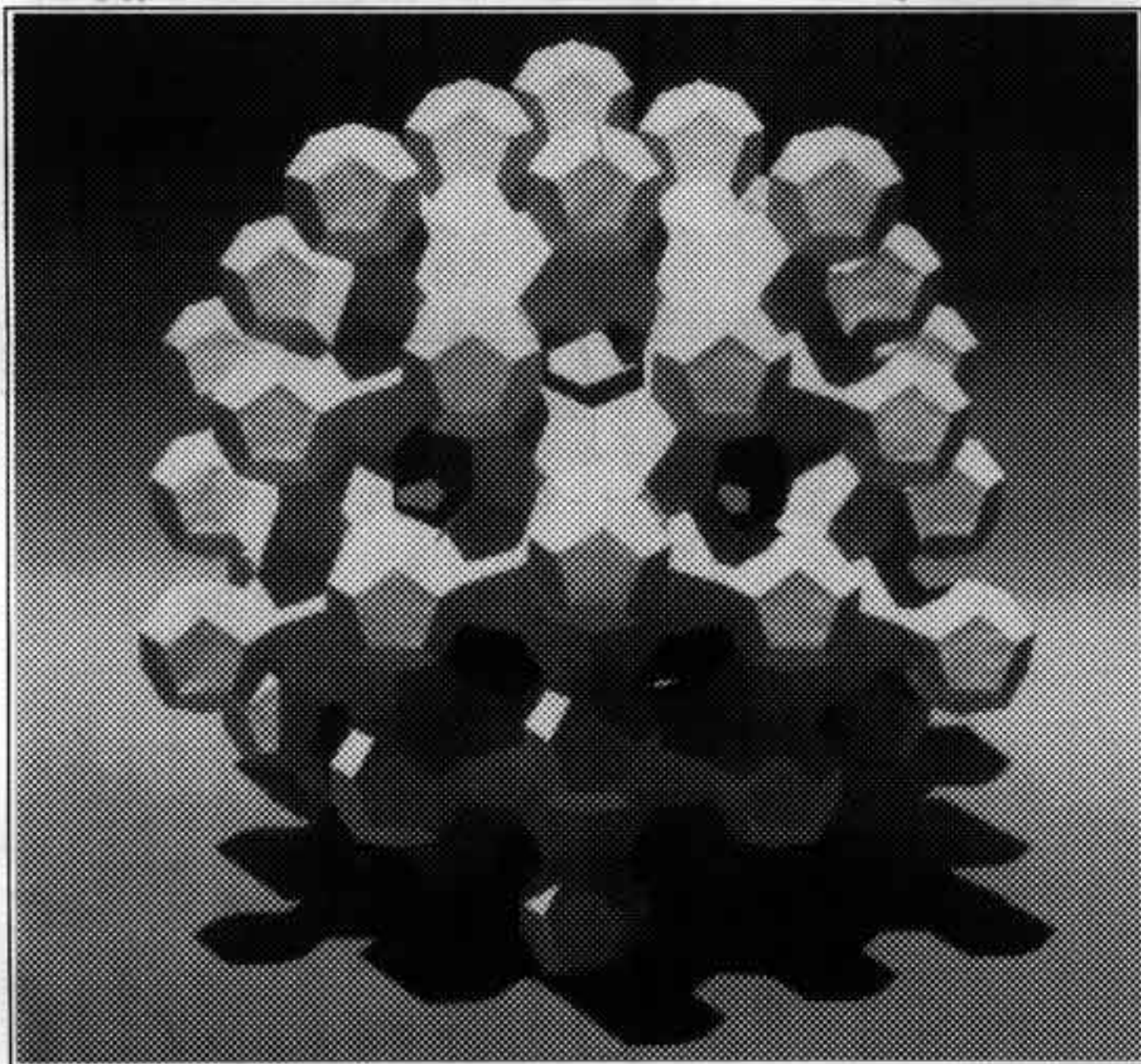


# Ylem

ARTISTS USING SCIENCE & TECHNOLOGY

This issue  
created on  
a Mac  
see page 7

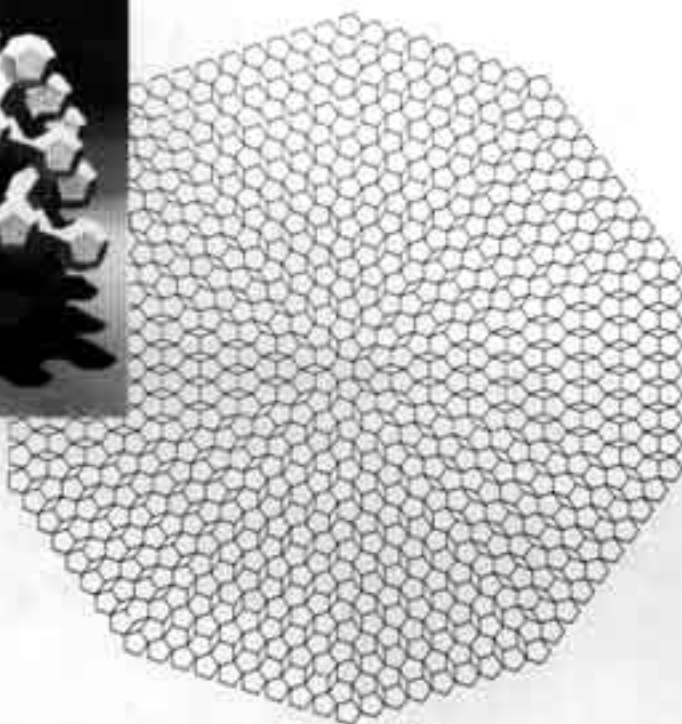
*Ylem* (Eye-lum): 1. The primordial stuff out of which the universe emerged.  
2. An emerging group of artists who believe that science and art enhance each other and human understanding.



## About the Cover



©Robert E. Dewar 1985



© Robert E. Dewar 1985

Bob Dewar started working at JPL in the 60's while he was going to art school, getting in on the ground floor of computer graphics, and inventing software which is widely used today in image-processing. He enjoys exploring unusual geometries with computers and inventing polyhedral packing structures that have implications in chemistry and biology. He writes:

Five-fold symmetry in matter is a recently accepted scientific fact thanks to the work of Dan Schectman of the Israel Institute of Technology, who has succeeded in making a crystal out of aluminum and magnesium which

This newsletter is published bi-monthly and distributed to members of *Ylem*. Membership application is on page 7.

### *Ylem* Officers

Beverly Reiser, president  
Bill Henderson, vice-president  
Fred Stitt, secretary  
Penny Robertson, treasurer  
Mark Burstein, Bob Isli, editors  
David Healy, art director  
Trudy Myrrh Reagan, programs  
Katherine Monahan, publicity  
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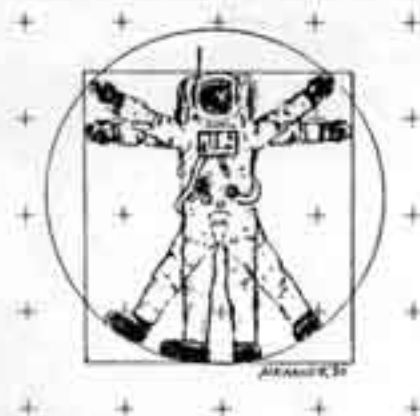
