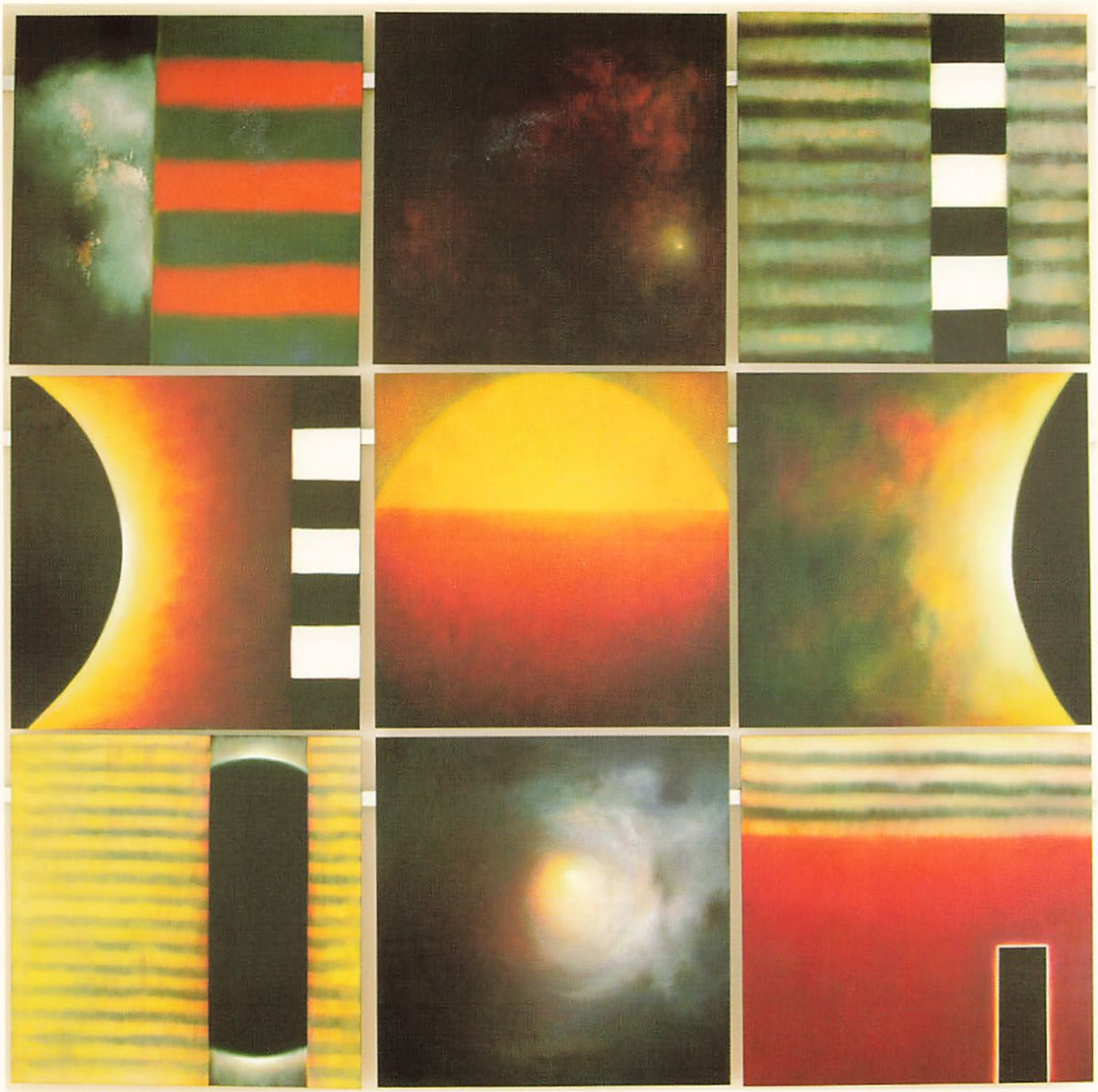
COMMUNITY COLLEGE MOMENT



TECHNOLOGY & SOCIETY

Printing
Lane Community College
Printing and Graphics

Cover
"Transition Zones: Genesis"(oil, wax on wood panels, 90" x 90" x 1/2") by Kathleen Caprario, studio arts faculty at Lane Community College. She writes: "The group of paintings titled 'Transition Zones' are ... spaces that offer the possibility of passage and change.... By juxtaposing nine painted panels in a particular order I hope to create for the viewer an unfolding drama — a story — that will enlighten, sustain, and inspire new voices."

