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EDITORIAL

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WOMEN, ART AND TECHNOLOGY

Judy Malloy, jmalloy@mail.well.com

This issue of *Leonardo Electronic Almanac* provides an introduction to the
newly released book, *Women, Art, and Technology* (MIT Press, 2003, Leonardo
Book Series). Originating over 10 years ago, when I pointed to the need for
more articles by women in *Leonardo*, the book is a comprehensive compendium
that documents the core role of women artists in pioneering and continuing
to shape new media practice. It not only situates computer-mediated work as
a central contemporary art medium, but also includes shapers of new media in
the fields of video, environmental art, information art and the body.

Body, body/mind separation, body/mind amalgamation, body as interface,
female body - the pervasive keyword "body" threads through the narrative -
from Lynn Hershman's article, which documents a progression from her
alternative identity Roberta Breitmore (created in 1971 for a series of
performances), to the body of the "guide" Marion, which serves as in
interface in Hershman's videodisc *Deep Contact*; to Dawn Stoppiello's wired
body in performances by her digital dance theater *Troika Ranch*; to Zoe
Sophia's article, "Contested Futures," in which she writes, "For many women
artists working with digital media, the body's physicality is not
transcended or obsolesced by technology; rather it is a source of poetic
efforts to at once use and counteract the machine's own anti-body logics by
using it as a medium to explore organic or visceral forms." Linda Austin
states that "For me as a choreographer, the fascination with the
'mechanical' is part of my insistence on the ineluctable materiality of the
body - our interface with the physical world it inhabits."

Interactivity - an active relationship between the viewer and the work - is
also a compelling theme that informs much of the work, not only work that is
declaredly interactive, whether it is the user's relationship with "Margo,"
the oppressive mother whose dominating presence becomes unavoidable when
Sara Robert's 1989 interactive installation *Early Programming* is
activated, or the community relationship with Nina Sobell and Emily
Hartzell's *ParkBench* (1993), a network of interactive kiosks that enabled
people in diverse New York City neighborhoods to communicate collaboratively
via the Internet.

Computer graphics artist Diane Fenster, in her chapter "Diane Fenster: The
Alchemy of Vision" (written with Celia Rabinovitch), writes "...I am also a
'window maker' in that my art creates windows through which others look to
see an inner world, and to recognize themselves in that invented space."
Video/performance/installation artist Joan Jonas, speaking of the mirror
imagery in her work, writes "...I could mix the reflections of performers
and audience, thereby bringing all of them into the same time and space of
the performance."

OVERVIEWS

Women, Art, and Technology, edited by and with a preface and introduction
by myself, features overviews of the history and foundations of the field by
critic/curator Patric Prince, critic Margaret Morse, artist/educator Sheila
Pinkel, artist/networker Anna Couey and Kathy Brew, artist and former
director of the new media initiative, ThunderGulch. The foreword is written
by Patricia Bentson, managing editor of the *Leonardo Music Journal*.

In her chapter "Women and the Search for Visual Intelligence," Patric Prince observes that "[w]omen have participated in the computer art and technology movement from the first decade, learning to speak the language of the machine as well as enjoying the implementation of ideas, techniques and experiences derived from its inherent logical involvement." Prince points to work, beginning in the 1960s, of Collete Bangert, Lillian Schwartz, Vera Molnar and, in the ensuing decades, Eudice Feder, Copper Giloth, Ruth Leavitt, Nadia Magnernet-Thalmann, Barbara Nessim, Sonia Landy Sheridan and many others.

Margaret Morse, beginning with a discussion of pervasive, daily encounters with interactivity and its relationship to the ways in which artists utilize interactivity, looks at works such as the CD-ROM, *She Loves It, She Loves It Not: Women and Technology* (1993), by Christine Tamblyn (with Marjorie Franklin and Paul Tompkins) and Lynn Hershman's *Lorna* (1980-1984), the first interactive laser artdisk. Speaking of Agnes Hegedus' *Handsight*, Morse observes that "Handsight offers a metaphor for perception of a virtual realm that is not matched to the physical world but rather is a view of the 'mind's eye' or of externalized imagination. At the same time, it exposes the logic of this construction and does not participate in the illusion. In this way, the piece both offers and deconstructs interactivity."

Sheila Pinkel documents artists who have focused on some aspect of the body or environment in their work, including Lynda Benglis, Coco Fusco, Suzanne Lacy, Robin Lasser, Christina Fernandez, Esther Parada and Barbara T. Smith. "For over 500 years, women have actively participated in the art-making practices of their time but have been excluded from history and the system that acknowledges or communicates their ideas," she concludes. "In the last 30 years, however, women artists have managed to find opportunities to work together to expand the possibilities of content and for exhibition. They have seen their works enter the dialogue of their time. The challenge for women is to continue this intensity of activity, to remain true to the interior voice that gives veracity and energy to art making, to continue to lobby for parity and to generate innovative solutions for exhibition and change."

In "Restructuring Power: Telecommunications Works Produced by Women," Anna Couey emphasizes the major influence network communications technologies have had "in shaping individual and cultural perceptions across the planet." Through interviews with early women network artists including Sherrie Rabinowitz, Lorri Ann Two Bulls, myself, Karen O'Rourke and Lucia Grossberger Morales, Couey highlights and preserves an important and evolving history.

In "Through the Looking Glass," Kathy Brew, who for over 20 years has followed the intersection of multimedia and contemporary art, reviews the work of artists working in multimedia, including Laurie Anderson, Mary Lucier, Maryanne Amacher, Beryl Korot and Toni Dove.

ARTISTS' ARTICLES

Women, Art and Technology includes classic *Leonardo* articles by Lynn Hershman, Pauline Oliveros, Helen and Newton Harrison, Nancy Paterson, Sonya Rapoport and Steina. These articles ground the development of the medium in such works as Sonya Rapoport's *Biorhythm* (1981-1983), which incorporated participants' assessments of their emotional conditions; Lynn Hershman's *Deep Contact* (1985-1990, programmed by Sara Roberts), which situates interactivity in the realm of intimacy; and Pauline Oliveros' use of technology in live performance, which began in the late 1950s.

Interspersed with these *Leonardo* articles are artists' articles that document the role of female creators in shaping new media art and that were

written expressly for this book. Cecile Le Prado's sound installation, *The Triangle of Uncertainty* - documented in the article "Sound Installations and Spatialization" - creates, in her words, a "fictive virtual space" on the basis of sound recordings made at the southern tip of Ireland, the western edge of France and the westernmost point of Spain. In essence, the installation refers to the position of sound in space, constantly chopping and changing between orientation and uncertainty.

Canadian artist Char Davies discloses the ideas and implementation of her immersive virtual-reality environments, which, as has been all of her work of the past 20 years, are grounded in "Nature" as metaphor. Jo Hanson documents the progression of her work from the use of technology to eco-art. "Finally," she notes, "I ask questions about the role of technology in a world facing (or failing to face) ecological crisis, which has the potential to be reflected in economic and political crises. I have tried to create work that is practical and visionary, and I offer certain practical and visionary propositions here."

In "Imagine a Space Filled with Data," German artists/researchers Monika Fleischmann and Wolfgang Strauss set forth their collaboratively shaped communications spaces. "The old metaphors have remained the same: 'Explorer' or 'Navigator' - the language of the conqueror is apparent to everyone on the Internet," they write. "As artists, we explore aesthetic strategies of communication processes to influence and transform the development of the market for the community of the future."

Other artist contributors include computer graphics artists Rebecca Allen and Donna Cox; video artists Dara Birnbaum, Judith Barry, and Valerie Soe; interactive artists Jen Hall and Blyth Hazen and Agnes Hegedus; Net artists Allucquere Rosanne Stone and Kathy Rae Huffman; biotech artist Nell Tenhaaf; and choreographer/dancer/musicians Linda Austin and Leslie Ross and Dawn Stoppiello with Mark Coniglio.

CRITICAL ESSAYS

The book closes with a series of critical essays that compliment the introductory overviews. Chapter authors are Jaishree Odin (writing about Shelley Jackson's hyperfiction *Patchwork Girl*); Simone Osthoff, whose chapter "Brazilian Counterparts: Old Histories and New Designs" documents the work of Jocy de Oliveira, Marcia X, Lygia Pape and many others; Zoe Sofia, writing about the work of Australian women, including *VNS Matrix*; and Mexican critic Martha Burkle Bonecchi, who points out that technology is not available to many Third World women.

In selecting the work for this book, I acted as an artist who believes in giving voice to each artist's description of her work. Thus, this editorial interface does not attempt to twist the multiple approaches in this volume into one meaning. It merely suggests a few approaches and opens the door to other approaches that range from Steina's lifelong involvement with video and installation to Donna Cox's algorithmic art to Pamela Z's translation of physical movement to sound to Helen Mayer and Newton Harrison's environmental activist narratives.

THE ARTICLES IN THIS ISSUE

This issue of LEA includes two complete articles from the book: "Fleshmotor," by Dawn Stoppiello and Mark Coniglio and "Video Art Povera: Lo-Fi Rules!," by Valerie Soe. Also included is part of the article "Face Settings: An International Co-Cooking and Communication Project," by Kathy Rae Huffman, and short articles by artists whose work is documented in longer articles in the book: Nancy Paterson, Jen Hall and Blyth Hazen.

These articles serve as an introduction to *Women, Art and Technology*, a comprehensive book that includes 36 chapters and documents the work of over

100 artists.

