

"HUMAN LIFE IS DRIVEN FORWARD BY ITS DIM  
APPREHENSION OF NOTIONS TOO GENERAL FOR  
ITS EXISTING LANGUAGE" - A.N. WHITEHEAD



PRESENTS:

# "THEORY ACQUIRES FLESH"

May 22, 2-5 pm at CCAC

CALIFORNIA COLLEGE OF ARTS AND CRAFTS AUDITORIUM

5212 BROADWAY AT COLLEGE, OAKLAND

## PROGRAM:

PETER RICHARDS, Artist-in-residence Program  
director at the Exploratorium

RON PELLEGRINO, Electronic Arts Productions

"TURNING THE SPHERE INSIDE OUT",  
a computer-animated topology movie

WALTER ZAWOJSKI, painter and director of  
graphics at Stanford Linear Accelerator



## YLEM CALENDAR - SPRING 1982

- DURING MAY**      ANTI-WW III AND FOR THE FUTURE Exhibit of all media including performances at Southern Exposure, 401 Alabama, SF. Call 621-9551.
- May 5-29  
Wed-Sat, 1-5pm      HANDS ON, A COLOR XEROX SHOW by Ylem artist Eleanor Kent. At the South of Market Cultural Center, 924 Brannan, (between 8th & 9th) SF.
- May 10-12      WATCH KENNETH SNELSON build a tension-structure sculpture on the Stanford campus near The Bookstore.
- May 12  
8:15pm      SNELSON LECTURES ON HIS SCULPTURES Reception following to meet the artist. Ylem members are especially invited. (see note on pg. 6) Auditorium in basement of Art building, near Hoover Tower.
- May 14-16      WORLD PRINT CONFERENCE "New Print(making) Technologies" Palace of Fine Arts, SF. \$85.00. Some computer graphics and color xerox will be shown. Contact, World Print Council, P.O. Box 26010, SF 94126
- May 22  
2-5pm      YLEM MEETING "Theory Acquires Flesh" at College of Arts & Crafts, Auditorium, 5212 Broadway, Oakland. Auditorium is in large concrete building on west end of campus. Park across Broadway from School on neighborhood streets. BART riders get off at Rockridge Sta.
- May 27-30      TOURNÉE OF ANIMATION Best of recent animation at New Varsity Theatre 456 University, Palo Alto. (Look for it in other communities, too.) Showtimes: 7:30, 9:45, Sunday 3:00, 5:15 too.
- June 2  
ALL DAY      TOUR 3 COMPUTER GRAPHICS FIRMS For information and reservations call Eleanor Kent, 544 Hill St. SF 94114, 415/647-8503. \$25.00. A mini-bus will be used so space is limited to 14. Act now. Deadline for reservations--May 24. Eleanor strongly needs assistance and advice.
- June 6  
2:00 pm      YLEM TOUR Stanford Linear Accelerator (SLAC), 2575 Sand Hill Rd., Menlo Park off I-280. Physicist Daryl Reagan will show a mini-bus-load (12 people) around. Sign up at YLEM meeting or call 415/856-9593.
- June 13-15      NATIONAL COMPUTER GRAPHICS ASSN. CONFERENCE IN ANAHEIM Emphasis on animation (Lucasfilms, Jim Blinn). \$345, 3 days; \$270, 2 days; \$150, 1 day. Contact, NCGA '82 #330, 2033 M St. NW, Wash. DC 20036
- June 14 -  
August 28      CALIFORNIA COLLEGE OF ARTS & CRAFTS SUMMER SESSION Extension courses in computer graphics, animation, and 30 others. Contact, CCAC, 5212 Broadway, Oakland 94618
- July 26-30      SIGGRAPH '82 IN BOSTON 9th annual conference on computer graphics and interactive techniques. Contact, Assn. for Computer Machinery, 1133 Ave. of the Americas, N.Y., N.Y. 10036
- July 20-27      SPACEWEEK '82 13th anniversary of Apollo moon landing. Artists solicited for group show on space exploration. Juried by studio visits in early summer. Contact, Space Art, 533 Sutter St. #624, SF 94102
- July 22-24      STANFORD CONFERENCE ON DESIGN Three days of classes with internationally recognized designers, \$276.00. Contact, Stanford Conf. on Design, Bowman Alumni House, Stanford, CA 94305.
- July 25      YLEM MEETING "Space Consciousness" Palo Alto (location to be announced) Ideas for program?? Call Ruth Silnes 347-3886.

## THEORY ACQUIRES FLESH

A resource compiled May 1982 by Scott Kim for Trudy Reagan's Yiem newsletter.

### THEORY/FLESH

**Theory Constructions From Verbal to Mathematical Formulations.** H. Black Jr. Prentice-Hall 1969. By an author of textbooks on sociological modeling.