Community College Moment
Spring 2007

The *Community College Moment* is a faculty-led journal offering a forum for high quality progressive works that reflect a new vision of scholarship at the intersection of academic, activist and community interests. The *Moment* seeks to encourage and enhance the vital, inclusive scholarly culture uniquely possible at a comprehensive community college.

The *Moment* is published at Lane Community College in the spring of each year, and is available for single-copy or subscription purchase. Address all correspondence to: Community College Moment, Lane Community College, 4000 E. 30th Avenue, Eugene, OR 97405, attn: Steve McQuiddy. Visit us on the web at https://teach.lanecc.edu/ccm

Thanks to the Review Panel members, who volunteer their time and expertise reading submissions and offering extensive feedback to authors. Special thanks to President Mary Spilde, Tamara Pinkas, Eileen Thompson, Sylvie Matalon-Florendo, and Jim García. And a steady thank you to the Moment Board of Directors, and the countless faculty, office staff and other members of the Lane community, and particularly the editors' departments, Academic Learning Skills and English, who continue to support an environment that makes this Moment possible.

The views, opinions and ideas expressed in the *Community College Moment* belong to the authors and artists, and do not necessarily reflect those of Lane Community College, its employees or Board.

This information is available in alternate formats upon request by contacting Disability Services: (541) 463-5150 (voice), 463-3079 (TTY), or disabilityservices@lanecc.edu (e-mail).

ISSN 1533-8851. Volume 7, Spring 2007

Community College Moment

Volume Seven
Spring 2007

Art

Print Technology

Faculty Professional Development

Readings and Reviews

Don't Think Computers

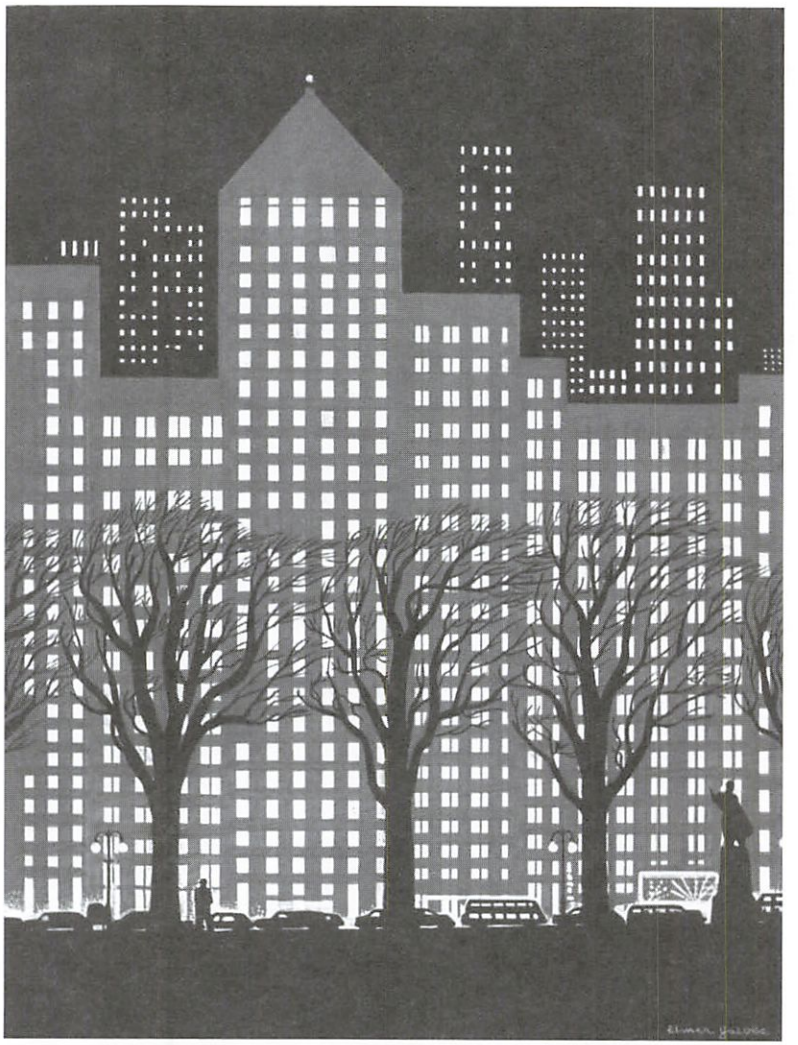
Of course think computers. But not only computers. Technology, in its broadest sense, describes our tools and how we use them. From the hammers, chisels, screwdrivers, telephones, washing machines, and word processors that shape our material world, to the words, numbers, sounds and symbols that inform our mental landscape, we can think of technology as a wide-ranging topic that addresses not only our tools but the effects of our choices in using them.