Women, Art and Technology is available from MIT Press at
http://mitpress.mit.edu/catalog/item/default.asp?sid=D1716CC8-E9CC-4EDA-991B
-40C7EEAE4A56&ttype=2&tid=9905, from Amazon at
http://www.amazon.com/exec/obidos/ASIN/0262134241/leonardoonlin-20 or from
Booksense.com, your local Independent bookstore's online order service, by
going to http://www.booksense.com and searching under "Find a Book"

The complete table of contents, articles not included in the book, and links
to new works in the field are available on the book's website at
http://www.judymalloy.net/newmedia.

BIOGRAPHY

Electronic narrative pioneer Judy Malloy (http://www.well.com/user/jmalloy)
has been writing hypernarratives since 1986, when she began writing *Uncle
Roger* (a narrative of sex and politics in Silicon Valley) on Arts Com
Electronic Network on the WELL. She is currently the editor of *NYFA
Current*, a publication of the New York Foundation for the Arts.

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STOCK MARKET SKIRT AND NEW DIRECTIONS

by Nancy Paterson
Nancy.Paterson@senecac.on.ca

In the early 1990s, I began working with laserdisc technology and
custom-designed microcontrollers to develop interactive projects such as
Bicycle TV, *The Machine in the Garden* and *The Meadow*. In the mid 90s,
my interest turned to Internet-based installations, as the technology had
evolved significantly and become more commonplace since I had first gone
online in 1982.

Stock Market Skirt, [1] a project that I began to work on in 1995, was
actually conceived long before the technology was available to realize it.
The concept of controlling the length of a woman's dress by referencing
stock market quotes in real time could only be put into practice as the
Internet evolved to supply data that I could access. Originally, *Stock
Market Skirt* was comprised of a BASIC program using Toronto stock exchange
historical data, which had been donated to the project. With the
transformation of the Internet from an academic resource to more mainstream
entertainment and commercial applications, it was my expectation that it
would only be a matter of time before online trading became accessible
online, 24 hours a day, seven days a week.

In 1995, when I began working on *Stock Market Skirt*, the only financial
resources available online were expensive proprietary subscription services
such as Reuters, Star Data and Bloomberg. By 1998, when *Stock Market Skirt*
went public, I had my choice of sites providing stock quotes, from markets
across the globe.

Stefaan Van Ryssen, writing about the work in *Leonardo Digital Reviews*,

points out that "this work, of course refers to the theories of Desmond Morris and Helmut Gaus, that women's clothing follows economic activity. In times of crisis and deflation, hemlines are lowered and colors disappear, in times of growth and at the height of a business cycle, skirts (and pants) are getting shorter and clothes more colorful. At the same time, the work comments on the presence of women as object and consumer in the 'real' world, while men are absent, hidden by technology and steering the economy rather than undergoing it" [2].

Stock Market Skirt works on many levels, as a cyberfeminist fashion statement and as the embodiment of the emerging intelligence of the Internet. Instantly, several message are imprinted on the viewer's subconscious. This project has the potential to be interactive with the global flow of information by responding to a dynamic feed of data. We are not merely voyeurs, watching the hemline quiver, rise and fall. A viewer might influence the media work by making a call to their broker, to buy (or sell) shares in whatever company the skirt is currently tracking or this might be accomplished through online trading. If the stock or composite being tracked is bought/sold as a result of automatic trade execution, then *Stock Market Skirt* becomes interactive with the flow of data within the Internet itself, rather than being interactive through the Internet as a pipeline or conduit.

The completion of *Stock Market Skirt* allowed me to pursue another interest, with the development of a fully navigable, multi-storied 3-D environment titled *The Library* [3]. Whereas *Stock Market Skirt* required relatively low bandwidth, *The Library* was at the opposite end of the bandwidth spectrum. A common theme, however, was the re-purposing of online data; in *The Library*, for example, a updated satellite image of the Earth's surface from space (taken from NASA's website), updated every five minutes, is retrieved and used as the texture map for a rotating sphere (world globe), which is the centerpiece in my 3-D environment. Such applications hint at the promise of the Internet for true interactivity and the symmetrical exchange of data.

Further expanding my artistic practice, I have recently produced a short video entitled *Coppelia* for BRAVO [4]! This dance/robotics project, produced when I was artist in residence at the School for Communication Arts, Seneca@York (Seneca College of Applied Arts and Technology, Toronto), utilizes ORAD virtual set technology. This was an opportunity for me to experiment with choreography and collaboration on the development of an audio soundtrack. I am currently developing a performance project that will further explore the potential of Seneca@York's Vicon motion-capture technology in conjunction with the ORAD.

Another project currently under development is *MULTI: Multiple User Laser Table Interface*, which will continue to develop the 3-D library environment as content for a collaborative multi-user tool. Partners for this development are Dr. Wolfgang Stuerzlinger (Computer Science, York University) and Dr. Jennifer Jenson (Education, York University).

REFERENCES

1. Nancy Paterson, *Stock Market Skirt* http://www.vacuumwoman.com/MediaWorks/Stock/stock.html

2. Stefaan Van Ryssen, "Review of Mediaworks by Nancy Paterson, Surrey Art Gallery, Surrey, Canada, 2001," Leonardo Digital Reviews, http://mitpress2.mit.edu/e-journals/Leonardo/reviews/jan2003/MEDIA_ryssen.html, January 2003.

3. Nancy Paterson, *The Library*, http://www.thelibrary2.com. The rotunda of the Canadian Library of Parliament was the inspiration for this 3-D

environment.

4.Nancy Paterson, *Coppelia*,
http://www.vacuumwoman.com/MediaWorks/Coppelia/coppelia.html

BIOGRAPHY

Nancy Paterson (http://www.vacuumwoman.com) is a Toronto-based electronic
media artist working primarily in the field of interactive installations.
She is coordinator of the artist in residence program at the Centre for
Creative Communications and Visiting Artist at the School of Communication
Arts, Seneca@York. She is an instructor at the Ontario College of Art and
Design and facilities coordinator at Charles Street Video in Toronto.

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FLESHMOTOR

Dawn Stoppiello with Mark Coniglio
troika@panix.com

/(SLASH)

When considering how to describe my work here, I am immediately drawn to use
a term that my collaborator Mark Coniglio invented several years ago - < i
>Slash (/) Artist< /i >. The term grew from a time when all of the artists
that we met seemed to describe themselves as a "dancer slash performance
artist," "poet slash technologist slash actor" or some other similar string
of metiers separated by the all-integrating slash. What these people were
trying to say was that they were attempting to hybridize multiple forms into
some-other-thing that they could not, as yet, put words to. This is the way
I have felt as I have attempted to bring my primary metier of dance together
with media and technology for over ten years.

Through this process, my choreography has changed in response to my close
contact with computers and computer-controlled devices. As a choreographer
and dancer, my relationship to the world begins with the work *In Plane*
(1994). This piece was seminal in the development of our thinking about the
relationship of the body to technology as an aesthetic idea, as well as the
technological innovation required to realize it.

We have used many varieties of homemade and commercially available sensing
systems in our performances, but the most sophisticated is MidiDancer. Mark
first had the idea for this device while we were both students at California
Institute of the Arts. He had been inspired by *Hungers* (1989) a
collaboration between his mentor Mort Subotnick and video artist Ed
Emshwiller. In that piece, singer Joan LaBarbara controlled MIDI
synthesizers using a small baton that responded to the way she moved it
through the air. Mark was immediately inspired to attach this device to the
leg of a dancer, but was discouraged by the wires needed to get the
information to the computer. So he envisioned, and shortly thereafter
implemented, a wireless device that would allow a dancer to make music with
the movement of her body.

The first MidiDancer system was built for a collaborative project at CalArts
in which Mark and I took part. The original device was quite primitive,
being made from radio-controlled car transmitters. Attached to each
transmitter were two sensors in the form of metal levers that we taped (at
the cost of much body hair) to our arms and legs. Each sensor measured the
flexion of a joint and sent that information, via the radio transmitter, to
a computer, where it could be used to control music synthesizers.

The piece we made was for four performers, each of whom was wearing two sensors, one on the elbow and one on the knee (four individual MidiDancer systems in all). The idea was to give each dancer two sounds to control, one on each sensor, that would stay the same during the course of the piece. Our hope in keeping this fixed relationship was to create a kind of sonic identity for each dancer, which the audience could recognize.

After creating material separately, we came together to work with the dancers and quickly realized that this one-to-one relationship, one gesture producing one (and only one) sound, did not make for a rich composition, either as dance or as music. We came to call this technique the "bleep-bloop" method, as this is all that the first attempt ended up being - a series of bleeps and bloops in conjunction with the robotic choreography required to trigger the system. We were disappointed that the piece lacked the kind of complexity and subtlety that we had envisioned and knew right away that we were going to have to try again.

What we did not know at the time was that, in that moment, MidiDancer had changed the way we thought about composing. In retrospect it should have been obvious that we had begun to compose for a new and unfamiliar instrument and that, of course, the artworks that we made with it would be directly influenced by its nature. For one thing, it was clear that we could not work in isolation when creating our materials, but instead needed to work collaboratively on both sound and movement. We did not know the instrument well enough to imagine the outcome, and we needed to really see and hear it happen. Also, we found that the physical gestures required to play the instrument were not inherently interesting or meaningful as choreography. To understand what I mean, imagine for a moment that you are watching a great violinist play. You may choose to watch her fingers move along the neck of the instrument, but I don't think that you would expect those same finger movements to give you any dramatic information about the piece. We were faced with a challenge: the dancer needed to simultaneously make both meaning and music with the same movements. This is a problem that became even more complicated as we added other media into the mix.