**Experience and Position.** University of Massachusetts Press, 1970. Quines: The notion of a molecule or positron is more theoretical than that of a golf ball or rabbit. By this I mean that it is more remote from the data. The notion of a golf ball or rabbit is in turn more theoretical, in my view, than the notion of water or rubber; but this will take some explaining. I propose in this paper to examine some of the differences between one grade of theoreticity and another.

**Flesh.** Philip Jose Fenner. MAL 1981. The crowd in front of the White House talked, shouted and laughed. Women shrieked, men boomed. The high-pitched cut of children's voices was missing. They were home and being cared for by their older but prepubescent brothers and sisters or cousins. It was not fitting that children should see what would happen there. They would not understand the rites, one of the most holy, honored of the Great White Mother.

**Flesh of Steel. Literature and the Machine in American Culture.** Thomas Reed West. Vanderbilt University Press, 1967. (p. 135) The energies of machine society can answer to a need of another sort. It is a need to experience an environment that is more than an ordered rationality: surroundings concrete and substantial, finished with a varied detail that may fully engage the senses. The effect is given in a scene from *Memoirs of a Geisha*: "Dark gently smothering crisscrossed streets. Dark presses light the steaming asphalt city, crushes the framework of windows and lettered signs and chimneys and water tanks and ventilators and fireescapes and moldings and patterns and corrugations and eyes and hands and neckties into blue chunks, into black enormous blocks. Under the rolling heavier heavier pressure windows blurt light. Night crushes bright milk out of arcflights, success the sullen blocks until they drip red, yellow, green into streets resounding with feet. All the asphalt oases light. Light spurts from lettering on roofs, mills dizzily among wheels, stains rolling tons of sky." The city is at once an anaesthetic profusion of particulars and a compressed solidity; it has the multifariousity and the composition of a highly concrete thing. Machine centralism, in its energies, regains the thickness of which the austerities and abstractions of mechanical technology would strip it.

**Institute for the Future.** 2710 Sand Hill Road, Menlo Park. 654-6322.

**The Structure of Scientific Revolutions.** Thomas Kuhn. University of Chicago Press, 1952. Philosopher of science have not ordinarily discussed the problems encountered by a student in laboratories or in science texts, for these are thought to supply only practices in the application of what the student already knows. He can not, it is said, solve problems at all unless he has first learned the theory and some rules for applying it. Scientific knowledge is embodied in theory and rules; problems are applied to gain facility in their application. I have tried to argue, however, that this localization of the cognitive control of science is wrong. After the student has done many problems, he may gain only added facility by solving more. But at the start and for some time after, doing problems is learning consequential things about nature. In the absence of such exemplars, the laws and theories he has previously learned would have little empirical content.

**Gossamer Odyssey.** The Triumph of Human-Powered Flight. Morton Gossamer. Josephine Mifflin, 1981. A story of obsessive innovation and uncompromising collaboration.

**On the Origin of Species.** Charles Darwin. Harvard University Press, 1975. A facsimile of the first edition.

**The Double Helix: A Personal Account of the Discovery of the Structure of DNA.** James Watson. Atheneum, 1968. A theory born of insight, spectacularly confirmed. DNA is itself a molecularly encoded theory that becomes, through biochemical activation, living flesh.

**Relativity. The Special and General Theory.** Albert Einstein. Crown 1961.

**Pygmalion.** George Bernard Shaw. Penguin 1959. And the words became flesh!

**The Mind's I.** Douglas Hofstadter. Basic Books 1981. No engineer or chemist claims to be able to produce a material which is indistinguishable from human skin. It is possible that at some time this might be done, but even supposing this invention available we should feel there was little point in trying to make a "thinking machine" more human by dressing it up in such artificial flesh.

### LASERS/MUSIC

**Lasers and Light. Readings from Scientific American.** Freeman 1968.

**Digital Harmony.** John Whitberg. Dyer Books, 1969. This book documents how the application of graphic harmony, in that "real" sense of ratio, interference and resonance, produces the same effect that these physical facts of harmonic force have upon musical structures. The book points to these forces of visual harmony at work in a number of my recent films. There remains a need for confirming demonstrations of that hypothesis in a larger body of work. Art, unlike science, is proved by art alone, not by mock-scientific experiment in the isolated case.

### PHYSICS/ART

**Structure in Art and in Science.** Gyorgy Kepes, editor. George Braziller, 1965. The *Visions + Values Series*. The world as a set of structural systems does not divide into the two territories of scientific knowledge and artistic vision. Rather, both our scientific understanding and our artistic grasp of the physical world exist within a common structure of motivation, communications, and knowledge. Every step toward the mutual enrichment of art and science brings us closer to full realization of our own potentials. To reach what we all hope for, to become worthy of an environment worth living in, we must do what we can to bring our outer and our inner worlds together—renew the ancient marriage of art and science, art and nature. To rely solely on one area of our knowledge may lead us into blind alleys. Let us heed the warning given us by John Milton in *Areopagitica*, 1644: "We boast our light, but if we look not wisely on the sun itself, it smites us into darkness . . . the light which we have gained was given us, not to be ever starting us into darkness; discover upward things more remote from our knowledge."

