San Francisco Examiner
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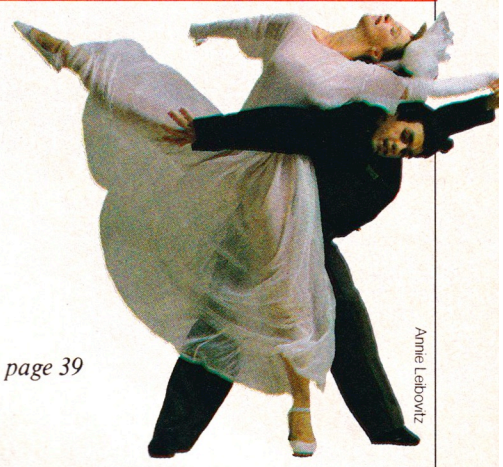
FEATURES

Examiner / Judith Calson

DEPARTMENTS



page 39

Annie Leibovitz

Deacon Chapin

Cover photo by Dolores Neuman.
Inset photo courtesy the Astronomical Society of the Pacific.

San Francisco Examine

Explorations in Ballet: A Robot Joins the ODC at Stanford

Two unusual evenings of music and dance will take place this Friday and Saturday, December 6 and 7, at Stanford University. Brenda Way, founder and choreographer of San Francisco's Oberlin Dance Collective (ODC) and composer Michael McNabb of Stanford's Center for Computer Research in Music and Acoustics (CCRMA) have collaborated on a new ballet entitled *Invisible Cities.*

Based on the Italo Calvino novel of the same name, it relates an imaginary conversation between Marco Polo and the aging Kubla Khan, whose domain Polo has recently explored. Sitting in the Khan's garden, the adventurer describes to the ruler the wonders he discovered in the far reaches of his realm. In Way's ballet, Marco Polo is portrayed by one of ODC's dancers (a woman). The Kubla Khan is danced by a robot.

"As far as I know, this is the first time a robot has ever been used in a ballet," says Way enthusiastically. "And the surprising thing is, it works very effectively. The robot makes an expressive, lyrical contribution."

Developed by Stanford University and the Veterans Administration Rehabilitation Research and Development Center in Palo Alto, the robot is a state-of-the-art, proto-

Jerry Spagnoli

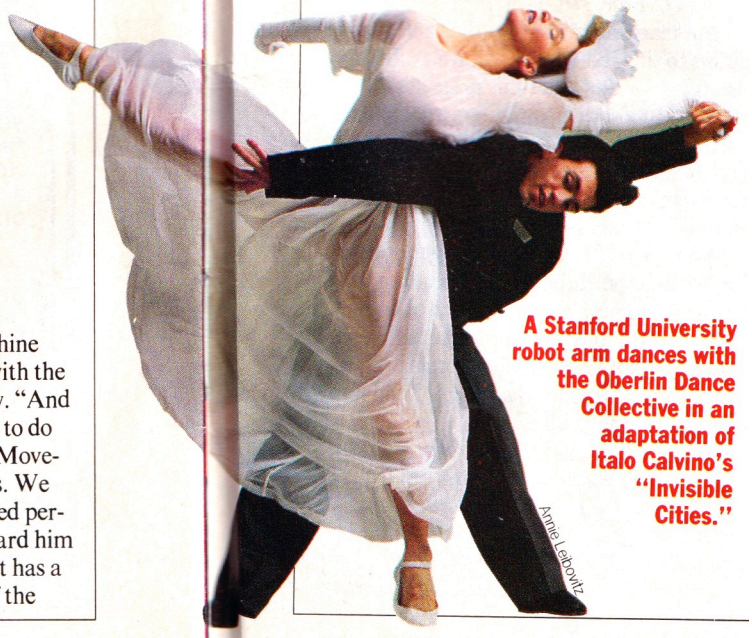
typical device. "Originally, this machine was developed to help the disabled with the activities of daily life," explains Way. "And the quality of its movement has a lot to do with its effectiveness as a living aid. Movement has meaning for human beings. We respond to it emotionally. If a disabled person sees C3PO thrusting jerkily toward him to comb his hair or give him coffee, it has a different psychological effect than if the movement is fluid and graceful."

Far from resembling C3PO or his fellows, Stanford's robot is a 67-inch-long arm with six "joints," or axes, along its length, each of which can be precisely programmed on a computer. Way's job was not only to make this arm move gracefully, but to make it move in time with the music.

She programmed her choreography into the robot with the help of technicians at Stanford. The process, she says, was incredibly painstaking and time-consuming. "I spent over 150 hours on the machine to program its part in a 45-minute ballet," says the choreographer. "But the final result was astonishing. Like everyone else, my vision of robots includes lurching, spasmodic movement. But with the right programming, the robot can be imbued with a sensual lyricism and even a human warmth. In this ballet it interacts with the nine other dancers on stage in very real and human ways. In fact, I think that you forget it's a robot. It really becomes a character in the piece."

Brenda Way founded the Oberlin Dance Collective in 1971 while a professor at Ohio's Oberlin College and Conservatory of Music. In 1976, thinking that she and the company needed to be part of a broader and more challenging artistic community, she relocated the ODC to San Francisco. Three years later she purchased an old building at 3153 17th Street and transformed it into what is now one of San Francisco's most vigorous and adventurous catalysts for innovative art of all kinds, the New Performance Gallery. The recipient of numerous choreographic awards and commissions, Way has produced more than 35 dance works in the last fourteen years. And her passion remains exploring new realms.

"When Michael McNabb approached me two years ago with the idea of putting a robot into a ballet, it struck me as an in-



Annie Leibovitz

A Stanford University robot arm dances with the Oberlin Dance Collective in an adaptation of Italo Calvino's "Invisible Cities."

triguing idea. I had never worked with computers before, to say nothing of robots, but I like challenges, and this certainly seemed like one."