Contributions are most welcome. Drawings, graphic pieces, photos, explanations, submissions to 'Opportunities', 'Random Access', or 'Calendar'; short book reviews or articles are also sought.

## Changed Measures

c 1985 Jon Alexandr

When the first man walked on the Moon in late July of 1969, he weighed no more than a child. His sky contained a brilliant patch of swirling clouds, but it would be another three days before they could possibly rain on him. The surface beneath him, on average, allowed for a somewhat larger sky than he was accustomed to on his home planet. The sun was very bright and the sky was deep, very deep, black. The stars did not twinkle, though the man would occasionally perceive flashes of light when small, very small, bits of speeding cosmic debris confused his retinal cells.

If the man had chosen to make a paper airplane, it could not have flown; had he thrown it, its path from his hand would have transcribed a ballistic arc worthy of a graph. If he had attached small instruments to it, a thermometer perhaps, a transmitter, one could have been tempted to call it a space craft. On its brief



journey over the surface it could then have reported on surging temperatures twice as hot as the hottest Earthly deserts and, if it had passed into the shade of a boulder (or another man), it would have reported on cold that was very cold indeed. The man would not have been at all surprised. He had come prepared. He did not die. He was even reasonably comfortable. He could make silly jokes and hop around. He had realized an ancient dream. He had stepped onto another world.