**Dynamics: The Geometry of Behavior.** Ralph Abraham and Christopher Shaw. In the process of being published. 4-color book plus cassette (animation for your personal computer). Advance orders and information: 488-479-4525. Truly, there is a cultural resistance to mathematical ideas. Due to the widespread impression that mathematics is difficult to understand, or to a structural flaw in our educational system, or perhaps other mechanisms, mathematics has become an esoteric subject. Intellectuals of all sorts now carry on their discourse in nearly total ignorance of mathematical ideas. We cannot help thinking that this is a critical situation, as we hold the view that mathematical ideas are essential for the future evolution of our society. The absence of visual representations in the curriculum may be part of the problem, contributing to mathematical illiteracy, and to the math-avoidance reflex. This series is based on the idea that mathematical concepts may be communicated easily in a format which combines visual, verbal, and symbolic representations in tight coordination. It aims to attack math ignorance with an abundance of mathematical ideas, by presenting them visually.

### EXHIBITION/MUSEUMS

**The Second Shopper's Guide to Museum Stores.** Compiled by Shelly Hooy. Universe Books, 1970. This is a single-volume reference to merchandises from more than one hundred museums in the United States and Canada whose subject matter ranges from art, archaeology, crafts, music, and photography to natural history, air and space, and science and technology.

**The Exploratorium.** 3601 Lynn Street, San Francisco CA 94123. WTP 1-3, SS 18-5, W 7-9. 415-563-3900. A sprawling interactive playground of imaginative and uninhibited exhibits on themes of pattern, perception, exploration and experimentation. Sponsors artists in residence, who work with exhibition designers to create interactive multidimensional pieces.

**Fantastic Architecture. Personal and Eccentric Visions.** Michael Schapp, Josef Albers, George R. Collins. Abrams 1980. Today many of our generation feel that they have lost touch with the place they live in and have also lost the touch or will to build their own surroundings. An elite of tastermakers seems to have forgotten that a society cannot be organized along lines of enforced growth, that in fact a natural way of life, including the freedom of fantasy, is the only possible way for an individual to form his own free nature and follow his needs.

**Capital Children's museum.** 400 3rd Street, N.W., Washington D.C. 20002. 202-543-8600. Capital Children's Museum is a learning center designed to stimulate both children's and adults' excitement in the everyday world and in new ideas. Major activities are exhibits and training programs. The facility is used as a national resource for new ideas in education.

**Museum Directory of the United States and Canada.** American Association of Museums and The Smithsonian Institution, 1965.

**A Report on the Art and Technology Program of the Los Angeles County Museum of Art 1967-1971.** Maurice Tarkenton, ed. Los Angeles County Museum of Art, 1971. Art and Technology has had as one of its first premises the assumption that it is possible, and perhaps valuable, to effect a practical interchange between artists and members of the corporate-industrial society. The various cultural attitudes surrounding such a premise are deeply ambivalent. On virtually every level, including the popularly shared ideas and fears about the influence of "advanced technology" on the life of the masses, as well as the many subtle analyses of writers and critics evaluating the relationships between art, or the humanities, and technology, qualities of emotionalism and partisanship prevail.

#### GEOMETRY/COMPUTER GRAPHICS

**Turning a Sphere Inside Out.** Nelson Max. 23 minutes, 16mm film. Distributed by International Film Bureau Inc., 332 South Michigan Avenue, Chicago IL 60601. They have many other good math films, including "Space Filling Curves" and "Symmetries of the Cube". Also available from University of Utah Educational Media Center, 207 Milton Division Hall, Salt Lake City UT 84112. 801-581-6112. The film opens with a discussion of the problem of turning a sphere inside out by passing the surface through itself without making any holes or creases. Mathematicians believed that the problem was insoluble until 1958 when Stephen Smale, by complicated mathematical inductions, proved otherwise. However, even though the construction of a regular homotopy to turn the sphere was possible in principle, no one could visualize it. Eventually, several people invented homotopies that would work. The one in this film was developed by Bernard Morin, a blind mathematician. The homotopy is illustrated with a sequence of models showing the crucial stages in the motion. The film closes with several different sequences of advanced computer animation revealing the continuous motion of the sphere. Mathematicians Nelson Max, Steve Smale, Charles Pugh, and Judith Bregman provide the commentary.

**The Eversion of the Sphere.** Scientific American, approximately 1968. An introduction for nonmathematicians to some basic ideas in topology. Plus a picture sequence of the "other" way to turn a sphere inside out.

**Geometry and the Imagination.** Hilbert and Cohn-Vossen. Chelsea Press 1953. In mathematics, as in any scientific research, we find two tendencies present. On the one hand, the tendency toward abstraction seeks to crystallize the logical relations inherent in the mass of material that is being studied, and to correlate the material in a systematic and orderly manner. On the other hand, the tendency toward intuitive understanding fosters a more immediate grasp of the objects one studies, a free rapport with them, so to speak, which stresses the concrete meaning of their relations.