Composer McNabb has been associated with Stanford's CCRMA since 1976. He has taught music at the university and composed scores for films and modern dance. The idea of putting a robot in a ballet was inspired by work with prosthetics he had seen at the Veterans Administration Rehabilitation Research and Development Center in Palo Alto. McNabb's computerized score for *Invisible Cities,* written for a digitally recorded orchestra of computer-synthesized instruments and modified environmental sounds as well as two live musicians, was funded by a $10,000 grant from the National Endowment for the Arts.

Anne Leibovitz

Choreographer Brenda Way (seated, center) and members of the ODC.

"I've always wanted to write a large ballet score—like Stravinsky's," says McNabb. "But of course, writing it on a computer is a much different process from writing it for instruments. There are no musicians to give expression to your ideas. You not only have to write the music, you have to invent the instruments! It sometimes takes an incredible amount of time."

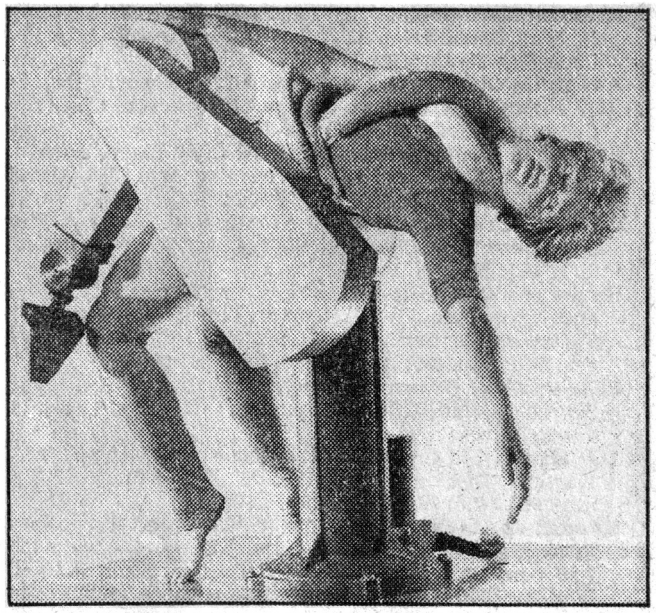
But teaching robots to dance and computers to sing, both Way and McNabb insist, is just part of what this project is all about. "Robots and computers are not just the brainchildren of the high-tech society," says McNabb. "One of the things this ballet shows is that they provide a means of extending and enhancing human expression."

Adds Way, "In the same way that Marco Polo and the Kubla Khan, speaking different languages, gradually learn to communicate with one another in the ballet, so must the robot be taught to express itself in human terms, first for the disabled and now, it seems, for the public."

Invisible Cities will be performed at Memorial Auditorium on the Stanford University campus at 8 p.m. on December 6 and 7. For ticket prices, reservations and other information, call 497-4317 or 497-2551.

MARK STEINBRINK

San Jose Mercury News ■ Friday, December 6, 1985



'Invisible Cities' at Stanford tonight

Howard hits the stage

The first robot dance partner

By Paul Hertelendy
Mercury News Music Writer

THE robots are being upstaged. They're madder than hell, and they're not going to take it any more.

It all began when the choreographers and robots got together at Stanford and planned a collaboration. It was going to be the new era of robots in dance. For the first time, four robots would "dance" together with human dancers on the same stage, their movements choreographed. Both stationary robots and those on moving platforms would take part. And the robotic movement would be keyed to the rhythms in an electronic score, just as though the robot were actually listening.

But the project was gradually whittled down as its cost and complexity skyrocketed. "Invisible Cities" now has a

See ROBOT, Page 14D

This dancing robot will aid handicapped

ROBOT, from Page 1D

and complexity skyrocketed. "Invisible Cities" now has a budget of at least $150,000. The moving platforms are out, and so is the metric cueing. The robots and humans are widely separated, partly for the sake of safety.

And the army of robots has given way to a single recruit whose name is Howard.

The robots presumably are no happier with all this than the audiences awaiting tonight's debut of "Invisible Cities" at Stanford University. The pressure will be great on Howard, who is a stationary, programmable, multijointed $45,000 arm that, when fully extended, is the height of a basketball player, looming over the human dancers of the ODC Collective around him.

Howard may not want to admit it, but the era of the robotic ballet is clearly still languishing in the maternity ward. Certainly a properly programmed robot could do much of what you and I do and do it faster, more accurately and more economically, without so much as a strained muscle. But the complexities of mounting even a rudimentary dance piece with a robot arm in the background have been immense.

Though created with touring in mind, an "Invisible Cities" tour will be both costly and difficult, because at least two robotic programmers would have to tag along, to set up and help supervise all performances.

Complicating the tour situation further is that Howard cannot get permission for foreign travel. Because of U.S. government restrictions (and fears that he could be kidnapped to a certain country that gave us "The Nutcracker" and "Swan Lake"), he cannot even go to Western Europe, where a locally made stand-in would have to be hired.

Howard has not commented on this affront to his silicon sensitivities.

Choreographer Brenda Way is clearly crestfallen about the time-consuming production process for this dance, but "That's the way it is in new technology," she said. It was she who gave this Puma 560 robot (made by Unimation Inc. in Danbury, Conn.) the name of Howard.

A major sticking point has been the cumbersome programming of Howard, done by engineer Gayle Curtis, with the help of choreographer (and fellow robot tender) Margo Apostolos.