Leonardo would have been fascinated.

produced an electron diffraction pattern that showed it has five-fold symmetry. The idea that such symmetry could not exist in crystals was so ingrained in the thinking of crystallographers that it took him three years to convince the scientific community of his discovery.

The tile pattern, which was considered impossible even to draw, is shown here. It led to the discovery of a three-dimensional network (cover) which develops radially from a central dodecahedron which has the surface form of an icosahedron and bears a striking resemblance to several different kinds of viruses.

That viruses may be incorporating the principle features of five-fold symmetry crystal growth to form their capsomere shells is no longer a far-fetched idea. Each capsid may be seen to represent a molecule of mostly carbon atoms having the form of a dodecahedron. Thus all capsids would be identical, a much simpler model than the current geodesic one which incorporates both five- and six-sided capsids.

This new research into a new form of matter may ultimately lead to a more effective control of viruses. ■

# Synopsis of "Prestidigitation"

Ylem Forum, June 1985, San Francisco State University

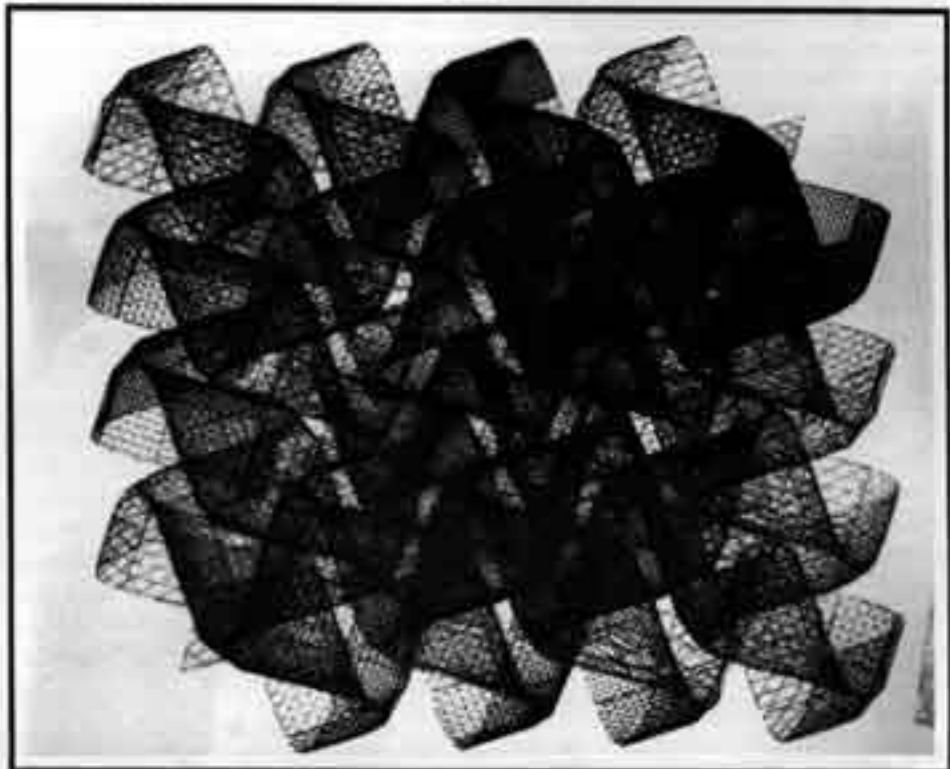
by Mark Burstein

*Prestidigitation*, the magical arts of the computer, was the theme of Ylem's June meeting. Highlighted were the works of several people "keeping watch on the cultural frontiers."

Stephen Wilson, an art instructor at SF State, presented us with the histories of some of his *Interactive Installations: Computer encounters with the public*. These were "conceptual pieces," which often used input from the random public. After a short talk on the function of the artist ("to help the culture digest change, new contexts") he discussed several of his installations. One, for example, called "Telephone Piece", and manifested at the Art Institute of Chicago, was a performance piece. He had prepared slides and recorded sounds of the space around public phone booths (and noted their numbers). The *realization* (in the purer sense of the term) took place as an interactive phone network, where the audience, artist, and whoever happened to answer the phone became parts of a greater whole, and patterns and revelation emerged.