++(PLUS PLUS)

In the summer of 1990, Mark and I first collaborated with Kit Galloway and Sherrie Rabinowitz at The Electronic Cafe, their performance space/lab in Los Angeles. In this pre-Internet world, Kit and Sherrie pioneered the use of various kinds of telecommunications links to create live artworks between distantly located sites. At this time one of the most common ways for them to get video between cities was a slow-scan, hand-held, black-and-white video phone. Mark's and my experience with that device would begin our next series of insights regarding the combination of dance and media.

Tactile Diaries, our first collaboration with Kit and Sherrie, had performers at The Electronic Cafe and the New York University television studios in Manhattan performing together using slow-scan video phones and telephone-grade audio connections. One section of the piece was a solo that I performed using the MidiDancer. In this section, Mark programmed the software to trigger the videophone when I made a particular shape with my body. It would capture an image of my performance in Los Angeles and then send that image to New York. At the other end, the still image would arrive on a television monitor, slowly scanning in from top to bottom over a period of five to ten seconds. I carefully chose all of the movements that would trigger the video phone because these would be the only representation of the dance that the New York audience would see. I became very interested in selecting body shapes that, when seen in sequence in New York, would create a different narrative experience from the one that the live audience would have in Los Angeles. It seemed essential to find a way to have the choppy, low-bandwidth video express something different than

what the full-bandwidth (live) dancer could provide. What was important about this approach was that it emphasized what was distinctive about the technology and provided a different way of seeing the dance.

The use of video in this piece introduced me to a new theatrical element (i.e., beyond sound) that could be manipulated with the MIDI data coming from the MidiDancer. MIDI was no longer just an acronym for Musical Instrument Digital Interface or simply a word in the name of our device, but now represented to me a pathway that would allow my gestures to control basically any media device.

My understanding of how extensive these pathways could become expanded further when I saw Steina Vasulka during a lecture/demonstration at the Electronic Cafe some months after *Tactile Diaries*. I was watching Steina use her MIDI violin to "play" a computer-controlled laser disc that contained video images of water, fire, bubbling mud and other natural environments. The MIDI information was used to randomly access specific frames on the disc, to play forward or backward at varying speeds or to freeze on a frame with no distortion of the image. The flexibility of the laser disc, as demonstrated by Steina, was extraordinary, and Mark and I were instantly taken by its possibilities.

Soon after this demonstration, these influences came together as we developed the initial plan for what would become *In Plane*. Our idea was to make a videotape of me dancing, transfer it to laser disc and then have me control the playback of that image using the MidiDancer. We wanted to create a duet between me and a "virtual" me stored on the laser disc. This duet was appealing because it emphasized something that was of growing importance to us: the duality between the fleshy body and another body, which we didn't have a name for at the time, but which we later came to call the electronic body. The corpus and its electronic doppelganger became characters that would find their way into several of our future works.

* (ASTERISK)

As I mentioned earlier, *In Plane* was a seminal work for us. It was not only our most technologically complicated piece, but it also became the cauldron in which we synthesized the theoretical paths that we had been on for the past four years.

The piece was to be a competition between the corpus and its electronic doppelganger; a body that bleeds, sweats, gets tired and feels pain versus a body made of light, which is not bound by time, space or gravity. I became the fleshy presence, while my video image, stored on the laser disc, was my electronic counterpart. Which was the more powerful and beautiful presence? The flesh and blood woman exerting herself to an exquisite extreme with the potential of physical failure at any moment? Or was it the ethereal video body who flies so gracefully through space, can freeze in mid-air and never tires? This was to be the essential question posed by the piece.

On a technical level, we wanted my gestures to control the musical score, the playback of images from a laser disc, the movement of a robotic video projector and the theatrical lighting for the piece. We realized that this was ambitious, but we wanted to see how far we could go. We wanted to find out how much one performer could play.

We began our work by collaborating on choreographic and musical materials that echoed the traits of the two bodies. The music, representing the electronic, was comprised solely of sampled sounds of machines, while the choreography, clearly representing the corporeal side of the equation, was constructed from a fundamentally human movement vocabulary consisting of running, jumping, falling and rolling. These movements were consistent with my stylistic leanings. I am not too concerned with taking a gesture through all of the compositional gymnastics required to expose its many

possibilities for interpretation. Instead, I want to guide the audience through the energy of the movement itself. I want to see the relationship of the performers on stage. Of course, *In Plane* is a solo if you only count the number of fleshy bodies on stage. But it is actually an ensemble piece because I consider video, sound, robotic set pieces - whatever - simply to be additional performers. The beauty of using the MidiDancer system was that the notion of a duet with the video was much more than a conceptual idea, but was in fact the result of a tangible physical relationship: body-sensor-video.

Furthermore, like dancing with a live performer, this was not a one-way street. During the process of creating and rehearsing *In Plane*, I became acutely aware of how information would flow back in the other direction. I would see the video move in response to my gestural control and my dancing would be influenced by my "playing." Mark prefers the term "reactive" over "interactive" because he claims that it is more true to the actual flow of information, his point being that the computer does not have the intelligence of a human being and cannot interact in the truest sense of that word. As a performer who feels the feedback loop that I describe above, I feel certain that I am interacting with something, even if the modulation of image and sound originates solely with my own gestures.

In setting out to create these kinds of performative relationships, one thing was readily apparent: the radio-control car transmitter and dual sensor design was not going to allow us to make the piece we had in mind. Mark created a new MidiDancer with a significantly smaller transmitter box and eight thin, flexible plastic sensors that could be placed at almost any joint on the body. When I first danced in this new costume, the difference in my movement was immediately obvious. It was less restricted and more fluid because the new design allowed it. We realized how much the sensory device imposes its own limitations on the choreography; every instrument needs to played in a particular way to get it to sound, and the MidiDancer was no different.

Traditional instruments respond to gestural input in a consistent way and the audience can generally come to understand that relationship, even if the instrument is unfamiliar to them. Based on this traditional model, we felt a certain pull to establish a clear relationship between my movement and the media I was controlling. But we both remembered how stifling this fixed relationship was in the first MidiDancer performance we had given at CalArts. Further, this time, I wanted the choreography to serve my aesthetic intention first and the requirements of the sensory device second, something that was already easier to accomplish with the more sensitive MidiDancer. So, we chose to allow the possibility of a joint changing its function during the course of the performance. For example, in the first section of the piece the angle of my elbow directly controlled the volume of a rhythmic musical phrase. In the next section that same elbow movement would trigger the playback of a video sequence. We chose to sacrifice the audience's clear understanding of the instrument in order keep our expressive options open.

In the end, there were a myriad number of lessons learned as we made *In Plane*. Each day felt a bit like my first dance class, overwhelming because I was not yet familiar enough with the instrument to keep track of all of its parts. But perhaps the most important experience for us both came late in the creation process, when the elements had begun to coalesce. There was one rehearsal in particular in which I felt that the laser disc images were not just some external object to which I was weakly linked via some sensory interface. Instead, they started to feel like a hand, or a torso or some other part of my body. The media was not separate from me any longer, it was an extension of me. This was curious in one sense, since my video counterpart, with whom I was supposedly having a fierce competition, was actually under my control all the time. Perhaps this is the hidden message of *In Plane*.

= (EQUALS)

As a dancer, I inherently understand the realm of the body. I had no idea
that technology would enter into that understanding until I chose to
entwine myself with the machine. I was altered and so was my body, as it
expanded to include sound, light and image. The slashes in my art are
inserted between my flesh, the media that moves with it and the machine
that locks the two together; this puts me at the intersection of flesh and
silicon, blood and television, body and computer that our culture is in the
midst of splicing together.

Troika Ranch (http://www.troikaranch.org), a digital dance theater by Dawn
Stoppiello with Mark Coniglio, has performed throughout the United States in
venues including The Duke on 42nd Street, New York City; the Walker Art
Center, Minneapolis; the Luckman Fine Arts Center, Los Angeles and the Lied
Center for Performing Arts, Lincoln, Nebraska.

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FACE SETTINGS: AN INTERNATIONAL CO-COOKING AND COMMUNICATION PROJECT BY
EVA WOHLEGEMUTH AND KATHY RAE HUFFMAN

Kathy Rae Huffman, kathy.rae.huffman@cornerhouse.org

Face Settings: An International Co-cooking and Communication Project [1]
is a female-focused communication project and website that reveals the
growing Net community of women. It is a cross-platform forum to develop and
explore the interests and needs of women online. The project, initiated by
Eva Wohlgemuth and myself, was a series of "dinner performance events" that
took place between spring 1996 and autumn 1998. The objective was to join
real groups of women in network strategies to expand female connectivity and
to engage women in discussions of importance on local, regional, national
and international levels. Through FACES, a female-only mailing list for
discussing art, communication and online policy, an online community has
developed and expanded beyond the process of preparing meals and eating
together. *Face Settings* raised various questions, which were presented at
Face2Face, a meeting of FACES in Graz, Austria, from 8 - 11 July, 1998.

Throughout our Face2Face events and virtual online communication, women
focused on communication practices and how they differ in various cultural
settings. Aware of how women are kept out of the technically challenging
network, we set an example of what could be done to change that practice and
constantly mused about how the fact that women speak and communicate
differently than men affects our female involvement in online culture.

The cooking performances took place between summer 1996 and summer 1998 and
evolved directly from our experiences on the (then) recently concluded
Internet travel project, *Siberian Deal* [2], which took place in 1995. From
Russia, we sent weekly "reports" to Vienna, which were uploaded to the
project website. The goal of *Siberian Deal* was exchange: we were traders
dealing objects and information to strangers in "the worst place in the
world." Our mission was to understand value and learn how our opinions were
informed by Cold War media and propaganda. In Russia, we established a
network of friends we would meet again and again. Our observations of women,
their buying and selling techniques, and their status in society were common
topics of conversation during our travels, influencing our future work
together.