When *you* move your arm, you barely even think about it; in a flash it's done. For a robot, the same movement takes many instructions and exacting specifications on position, angle and attitude at start and finish. Where *you* think in terms of a function, a robot thinks in terms of coordinates, velocities and vectors: jumbles of numbers.

But a robot can do more. "You can't just use human arm movements for robot-arm choreography," says Apostolos. "There is no way that the (robot) arm would get to ballet second position. It's really closer to kinetic sculpture."

"I developed a connection (with Howard)," Way explains. "I see a robotic style, with shorter, poetic phrases."

The poetic phrase — what Curtis would call the quality of movement — was the motivating factor for the whole project. The Veterans Administration Rehabilitation Research and Development Center in Palo Alto, where Curtis and Apostolos work, wanted to make robots more acceptable to paraplegics, who could use robots that respond to voice commands as 24-hour housemaids.

While the voice commands work very well indeed, many people rejected robots as being — well, not human enough. Not even doglike enough.

ODC/San Francisco

What: A dance company
Where: Memorial Auditorium, Stanford University.
When: Tonight and Saturday at 8
Program: "Invisible Cities," a human-robotic dance; Kate Nelson's dance "No Secrets" and McNabb's composition "Love in the Asylum"
Tickets: $6-$13. (415) 497-4317, (408) 998-2277, (415) 893-2277

In a preliminary study, however, poetic movements appeared to decrease anxiety about the robots, and win them some acceptance among the handicapped.

Putting the robot in an aesthetic sphere — such as this post-modern dance group's performance — can enhance the robot's image as an attractive near-human: Not a menace, but more a companion worthy of trust, maybe even of attachment.

"Invisible Cities" is inspired by the book of that name by the late Italo Calvino, writing about Marco Polo's meetings with Kubla Khan. In it, the Khan describes the cities of his empire, real and fantasy. In Brenda Way's dance version, these become the City of Desire and the City of Congruence, among others. The elaborate decor by Christine Walker has geometric landscapes, somewhere between the worlds of Dali and Giorgio de Chirico.

When last heard from, Howard was still being programmed — or choreographed, if you prefer.

As Way puts it: "Howard is still developing his individual expressive capabilities."

Brenda Way gets robots into the rhythm of things

By Janice Ross
The Tribune

IT LOOKS LIKE THE LABORATORY of a mad scientist — a bleak, decaying, gray circular building surrounded by the charred ruins from the fires that ravaged the Lexington Reservoir countryside last spring.

What's going on in this building does nothing to change that impression. A pale, slight young woman in torn plastic pants dances around a whirring robot, carefully avoiding its iron-fisted swing as it offers a mechanical approximation of her moves.

For the past five months Oakland choreographer Brenda Way, artistic director of ODC/San Francisco, has been commuting to Stanford several days each week to try to teach Howard, a Puma 560 Robot, how to dance. Despite the setting for Way's experiment, her undertaking is neither gummicky nor bizarre.

Last spring the Robotic Aid Project, a joint effort of Stanford's Department of Mechanical Engineering and the Palo Alto Veterans Administration Rehabilitation Research and Development Center invited Way to create a robotic ballet as part of the project's investigation into the expressive potential of its robots.

"Invisible Cities," a collaborative dance work performed by ODC/San Francisco using robotic research technology, and choreographed by Brenda Way, premiers at 8 p.m. Dec. 7 in Memorial Auditorium, Stanford University. Tickets $9 - $13. Call the Lively Arts at Stanford, 497-2300, for more information.

"What made the project intriguing to me was a story I heard about how quadriplegic patients in the Vets Hospital were very moved by an example of robotic ballet they saw," Way said last week during a late morning rehearsal at Stanford with ODC dancer Katie Nelson and Howard, the robot.

"The fact that the robot's actions were meaningless and functionally useless, and yet still held special meaning for the quadriplegics — people who depended on the robots to get through the simplest of daily tasks — was very interesting to me," she said. The result is "Invisible Cities," a complex 45-minute work, a musical, visual, choreographic and technological collaboration.

Taking its title from a novel by the late Italian writer Italo Calvino, "Invisible Cities" teams the imaginations of Way, composer Michael McNabb, robot programers Gayle Curtis, Margo Apostolos and Julie Kanter and, of course, Howard, to produce what is hoped will be a chilling commentary on Calvino's portrait of a meeting between Kubla Khan and Marco Polo. As Way explains it the two can't speak the same language — a perfect metaphor for the real life predicament between Nelson and Howard.

"Invisible Cities" is set to debut Dec. 7 at Stanford's Memorial Auditorium, specifics are below.

Despite the complexity of the undertaking, Way said she hopes the work will live beyond this initial performance.

"Initially ... I was interested in the social capacity of the robot," she said. "But the project has gotten much deeper than an event, a surface investigation. It now has the stuff of recurring viewing."

" 'Invisible Cities' will be very shape-oriented. We'll have a quote from Calvino for each section," Way said as she displayed visual artist Chris Walker's sketches for modular sets and stylishly severe costumes. "To work with a robot as an integral part of a work is what really interested me."

Indeed, the $50,000 Howard, really more of a seven-jointed robotic arm than an ambulatory mechanical being, will spend the entire dance downstage, anchored to a table top. It will be the dancers, particularly Nelson, who will approach him in order to do some stylized table top duets.

According to Way, the 120-pound Howard packs a human-scaled wallop. One malfunction of his little tan painted steel arm would be enough to knock the slim Nelson for a loop.

"We keep the panic button handy at all times," Way said, pointing out a small black box with a red button that can instantly sever the robot's power connection.

"This is an untutored robot," Curtis said affectionately. "He is usually used in automated factories assembling electronic equipment where he can position within one-thousandth of an inch the same little part again and again."