Susan Brown, formerly of Indiana University, pursues the *Fabric of Technology*, creating "paper quilts" - computer generated stitchery of cross-hatched lines, pushing some powerful plotters to their limits (and beyond). Working in FORTRAN with a CDC-85 and Versatec plotters, she shared with us her creative evolution, from simple Mondrian-like squares to a series of intricate, inspiring pieces with an astonishing range of colors (from a 4 pen plotter), techniques (transparencies, laces, ribbon effects), and inspirations (including a series based on the harmonics of a violin). The resulting drawings were three to four feet long and took ten to fifteen hours apiece just to plot. Whether viewed from inches or yards away, the work was a marvel to behold.

Ron Pellegrino, of Electronic Arts Production in Petaluma, talked on *Visual Music*, and presented some of the theory behind it, such things as the light/music spectrum, wave forms, how the brain recognizes vibrations at the atomic level and how patterns are formed. He then showed a fabulous videotape of



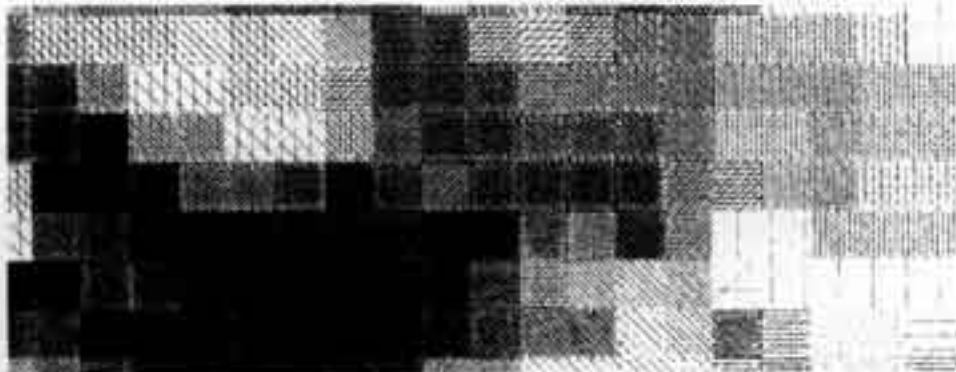
© Susan Brown

excerpts from a "jam session" of seven artists and musicians. A realtime projection of laser light was controlled from a music synthesizer and run through an electronic camera to a video synthesizer, where more effects could be added (digitized video feedback, and so on.) My notes at this point are fairly incoherent, but include such phrases as *layers of diagonally pulsating colored rain, green dragons with fiery vapor, japanese brushstrokes, fireworks, and lightning storms. Inspiring!*

Milton Komisar, also of SF State, is the creator of enormous (up to 42' tall)

electronic sculptures of "what we see when we close our eyes". Using fibre optics and incandescent lights in precisely programmed sequences, rods of light-carrying plastic, the hypnotic patterns he produces are dreamlike, spirited. The slides barely do justice to the experience of lying in a half-light with these huge, spacey creatures revolving above your head. The ultimate chandelier!

The meeting ended with an interesting panel discussion, *The Artist's Kluge: Transcending the Technology*, which was followed by the ultimate prestidigitation: a mass disappearance! ●



© Susan Brown

## The Technology of the Human Brain

## ShowPage

**Editor's Note:** We welcome Fred Stitt, Ylem's new secretary, as a featured columnist, replacing Trudy's *Ylem Notes*. Fred is an architect, lecturer, and published author. He is a lifelong advocate of what he now calls *Techno-Romanticism*, the integration of the arts and sciences. By next issue, we'll think of a better title.

Several years ago, I attended a lecture on "quantifying consciousness" conducted by Dr. Harris Walker, a physicist at Johns Hopkins. He thought it would be useful to find some *measurement* of conscious activity. A provocative idea.

Imagine! We spend every moment involved in some level of conscious activity by until now noone has suggested that it be *measurable*, that it be identified in discernable quantities.

The "bit" is an immediately applicable measure. As most of you know, the bit is the "atom" of information, the irreducible primary of data. It means, variously, "yes" or "not yes"; "on" or "off"; "existing" or "nonexisting"; or, in binary: 1 or 0.