More efficient production and broader delivery of materials and knowledge have in some cases returned the investment many times over. In other cases, the results have been less desirable. The task, it seems, is how to achieve a balance between the possibilities presented by technology and its costs and unforeseen consequences.

The college environment is a natural developing ground for new technologies as well as a place to study their effects on society. We can't begin to cover all that is going on concerning this topic at Lane, or any other comprehensive college with a similar mission.

Join us, then, in a look at what some elements of society are thinking about some elements of technology. From poetry spitballs to water stepwells in India, from lithography and digital divides to "SimMan" and Braille, from pencil and paper to time travel, from Ekgmowechashala to comedia del teatro histórico, from Internet colonists, Chinese proverbs, orca pods, and murder — to water, CDs, and the Society for Sanity in Art. As long as we retain the desire to make our ideas reality, we have the ability to create technology; and as long as more than one of us survives, we have the basis for a society. Turn the page now to consider your options.

The Editors



"Cityscape" by Elmer Jacobs. For more on Jacobs, see "Deconstructing Elmer" on page 121.

Baseball, Poetry

Jean LeBlanc

From this camera angle, the pitcher is
backlit by the low sun setting over
the left field wall. The camera zooms in
to capture his expression as he looks
in for the sign. He straightens up. Before
he goes into his wind-up he spits
through his teeth, a perfect loogie,
compact mucus core with just enough moisture
to make the whole thing gleam, a miniature
Milky Way of spittle. This galaxy
of droplets sparkles, swirls in the sunlight
in slow motion, slowly dissipates
around the pitcher's boyish face and halo
of blond hair. Angels dancing on a pin
are not more lovely than this moment.
I wish I could do that in my job, spit
as I prepare to hurl poetry
at my students. Here's the wind-up, the pitch:
"Yeats!" the umpire cries. I see what's needed next:
"Frost!" The crowd goes wild. And here's my moment,
when even the most hostile kid in back,
the one who asks why Comp. II is required
for criminal justice, even he's impressed
as a ninety-mile-an-hour Wordsworth
comes straight toward his head, and for an instant
he doesn't know what hit him, a sonnet
has knocked him on his ass. And I savor
that flash of anger in his eyes, knowing
I made him think, at least once. If only
teachers could spit, Emily Dickinson
hidden in the webbing of our gloves,
Whitman keeping us loose between innings.

Jean LeBlanc *is an adjunct at Sussex County Community College in Newton, New Jersey. She grew up in Massachusetts, the heart of Red Sox country, and though she is now an exile in the land of Yankees and Mets, she loves her life of poetry, gardening, and teaching literature and writing. She admits to an occasional indulgence in Schadenfreude when one of the local teams does poorly.*

Ekgmowechashala: The Tooth in the Brain

Sandy Jensen

"Monkeys in Oregon?" said the museum display plaque.