Way said that the challenge of working with Howard has far more to do with the excitement of exploring the parameters of joints and constraints on movement — something that has concerned her with her own dancers — rather than repeatable precision. She said she finds Howard's mindless, wholly egoless action strangely liberating.

While the actual process of "getting Howard to dance" involves painstaking repetition — Way must map out the poses she wants the robotic arm to assume while Apostolos punches them into the computer keyboard that governs Howard — the results are more accurately reliable and pristinely unaltered than those of the best dancer.

Despite his electronic memory, however, Howard does make mistakes. "There is a great possibility for error," Way said, pointing out the irritating "Fatal Error" command that flashes across the computer's screen whenever Howard accidentally swings one of his joints beyond its 300 to 550 degrees of rotation.

"The mistakes Howard makes are exactly like those of a dancer," said Way. "The only difference is how it goes wrong."

No matter what the artistic results of Way's experiment turn out to be, Curtis suggests the Robotic Aid Project people have already deemed it a success, because each time Way requests some special action from Howard — for example, a program that will enable his smallest flange to grasp a flashlight and scan the stage with it — Curtis and the other "wranglers" must invent new commands to stretch Howard's capabilities.

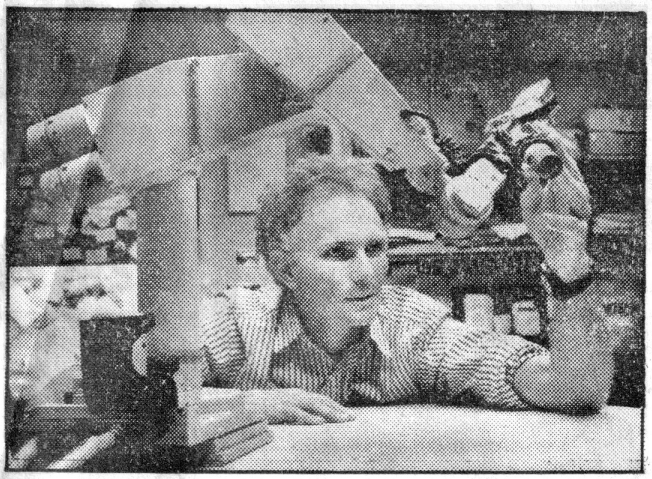
The result is a technological tool with an increased range of possibility and, just perhaps, a machine that has been touched by an artist's expertise in non-verbal expression.

Janice Ross writes on dance for The Tribune.

Left and below: Dancer Katie Nelson works with Howard the robot; below left, choreographer Brenda Way and robot programmer Gayle Curtis discuss a movement for Howard.

Rudolf 'Robot' Nureyev?

Mechanical marvels may soon be dancing the night away



Gayle Curtis find robots a bit disarming

By Paul Hertelendy
Mercury News Dance Writer

THE world of automation is attempting something long regarded as nutty or unlikely: teaching robots to dance and move, but gracefully.

The dance debut of the robot in concert could be as early as October right here in the Bay Area, under the auspices of Stanford University's Lively Arts. According to Lively Arts representative Lois Wagner, another $30,000-$45,000 remains to be raised toward the necessary $70,000 of the total budget. The expenditure involves everything from (live) dancers' fees to robot-programming to costuming the automatons.

The dancing robots are commercial models, on loan from a research group at Palo Alto's Veterans Administration Hospital. The live dancers collaborating are the San Francisco Oberlin Dance Collective. And the electronic music accompaniment — you wouldn't expect a robot to keep time without music, would you? — would be original computer-music

Continued on Page 2C

Robots may soon bolt across the dance scene

Continued from Page 1C

compositions created at Stanford by Michael McNabb, who received a $10,000 National Endowment for the Arts grant.

Choreographing the collaboration of live dancers and robots will be Brenda Way, veteran director of the Oberlin group. Way hopes to take the new work on tour, both in the U.S. and in Europe next season, with her seven live dancers and three robotic devices.

The modus operandi of the robotic ballet is to program the robots to move not only gracefully, but also in synchronous motion with the beat of the music. The feasibility of this to piano music of Chopin has already been shown in video tapes prepared at the hospital's Rehabilitation Research and Development Laboratory.

These demonstrations are dazzling in the poetic movement of the robot arm, geared to the tempo of the music. Gayle Curtis, research biomedical engineer at the laboratory and programmer of these devices, essentially can give the robot for each move a Position A, a Position B, and a set time span to move from one to the other. The robot then in effect takes a straight-line route between A and B, without missing a step.

It's much too early to order tickets for these mechanical Pavlovas. "All three phases of this project (programming, composition and choreography) are in development," cautions Curtis.

If fund-raising is far enough along, he plans to start formally on July 1. As for choreographer Way, before she begins on this five-part, 45-minute piece she will have to bring her live troupe back from a Midwestern tour and complete the May 29-June 2 performances in San Francisco's Herbst Theater.

Curtis' lab is unaccustomed to dabbling in dance, working mainly in devices to assist the severely handicapped. He sees a natural tie-in of robotic dance, however.

"Quality of movement is a factor, especially if we have robots as living aids in the home. A high quality of movement gains acceptance among the disabled. In this area the experts are the choreographers."

"Finally, the research is geared to total movement (i.e., shaping), rather than just the point-to-point approach."

All these human engineering questions have great relevance for robotic design. And who knows? Perhaps the little home robot that you have in the year 2001 for your grocery-shopping and emptying your garbage will also be able to dance an evocative Isadora Duncan impression at the press of a button.

It's a distant dream still. Even the smaller programmable robot arms cost $40,000 today. Research, however, is making the robot not only more versatile, but more human, and therefore more acceptable among skeptical humans.

