you had in your life?

RR: I had my first really important musical experience very late, at the age of 14. It was a record of Horowitz playing Chopin's Ab Major Polonaise, which I effectively destroyed in two weeks, playing it again and again.

TL: Did your parents listen to music at home? Would you say that you grew up in a musical environment?

RR: No, nothing.

TL: If I am not mistaken, you had started

studying other things and eventually you returned to composition and music. What was it that led you to other things after you had already felt your first musical excitements?

RR: When I became aware of my inclination towards music, I asked my parents to buy me a piano. They did and I started piano lessons right away. Because I was 14, as I said, and although I studied hard, my fingers did not have the agility they would have if I had started at the age of 4 or 5. I was in a continuous struggle to keep a balance between my intellectual ability and sensitivity on the one hand and the limits imposed by my physical incapacities on the other. As I finished high school and entered college, I started playing piano recitals, but the problems with my physical conditioning created in me a feeling of limitation which was very unpleasant. So I realized that this was not a sensible way to spend the rest of my life. Some older persons whom I held in high regard advised me to turn to science - which I did. While studying it though, the attraction I felt for music never left me in peace. I graduated from the University and started working as an engineer, but music always continued to be present within me. So I submitted my resignation and returned to the University to study it.

TL: Do you believe that what we eventually do in our life is determined by the choices we make or by the influences we receive?

RR: It should rather be from both.

TL: From your former answer I felt that finally, maybe, talent is the ability of a person to express what he really wants from his soul. But I would like to have your own definition of what talent is.

RR: Besides what you just said, I think it is something else too. Let us not forget that in addition to "talent" there is the word "gift" which means that a capacity is given to you which, in essence, does not belong to you; it is not yours.

TL: Do you believe that there is "Someone Else" who "gives" to people what does not belong to them? He whom we call God?

RR: Your definition is interesting but it is not complete. Besides, I would say that it leans a little on the usefulness of the term,

it is somehow utilitarian. The truth is that we need to have the sensitivity and the intellect to be able to sort out what is hidden in our imaginations. It is equally true though that there is a dimension, an ability which is not under our control but is "given to us" from elsewhere. What exactly this is and where it comes from I don't think I am in a position to say.

I would like to add something regarding your previous question. Talking about choices, my impression is that we move through life selecting between those urgings that arise within us, on the one hand, and those that are offered to us by external circumstances, by chance, on the other. The moment that I consider the defining one in a person's life is the one at which he makes his choice in favor of what is offered to him by chance.

TL: A good teacher of computers, after many years, is teaching a student of composition the works of Reynolds. If he were [culturally probing] like your own piano teacher - in order for the student to be able to understand Reynolds - which [extra-musical] things do you believe that he should encourage him to study at the same time?

RR: I'm not sure that there is anything special... Look, being taught Debussy and studying at the same time Baudelaire or Renoir paintings is something we can understand today, because we see from a distance now - and my piano teacher even then had seen - that those were artists who explored parallel areas, and, moreover, they excelled in their explorations. Now, if with your question you want me to refer to allied artists of my own time, I can respond. To start with, the first artistic form I would refer to is the cinema. To me the most interesting director of the recent years is Krzysztof Kieslowski.

TL: Why?

RR: Because his movies have a tremendous power to charge one emotionally, although the subject matter, the theme of each movie is never obviously stated. What overwhelmed me with Kieslowski was that he had a novel way of leading his audience towards strong realizations. Kieslowski expands and strengthens the [degree] to which one can reach essences. As far as writers go, I would refer to Beckett for his parsimonious approach that reduces every-

thing to the absolutely essential. And on the other hand Michael Ondaatje, the Canadian author, on whose book the film *The English Patient* was based. Ondaatje is interesting for just the opposite reason from Beckett, although he is a kind of minimalist too: that is, he omits a great deal. From the contemporary artists, Jasper Johns is one of the most interesting to me. I also like Frank Stella.

TL: Maybe because you have not seen a recent review of his work...