"Something wrong with that," I thought to myself and peered closer at the tiny fossil tooth pinpointed by a tightly focused spotlight.

Earlier that day, my husband Peter and I had driven our Subaru Forester like a time machine 45 million years into the past. We started from the Wilson Ranch in Fossil, Oregon, and drove around behind the Fossil High School, where for a few bucks, you can dig for Clarno Formation fossils. And the cool thing is, you have just as good a chance to find a superb specimen of moonseed, metasequoia, kiwifruit, an interesting nut or even a bat as any professional paleontologist. Digging this rich cliff is like taking a 45 million year step back into the Eocene, only back then a vacation here would have been more like a trip to Costa Rica, complete with volcanoes rising out of a bio-diverse jungle.

As we continued our journey up the John Day River valley, the eons unraveled past our car windows like a scarf caught in time's door. Woven rock strands braided the exposed layers of cliff face with all the juicy colors that tag this to the trained eye as a world-class paleontological site. For rock nuts like me, the pancaked layers of mudstone, siltstone, clay, ash, tuffs and lavas are dizzying for the secrets of fossils they hold from the mega faunal to the microscopic.

Peter and I are trying to figure out this 14,000 square acre national crown jewel in our own back yard: The John Day Fossil Beds National Monument (est. 1975). Nature is trying to make it easy for us by color-coding the rock layers. The loose, deserty brown is roughly speaking the oldest, the Clarno Formation (54-37 Ma), full of fossil fruits, nuts, and leaves, as well as the peculiarly large amynodonts and brontotheres and the ruling saber tooth, Patriofelis.

Working the eye up from the bottom of the canyon, on top of the Clarno strata are the three members that collectively make up the John Day strata (39-18 Ma). I know that the Turtle Cove member is that eerie, aquamarine blue-green streak, which sometimes opens up into blue basins or blue cliffs by the side of the river. Weirdly enough, the fossils here are maroon, even purple at times. These represent the explosion of life that typifies the Miocene — oreodonts, rhinos, and more saber-toothed cats — in all, in excess of 100 mammal groups.

In a striking contrast so vivid no one would ever confuse the two, the reds and oranges of the Mascall Formation (16-12 Ma) pile on top of the blue. Oregon was

a savanna by this time, and fossils tell us that gomphotheres (early elephants), bear-dogs, weasels, more cats, and more rhinos all roamed this vast grassland.

Capping the whole wild assemblage are the Rattlesnake strata — a spectacular ignimbrite known as the Rattlesnake Ash Flow Tuff and a thick sequence of paleosols and conglomerates (8-6 Ma), which to the eye look like black basalt, but in reality are much more complex than that and hold their own fragmented record of dogs, peccaries, camels, sloths, and horses (National Park Service. U.S. Department of the Interior).

All of these formations, we know, hold a mind-boggling array of ancient critters. But monkeys? I think not!

Our time capsule had deposited us on Memorial Day 2005 at the new, not-quite-finished Thomas Condon Paleontology Center, a modern interpretive museum out in the delicious middle of nowhere, Oregon. The so-called monkey tooth was front and center in its own display case. The provocative signage certainly had my attention, so I started in on the fine print. "Ekg-mow-we-cha-sha-la," I read, a flying lemur. Oh, not a monkey, but a lemur, and lemurs are primates. I get it now."

I knew from reading Chris Beard's book, *The Hunt for the Dawn Monkey: Unearthing the Origins of Monkeys, Apes, and Humans,* that lemurs were way back there on the primate family tree; not exactly kissin' cousins to us humans but fewer degrees of separation than you might want to think. I understood now what the excitement was all about: This tooth "is the last solid record of it [Ekgmo] in North America" (Fremd). Across the river from the museum rises a jaw dropping, multi-layered, many-colored baklava of a mountain, 1024 meter (3360 feet) Sheep Rock. This crazy tooth had been picked up by a BLM person in a routine fossil scrounge for bones exposed by the winter rains (Chapman). The tiny flash of enamel in the blue dust probably looked like a rat's tooth, but rats are interesting, too, so the stratigraphic details were carefully recorded before it was carted away to await further identification by Ted Fremd, the National Park Service paleontologist for the John Day Fossil Beds National Monument (JODA).