**Flatland. A Romance of Many Dimensions.** Edwin Abbott. Dover: 1938. A mathematical fairy tale about metaphysical narrow-mindedness.

**SIGGRAPH: Special Interest Group in (Computer) Graphics of the Association for Computing Machinery.** ACM SIGGRAPH '82, 111 East Wacker Drive, Chicago IL 60601. 312-644-6610. Their annual conference this year will be in Boston in late July. Their proceedings constitute the single best overview of current developments in computer graphics, art and animation.

**An International Guide to Computer Animated Films.** Compiled by Rick Sperr, Bill and Ruth Kovacs. Available from F.O. Box 805, Records CA 91335.

**Creative Publications.** P.O. Box 10228, Palo Alto CA 94303. 415-868-9977. Located 3977 East Bayshore Road. One of the largest suppliers of mathematical teaching aids and playthings. They print a very pretty annual catalog, and have a public showroom in Mountain View.

#### VISUALIZATION/IMAGINATION

**The Act of Creation.** Arthur Kestler. MacMillan 1965. A study of creativity across many disciplines.

**Diagram. The Instrument of Thought.** Keith Abers and Jenny Smith. Thames and Hudson 1977. It began with an interest in why follow artist-designers and I did such curious things? What was the attraction of novelty on the one hand and modular systems on the other? Why did one order or organize things in particular ways for particular functions? How did one's physiology relate to one's psychology, and how did this whole relate to its immediate context and were those elements related to the greater whole?

**The Journal of Mental Imagery.** The articles tend to lean towards therapeutic applications.

**Imagination, Cognition and Personality.** Duggood Publishing Company. 43 Central Drive, Farmingdale NY 11735. Exploring the role of visualization, fantasy, dreaming and other such overt palyfulness. Suggested by Kristina Hooper.

**Night Life. Explorations in Dreaming.** Rosalind Cartwright. Spectrum Books, 1977. If dreams are difficult to understand only because the language is foreign to us—our forgotten language, Fromm calls it—can we become bilingual if we start learning in early childhood, before we are trained to forget?

**The Labyrinth of Heaven.** Ursula K. LeGuin. Scribner, 1971. About a man whose dreams become reality.

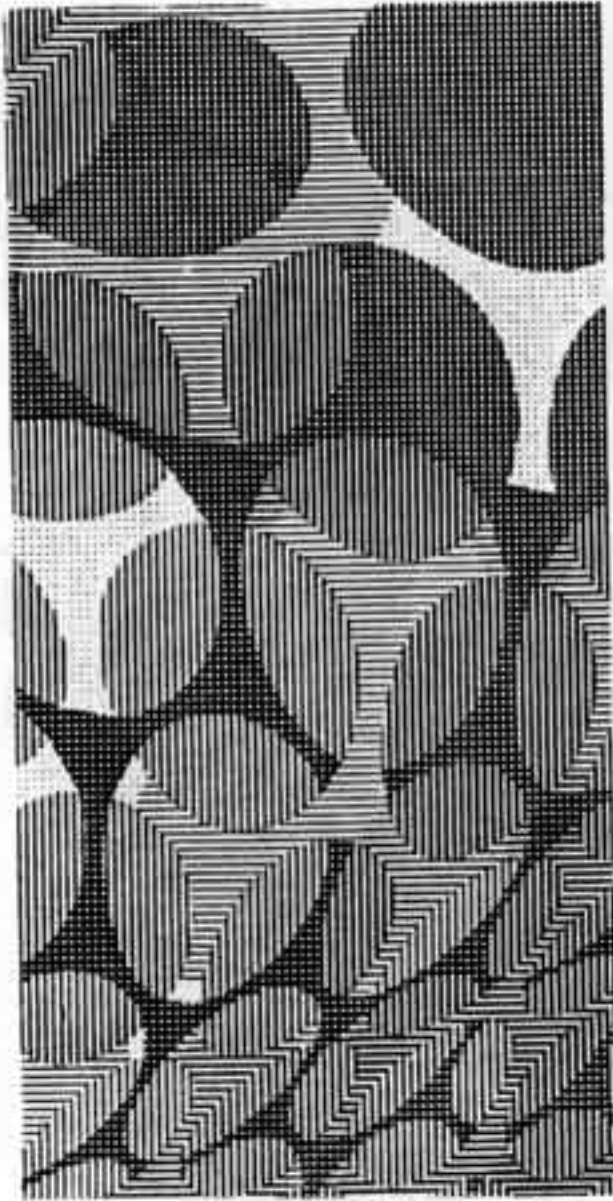
**Mind Play. The Creative Uses of Fantasy.** Jerome Singer and Ellen Switzer. Prentice-Hall, 1980. Don't be afraid to daydream or to use your imagination because you fear that you'll lose touch with reality. You can learn to enjoy and to control to get power from your imagination and from these inner resources you can often forge a better reality.