Working towards a new project concept, Eva and I realized that our
personalities, skills and backgrounds complemented (and sometimes

compensated for) one another. I loved gathering people into social situations for information exchange and brainstorming ideas. Eva was fascinated by the challenge of translating the process of communication into a visual form that invited participation. She was keen to establish strong conceptual guidelines for a new Internet project. I was immersed in Internet research on a variety of topics, including "cyberintimacy." As we talked, we decided to continue our real and virtual working system, and travel to places we found compelling (for various reasons). We also made a conscious decision to focus our energy and dedicate our project to connecting women. We made these choices naturally and without any debate. In Europe, the lack of structure, encouragement or reward for women working in the new communication technologies was obvious to us.

As a conceptual artist, Eva had been working on the location sculpture *Systems* since 1989. I had been an active media art curator, producer and networker (by the old definition) since the early 1980s. In 1994, I was living on my own in Austria, and Eva had become a good enough friend to engage in "girl talk" and relationship problem-sharing. During these occasional meetings, Eva and I became aware of the differences in our cultural conditioning, especially how I had been encouraged to develop verbal and social skills in school while Eva had been encouraged to develop her excellent logistic planning and technical skills. As an American, I experienced how "citizenship" and "extracurricular participation" were highly regarded during formative school years. Eva, on the other hand, had suffered a very strict and academic education, without many social functions, in a dogmatic system that did not tolerate deviation from the traditional pedagogic plan.

The basic cultural differences that informed us - which we were aware of - fascinated us. We also noticed that the way we communicated with each other and with women, and the ways in which we communicated with men, were very different. We began an intensive investigation that included Internet research, and the compilation of information on this phenomenon.

The writings of Dr. Deborah Tannen provided great insight, as did many scholarly studied and linguistic observations about how women and men relate in the online environment. We found corroborative theoretical opinions and that was enough for us to set out to combine our newly acquired Internet skills, interest in social communication and cultural difference and art practice. Our new work would evolve with women in five different countries, located on the borders of Europe.

The events we planned would combine women, cooking and communication, but we admitted to ourselves that we needed to define what it was we wanted to achieve as clearly as possible. At this point, we realized it would take time to develop relationships, and that it could take several years to build the network we were envisioning. In an effort to proceed logically, we outlined the following list of considerations for *Face Settings*:

1. Communication: It is often difficult to engage strangers in discussions about communication, especially when there are language problems, different social customs and lack of understanding about the widespread practice of Internet connectivity. Neither of us was the type who readily engaged strangers in conversation, even in local places we go to. We would benefit from a defined group in each location.

2. Online representation: the website would be a key element of the project, linking the real local events between the regional groups. It would need good stories, provocative photos of the participants, tasty recipes and theoretical food for thought. We wanted to profile the women we met and give an idea of what their working situation was like. We also decided that the website should maintain links to female sites and a suggested reading list, references, our biographies and personal links.

3. Live performing installation events: With a group of 10 to 12 women, we would be able to talk while we cooked and served meals. We wanted to give pleasure to others in these events by serving them and taking care of all the details. This would be a treat, a vacation from the normal work that women know well. This could also be hard work for us. With the understanding that we would encounter various customs, we also knew that dinners "at home" are usually family events, and as strangers cooking the meal, we would be a rare exception.

4. Artifacts: as a net art project, there would be little need for physical evidence, but we still wanted to provide some objects that resulted from the collaboration with the groups of women we would work with. Clearly, most artists do not have the time to give to other artists' projects without some real clear understanding of the exchange. We wanted to provide our project partners with specific rewards.

5. Publications: A cookbook catalog that included recipes gathered during our travels was an idea we wanted to pursue. In the beginning, a photo album of each dinner and a collection of memorabilia from each of the events would be created. We would make this book available at each dinner, adding progressive chapters, like courses, as we continued with the project.

6. Goals: *Face Settings* dinner events were to be enjoyable events, celebrations with low stress and lots of personal care (for ourselves and the women we met). Pleasure connected to food and the sharing of information would be a topic to introduce in our dinners. We hoped to establish real communication that would grow in the digital environment, eventually linking the regional groups in a collaborative cooking performance event.

REFERENCES

1. *Face Settings: An International Co-cooking and Communication Project* is now archived at http://www.t0.or.at/~amazon/FACE/index.htm.

2. *Siberian Deal* - http://www.t0.or.at/~siberian/vrteil.htm.

BIOGRAPHY

Kathy Rae Huffman (http://www.t0.or.at/~amazon/FACE/index.htm) is Director of Visual Arts at Cornerhouse, Manchester, U.K.'s leading center for contemporary art, media and cinema. She is a networker and specialist for Web-based initiatives, a collector of new media works and a curator who pioneered support of artists work centered in media theory and practice.

Eva Wohlgemuth (http://www.t0.or.at/~siberian), based in Vienna, Austria, realized several land art and concept projects before she profiled as a media and Web artist. She is now producing in the field of reactive visual systems installation (sculpture, drawing, painting) and media. She has exhibited internationally, including at Documenta X (Web Section).

< Note from the book editor >

The section above is the beginning of this article. The complete chapter, available in the book *Women, Art and Technology*, covers the project's beginnings, a gathering of a group of women in Vienna; a St. Petersburg dinner event concurrent with the presentation of *Siberian Deal* at the St. Petersburg Biennial; "Digital Care," the next phase of the project; the introduction of the first version of the *Face Settings* website at the Secret Conference held at Backspace, in London; and the project's inclusion in the 1997 Ars Electronica Festival. It concludes with thoughts about the project.

Participants in various stages of the project included Beverly Hood and Lindsey Perth, Glasgow; Irina Aktuganova and Alla Mitrofanova, St. Petersburg, Russia; Maria Pallier, Spain; Zana Poliakov and Vesna Manojlovic, Belgrade; Margarete Jahrmann, Doris Weichselbaumer, Sabine Seymour and Elisabeth Binder, Austria; Cornelia Sollfrank (OBN), Hamburg; Katy Deepwell (n.paradoxa), London; Evelyn Teutsch, Leipzig, Germany; Birgit Huber, Germany; Betty Spackman, Toronto; Anja Westerfroelke, Linz, Austria; Julia Meltzer, New York; lizvlx, Vienna; and Veronika Dreier and Reni Hofmueller, Graz, Austria.

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VIDEO ARTE POVERA: LO-FI RULES!

by Valerie Soe
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When I was a young college student, I wanted to go to the UCLA film school. I admired Alfred Hitchcock's narrative stylings, Stanley Kubrick's peculiar characterizations and Martin Scorsese's fluid and expressive camerawork. But as fate would have it, the film school at UCLA was severely impacted and I instead completed my undergraduate degree in the art department.

What I discovered was that video art's aesthetics appealed to me much more than Hollywood's narrative filmmaking conventions. I found that by working in experimental forms, I could easily access topics such as identity politics, race and ethnicity, and pop culture. This was much more effective using experimental video's direct and expressive poetics than through narrative film's elephantine character and plot machinations. I also found that experimental forms allowed me to utilize all manner of unusual source materials, including found footage. This recycling aesthetic, making silk purses from technology's sow's ears, continues to appear in both my single-channel videos and multiple-channel installations.

In my work, I have used video, text, pop-culture artifacts, autobiography and interactive elements, employing technology both high (computer terminals, electronic message boards, video monitors) and low (zoetropes, viewer-generated graffiti, artists' books) to look at issues of culture and identity in the information age. I am interested in an organic use of technology as a vehicle for the requirements of the creative concept. In other words, I let the artwork's content dictate the choice of media, rather than simply using technology for its own sake.

By working in experimental forms, I continue to readily explore political and social concerns such as racial discrimination and bigotry (*Diversity*), intimate interpersonal relationships (*Mixed Blood*), body image, power and control (*Binge*) and the representation of Asians in pop culture (*Picturing Oriental Girls a (re) Educational Videotape*; *Beyond Asiaphilia*)

MIXED BLOOD (1992-94)

Mixed Blood, as an interactive video installation, utilized unexpected juxtapositions of found footage, flashing text, talking heads and scientific footage displayed in a brightly colored graphic installation that challenged potential viewers to stop, look and listen. Using two discrete channels of video, *Mixed Blood* combined interviews with over 30 concerned individuals, relevant quotes and statistics, and clips from scientific films and classic miscegenation dramas such as *The World of Suzie Wong* and *Sayonara* to examine interracial relationships in the Asian American community.

In addition to the information disgorged via video monitors, *Mixed Blood* also encouraged viewer interaction. A computer terminal and electronic message board output allowed viewers to respond to questions regarding cross-cultural relationships such as, "What do you think when you see an interracial couple on the street?" and "What are three characteristics of Asian American men?" The query changed daily, and each day's responses were strung together and displayed on the electronic message board mounted on the installation.

For those who preferred more direct expression, the piece had a "talking wall," a blank white panel on which viewers could write their opinions without technological mediation. This element was extremely popular, with comments on a range of topics from politics to sexuality. There were also small stickers printed with phrases including "Identity/Affinity" and "Who Do You Love?," which viewers were free to take and distribute as they wished.

Mixed Blood attempted to present often controversial topics of miscegenation, bigotry, and sexual stereotypes without being didactic and overbearing. By using both high and low technology, I hoped to ease the viewer's interaction with the piece and facilitate participation, contemplation and debate, and allow the viewer to fill in the blanks and actively contribute to the form and content of the piece.