RR: (Laughs). I will take you back now to the concept of genius. The point is not Mozart's greatest works. The point is that Mozart continues to exist, he goes on and on and on, and you can hear and you can feel that his ability to discover does not lessen. [Through his life], his music continually grows, maintaining the highest standards. On the other hand, when I saw the exhibition of Jasper Johns at the MOMA in New York recently - where a vast amount of his work was shown - I discovered that his technical ability was a lot more solid than I had thought. [However], consistency of expressiveness among his works was not something you could entirely rely on.

TL: Finally, do you believe that the need for art in our time remains the same?

RR: More than any other time, since our time is more confused than any other before. What we now need especially is for the feelings and the intellect to come together, to coexist, and this is something that only art can achieve.

TL: Can works of art be created today that would confront Time and then overcome it? That is, works which after 500 years can still be powerful - like the works of Beethoven, for instance, or Mozart? Finally what is it that conquers Time?

RR: Let us see how we could explain this. At about the end of the 19th century, the first one billion people in human history had lived on this planet. How many are we now? About 9-10 billion? It is not only the passage of time and the growth of information. Statistical realities on our planet have changed too. Just think of what clashes, tensions, passions are created among so many billions of people, and that all of these might be expressed in art.

I still think, though, that the criteria that determine whether a work will last over time always remain the same. The first one is that a work of art should reflect well the time from which it emerges. The second is the response that a work of art arouses through the quality which it brings to the age that shapes the critical assessment it receives. And because I might have rather confused you, I will say it again in a different way. The artist reflects in his work the time in which he lives. Now there are two things that will determine how long the work will last. One is: with what intensity does the work reflect its time and what is the quality of this reflection? The other is the relationship between the time that created the work and the time that judges the creation. At some phase of history we express a strong interest in Romanticism and at another we are more interested in "classical" art. So there is a relationship created between the artist and his time, on the one hand, and the artist and the time that judges his work, on the other. When we say that we like artists like Mozart, Bach, Monteverdi, Wagner, we turn back to another time, another society. We respond to their time in a very strong clear and profound way. One of the basic reasons that we are attracted to their works is not the connection the artists had with their time, but the connection of our time with theirs. If our society is concerned with things that had excited Monteverdi's age, our interest will be shifted towards Monteverdi's work itself.

TL: Eventually, the main adversary of people in this life is Time, and the question is how to conquer it. How, finally, can one succeed in something like that?

RR: This brings me back to the discussion about talent and a utilitarian approach to the idea of a God. If [a composer's] goal is to win, to be understood, to be noticed, I think that it is likely he will not be successful. What one should do - and I am talking from the point of view of artists, expressing obviously a personal opinion - what I would do, is to undertake this task by creating works which can please me, in the first place, which give me a sense of satisfaction without irritating me [with inconsistencies]. If I reach that goal, there is a possibility that the quality of balance, or "wholeness" will strike a response in somebody else.

TL: You say "to please me, in the first place." What is pleasant? That is, how can

one define pleasure?

RR: It is very simple. It is enough that something doesn't rub one the wrong way, that it is not foreign to its environment...that it is not "out of place," as one might say. Sometimes, of course, you understand that through the process of thinking; that is, you are intellectually sure that something is wrong. Other times it is simply a feeling, a shadow of doubt that you would very much like not to be there.

TL: The test is through the feeling of others or your own feeling?

RR: Your own, of course. This is where the doubt is hanging.

TL: So, it is like a statement of sincerity, like settling with yourself.

RR: No, it is different. It is something more than what you are saying. If something unexpected, even ugly, happens, it can still be accepted if it fits within the whole experience. It is not that something must be beautiful...but that it has to belong.

TL: One last question. What is the role, in your opinion, that Boulez and Xenakis played in what we call electronic music?

RR: I think that the contribution of Boulez is more general and institutional. He took the initiative to create an enormous research facility which has served many people in a very general way. Boulez, one could say, can look and listen beyond the needs of his own music, towards what he considers necessary in the wider field of music. Xenakis, on the other hand, is more concerned with the needs of his own work. From this standpoint, his innovations tend to bring solutions to problems of creativity that exist in his own imagination and in his own work.