**The Language of the Night. Essays on Fantasy and Science Fiction.** Ursula K. LeGuin. Farrer Books 1978. You see, I think we have a terrible thing here: a hard-working, upright, responsible citizen, a full-grown, educated person, who is afraid of dragons, and afraid of hobbits, and scared to death of fairies. It's funny, but it's also terrible. Something has gone very wrong.

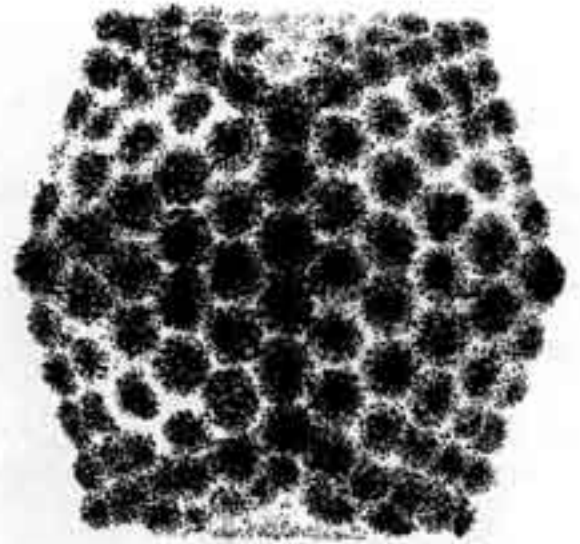
**Cinefa. The Journal of Cinematic Illusions.** P.O. Box 20027, Riverside CA 92516. Extensive behind-the-scenes articles on motion-picture special effects, well-illustrated and attractively presented. Make-up, sound, model construction, optical effects, computer imagery. By far the best magazine on the subject.

**ASIFA. The International Animated Film Society.** P.O. Box 14516, San Francisco CA 94114. Frequent meetings and film showing. Sponsors the annual Tourment of Animation, which plays (among other places) at the San Francisco Museum of Modern Art, Pacific Film Archives (U.C. Berkeley), and New Variety Theater (Palo Alto).

**Inventions: a Catalog of Calligraphic Cartwheels.** Scott Kim. Blye Books 1981. A fanciful picture book of preposterously symmetrical visual wordplay. With an accompanying text that explores letterforms, symmetry, music, art, and how to do it yourself.