One way to burrow your mind into a database of information as complex as that represented by JODA is to grab hold of one artifact and follow its trail. That tooth bit into my mind and my imagination and, okay, I got a bit obsessive-compulsive about it. I don't know if you remember Wallace Stevens' poem, "Anecdote of the Jar" (Hint: It's not about Tennessee):

I placed a jar in Tennessee,
And round it was, upon a hill.

It made the slovenly wilderness
Surround that hill.

The wilderness rose up to it,
And sprawled around, no longer wild. (36)

This is the poet's way of saying that just one artifact, a jar or a lemur tooth, placed in the "wilderness" of a field of data starts to act like a magnet placed under a sheet of paper scattered with iron filings. The artifact will act as a magnetizing agent around which information will organize itself. The wilderness of data will "sprawl around, no longer wild."

So it was the magnetic guidance of Ekgmowechashala that led Peter and me to wander into the Prineville, Oregon BLM office three months later, in August. Just to make the young lady behind the desk feel like she was being acknowledged when she asked, "May I help you?" I said, "Do you have any information on archeology in the Ochoco Mountains?"

Two minutes later we were shaking hands with the Paleontology Program Coordinator for the BLM in Oregon and Washington, a thin, smiling man, who looked wiry and tanned as a field worker yet academic with his sharply focused gaze behind thin-rimmed glasses. He had the body tension of a person who is so enthusiastic about his subject that he's practically jumping out of his skin. "Hello," he said, "My name is John Zancanella. What can I do for you?"

I hadn't actually expected to meet a real person, so I hadn't prepared any interview questions. Without thinking, I blurted out the first thing that came to mind (I like to think the lemur made me say it), "Do you know who found that lemur tooth on display at the Thomas Condon?

Zancanella's already vivid face lit up several more watts, "I did!"

I felt like screaming in my best Valley Girl voice, "Ohmigod!" but I restrained myself to an excited, "That's amazing! Tell us the story."

That little lemur tooth in the brain had led me to the horse's mouth. Peter and I both had our notebooks out, and our hands flew across the pages while John told his story and gave us an impromptu undergraduate seminar in Oregon field paleontology. "Fossil hunting isn't exciting," he said, the madman's fire in his eyes belying his words, "It's hot, dusty, dry, dirty work." Too late to discourage me, John Z., I got hooked on fossils in fourth grade. Might I add that I was born and raised in this hot, dusty, dry, fantastically beautiful, endlessly fascinating, smelling-of-juniper-and-sage-after-a-rain country? Now, about that tooth.

John told us about finding the tooth in the Turtle Cove blue zone of Sheep Rock, and, indeed, thinking it was a rat's tooth. When asked to speculate how it got there, he said the tooth "perhaps was excreted by a predator, who could have moved twenty miles from where it first consumed Ekgmo.

John took his routine find that day to Ted Fremd, who said later, "I will admit when looking through Zancanella's field collections for that day, that I got rather excited recognizing this as what it was. We went out shortly thereafter to see if there was more, and couldn't locate any. I'm sure that on one of our forays we'll find more of this little fellow — and that will be exciting."

Zancanella filled in a few visual gaps for us, too. The little nocturnal lemur was as small as a cat or a spider monkey. It had skin wings like a flying squirrel. I knew nothing about lemurs, so later I augmented John's description with some reading:

> Most lemurs are lanky, agile animals. Relative to their torsos, lemurs have long, gangly limbs, longer than their forelimbs. As a result of these body proportions, when lemurs walk on all fours they look like "rear-wheel drive" animals, with their rear-ends higher up than their shoulders. Most lemurs spend relatively little time on the ground, however. Like the vast majority of other primates, they strongly prefer to move and feed in trees. There, their seemingly skewed limb proportions aid them immensely during their acrobatic leaps from tree to tree. Lemurs use their powerful and elongated hindlimbs to propel themselves forward at the beginning of each leap, which explains why their limb proportions are so unusual compared with more typical quadrupedal mammals. (Beard 40)

Beard points out that comparison between living animals and these ancient primates "can only be pushed so far" (41), but this plus my none-too-recent zoo visits helped remind me what general sort of critter Ekgmo was.