TL: Thank you.

CD Reviews

PLEASE NOTE: THE NEXT ISSUE OF ARRAY SEES A CHANGE OF ADDRESS FOR SUBMISSIONS. DO NOT SEND CDS FOR REVIEW TO THE PREVIOUS ADDRESS (Katharine Norman, 18 Northcote Road...etc.) PLEASE CONTACT THE NEW EDITORS FOR SUBMISSION INFORMATION:

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Rocks and Wraiths
—Natasha Barrett

Ben Harlan, clarinets Hanna Marshal, cello
Note Bene Records - N.B. 970101M
30 Westerley Close Cinderford, Glos.
GL14 8EB England
n.l.barrett@city.ac.uk

and

Transmutations: Music for voice, piano and electronics

Works by alcides lanza, John Celona, Micheline Coulombe Saint-Marcoux, Robert F. Jones, Bruce Pennycook and Udo Kasemets

Meg Sheppard, voice alcides lanza, piano and electronics
SHELAN - eSp-9601-CD
6351, avenue Trans-Island Montreal, QC
H3W 3B7 Canada

I have had the opportunity to listen to these cds several times this past summer and have been struck on all occasions by how both offerings provide a thorough overview of currently popular and well-explored aesthetic trends in computer music as well as their roots in the methods of the past. Barrett's *Rocks and Wraiths* reflects the growing use of narrative "soundscape" materials which find their most effective presentation forum through multi-speaker installations and diffusion concerts. Well-constructed and engineered, the vibrant sounds used in Barrett's pieces thoroughly utilize the entire stereo spectrum and gave me quite an exciting ride even through the two small Tannoys of my home studio. The cd notes indicate that the composer does much work with film, dance, and sound

installations and defines *Rocks and Wraiths*' contents as "acousmatic", a term taken from alleged lectures given by Pythagoras from behind a curtain so his students would focus on the message and not his physical appearance.

Done in the composer's home studio and at a university facility, the pieces featured range from fourteen to twenty minutes in length and share a common theme of the fusion of natural earth sounds and human and instrumental objects. Most interesting for me was the 1995 *Imago* where the live clarinet and cello performance added an effective foreground to the piece's landscape drifting back and forth between unique musical statements and blending into the digitally-produced sounds. My only criticism of this cd would be with the relative sameness of the materials. Each piece had some slightly different processed sounds to distinguish it from the others but overall, the background and formal materials and constructions used varied very little. As a "concept album" this common musical thread works well, but I personally am interested in hearing more and different pieces from this composer in the future. Unfortunately, we are not told what equipment and applications were used in the production of the cd contents; I am always interested in knowing what tools a composer is using to present her ideas.

I do not know Natasha Barrett personally but hope to discuss her work and her cd program notes with her more closely if I meet her in the future. The use of the Pythagoras "curtain analogy" as an impetus for her music recalls for me the fascinating essay studies by Susan McClary of Laurie Anderson and Madonna's contradictory manipulations of the "woman on stage object" as a part of their compositional and performance output (*Feminine Endings*, 1991). As the composer behind the curtain on cd, Barrett places herself as the unseen puppeteer and storyteller, giving us all-encompassing narratives to entertain and fascinate us. On a musical level, her work presents to us the effectiveness of well-conceived and executed diffusion pieces while on a social level her notes and the medium of her message illustrate the affin-

ity and absolute correctness between computer (machine produced and performed) music and the female composer.

Transmutations is a presentation of pieces produced by composers currently residing in Canada. Most of the works featured were commissioned by and written for the duo of Meg Sheppard, vocalist and alcides lanza, keyboardist who have worked together for more than twenty years. The pieces range in time period from the 1971 "Arksalartaq" for voice, instrumentalist and tape of Micheline Coulombe Saint-Marcoux to the more recent (1994) "Praescio VII" (Piano.. and then some) for piano and interactive computer system of Bruce Pennycook. This time range makes for a quite varied cd with just about every art music aesthetic for the past twenty years finding a place here.