BINGE (1996)

This mixed-media installation was based on Amy Moon's short story of consumption, addiction and purgatory. *Binge* looked at body-image distortion, power and control from the perspective of a compulsive eater. The main character is an unnamed woman who dreams idly of escape from her middle-American life and her indolent husband. Her stifling suburban existence eventually leads her to desperate acts, as she first attacks her own body and then strikes outward, with deadly consequences. By telling the story in first person through the voice of the unidentified narrator, the piece invites the viewer's rapport with the unbalanced, yet sympathetic, main character. Her extreme impulses remind us of the frustration and agony of day-to-day existence and the desperate actions sometimes necessary to flee the killing banality of everyday life.

The installation consisted of various altered objects integrated with text, which reveal different elements of the narrative, outlining character traits, plot developments or other aspects of the storyline. Manipulated objects included bullet casings, an accordion book, a shooting-range target, a zoetrope made from a KFC (Kentucky Fried Chicken) bucket and assorted audio and video loops. Once seen, read or heard, these fragments converged into a composite text that explicated both plot and character in a non-linear, interactive format.

By using consumer-grade Radio Shack electronics, I emphasized readily accessible technology, including battery-powered plastic monitors, a hand-held Watchman television and a child's portable turntable. I similarly employed other everyday objects such as fast-food packaging, mirrors and picture frames. This underscored the quotidian setting of the piece, based on the diary of a mad housewife, and contrasted these items with more sinister objects such as a shooting-range target and spent bullet casings. *Binge* contrasted the banality of its source materials with the desperation and violence of the main character's actions.

DIVERSITY (1990)

Diversity was a three-channel video installation featuring footage of Chan Cheong-Toon, a man regularly seen at a traffic island at the corner of Broadway and Columbus in San Francisco's North Beach, singing furiously in

Chinese to whomever cared to listen. Through interviews with Chan as well as with his many observers, the piece addressed the projection of individual desire onto a single subject, as each interviewee offered his or her interpretation of Chan's intentions. In addition, by focusing on this unusual personality, the piece exploded the myth of the model minority, contradicting the fallacy that Asians are quiet, well-behaved and aligned with social conventions.

The installation consisted of three separate channels of video played simultaneously on individual monitors arranged in a triangular configuration, with screens facing inward. The viewer, positioned at the center of the piece, chose to view one or two monitors at once, although sound from all three was audible at all times. In this way the viewer sequenced and selected the configuration of the piece, choosing the order in which the images and narrative unfold. This threefold arrangement reflected the many aspects of the focus of the piece, the singing Chan - as he sees himself, as others see him, and as he objectively appears - suggesting the variety of perception and personality found in a single individual.

On the gallery wall were the names of various Asian Americans who have distinguished themselves in one way or another. Although several, including author Wakako Yamauchi and singer Pat Suzuki, are notable for outstanding achievements, others, such as convicted felons Joe Fong and Wendy Yoshimura, are known for more notorious actions. This strategy pointed out the complexity of Asian American culture, emphasizing again the diversity of a community too often stereotyped as one-dimensional.

In *Diversity*, the simplicity of the technology allowed the complexity of the subject matter to emerge. The stripped-down installation design consisted of three large monitors on black pedestals and a line of names on the gallery wall. Although the simultaneity of the three channels of video and the triangular configuration of the monitors were significant, the installation gave prominence to content rather technology.

WALKING THE MOUNTAIN (1994)

This installation was an ofrenda (altar) dedicated to my aunt Lula, who died from a nosebleed at age four in Phoenix, Arizona in the 1920s. The piece, consisting of sand, cacti, magenta taffeta, video and text, recounted the fate of my grandparents' cherished second daughter, born into a climate too arid and dry for her genotype. The cacti hanging on the wall and surrounding the video monitor were a metaphor for human tenacity, contrasting with the inability of Lula to adapt successfully to her new homeland. On the right-hand wall the legend "STAY HYDRATED" reiterated the first rule of human survival, one which Lula was unable to maintain because of her environment, age and circumstances.

In this installation, I juxtaposed unusual materials - cacti, taffeta, sand and a video monitor - to draw attention to the unusual subject matter. I hoped to suggest the alien quality of my aunt's new environment, which was a desert full of strange life forms including prickly plants, sand and Europeans. The piece was a metaphor for the difficulties new immigrants often face in adapting to their new homeland, especially in the U.S., where assimilation is valued over preservation of individual cultural traits.

I also wanted to contrast the natural elements - sand and plant life - with man-made elements - the video monitor and satin fabric - to make Lula seem like a fish out of water in her new environment. The video loop also emphasizes this point, recounting my aunt's tragic story through images of goldfish, faux blood and a length of scarlet taffeta rippling in the wind. Using a simple combination of video and non-tech elements, the piece presents its story plainly and effectively.

LA VIDA POVERA DE SAN PANCHO (1998)

This interactive installation was made up of melted and made-over Playskool plastic doll houses that had been altered to reflect the ghost stories, histories and legends of San Francisco. The tag line for the installation read, "Why do you choose to live in San Francisco, a beautiful, fickle and ever-entrancing city? What is the price of entry into this temperate wonderland? Where does reality end and imagination begin" [1]? Utilizing tiny TV monitors, sound chips, image, text and toys, *La Vida Povera* took viewers down Melancholy Alley, through Sound and Fury Avenue and up Sexolicious Lane, some of the imaginary streets realized in the piece. The installation was an emotional map, a psychic tour of the memories, hopes and dreams of a city that is constantly in transition.

Each plastic house engaged the viewer in its own way, with points of entry including video and TV images, push-buttons, switches, levers and other means to play with the structure and meaning of the buildings. The tiny structures became a dreamscape of the imagined and the perceived, the world of hopes and fears drawing the viewer to San Francisco.

I used toy houses with tiny video monitors to get away from the museum-aesthetic definition of "video installation" that often includes huge, beautiful and expensive video projections by established artists such as Steina Vasulka and Bill Viola. Instead I wanted to get back to the cheap-is-beautiful, consumer-electronics look of early video installations where the ugliness of the monitor was integral to the aesthetic of the piece. This strategy exemplified the do-it-yourself creed, "l'arte povera," the idea that you make what you can out of whatever you can scavenge.

How does this relate to little plastic houses with home electronics in them? It went back to the idea that it is possible to live in a horribly expensive city like San Francisco without being a yuppie or a multimedia professional. *La Vida Povera* celebrated the marginal underbelly of artists, writers and workers who give San Francisco its spice and texture, as well as the plumbers and painters and UPS drivers who give the city its soul and blood.

UNLEARNING THE LANGUAGE

By working in low-fi, experimental media, I have been able to create work that brings to light untold or neglected stories from outside of the mainstream. Using available and affordable technology frees me from many budgetary constraints and allows me to more readily create work and engage viewers in exchanges about culture, politics and representation. In this way, I am attempting to reframe and re-articulate an Asian-American perspective, by countering conventional stereotypes of Asians in American mass media and offering an alternate vision of the community and culture.

As Malaysian-American experimental videomaker Cheng-Sim Lim states, "These days I'm trying to unlearn the language of Hollywood. I am doing it because I know it's not my language. I am trying to remake my image in myself" [2]. Lim understands the vitality and newness of experimentation, which more accurately expresses experiences outside of conventional film and television. Experimental forms are a reflection of the multitude of voices suddenly speaking, each with its own cadence and lexicon, in the new, brilliant cacophony of modern times.

REFERENCES

1. Valerie Soe, catalog notes. URL Exhibit, Southern Exposure Gallery, San Francisco, CA, 1998.

2. Cheng-Sim Lin, "Rojack", Moving the Image, Independent Asian Pacific American Media Arts, UCLA Asian American Studies Center, 1991.

BIOGRAPHY

Valerie Soe is a writer and experimental videomaker living and working in
San Francisco, whose productions include *Mixed Blood*, *Picturing Oriental
Girls - A (Re) Educational Videotape*, (winner of Best Bay Area Short,
Golden Gate Awards, San Francisco International Film Festival) and *All
Orientals Look the Same*, (winner of Best Foreign Video, Festival
Internazionale Cinema Giovani; First Place, Experimental Category, Visions
of U.S. Festival).

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LABORATORY FOR EPHEMERAL INVESTIGATIONS - INTERACTIVE ROBOTIC SCULPTURES

Jennifer Hall and Blyth Hazen
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In our work, we explore the nexus of biology, technology and aesthetics
through interactive robotic sculpture and digital processes. Our Laboratory
for Ephemeral Investigations (2000) is a unique traveling research center
and learning environment. Like scientists, we use technology for creative
problem-solving, but our research goals are neither rational nor practical.
Instead, our ephemeral investigations are aesthetic, social and poetic. We
engage gallery-goers in a quest to understand our relationship with our
environment and to bridge the polarities of nature and technology, art and
science, life and death, thinking and feeling, body and mind.

The exhibition includes interactive sculptural installations, animated
drawings generated from genetic algorithms and live video of microscopic
organisms. For instance, *Acupuncture for Temporal Fruit* (1999) [1]
introduces a sequence of suspended needles triggered by viewers' presence.
Instrument for Mediated Terrain (2001) [2] is a series of miniature moss
gardens that are stroked, poked and prodded by robotic tools in response to
visitors' movements. We are interested in complex relational cycles of
growth and death, where human-made technology meets nature. Here, the garden
is a meditation on the relationship of the viewer to the artwork, technology
to nature and the temporal state of all forms of life.

Electronic devices weave a connection between the aluminum-clad gardens and
caretake the living moss. Mechanical arms hovering over the landscapes
activate only when people come close to observe, the interaction between
technology and the moss gardens directly depending on these visitors. One
can imagine that after years of this interaction, the mounds of moss, peat
and sand would be subtly rearranged - each landscape altered through the
impact of observation.