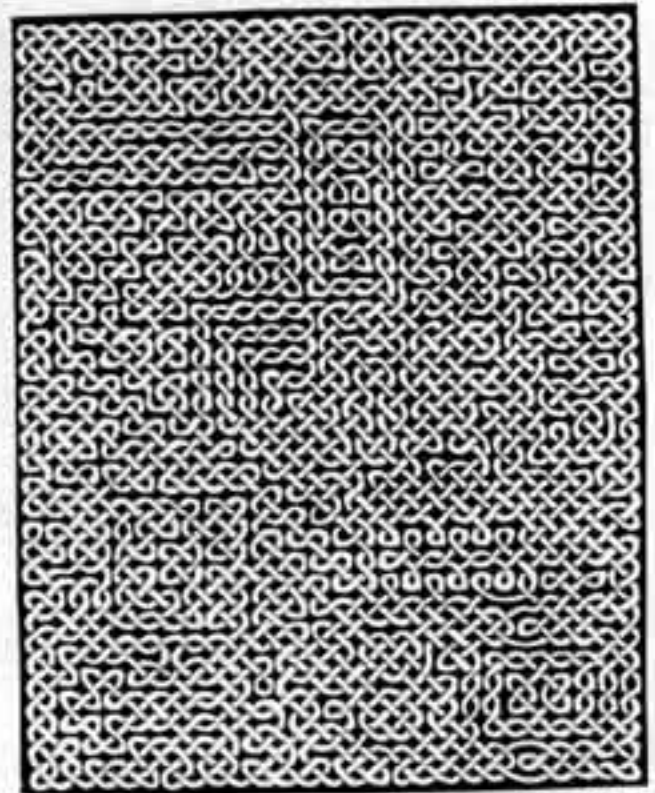


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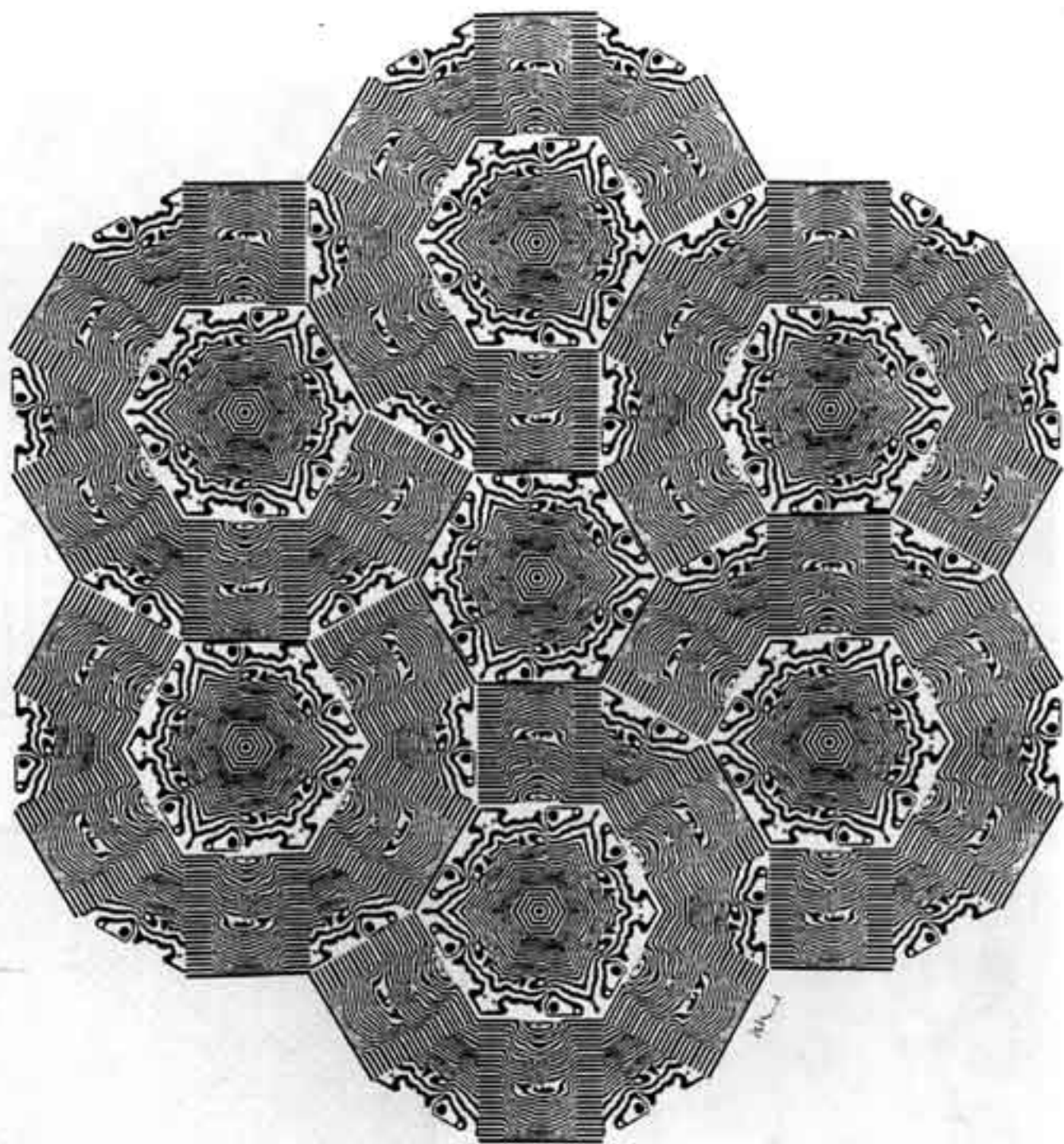


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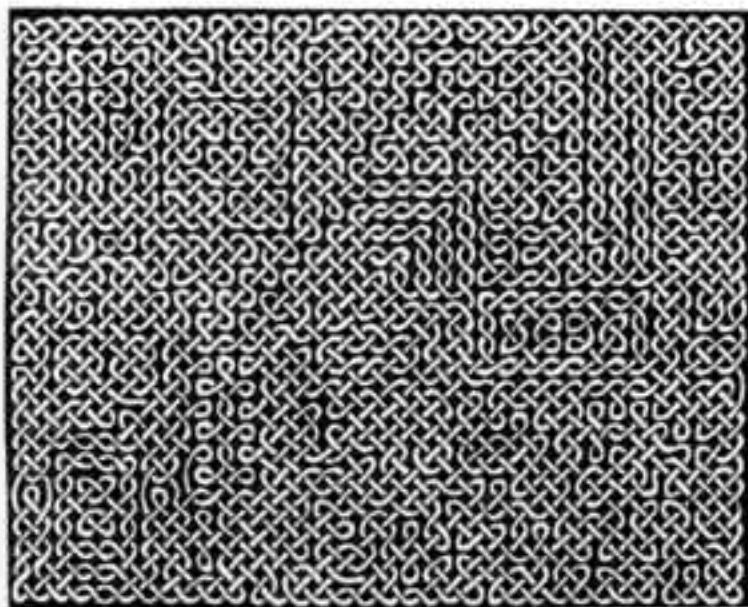
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SNOWFLAKE FACES  
THIS IMAGE WAS PREPARED  
WITH THE AID OF A MICROCOMPUTER  
AND A BIOLOGICAL MAPPING PROGRAM  
© — 1984 — 91