Going "by the numbers" Dr. Walker estimated that our brains are processing a prodigious 10 trillion bits per second!

There are many ways of making such an estimate. One such method is to start with synaptic activity and multiply the number of neural cells by communicative activity, which produces the rather overwhelming number of 10 trillion bits per second. And there are far higher estimates.

In pursuing the matter, I talked with a researcher at Xerox. He suggested that communication between cells was a *wave phenomenon*, rather than just linear switching, and involved frequency, amplitude, and period, to the point that *each cell* probably processes 10 million bits per second. Assuming that there are 100 million synaptic cells in the brain, the total rate of communication/data processing in the brain comes to one *quadrillion* bits per second.

Stopping short of the more extreme estimates, let's put the earlier numbers in a more graspable form. Starting with Dr. Harris' original estimate of ten trillion-bit processing power, we can use a word processing analogy to get an idea of what the numbers mean. Using the straight computer code that requires 8 bits to equal one discernable symbol such as a letter or number, and picturing then that the kind

of processing as words flowing across a screen, we are looking at the equivalent of 15 million English words per second. If processing were at a more realistic estimate of one quadrillion bits per second, you'd have to multiply that previous word processing analogy of 15 million words per second by 1,000.

We are, as conscious entities, processing information at rates and complexities that are truly staggering. We are incredibly brighter (potentially) than we have ever credited ourselves as being.

Those who work with computer visual simulations of reality have reported it takes a lot of Crays and a lot of VAXs many hours to approximate the type of visual stimulus we handle every instant of our lives.

And we're handling all the other stimuli, too: recycling all our memories of past events; running the "automatic" body functions from cell regeneration to digestion to breathing; and passing data not only about sensates, percepts, and concepts but also about another *level* of mental activity which includes the awareness of ourselves doing it -- our awareness of being aware.

The awesome brain power suggested by these estimates of quantifiable mental activity would imply several ideas:

1) Our childhood schooling processes are designed for such a low level of functioning that we are deliberately forced to shut down conscious activity to learn at the snail's pace required of us.

2) Our self-image as a species and as individuals has been extraordinarily low compared to what we would think of other creatures of similar brain power.

3) Most of us have not comprehended the enormous speed and power of our mental functioning because the tools we are using are not up to the task. Since we are *trained* to hold the mind down to ten miles per hour in functioning, the internal experience of racing at thousands of miles an hour is beyond our perception or understanding.

*continued on page 9*

ShowPage is the San Francisco Macintosh Users Group. The group has monthly meetings at Fort Mason in San Francisco. These meetings have featured speakers and companies such as; Andy Hertzfeld, Bill Atkinson, David Bunnell, Microsoft, ConcertWare, Adobe Systems, and a host of others. The group also sells Public Domain Software disks and they publish a monthly newsletter.



For further information write ShowPage, 2040 Polk Street #340, San Francisco, CA 94109, or call 415/ 864-7033

This issue of *Ylem* was created and produced with the *Apple Macintosh* and the complimenting technology associated with the *Mac* in the following order:

1) The articles and calendar were written using *MacWrite*, except for this article which was entered directly on this page with *Aldus's PageMaker*.

2) Graphics for the *Ylem* logo, and the borders were created using *MacPaint*.

3) The copy and graphics were then electronically pasted into the finished document using the *PageMaker* program.

4) The finished newsletter you are now viewing, was produced on an *Apple LaserWriter* which utilizes the *PostScript* language developed by *Adobe*.

The only elements in this publication not integrated into *PageMaker* were the photographs and the screen shots. These were all PMTs (a PMT is a form of high contrast photo). With the proper scanners and associated devices these too could have been integrated.

At the right is a Mac screen when the program is in *actual size* mode. I changed the column width to compensate for the image and I can easily change it back when I reach the bottom of this image. Also in this image the *File* menu can be seen at the right.

Once the copy is placed it can be edited and modified for changes in font, size, *style*, line length, line space, etc.