*Metro*Guide

Art
Continued

hand tools. Through February 15. Hours: Tue. - Sun., 1 - 4 pm.

Palo Alto Junior Museum—1451 Middlefield Rd., Palo Alto (415/329-2610). Opening December 7: The Funny Side of Science: Cartoons by Sidney Harris, a selection of original work including 60 cartoons and 11 paintings. Through January 12. Reception December 7, 1:30 - 4:30 pm, during which the Home Brew Robotics Club will demonstrate their robots. Hours: Tue. - Fri. 10 am - noon and 1 - 5 pm, Sat. 10 am - 5 pm, Sun. 1 - 4 pm.

Rosicrucian Egyptian Museum and Art Gallery—Park and Naglee Avenues, San Jose (408/287-9171). Opening December 9: Acrylics by Juan Pena. Through January 5. Continuing: Santa Clara Valley Watercolor Society show. Through December 8. Permanent exhibit of Egyptian, Assyrian and Babylonian antiquities. Hours: Tue. - Fri. 9 am - 4:45 pm, Sat. - Mon. noon - 4:45 pm. Admission $2 for adults, $1 for children 12 - 17, free for children under 12.

San Jose Museum of Art—110 S. Market St., San Jose (408/294-2787). Gallery I - Pioneers in Paradise, 19th and 20th century paintings and sculptures by self-taught artists from California, Oregon and Washington State. Through January 5. Gallery III - Selections From the Permanent Collection. Through January 27. Gallery IV - Glenn Brill: Recent Work, including shaped paintings on masonite, mixed media wall pieces, small scale sculptures, monoprints and freestanding screens. Through December 29. Gallery V - Rand Schiltz: Small Scale Bronze Sculpture, A Five Year Survey. Animal imagery that creates vignettes satirizing human conditions and situations. Through December 22. Hours: Tue., Wed. and Fri. 11 am - 5 pm, Thu. 11 am - 6 pm, Sat. and Sun. noon - 4 pm.

Stanford University Museum—Stanford (415/497-4177). Goltzius to Rembrandt, Dutch and Flemish etchings, prints and drawings. Through December 29. Museum Balcony - Interiors: Color Photographs by Lorie Novak, polaroid prints of ordinary places transformed illusionistically by collage. Through December 15. Rodin Sculpture Garden, an outdoor installation of 20 bronze -sculptures. Hours: Tue. 10 am - 8 pm, Wed. - Fri. 10 am - 5 pm, Sat. and Sun. 1 - 5 pm.

Triton Museum of Art—1505 Warburton Ave., Santa Clara (408/247-3754). Opening December 8: New Works, New Looks II, works by six California artists in media ranging from wood to hubcaps to oils. Through January 26. Continuing: Polish Folk Costumes, traditional regional and national costumes featuring elaborate decorative work. Through January 5. Reception for both exhibits December 6, 7 - 9 pm. Hours: Tue. - Fri. noon - 4 pm, Sat. and Sun. noon - 5 pm.

GALLERIES

Openings

Crescendo Gallery—Lyndon Plaza, 20 S. Santa Cruz, Los Gatos (408/395-1595). Opening December 8: Contemporary Latin American Art featuring mixed media works by Ruby Aranquiz, oils by Sopetran Domenech and oils on board by Carlos Campbell. Through December.

Ewert's Photo Gallery—2090 Duane Ave., Santa Clara (408/727-3686). Opening December 7: Nature and Power, monochrome prints by Richard and Beverly Spellman. Through December. Reception December 7, 4 - 6 pm.

San Jose Institute of Contemporary Art—377 S.First St., San Jose (408/998-4310). Opening December 7: Hope And Cars In Rain, work by Los Angeles artists Gary Panter and Bob Hope Zoell influenced by pop culture and cartoon imagery. Through January 4. Reception December 6, 5:30 - 8 pm.

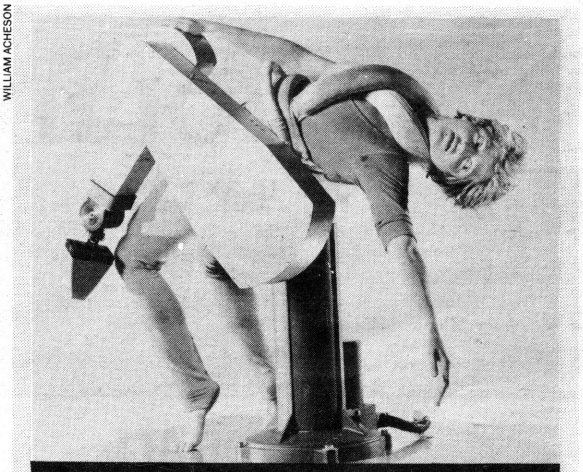
Continuing

Allegra Gallery—325 S. First St., San Jose (408/292-1234). Recent paintings and drawings by San Jose artist Bonnie Cook, including oils on canvas and paintings on paper. Through December 29.

American Institute of Architects—1333 Lawrence Expressway, Ste. 205, Santa Clara (408/945-8599;255-6921). Sculptural works by Matthew Gil, stationary and kinetic work in a variety of media that reflect humor, wit and whimsy. Through January 3.

Artform—815 Emerson St., Palo Alto (415/327-8089). Fred Reichman, etchings and monotypes featuring glowing colors and images influenced by Japanese design. Through December 7.

WILLIAM ACHESON



Exercise machine out of control: Katie Nelson in "Invisible Cities."

Dancing with Robots.

ODC/San Francisco dancers will not be doing the popular dance "The Robot" this weekend at Stanford University, but they will be dancing with live robots in what might be the first presentation of robot choreography.