Most interesting for me were the progressions (and sometimes retrogressions!) of stylistic tendencies that could be traced through the pieces. The 1978 "Player Piano" of Victoria, British Columbia-based John Celona presents a relatively generic "a la Steve Reich" minimalist piece, but the work later becomes an important reference point for the Pennycook's piece which contains similar mantra-like interludes with long inventive and abstract developments showing the growth and vitality of this particular aesthetic over the course of twenty years. Unfortunately for alcides lanza, the juxtaposition of her 1992 "voo" with the earlier-composed works of Quebec electroacoustic pioneer Saint-Marcoux and the Estonian-born Udo Kasemets (*Calendar Round: Megalices* - 1989) does not work well in her favor. Though utilizing the similar vocal techniques of chanting, phoneticization, humming, and multiphonics, the latter composers offer much more intriguing palettes of instrumental and digital sounds in accompaniment. A purely acoustic piece, *Sangeet* (1990), by Robert F. Jones is also included.

Well-performed and recorded, *Transmutations* gave me the opportunity to hear works by composers who were largely unfamiliar to me and I was glad of the experience. Sheppard and lanza are fine musicians, but personally I found the pieces (with the exception of Saint-Marcoux and Pennycook) to be rather unimaginative. However, the cd is still a worthy edition to any music library giving listeners an opportunity to explore some lesser-known works

and composers.

Reviewed by Elizabeth Hinkle-Turner
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Daniel Teruggi, *Syracus-Sphaera*

INA C 1014, distributed by
MUSICDISC, MUSICDISC 244722

Florent Jodelet, percussion Daniel Teruggi,
Syter

Reviewed by Peter Terry, Bluffton, Ohio
USA

Daniel Teruggi is an Argentinean composer who lives in Paris. He was trained in Argentina in composition and piano, and in France at the Paris Conseratoire in Electroacoustic composition and musical research. Since 1993 he has been a member of the INA-GRM where he is in charge of musical production and development of new digital music systems. He also teaches computer-assisted art at the Sorbonne in Paris. This recording features two recent pieces; *Syracus* for percussion and *SYTER* (1992) and *Sphaera*, in four movements: *Eterea*, *Aquatica*, *Focolaria* and *Terra*. *Sphaera* was composed between 1984 and 1989 and reworked in 1993. The *SYTER* is a real time digital processor which was developed at INA-GRM which is used in conjunction with a live performer. It apparently also allows for sound synthesis and real time sampling for interactive compositions.

Syracus is essentially a piece for live percussion with an interactive real time processing applied via the *SYTER*. The processing ranges from subtle flanging and phasing to massive textures created by looping of samples captured on the fly. The composer uses silence and density very effectively in this piece which is, in a sense a "hyper-percussion" piece. There is a certain "analog black box" feel to this composition. The percussion playing is extremely accomplished and exciting. The processing, on the other hand, seems to be fairly rudimentary—a lot of flanging and phasing reminiscent of early 60's stompboxes. I happen to like this sound, but the palette of processed sounds used is not very wide and not very subtle. The *SYTER*, at least as used in this composition, seems to be more powerful in its real time sampling capabilities than in its sound processing. The sampled

ICMA ARRAY V17, N3

portions are quite impressive with fairly long stretches of the piece in which it is difficult to decide who is doing what. There is a highly refined sense of drama at work here, and despite my reservations about the electronic sounds, the compositional skill in the blending of electronic, processed, sampled and live textures is masterful and the composers control of form is virtuosic. This is a very fun piece, and I suspect that on disk, much of the fun is missing since with the percussion and live processing it must be a very visual piece. I would love to see a performance of this composition.