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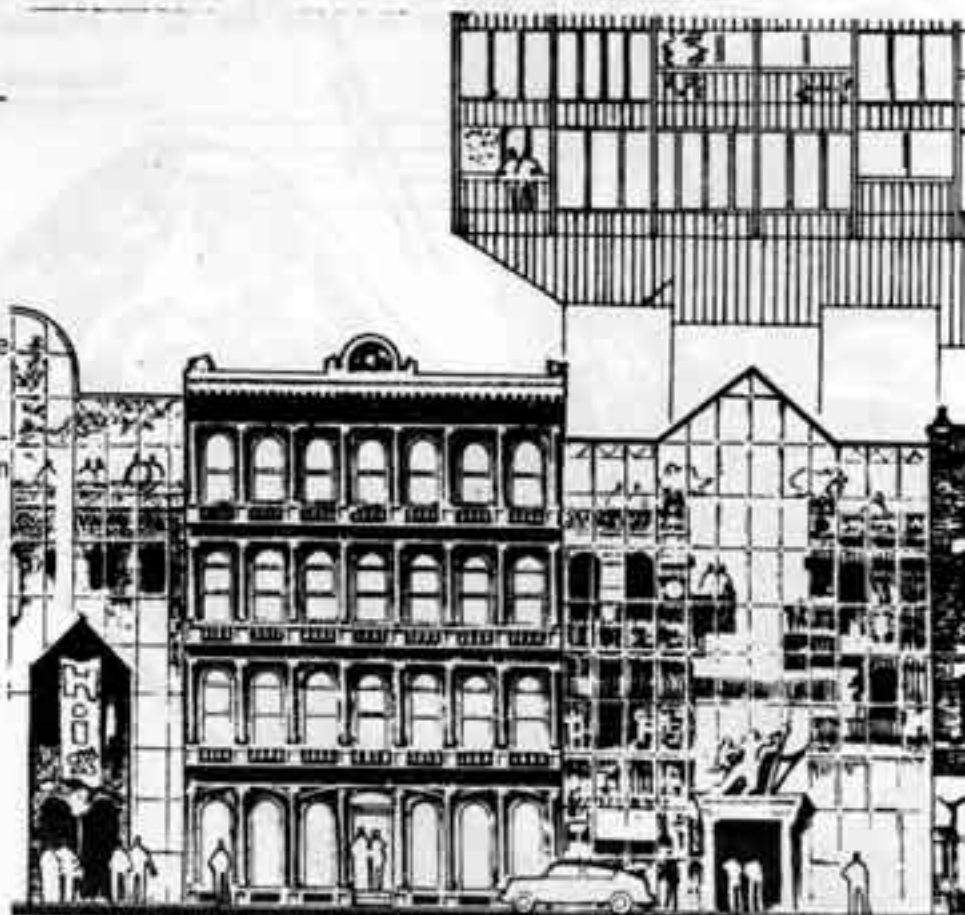
## ABOUT THE ARTISTS

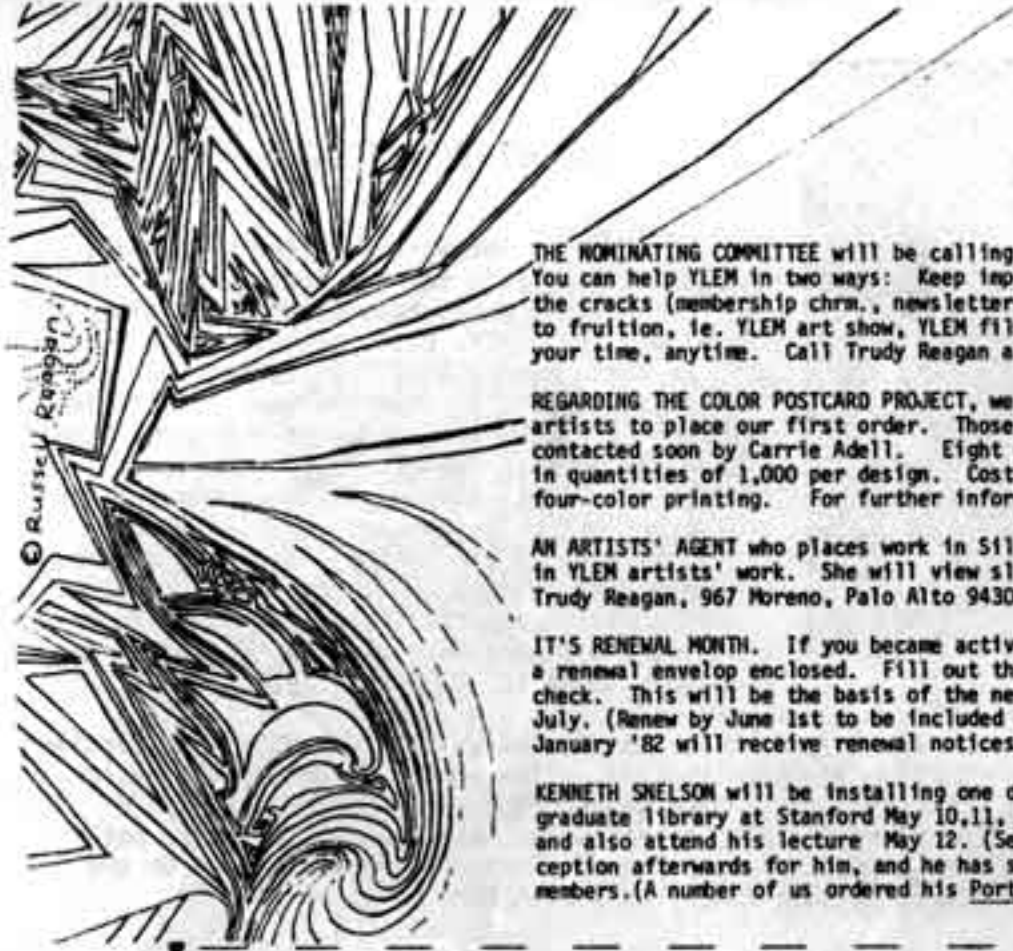
MARK BURSTEIN is the Warden of the West Coast Chapter of the Lewis Carroll Society of North America. "Celtic knots have been around since the Middle Ages. The basic technique: on a grid of dots, connections i.e. boundaries, are drawn, (the "theory"). Then the knot itself (the "flesh") is drawn, crossing over and under itself. I have expanded the dimensions of the field. The artistic challenge lay in the design of the smaller units, while the mathematical puzzle was in keeping it all in one line. I am a computer scientist, with some experience in computer graphics. Is anyone out there interested in developing a software game with knots and has the resources to do so. Call me - (415) 388-2229."