Robot engineer Gayle Curtis and choreographer Brenda Way have created a dance utilizing several ODC/San Francisco company members and 5-foot robots. The piece is called "Invisible Cities" and the robots are part of a project at the Stanford Department of Mechanical Engineering and the Veterans Administration Rehabilitation Research and Development Center in Palo Alto. The unique atmosphere of "Invisible Cities" is enhanced by live musical accompaniment (composed by Michel McNabb) combined with recordings of computer-synthesized instruments and modified environmental sounds.

A separate musical part of the program will be McNabb's "Love in the Asylum." Also included is "No Secrets," choreographed by Katie Nelson.

"Invisible Cities" is presented in association with the Stanford Center for Computer research in Music and Acoustics and takes place at Stanford's Memorial Auditorium Friday and Saturday at 8pm. Ticket prices range from $9-$13 for general admission and from $6-$10 for students. To order call Tresidder Ticket Office at 415/497-4317 or BASS.

—Sioux Benson

Artifactory—226 Hamilton Ave., Palo Alto (415/321-4586). Two Cooperative Quilts. One depicts issues of importance to women; the other is a "people's history" of the United States. Through January 18.

Bank Street Gallery—444 High St., Palo Alto (415/321-1950). Organic/Inorganic, metal and leather sculpture by Sid Garrison, William Baran Mickle and Rex Lingwood. Through December 28.

De Silva Gallery—71 N. San Pedro St., San Jose (408/998-1300). Recent work by Lauren Katz and Mark Tinsley. Through December 18.

El Gatito Gallery—123 W. Main St., Los Gatos (408/354-9977). The Outlook, abstract impressionist paintings by Mimi Tran Tuvan. Through December.

Foothill College—12345 El Monte Rd., Los Altos Hills (415/960-4349). Hubert H. Semans Library: Japanese Cultural Exhibit, including brush painting, calligraphy, and floral arrangements by students of the Japanese Cultural Program. Through December 12. Electronics Museum: Continuing exhibit of early radio equipment and electronics, including an eight foot animated robot. Call 415/960-4383 for information.

Freeman Gallery—415 University, Palo Alto (415/325-6888). Lithographs by June Felter, Louis Labrie, John Maxon, Mel Ramos and Wayne Thiebaud. Handmade paper pieces and lithographs by Donald Farnsworth. Through December. Paintings by James Warren Perry and Geoffrey Hales. Through December 6.

Graybox Adult Books—161 Jackson St., San Jose (408/294-1197). House of 7 Sins, scuz pulp from America's late mid-century.Through December.

Jalbert—14657 Big Basin Way, Saratoga (408/867-4219). Barbara Cate, watercolors enhanced by pen and ink overlays. The Fine Art of Clay, functional and non-functional ceramics by 10 Bay Area artists. Art Glass, hand blown or hand formed glass, crystal paperweights and ornaments. Gift Gallery, selected gift items by California artists. Through December.

Keeble & Shuchat—290 California Ave., Palo Alto (415/327-8996). Dramatic Landscapes, over 40 black and white photographs by Mathias Van Hesemans depicting the mystery and power of the earth. Through January 15.

Los Robles Gallery—167 N. Hamilton, Palo Alto (415/327-3838). Contemporary Crafts, ceramics, wood, glass, jewelry, fiber and basketry. Antiquities, African and Oceanic Art are also on exhibit. Through December.

Museum Services Gallery—434 S. First St.,San Jose (408/298-9909). Turn of the century Californian and European oil paintings.

Pacific Art League—668 Ramona, Palo Alto (415/321-3891). Elizabeth Norton Gallery: Laugh a Little - Laugh a Lot, 30 black and white photographs by Mathias Van Hesemans depicting the eruptive humor of people. Through December 23. Main Gallery and Studio One: Holiday Fine Arts and Crafts, all media work by member artists. Through December 23.

Palo Alto Cultural Center—1313 Newell Rd., Palo Alto (415/329-2366). East Gallery - Modern Allegories, paintings by John Hannaford and Jan Wurm. Creation Location Gallery - Signs and Symbols, a hands-on exhibit combining original art, games, and activities that explore how simple graphics can communicate complex ideas in visual art. Both through January 19. West Gallery - Everyday Objects, mixed media work by Helen Cohen, photography by Nancy Hutchinson, handmade paper by Geraldine Serpa and pastels by Elizabeth Ennis. Second exhibit in the series Fresh Perspectives, highlighting the work of emerging artists. Through January 5.

Pontius Galleries—2540 California St., Old Mill Center, Mountain View (415/949-4455). Eyvind Earle, original serigraphs. Through December 22.

San Jose Art League—482 S. Second St., San Jose (408/294-4545). New Faces, drawings, paintings and sculpture by San Jose artists Reuben Rutledge, Danny Rosales, Joyce McEwen and Eve Page. Through December. Reception December 5, 6 - 8 pm.

San Jose State University—Art Building, 9th and San Carlos Sts., San Jose (408/277-2526). Gallery I: Cast Metal Sculpture '85, work by faculty members and graduate students. Through December 13. Gallery 2: Cow Art, paintings, drawings, and sculpture of cows by elementary grade artists of Selma Olinder University Magnet School. Through December 13. Union Gallery in Student Union: What Risk Does The Figure Run?, recent works utilizing the figure by John Hannaford, Michael Hickman, Robert Horning and Patty Wickman.

HIGH-STEPPING SEASON SENDS SPARKS FLYING WITH FRESH APPROACHES

Author(s): PAUL HERTELENDY, Mercury News Music Writer **Date:** July 27, 1986 **Section:** Arts

THE 1985-86 Bay Area concert season that just wound down posed questions, answered some of them and above all maintained the area's imposing position in championing the cutting edge of new music.