The gardens are purposefully created to be low to the ground so that the
viewer can have the experience of flying over - presiding over - a
mountainous landscape. There is an overt and observable relationship between
the presence of an audience and the action of the devices. From a distance,
the mechanisms are still. It is only when the viewer is closely observing
an individual garden that the motion of the corresponding arm is triggered.
When they step away or move on, the motion is stopped. The gardens are alive
and continue to grow throughout the duration of the exhibition, slowly
shaped by human activation of technology.

Other devices include *Carousel for Invertebrate Broadcasting* (2002), an
interactive rotating petri dish of flatworms; *Television for Biological
Trajectories* (2002), a series of small-scale vignettes of real and virtual
worms; *Chambers for the Observation of a Decline from a Prosperous

Condition* (2002), for comparing real and simulated lifeforms; and *Room for the Projection of the Law of Intuitive Association* (2002), a large-scale, interactive animation referencing DNA and the double helix - changing in tempo, opacity and duration based on user input.

This laboratory, or its individual parts, has been presented at The Decordova Museum and Sculpture Park, Lincoln, MA; The Thorne-Sagendorph Gallery at Keene State College, Keene, NH; the Schlosberg Gallery at Montserrat College of Art, Beverly, MA; and the Lamont Gallery at Phillips Exeter Academy, Exeter, NH.

NOTES

1. *Laboratory for Ephemeral Investigations* is detailed in Jennifer Hall and Blyth Hazen, "Do While Studio," in *Women, Art and Technology*, Judy Malloy, ed. (MIT Press, 2003) pp. 290-297.

2. *Instrument for Mediated Terrain* (2001) aluminum, moss, electronics, software, and mechanical devices. More information and photographs of the installation are available at http://www.dowhile.org/physical/projects/exeter/index.html.

AUTHOR BIOGRAPHIES

Jennifer Hall (http://www.dowhile.org/physical/people/hallj.html), a sculptor, has been a pioneer in interactive media and art-science collaboration for over 25 years and is presently engaged in the refocusing of biological material as an artform.

Blyth Hazen (http://www.dowhile.org/physical/people/hazenb.html) navigates the space between painting, computer animation and robotics.

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         |        LEONARDO REVIEWS         |
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This month, Leonardo Reviews is pleased to welcome a new member of the panel, Cynthia Ann Bickley-Green, with a contribution reviewing *Vision and Art: The Biology of Seeing*, by Margaret Livingstone. Bickley-Green's expertise is a valuable addition to the established authority of Leonardo Reviews, as further exemplified this month by Robert Pepperell and Amy Ione's contributions. While Pepperell returns to familiar topics in reviews of *Primitivism and Art* and a lecture by Semir Zeki, he also opens a new discussion in his review of *Cymatics*. Ione reviews a new book on Degas in a lengthy article, while one of our most established contributors, Roy Behrens, offers us a selection from his own review publication, *Ballast Quarterly Review*. Not to be missed is Rob Harle's review of interspecies interaction, as it is discussed in Toni Frohoff and Brenda Peterson's new book on dolphins and humans. Over the past few months, Harle has become one of our very active reviewers whose range and insight is proving one of our most valued assets. As usual, all of this month's reviews, including a report on this year's conference of the Society for Literature and Science, can be seen at our new (user-friendly) URL, www.leonardoreviews.org.

We hope that you find them both engaging and valuable.

Michael Punt
Editor-in-Chief
Leonardo Reviews

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In this month's Leonardo Digital Reviews, at
http://mitpress.mit.edu/e-journals/Leonardo/ldr.html:

Anni Albers and Ancient American Textiles: From Bauhaus to Black Mountain,
by Virginia Gardner Troy
Reviewed by Aaris Sherin

Ambiguity in Art and in the Brain, public lecture by Semir Zeki
Reviewed by Robert Pepperell

Between Species: Celebrating The Dolphin-Human Bond, Toni Frohoff and Brenda
Peterson, eds.
Reviewed by Rob Harle

A Brush with Life, a film by Glen Salzman and Martin Duckworth
Reviewed by Aaris Sherin

Citizen Designer: Perspectives on Design Responsibility, edited by Steven
Heller and Vⵁronique Vienne
Reviewed by Aaris Sherin

Cymatics: A Study of Wave Phenomena and Vibration, by Hans Jenny
Reviewed by Robert Pepperell

Degas Through His Own Eyes, by Michael F. Marmor
Reviewed by Amy Ione

Merz to ƒmigrⵁ and Beyond: Avant-Garde Magazine Design of the Twentieth
Century, by Steven Heller
Reviewed by Roy R. Behrens

Primitivism and Twentieth-century Art: A Documentary History, Jack Flam and
Miriam Deutch, eds.
Reviewed by Robert Pepperell

Real-Life X-Files: Investigating the Paranormal, By Joe Nickell
Reviewed by Michael Punt

The 17th Annual Conference of the Society for Literature and Science,
Austin, Texas, 23-26 October, 2003
Reviewed by Michael Punt

Vision and Art: The Biology of Seeing, by M. Livingstone
Reviewed by Cynthia Ann Bickley-Green

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VISION AND ART: THE BIOLOGY OF SEEING

by Margaret Livingstone, Harry N. Abrams, NY, 2002. ISBN: 0-8109-0406-3.

Reviewed by Cynthia Ann Bickley-Green, assistant professor of art education,
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Vision and Art: The Biology of Seeing, by Margaret Livingstone, a neurobiologist at Harvard University, does not lead the reader to the meaning of the marks of artists, but rather to consider the commonalties of the visual evidence in painting and neurological processing. Why does one set of images from a group of artists, such as the impressionists, look similar? Or when we look at the configurations of the marks in different drawing compositions, we can see that they all look like lines. They are lines on a field. Even when the lines have width, we do not see a shape.

When we look at the neurobiological genesis of the forms, we can learn some of the neurobiological connections and locations that are active when we are drawing or painting. Livingstone clearly discusses how the human visual system is subdivided into two parts: the "Where" and the "What" systems. The "where" system is responsible for our perception of motion, space, position, depth and figure/ground (edge) separation. It cannot detect color. This is a fast, identifying system that rapidly locates the presence of potentially useful, sometimes threatening information. The What system is responsible for form and color. It is much slower and codes for additional identifying information.

Livingstone groups or connects cognitive, visual systems to the representation of the images from those systems in visual art images. The Where system is the primary network that gives the experience of linear perspective. Cells in our visual cortex, according to Livingstone's description, represent orientation at each point in the visual field. During visual processing, neurons become selective for features such as contours, corners and curvature. She also suggests that this is the system that is primarily employed in cubism. The What system gives the experience of color areas. The impressionist images are the result of the artist attending to the What system (Livingstone, 2002).

In summary, we might say that the styles of art are formed by the artists' selective attention to the visual experience of a particular visual processing area. This neurobiological understanding results in a paradigm shift in our understanding of the history of styles in art. Livingstone groups and connects the evidence of visual art images to the processes of human vision and cognition, thereby suggesting that during certain periods of art history, artists who worked in a particular style were all attending to a set of similar neurological processes.

This grouping, or paradigm, is not completely new. It is the neurobiological connection and evidence that makes Livingstone's work so important. Since the early Renaissance, art theorists and artists have examined the relation of visual images and evidence to the visual system. Among the most celebrated are Leonardo da Vinci and Goethe. In the twentieth century, the Russian painters Kandinsky (1912) and Malevich (1915) recognized that elements of art, such as line and color, were the result of mental activity. It is interesting to realize that in his description of the development of personal style in art, Wslfflin (1932) also grouped art images into two categories: the painterly and the linear. These are analogous to Livingstone's What and Where system. Wslfflin based his work on a systematic observation of the visual elements represented in the visual images.

Much of the literature related to the non-objective art movement pointed to the process of image-making as the result of mental processes. Hans Hoffman and Josef Albers consciously studied the experience of perception and how it could be manipulated through painted images. What Livingstone contributes to this discussion is the physical location of some of these psychological experiences related to image-making and an awareness of additional processes.

Relatively current art literature has also explored the creation of linear

marks as primary methods of communication of psychological processes (Ruberti, 1991). Without the rigorous neuropsychological proof provided by Margaret Livingstone, Ruberti groups and categorizes the images of post-informal art (Jackson Pollock, Remo Bianco, Franco Bemporad, Pierre Clerc, George No'l), the images of child art collected by Rhoda Kellogg (1955, 1969), and various decorative images from cultures around the world. Ruberti labels this collection of images as "protosymbolic" pictures, writing that the sources of the images are located in parts of our brain. Protosymbolic implies that the marks do not stand for anything. In fact, these primary marks do symbolize visual experiences that Livingstone has begun to define and her research gives definitive locations of the sources. This is useful to art educators and other art professionals because it illuminates aspects of visual communication and suggests new directions for the development of visual communication pedagogy and criticism.

In the epilogue to her book, Livingstone discusses the possibility that some styles of learning might be associated with artistic talent. Additional work in neurobiology with the focus of examining the teaching/learning transaction in visual art may reveal some aspects that will have direct application in the art class. For example, one might speculate that since drawing in three-dimensions directly engages the Where system and drawing from memory engages more of the What system, the student will add different knowledge (and not inconsequentially, different neural connections) to his or her memory when drawing from observation. The task of drawing from observation would provide critical information for later drawings to be done from memory.

Perhaps new art curricula would be developed to give all students more observational drawing as a means of collecting imagery. One might also speculate that non-objective image-making or drawing will utilize in other parts of the neural pathway. Educators might also consider the idea that increased use or attention to a particular set of neural operations increases the ability and efficiency to use that set of operations. More drawing in art may lead to more ability and efficiency in all similar drawing tasks that might be used in math, science and engineering. As noted earlier, drawing from life observation using the Where system will provide the store of images that are used in other drawing and visualizing tasks.