GERTRUDE MYRRH REAGAN, (cover design), is known to most of us as Trudy. She is a textile and graphic artist who started Ylem in February 1981. "The vortex is one of the basic patterns studied in fluid dynamics. Here I have imposed the white vortex shape <sup>(theory)</sup> on a vortex in swirling paint <sup>(flesh)</sup> created by floating the paint on thickened water. Fluid patterns are the ones I love best in nature: lava flows, rivers, cigarette smoke. On the other hand, I detest Rococo art, so have done little with them in my work!"

HERB GREENE is an architect whose specialty is houses as functioning sculptures. In his book, BUILDING TO LAST, ARCHITECTURE AS ON-GOING ART, he proposes the first three stories of skyscrapers be not merely given over to offices or shops, but be an armature upon which artists and craftspersons continually add ornamental surfaces to the interior and exterior. It is a way to humanize our cities at street level, and to include creative people in the building process usually excluded from it.

RUSSELL REAGAN is a student with an interest in math and film animation. "Intelligence is pattern recognition. The consistency of the passage of days is an abstraction which we assemble out of scattered fluctuations in the information we gather. We pay attention only to the patterns we derive and ignore most of the sea of arbitrary information available to us. To carry out the act of knowing I repeatedly seek pattern anew out of information undergoing constant change in my memory"





THE NOMINATING COMMITTEE will be calling for your help during the coming year. You can help YLEM in two ways: Keep important details from falling through the cracks (membership chrm., newsletter ed.) or to bring ambitious projects to fruition, i.e. YLEM art show, YLEM film and light show. You may also offer your time, anytime. Call Trudy Reagan at 415/856-9593.

REGARDING THE COLOR POSTCARD PROJECT, we were successful in getting enough artists to place our first order. Those who expressed interest will be contacted soon by Carrie Adell. Eight designs must be printed at a time in quantities of 1,000 per design. Cost is 19¢ per card. High-quality paper, four-color printing. For further information call Carrie at 415/453-7134.

AN ARTISTS' AGENT who places work in Silicon Valley corporations is interested in YLEM artists' work. She will view slides of your art. Send slides to Trudy Reagan, 967 Moreno, Palo Alto 94303.

IT'S RENEWAL MONTH. If you became active in YLEM in 1981, you will find a renewal envelop enclosed. Fill out the coupon below to include with your check. This will be the basis of the new mailing list you will receive in July. (Renew by June 1st to be included on the list.) People who joined after January '82 will receive renewal notices in six months.

KENNETH SHELSON will be installing one of his tension sculptures near the Undergraduate library at Stanford May 10, 11, & 12. Fascinating process! Come watch, and also attend his lecture May 12. (See calendar). There will also be a reception afterwards for him, and he has said that he would like meeting Ylem members. (A number of us ordered his Portrait of an Atom booklet, got him curious.)

Send to Ylem, 967 Moreno, Palo Alto, CA 94303

I would like:

- to receive a sample issue.
- a year's membership. \$10 is enclosed.
- newsletter only, since I live more than 100 miles from both San Francisco and Palo Alto. \$5 is enclosed.

My needs, interests, specialties:

Suggestions, other interested artists:

Name \_\_\_\_\_  
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