Some of the past season's music, new and not so new, made news, and the dance world made its contribution, too:

New music

The year's most significant innovation was the robotic dance "**Invisible Cities**." It failed in its function, but pointed the way toward a new dance form encompassing robotic movement. After massive fund raising, more than a year's work and gray hairs on every one except the robot (dubbed Howard), the dance piece made its debut at Stanford University in December. Brenda Way's dance company ODC worked around a solitary robot arm that undulated to Michael McNabb's new computer-music score.

It was a crude first, but the performance was completed without breakdown or injury, though much curtailed from the original scenario. Way, engineer Gayle Curtis and collaborators managed to make the ungainly robot graceful. Still to be resolved are the complexity of programming the simplest robot movements (still prohibitively time-consuming), the precise synchronization of the motions to musical beats, and the difficulties of using several robots and rolling robots.

(A second performance is scheduled at the University of California at Berkeley at 8 p.m. Friday and Saturday in Zellerbach Hall.)

San Jose State's CADRE, a festival of computer-assisted arts that has evolved into a biennial outpouring, fell far short of its ambitions because of a shortfall in grants. However, it exhibited myriad bubbling, blinking artworks and presented shirt-sleeve workshops and demonstrations by top synthesizer professionals. For the grand finale, it seized the Center for the Performing Arts for a concert highlighting Morton Subotnick's sophisticated integration of portable-computer music with live sextet titled "The Key to Songs."

The funky, high-flying Kronos Quartet breathes fresh air into the mustiest crannies of the string-quartet milieu. Its six-concert series at San Francisco's Herbst Theater is often electric in its energy, drawing animated audiences to its premieres of living composers. In its eight years of high-gear playing with its present personnel, this ensemble has performed a staggering total of 400 works -- a fresh, wet-ink repertory worthy of that book by Mr. Guinness.

The local Paul Dresher Ensemble with actor-tenor Rinde Eckert presented a new form of theater-opera at Stanford with the group-composed double bill, "Slow Fire" and "Was Are/ Will

WORDS ON WORKS

Words on Works *are short statements about new artworks in which art and technology coexist or merge.*
Words on Works *are published regularly on the ISAST online database F.A.S.T. (Fine Art Science and Technology) and in the ISAST online newsletter F.A.S.T. News. In the spirit of* Leonardo, *the information they contain is what the artists themselves have chosen to say about their own work.*

THE ODYSSEY

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The Odyssey is a collaborative computer program written as a Hypercard application for the Apple Macintosh computer (Mac Plus, SE or II). *The Odyssey* will travel for 4 months, 15 March–14 July 1989. During its travels, all who encounter *The Odyssey* are asked to contribute texts, sounds or images to its collection of data. Contributors pass their work on to others so that the journey may continue.

After 14 July 1989, all copies of *The Odyssey* will ask to be returned home. Upon their return, we hope to compile a modern-day Domesday book; an electronic picture of the time from the material we will have received.

SPEAKERS' CORNERS

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Since 1983, I have been creating electronic *Speakers' Corners*. These are outdoor sculptures that people can call up and talk through. The callers, using any ordinary telephone, can dial a special number and be automatically connected to these outdoor sculptures. The sculptures are usually integrated into preexisting structures on site and equipped with a public address system that enables the callers to express themselves directly to the public.

These electronically active sculptures exist in a public space and are accessible to the public on a 24-hour basis. My goal is to create, via telephone, an open forum for spontaneous oral communication.

Section Editor: Judy Malloy

HUGE UTERUS

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Huge Uterus (1989) includes the 6-hour real-time video record of the recent operation on my uterus. During the video/operation, the surgeon writes exploratory notes such as that used here for the title: "Huge uterus . . . with many tumors . . . no cancer . . . the tissue is healthy except for tumors . . . remove tumors . . . the uterus is an organ that heals well naturally".

The other image/narrative component of this installation is a visualization/preparation-for-the-operation sound tape that plays on an autoreverse tape player with detachable remote speakers: "As the anaesthetic begins to make you even more relaxed, external words and sounds simply serve as a background murmur interpreted as signals to relax. They're not recorded. You will not respond to them. You are very relaxed and very calm".

These tapes play on equipment that is configured as body/monitor/hookup. All of the apparatus (monitor, decks, speakers, wires) are visible in the actual installation. The video cassette recorder and audio tape decks are mounted on adjoining walls; their electrical wiring hangs free and visible and is connected to the video monitors and speakers, which are placed on the floor side-by-side in front of their decks. The video monitor lies on its back on the floor.

Huge Uterus was exhibited in the Bay Area Conceptualism exhibition (Hallwalls, Buffalo, NY, Fall 1989), at the Simon Watson Gallery (New York City, Jan–Feb 1990) and at L.A.C.E. (Los Angeles, CA, Feb–Apr 1990).

ELEGBA'S STRATAGEM

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Elegba's Stratagem employs the computer as a tool for the design and presentation of branching narrative ideas and viewer mediation. The basic equipment configuration consists of a personal computer (PC), three videodisc players that are controlled by the computer (via an interface card), a graphics overlay card that allows text and graphics originating from the PC to be combined with motion video from the videodisc players and a speech-recognition card for viewer input. The authoring system used creates the interactive program.

At the heart of this work is the projection of elements from the African orisha tradition—its pantheon of deities and their relationships—onto the story of a contemporary African-American artist who is in search of himself through his artwork. The connection between this tradition and the proposed interactive video is both metaphoric and symbolic.