The last decade of the twentieth century has sometimes been referred to as "the decade of the brain." *Vision and Art* is one of the fruits of this research, her work and ideas enhancing and extending our appreciation of visual art. The implications of the work she has done can extend beyond the walls of laboratories and museums into our classrooms to assist us to develop more effective educational experiences for all students. One might propose that in the next 50 years, art educators will know what cognitive processes lead us to judge why a composition "works;" why one painting is great and another mundane; and, the subject of this review, why art educators might profit from looking at new research in neurobiology. *Vision and Art* develops more precise definitions of cognitive processes utilized during art-making. Livingstone's work will cause art educators and general educators to develop new propositions and theorems about art, art-making and the teaching/learning transaction. The work may also provide new tools in art analysis and criticism.

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DEGAS THROUGH HIS OWN EYES

by Michael F. Marmor, Somogy Editions D'Art, Paris, 2002, 103 pp., illus. Trade, $35.00. ISBN: 2-85056-573-3.

Reviewed by Amy Ione, The Diatrope Institute, PO Box 12748, Berkeley, CA 94712-3748 U.S.A.
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Hilaire-Germain-Edgar Degas (1834-1917) once said that that he was convinced that differences in vision are of no importance to the artist. Rather, in his view, inner vision determined the nature of an artist's work. This seems like an ironic statement when we consider the visual difficulties that plagued him throughout his life. Engaging with Degas' actual visual situation, as Michael Marmor does in *Degas Through His Own Eyes*, allows us to think through Degas' case and to better place him in terms of his time. As an impressionist, it is easy to characterize the blurring and loosening of Degas' style in terms of cultural trends. Marmor convincingly argues that to do so is to lose sight of the degree to which the individual and the cultural are complementary. In this case, considering the degree to which Degas' deteriorating ability to see the world around him influenced his conception of his work reminds us that the artist's eyes complement his inner vision. Moreover, when we closely study Degas' situation, it becomes clear that both the emergence of impressionism and his subnormal acuity could account for the loosening of his style as his work matured.

Generally it is agreed that Degas had a condition called retinopathy. He first noticed poor vision in his right eye at the age of 36, when he found he could not aim a rifle during the Franco-Prussian War. We know that he realized this in the early 1870s, from letters he wrote while in New Orleans, where he wrote about weakness in his eye and an inability to read and write. Since there are no known measurements of Degas' acuity, Marmor uses four sources to make estimates: historical records of correspondence, personal remembrances, the shading of lines in Degas' art and Degas' handwriting. He also summarizes the key details of Degas' life in terms of his paintings and works on paper. As he explains, the precision we encounter in Degas' early work is extraordinary, as is the roughness of many of his later pieces, which are often done in larger formats. The quotations from his letters and friends were the most compelling evidence of the anomalous condition.

Fully recognizing the degree to which a visual artist depends on visual analyses when constructing a work, Marmor aids us in connecting stylistic trends of impressionism with Degas' physical capabilities. His book is also a welcome addition to the literature connecting visual science with visual art. It is not just that Marmor demonstrates intersections between art and science, he also shows a knack for finding ways to bring the reader into the discussion experientially makes *Degas Through His Own Eyes* more than a descriptive analysis. For example, I was impressed by the selections he chose to first show us visual acuity in general and then to apply the computer-simulated examples to Degas' experience. Reproduced examples of variations effectively transformed the words into a conceptual grasp of each

point introduced. Indeed, on closing the book I felt the visuals had allowed me to embody how his eyes deteriorated as he aged. The visuals also convincingly made the point that Degas himself did not recognize the degree to which his deteriorating eyesight changed his work.

What I liked most about the book was Marmor's highly original approach. He effectively brings an ophthalmologist's eye to art, without losing sight of the degree to which an artist's creative process includes more than just the eyes. We are reminded that cultural context, changing styles and visual acuity all influence an artist's oeuvre. Marmor's ability to aid the reader in "seeing" how one might clinically assess Degas' visual disabilities in clinical terms is a distinctive contribution to the literature in this area.

The most useful chapter, "Seeing Art with Blurred Vision," simulates how Degas would have seen his own work as his eyes deteriorated over time. Looking at his late work, Marmor also gives a lucid account of how some of the features that appear bizarre to the viewer might have appeared appropriately conceived to the artist. Here, too, the reproductions allow Marmor to clinically explain his analysis to the non-specialist. The illustrations of blur during the technical summary and when examining Degas work are a powerful component in the book. His laying out how this artist's visual experience of the world. Pages in which we are shown how a single image would look at 20/20, 20/60, 20/100 and 20/200 offer information that is hard to conceptualize without an image. Equally compelling are comparisons of early and late pieces in which Degas uses similar motifs. For example, Marmor compares lines and textures found in highly refined early images of dancers (*The Dancing Lesson*, 1871-1874; *The Dance Foyer at the Opera on the Rue Le Peletier*, 1872) with looser and more expressive later works (*The Blue Dancers*, 1890 and *Russian Dancers*, 1899).

Still, on finishing the book I felt I understood Degas' condition more than the pathos that no doubt accompanied the need to adjust to the pronounced physical changes. Nor does this survey does not encourage us to ask to what degree the artist might have been utilizing his failing vision toward artistic ends. In addition, even though the visual loss was optical in nature, the book did not seem to encourage us to reflect on whether a sense of mist and aura might have also been something Degas wanted to capture in the paintings.

One valuable component Marmor does include is a summary of artists who had known visual disorders. As the author explains, failing capabilities are not unique to Degas. Other artists who are often mentioned when this topic is introduced include Rembrandt, Titian, Monet and Cézanne. Monet, for example, had cataracts that significantly interfered with his work from 1920-1923. It is said that his visual acuity had fallen to 20/200 at one point. Yet after surgery, when his eyesight improved markedly, he reworked many of the canvases from earlier years. I was sorry that Marmor did not balance these examples with a paragraph or two on El Greco, whose elongated studies are no longer said to derive from astigmatism.

Exceptional as this book is, it is unfortunate that the author did not include a chapter on Degas' sculpture. We not only know that his eyesight deteriorated as he matured, we also know that he turned increasingly to sculpture in his latter years. Since it is well documented that tactile sensitivity increases with the loss of visual acuity, the book would have benefited from some discussion of this aspect of Degas' working process. Touch is briefly mentioned in a Halevy account of Degas, but overall receives little exposure throughout the text. Also, in terms of process, it seems Degas' working relationship with photography should have been included. His enthusiasm with the medium influenced his motifs, as the recent exhibition "The Artist and the Camera: Degas to Picasso" demonstrated. Reading through the book, I wondered if his photographic documents might offer some insight into how Degas coped with his failing vision. Finally, I wish the book had included an index.

In summary, *Degas Through His Own Eyes* is a book that underscores that theories about art often underplay the degree to which a visual artist sees the work through his or her own eyes. A thin book, filled with first-rate reproductions, this essay successfully conveys what Degas may have seen as he worked. To Marmor's credit, reproductions are scaled so that we are able to get a sense of size/scale relationships. Non-specialists will find the book accessible. Like Degas scholars, they will find much to ruminate on in each chapter.

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AMBIGUITY IN ART AND IN THE BRAIN

Public lecture by Semir Zeki, Centre for the History of Science, Technology and Medicine, Manchester University, Manchester, U.K.
30th October, 2003

Reviewed by Robert Pepperell
pepperell@ntlword.com

Commercial Ambiguity: "Use Dr. _____ Sachets de Toilette, and mothers and daughters will look like sisters." Gentlewoman -(cited in *Punch*, October 1907)

With new art historical work being published on ambiguous "potential images" [1], and the hybrid discipline of neuroaesthetics becoming more widely recognized as a specific strand in the larger debates about art and consciousness [2], I was intrigued to learn what one of the leading proponents of neuroaesthetics, Semir Zeki, had to say about the neurological basis of ambiguity. The exploitation of ambiguity has been a deliberate artistic strategy, not only amongst modern and contemporary practitioners but throughout the pre-modern world and across many different cultures. Sometimes ambiguities have been presented as a kind of amusement or curiosity (as in certain optical devices, or the quote above) and sometimes as a way of profoundly affecting the viewer, resisting stasis and multiplying perceptual and conceptual possibilities (as in analytic cubist paintings or Vermeer's enigmatic domestic interiors).

Zeki's contribution is to attempt an account of artistic ambiguity from a neurological standpoint, drawing on his own extensive research into color constancy and the nature of visual perception. He is keen from the outset to situate his analysis within the context of consciousness studies, and in particular to stress his theory of "microconsciousness." In contrast to those who regard conscious experience as singular and unified, Zeki proposes a model in which the various functionally specialized areas of the brain (such as those responsible for color perception or motion perception) in themselves constitute regions of conscious activity needing no higher interpretation. The impression we have of an immediate holistic conscious experience is in fact illusory given that, as Zeki has shown experimentally, we see color a fraction of a second before we see motion, even though a moving red bus seems to form a perceptual unity. Over longer time frames (greater than one millisecond), such temporally distributed events form a "macroconscious" state, which might be further modulated by those higher conscious states conditioned by culture and language, ultimately generating the kind of conscious awareness we associate with our everyday general activity.

Even though these higher conscious processes are prone to error, by misconstruing the reality of what is present in the world, the functionally specialized areas cannot in themselves be fooled into seeing what is not there. The perception of color, for example, can never be ambiguous because

color is nothing but a product of functionally specialized brain regions. As Newton had already pointed out, there is no color "out there" in the world for us to see, only variations in the frequency of electromagnetic radiation that we experience in a chromatic register.