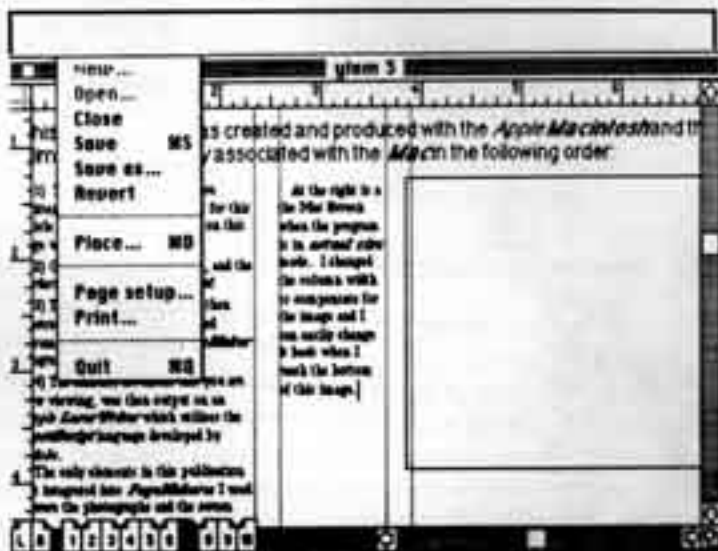
*PageMaker* requires a 512K Mac and an external drive.

The program comes on two disks so any files you create are best stored on a third disk. A hard disk is essential for doing any volume work with *PageMaker*.

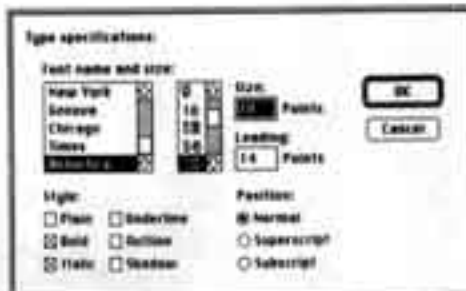
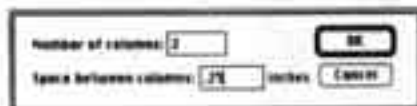
*PageMaker* puts the Mac into a category closely rivaling a full fledged typesetting system. In some respects even surpassing these systems

in its ability of enabling you to experiment with the proportion and placement of your copy and the integration of graphics.

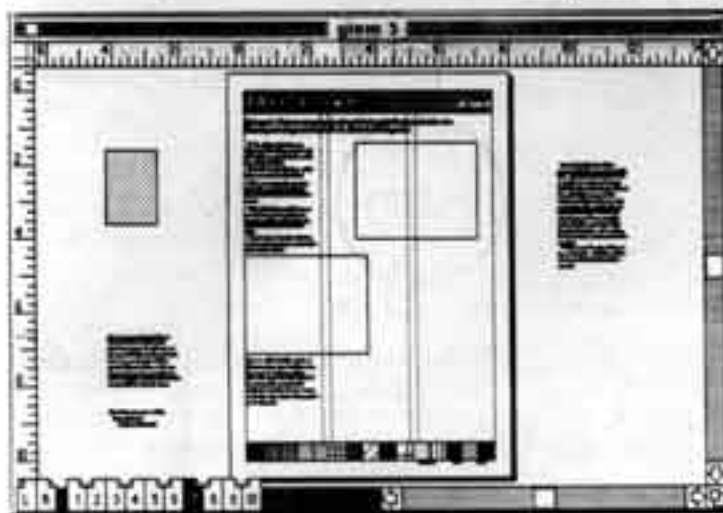
The Mac will be able to interface directly to *Allied Linotype's* new *Linotronic 300* and *Linotron 101* which will be available in the next few months. These are high-quality typesetting systems which will have *Postscript* resident as does the *LaserWriter*.



Shown below are some of the command windows for setting specs in *PageMaker*.



For consultation concerning graphic production with the *Mac*, *LaserWriter*, *PageMaker* and other bits, call: David Healy at **HEALY DESIGN** 415/ 864-7033.



Above is a 68% reduction of a Mac screen from *PageMaker* when the program is in *Fit in window* mode. You can see the extent of work I have done on this page. On the pasteboard surrounding the page you can see the other pieces of copy I am considering for placement. In this program there are 5 sizes at which one can view the page, they are: *actual size*, *70% size*, *50% size*, *Fit in window*, and *200% size*.