Systemically, the screenwriter draws parallels between the role and function of Elegba (deity of the crossroads, or of karma in Eastern terms) and that of computer-program intelligence. As Elegba opens and closes doors of human destiny, so the computer governs the travel of data through a design of treelike structures. Factors determining which pathways will be open or closed at any given moment are largely a matter of the interaction between human behavior (viewer input) and the program, which represents the laws of the system—the values system.

Symbolically, the relationship is supported in terms of story, particularly through its major characters. They are seen as archetypal extensions of various important deities, all of whom are well known for their powers, personalities, behavior and domains of responsibility. In effect, these spiritual presences are manifested through their earthly hosts, who themselves are unaware of their possession by the archetypes.

The protagonist, Lazarus Wilder, named after his biblical namesake, en-

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graph paper to make knitting patterns. I knitted the designs by hand and mounted them on padded boards.

After several years of working with computer graphics, I wanted to make something tangible that I could hold in my hands while still working with computers. I also wanted to explore the beauty of fractal designs that had been made visible only after the invention of computers. Knitting with thick wools and light silks gave me the pleasure of touching the material and also reminded me of the textile origins of computers with the Jacquard looms of the nineteenth century. By slowing down my hands, I was able to observe and think about the complexities of fractals and to make comparisons between the building of designs by stitches and of designs by pixels.

Although the correspondence of pixel to stitch is not precise in these pieces, the experience of translating the design to knitted fabric gave me an understanding of the construction of computer images, and of the connection between discrete stitches and electric pulses. It also allowed me to ruminate on fractals as boundaries, the infinite self-replications inherent in fractal makeup, and the realization of an order that I originally perceived as chaos or at least as complexity beyond comprehension. The experience made me more visually aware, and I learned how to read fractals and other kinds of complex information-laden, pixel-built images. By knitting computer designs, I enjoyed reconnecting the discoveries of computer sciences with the gentle, ancient world of making cloth.

Invisible Cities

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In 1985, the ballet *Invisible Cities* was realized as a collaboration between myself, choreographer Brenda Way and the Oberland Dance Company (ODC)/San Francisco Dance Company, and designer/engineer Gayle Curtis. Although most of the music is computer synthesized, there are also two live instrumental/electronic performers, including myself. This was a personal challenge, since I had been away from performing for a while. It was also an opportunity to try to raise the technical standards of music in dance performance, which I saw too often neglected. The music was funded by a grant from the (U.S.) National Endowment of the Arts and produced at the Center for Computer Research in Music and Acoustics, Stanford University.

Italo Calvino's novel *Invisible Cities* inspired us with its beauty, its original and concise structure, and its dream-like imagery. It is an allegorical account of a meeting between the Venetian explorer Marco Polo and the Tatar Emperor Kublai Khan. Sensing the decline of his empire, the aged Kublai Khan summons the young foreigner Marco Polo to his garden to reassure him of the greatness of his realm. Marco Polo diverts the great Khan with tales of cities he has seen within the empire. As the barrier of their different languages is overcome, the images of the cities become increasingly vivid. Kublai Khan searches for a pattern among them, concluding finally that each description is of the same place and all are within him.

The music contains both subtle and explicit stylistic elements of various popular and classical world musics, sections of pure musical fantasy, and various musical and digitally processed environmental sounds. In this way it conveys feelings and moods similar to those created by Calvino's weaving of hyper-realistic description and veiled, dreamlike fantasy. Conversely, the literary symbolism, characters and narrative of the book provided much of the inspiration for the choreographer and designers. However, rather than follow the book explicitly, we chose to adopt something of its form, then invented our own 'invisible cities' for each of the five major movements.

At the time, Gayle Curtis was participating in work being done in machine choreography at the Veterans Administration Robotic Aid project. He wanted to see the concept carried further. For *Invisible Cities*, he directed the addition of a large robot arm as a visiting member of the ODC dance company. The powerful robot, transformed by the choreography of Way, Margo Apostolos, and Curtis, performed the role of Kublai Khan. I further enhanced its persona by amplifying the sounds of its motors and digitally processing these sounds into musical material during the performance. We deliberately treated the robotics as a proven rather than as an experimental medium, in order to avoid making any clichéd statements on 'art versus technology'. The presence of the robot garnered us worldwide publicity, often at the expense of the artistic message.

The music for *Invisible Cities* has been released on compact disc on the Wergo label, WER 2015-50, distributed in the United States by Harmonia Mundi, Los Angeles. The work was awarded a mention at the 1989 Ars Electronica. An earlier recording, *Computer Music*, which includes "Dreamsong", "Love in the Asylum" and "Mars Suite", is available on CD from Mobile Fidelity Sound Labs, MFCD-818. The "Mars Suite" formed part of the soundtrack to the NASA stereographic film *Mars in 3D*.

Wringer/Washer TV

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The subject of this project is abortion. Rapid juxtaposition of imagery and arguments from both 'pro' and 'anti' positions are interspersed with a view of a load of wash going through the wash cycle from above. Video segments are approximately 10–20 sec long. An 11-in color monitor is encased in the wash tub of a pink, white and chrome 1950s-style wringer-washer. In order to see the video, a viewer must look down into the machine. A control unit activates the machinery in the presence of a viewer.

The pink and chrome wringer washer represents a 1950s futuristic view of technological progress. The juxtaposition of this outdated technology with the contemporary arguments of the abortion debate reveals the irony of the fact that this issue is just beginning to be publicly addressed.

From Osiris to Sinai

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While working on my project about Ancient Egypt and everlasting life, I came upon an interesting and remarkable chapter in the Egyptian *Book of the Dead*. "Spell 120" illustrates the lofty moral and spiritual concepts of the Egyptians in the Eighteenth Dynasty—about 1580 B.C.