The second piece on the CD, the four movement *Sphaera* is a depictive composition which moves from ethereal intangibility to a massive and very "crunchy" physicality in the *Terra* movement. The composer's use of relative silences, texture, sound motion and subtle transformations of color makes a wonderfully descriptive piece. The timbral world is evocative and restrictive enough to make subtle gradation both apparent and important. *Eterea* which concerns the seen and unseen forces of the air, is very highly colored white noise, which builds in subtle layers into massive textures. The sense of motion, both musical and physical, is skillfully extended. *Aquatica* opens with some powerful gestures, somewhat firm in nature, giving way to burbly, resonant filtered water sounds. I found the end of this a little odd, as a filtered sound very clearly sweeps the harmonics prior to a rising fourth gesture. To my ear the strong V-I sounded anachronistic. I suspect a musical joke of some sort (or I've been teaching beginning harmony for too long). *Focolaria*, at 3 minutes the shortest movement, depicts unsteady fires at the entrance to the earth. The final movement, *Terra* has a texture which is so physical that you can just about chew it. I loved this movement with its massiveness and grainy, chunky sounds. This disk is well worth the effort. Florent Jodelet is a very fine percussionist with some virtuosic playing and both pieces stand up very well to repeated listening. I look forward to becoming acquainted with Daniel Teruggi's other music as this recording reveals him to be a composer of the first order.

Peter Terry is an American composer and performer of acoustic and electro-acoustic music. For more information about him and his ensemble, Electro-Metamorphosis, check out his web pages at <http://www.bgsu.edu/~pterry>

Winter 1997

Review

Forêt Profonde (1996)

Francis Dhomont, Montréal, Canada
empreintes DIGITALes, IMED 9634

by Susan Jenkins Saari, D.M.A.
Ohio Wesleyan University
Delaware, Ohio
USA

Francis Dhomont takes the listener on a spiritual journey inspired by psychoanalytic thought via the language of children's fairy tales in his thirteen movement work, *Forêt Profonde*. The hour-long composition, termed "acousmatic melodrama" by the composer, is based on "The Uses of Enchantment," an essay by Bruno Bettelheim. It is part two of a diptych, *Cycle des profondeurs* (Cycle of Depths), begun more than 15 years ago. Part one, *Sous le regard d'un soleil noir* (*Under the Glare of a Black Sun*), was inspired by the work of British psychiatrist and psychoanalyst Ronald D. Laing. Part three will be devoted to the works of Kafka and critical writings of Marthe Robert.

In the *Forêt profonde* musical landscape Francis Dhomont reminds humans of their subconscious primeval fears and joys by telling childhood stories, dreams, and fairy tales in the many languages of the world's children. *Forêt profonde*'s thirteen movements contain six "rooms" (movements 1, 3, 6, 8, 10, and 12) between seven spoken movements (2, 4, 5, 7, 9, 11, and 13) that contain the excerpts of stories. The "rooms" contain no text, but serve to set the scene or create an atmosphere. The composer credits the origin of this idea to composer Robert Schumann, in his *Kinderszenen* (*Scenes from Childhood*).

Each musical "room" is exquisitely painted and presented as a clever mosaic of natural-sounding groans, sighs, and ticks; children's toys; dripping sounds; bird cooing; and many more. The spoken movements intertwine fairy tales with commentary on their meaning. Particular favorites of this reviewer are the stunning first movement, *Chambre d'enfants*, (Children's Room) featuring a child-like rendition of a familiar tune and the terrifying ninth movement, *Forêt furieuse*, (Furious Forest), tapping into the darkest side of fairy tales intermingled with horrific stories of Auschwitz. Every listening of *Forêt profonde* reveals a new insight, pain, or delight.

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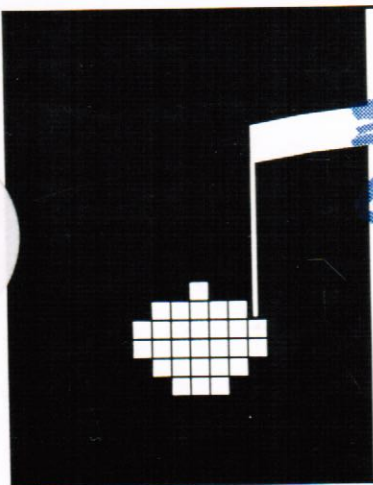
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