**Upward Profiles**

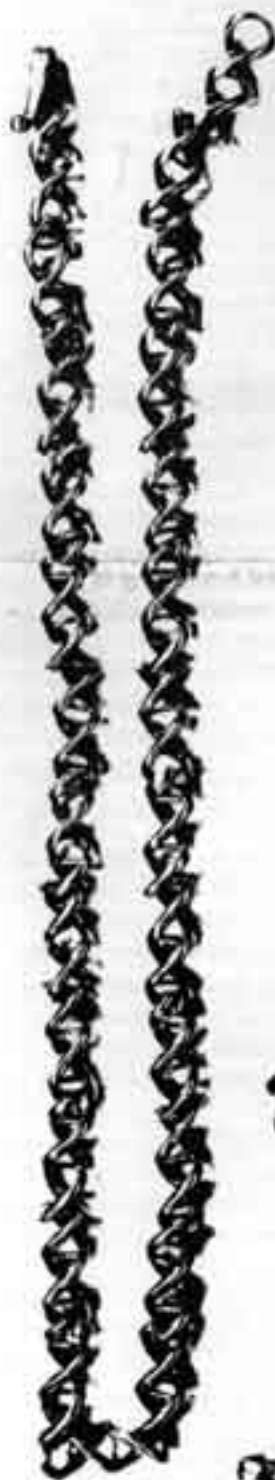
**Upward Profiles**

**Upward Profiles**

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**Upward Profiles**

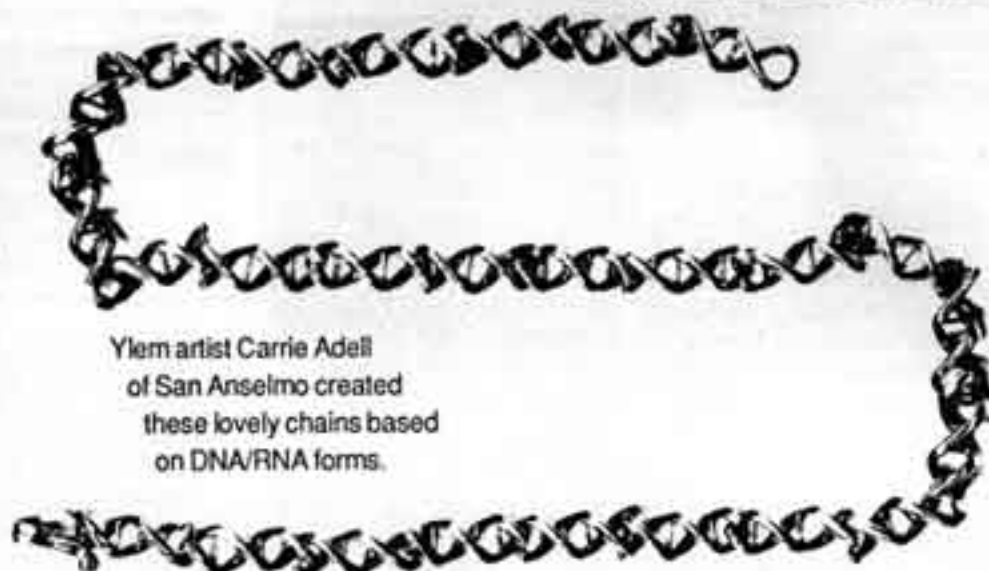
In the interest of raising our Techno-Romantic profiles a tad higher, I would like to start publishing more photos of artists' work. This column will be the medium. If you or your gallery would send an 8x10 glossy, a press release or an article, I will do my best to get it in the newsletter at a time as close as possible to your show. Even if it misses the show date, it still helps to keep members apprised of what other members are doing. If you have a show scheduled and don't want to concern yourself with getting the glossy and press release, give me a call and I'll contact the gallery. Most shows are scheduled far in advance of their opening so please let me know, equally far in advance. The logistics of getting paper from one spot to another for a publication deadline are suprisingly slow. I can be reached at (415)482-2483 - by Beverly Reiser



Bay-Area artist Beverly Reiser started working in neon about a year ago, applying tubing to sand-blasted mirrors to create fantastic swirls of color that vibrantly interact with reflective surfaces. Her tour de force so far has been a neon mirror wall, nine by thirteen feet, with neon tubes meandering ambivalently upward like stepping stones to the clouds culminating in a brilliant gothic arch. She explains, "I've been very interested in how neon makes the glass glow in a special way and casts light out into the environment. I also love that sense of motion that can go on in a piece. I don't like things to be rooted and static."