Although many perceptual processes result in visual experiences that we cannot consciously influence (such as color), there are other kinds of visual phenomena that are subject to cognitive contingencies - ambiguous images being prime examples. In the familiar Necker cube or Schroeder staircase (examples from Zeki's lecture can be found at http://turner.stanford.edu/art/zeki_images/) we are able to some extent to determine the apparent orientation of the object, which lies in one of two directions. (I would also suggest it is possible to see other kinds of orientations, but for the purposes of this review I will accept the convention that there are two). In such cases, Zeki argues, the functionally specialized visual areas (those responsible for recognizing lines and angles) draw upon other brain processes, notably those concerned with memory and experience, to produce a cognitive interpretation containing spatial information that is actually absent in the image. It is this cognitive interpretation that is prone to vacillate between the ambiguous readings, but which is also subject to some degree of conscious control insofar as we can force ourselves to see one orientation or the other.

For Zeki, this way of understanding ambiguity differs markedly from its dictionary definition as "doubtful" or "uncertain." On the contrary, each of the possible interpretations is, for the viewer, an utter certainty, albeit a certainty that can change from one moment to the next. The microconscious brain region associated with any particular perceptual state gains a kind of sovereignty over the moment of experience; if only for a given time it dominates or occupies the cognitive high ground. This then is what Zeki terms the "neurological definition of ambiguity", the evolutionary rationale which, he claims, is the inherent survival advantage in flexibility of interpretation.

Applying these principles directly to the analysis of art, one finds cases from across art history (and Zeki concentrates almost exclusively on the traditional European canon) in which artists leave open or unresolved certain parts of the work in order that the viewer (or indeed, listener) can more freely interpret. Although demanding greater cognitive resources, this rewards with greater semantic richness. The "unfinished" marble carvings of Michelangelo and the Belvedere Torso are exemplary cases.

Despite the fact that the thesis is not particularly ground-shifting, certainly to many aestheticians or psychologists of art, it does have the advantage of being supported by some robust physical data. It also raises some fascinating philosophical questions about the nature of reality as constituted by the brain. I raised some of these questions in a later discussion with Professor Zeki, and in particular I asked him about the assertion he made during the course of the lecture to the effect that "ambiguity is a property of the brain and not of the external world." This, I felt, not only presupposes an essential rupture between brain and world, but also might suggest a relegation of the role of the art object itself in the production of the ambiguous effect. He replied by stressing the evolutionary imperatives that must have formed our perceptual apparatus, especially the fact that the brain is so selective in what it chooses to recognize as it searches for what he calls "constancies," i.e. patterns, regularities and invariant forms. In doing so it discards, or simply fails to register mountains of other data that is not essential to the conduct of the organism. Part of this inherent efficiency lies in our very capacity for interpretation, which allows us to evaluate possible states of the world that may not easily be determined - at least before it's too late. So, for example, a wary smile from a potential adversary might be a benign invitation or a concealed threat. So it seems that the brain reflects the potential ambiguity of the world, but moreover allows us to negotiate it

with the benefit of our acquired experience.

One further statement made in the lecture caught my attention, the claim that the "brain can accommodate contradictions." He was referring specifically to Johann Winkelmann's description of classical sculpture as carrying an essentially contradictory meaning, at once violent, aggressive, turbulent and at the same time sublime, composed and static. This contradictory ambiguity, as Zeki claims, can be held by us as an aesthetic whole, and is manifest in works like the Belvedere Torso. But this raised in my mind the equally intriguing possibility that, in contradiction to Aristotle's principle of non-contradiction, Zeki's neurological evidence might offer grounds for the naturalization of a dialectic approach, one in which contradictory states are accommodated simultaneously without the necessity for resolving them one way or the other. He responded by distinguishing between two modes of neurological time, the very short (less that one millisecond) in which possibilities are "collapsed" into one orientation or another, and longer time frames (over one millisecond) in which various and contradictory orientations might be accommodated as the possibilities "flip-flop" from one to another.

There is little doubt that Zeki's work in this field could contribute to our scientific understanding of the nature of art and, indeed, of perception and consciousness. He is clear that art, science and philosophy are epistemologically convergent, but seems to have difficulty persuading his colleagues in the scientific community of the value of taking artist's investigations into perceptual behavior seriously. Equally, from the artistic standpoint one is entitled to be critical of approaches that seek to reduce complex sensory and cultural phenomena to neurological processes, although such processes are inordinately complex in themselves. But there is certainly an intrinsic value in sharing ideas and stretching methodological boundaries, even if that means both science and art have to examine their own working assumptions. One perceptive audience member in the lecture asked, in response to Zeki's claim that art and science were indistinguishable, "Does that mean science is ambiguous?" It was heartening that his reply was a cautious affirmation.

NOTES

1. D. Gamboni, *Potential Images: Ambiguity and Indeterminacy in Modern Art*. London: Reaktion Books (2002) (reviewed online in Leonardo Reviews, July 2003).

2. S. Zeki, *Inner Vision: An Exploration of Art and the Brain*. Oxford: Oxford University Press (1999). Reviewed online in Leonardo Reviews, May 2003.

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Filipino, English, Spanish

THESIS TITLE
"Phase Space Portraits of the Nuestra Se-ora delos Dolores of Baclayon
Church, Bohol"

ABSTRACT
This thesis investigates a contemporary idol-making that uses the
mathematical concept of recurrence plots to express the magical identity
that exists between sacred entities and perceptible form. This thesis
presents ways by which the use of the mathematical concept of recurrence
plots have assisted in determining the coloring of patterns and the design
of planar symmetry for three-phase space portraits of the Dolorosa, a
nineteenth-century Spanish colonial sculpture. By digitization, the additive
color signals of an image of the Dolorosa were processed to yield patterns
by which symmetries were motivated. This study provides a new method for
pattern formation that artists can utilize where aesthetics and mathematics
converge using analog and digital studio materials and processes. Recurrence
plots and the use of software that explore their importance as visual
qualitative analysis tools deserve further investigation by artists who seek
new modes of creating new symbols.

KEYWORDS
recurrence plots, religious sculpture, dynamical systems, glass engraving,
giliding, Philippine religious art

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IN MEMORIAM: FORMER *LEONARDO* EDITOR AND UNESCO *COURIER* EDITOR IN CHIEF, SANDY KOFFLER

On 11 November, 2003, Sandy Koffler passed away in Paris at the age of 86. Koffler was the founder and editor in chief until 1977 of the UNESCO *Courier* magazine, published in 35 languages until 2001. Sandy Koffler met *Leonardo* founder Frank Malina in 1947 at the inception of UNESCO, where Malina was helping set up the UNESCO science program and Koffler established *Courier*; Their deep and uninterrupted friendship lasted over 30 years of hectic discussions, shared enthusiasms and mutual encouragement. Malina left UNESCO to devote his time as an artist and pioneer in kinetic art and later the establishment of the *Leonardo* journal.

The sudden death of Malina in 1981 threw the immediate future of the journal into some doubt; it was then that Koffler offered his editing experience to assure the continuation of *Leonardo* and served as editor in chief during 1981/1982, until the *Leonardo* editorial offices were moved to San Francisco State University, where they are still headquartered. Koffler and Malina were part of a generation that helped rebuild world institutions after World War II; Koffler dedicated his life to promoting international understanding and making known the world heritage and developments in education, science and culture. Koffler is survived by his wife Pauline Koffler, who also served for many years as a corresponding editor of *Leonardo*. The Leonardo network mourns the departure of a friend, colleague and kindred spirit who contributed though his work to the creation of a saner world based on international collaboration and dialogue.

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IN MEMORIAM: HONORARY *LEONARDO* EDITOR AND HOLOGRAPHY PIONEER, STEPHEN BENTON

Stephen A. Benton, inventor of the rainbow hologram and a pioneer in medical imaging and fine arts holography, died of brain cancer at Massachusetts General Hospital on Sunday, 9 November, 2003. He was 61. Benton was director of the MIT Center for Advanced Visual Studies (CAVS) and an honorary editor of *Leonardo*.

Benton delighted in both the scientific and aesthetic applications of holography. He held 14 patents in optical physics, photography and holography, and his own works in holography have been displayed at the Museum of Holography in New York. He described holography as a true "intersection of art, science and technology." While he considered viewing a good hologram to be a "magical experience," the rigor and depth of his research yielded far more than visual wizardry. Holograms have been used to create three-dimensional composites of CT and MRI scans that have been very useful in medical diagnosis.

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HTTP://WWW.SPACEARTS.INFO

Leonardo/OLATS and the Ours Foundation have joined forces to create a
database about space art, documenting the works of artists who, since the
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for their creations. When completed, this database will host over a thousand
entries. Artists are invited to submit their work for inclusion in the
database. Entry forms to submit your artworks are available online at
www.spacearts.info.

The Spacearts database project is funded by the European Space Agency and is
co-sponsored by the International Academy of Astronautics; Advisors to the
project include:
á   IAAA (International Association of Astronomical Artists) - www.iaaa.org
á   MIR, an international consortium of institutions with space art
activities. MIR includes: Leonardo/OLATS, Arts Catalyst, V2, Projekt Atol
(Slovenia), and the Multimedia Complex of Actual Art (Russia).
á   Maison d'Ailleurs/Museum of Science Fiction, Yverdon - www.ailleurs.ch

For 35 years, *Leonardo* has documented the work of artists involved in
space exploration; It has co-sponsored six Space and the Arts workshops and
promoted the interaction of artists, scientists and engineers involved in
space. The SpaceartS database can be found at www.spacearts.info. Further
information can be found at: Leonardo/OLATS: Space Arts Workshops
documentation at http://www.olats.org/setF3.html or Leonardo/ISAST: Space
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