Beverly Reiser, *Ribbons of Love*, neon and sand-blasted mirror



Ylem artist Carrie Adell of San Anselmo created these lovely chains based on DNA/RNA forms.

## Random Access

### Light Ideas

Environmental ethics and high energy costs continue to fuel research into architectural designs making efficient use of the sun's heat and light. One product of this research is the *holographic window*, a passive solar technology artists may wish to explore for non-architectural uses. (see "It's all done with holograms" in the September 1984 Ylem)

More news on the solar front can be found this year in the May 25th issue of *Science News*. In an article titled "Building for the Sun," holographic windows are but one of several new ways to manipulate sunlight. These range from high-tech *smart windows* with *electrochromic* layers enabling manual or automatic control of the window's transparency...to more prosaic but nonetheless sophisticated systems of mirrors and *light pipes*. Taken together, these new technologies offer intriguing possibilities for artists looking to expand their palettes. Got a light?

- Jon Alexandr

### Techno-squirrelling

For hardy techno-squirrels, the outlet for Stanford Medical School's old instruments (oscilloscopes, office furniture, plotters, laser equipment, etc.) presents some unusual opportunities. The office, called Stanford Surplus Property, closes at 4 pm and is "the devil to find", but the Shell station at Campus Drive and Serra St can give directions to Bon Air Siding.

-Trudy Reagan

### Cosmic Glue Review

Cosmic Glue is a table tabloid glued, taped, and tacked together once a month or so dealing with pet aliens from outer space, yuppies in love, the soul of a donut, madness, and waging peace. Subscription information: 4410 Northwest Road, Bellingham WA 98226.

- Carol Goodrich

### Ride on the Space Shuttleif

you didn't happen to be selected as a space

tourist, you can experience the next best thing: an awe-inspiring film of the earth and the shuttle itself, taken by a 70mm IMAX camera handled by the astronauts and projected on the 96 foot wide, 7-story Pictorium screen at Great America in Santa Clara. Called "The Dream is Alive", the 37 minute film takes you from blastoff to deep space in colorful, supremely detailed photography.

### T-Shirt Mania

*Underware* sell a set of ribbons or pens for your printer (ImageWriter in color, most others in B&W) which prints designs on regular computer paper, but which can then be ironed onto your shirt. Information: Diversions, Inc. 1550 Winding Way, Belmont, CA 94002 (415) 591-0660

*Fred's Corner* continued from page 4

4) We probably *do* have glimpses of our high rate of mental functioning in the form of insights, multilevel hallucinations, and artistic inspiration.

5) Our processes of communication, creative activity, education, problem solving, perception and cognition, may be radically changed and accelerated by this fresh look at ourselves and our capabilities.

I'll have some provocative references as follow-up to this item in later issues of Ylem. ☘

### Membership/Subscription

Send to Ylem,  
P.O. Box 749 Orinda, CA 94563

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I would like:

- to receive a sample issue
- \$20 year's membership
- \$15 student member
- \$15 (US dollars) newsletter only



**Lightscares** is a mounted show of state-of-the-art holography which is available for exhibit centers. It includes 20 holographic images, complete with title cards and independent lighting fixtures, installed on free-standing 4' by 8' walls. For information: LIGHTSCAPES c/o L.A.S.E.R., P.O. Box 42083, SF CA 94101 (415)431-9581.

**Next forum:**

## **LIFE**

August 3, 2-5:30 pm

Cypress Room, Tressider Union, Stanford University

**Molecular Graphics: Computer-Assisted Insight and Reasoning in Three Dimensions**, Bob Langridge

**Cellular Automata & The Game of Life**, Adolph Smith

**Medical Illustration**, Ellen Going Jacobs

**The Function of Beauty in Nature**, A National Geographic Film

**Microcosm: A Cellular Fantasy**, Videotape by Earl Etienne

Directions: Tressider Union is behind the Main Quad. From Palm Drive (University Exit on 101) or Embarcadero, turn left onto Campus Drive and follow signs to Tressider Union. We'll be upstairs - follow YLEM signs. Parking is ok almost anywhere on Saturdays.

Special thanks to TechArt 415/ 550-1110 for the use of their **LaserWriter**



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