I asked Zancanella how big a more complete fossil find of Ekgmo might be, and he replied, "If anyone were lucky enough to find a more complete fossil, perhaps a skull attached to the axial skeleton, even its fossilized bones would be small and fragile. All dressed up in a plaster jacket and ready to tote back to the museum, it would still not weigh ten pounds."

Zancanella drew us a picture with quick, bold strokes on the back of the nearest piece of paper demonstrating how such a specimen would be recorded stratigraphically, treated with Vinca, covered with plaster, pedestaled, and removed. His description

was so evocative, I felt like putting on my hat to protect myself from the sun beating down on the exposed, blue-green cliff where we had made our find.

Two hours later, John Z. said, "Now. Did you come in with an archeology question?"

My mind went blank. I was caught in deep time 27 million years in the past, and I couldn't come back.

Our next stop was over the Ochoco Mountains and back up the John Day River to revisit the Thomas Condon Paleontology Museum. Since our last trip in May, the $7.5 million museum had officially opened its exhibit hall, and we were eager to see it. John Z. told us to look for an image of Ekgmowechashala in the Turtle Cove mural, so the tooth in the brain led me on.

Once there, we fell into the exhibits and didn't come out until four hours later. The visual journey through time is made up of eight color-coded rooms; the color of the room matches one of the colors in the stacked rock outside the front door. The contiguous mural is nine feet high and forty-four feet long, painted by Portland-area artist Roger Witter (Hill Science C07). There's a twelve-foot high metasequoia tree, Oregon's official state fossil, made of epoxy resin that sports its autumn leaves on one side and vernal foliage on the other.

Illustration by Michael Backus

More about the exhibit's many wonders another time, but sure enough, in the turquoise room representing the Turtle Cove formation, there was Ekgmowechashala (Sioux for "little cat man"), big-eyed, long toes gripping the branch of a fruit tree in case the "little fellow" got hungry. And there was that tiny, magical tooth which told us all that.

Months later, back home in the lush green of the Willamette Valley, I continued to look for Ekgmo on the Internet and in my fossil books. I learned about the South Dakota specimens and about the first Oregon find in 1961 by John Rensberger of the University of Washington's Burke Museum. He was also obsessed with finding additional evidence of Oregon's only primate, and spent many summers breathing blue Turtle Cove dust on the hunt for more than a tooth. I suspected he had written the paper on the holotype; that is, the official specimen against which all others would

ever be measured, but I couldn't find it. I used this one rainy November day to call up Ted Fremd, the JODA paleontologist, and introduce myself.

I always think these scientists I've read so much about are going to be scary, but Ted's voice was warm. He sounded as interested in Ekgmo as I am. Probably more so, as he is preparing a paper with a couple of colleagues on the famous teeth. Ted read off the references I was searching for, right down to volume, issue, and page number. Warmed by his friendliness and re-fired in my enthusiasm to learn more about "my" lemur, I ran up to the UO Science Library and trailed my finger along the stacks until I hit *Folia Primatologica*.

The 1983 paper by Rose and Rensberger is nerdy but not opaque. It describes the age and stratigraphic position of Rensberger's tooth, then goes on to describe and illustrate the dentition in detail, concluding with a discussion of intergeneric relationships. I looked up the words I didn't know and started turning all I knew about Ekgmo around and around that tooth in my brain.

What is it about this tiny fruit eater with the long tail, big eyes and funny fingers from 27 million years ago that so grabs the imagination? I decided to formulate my best questions to ask Ted Fremd:

SJ: Why is Ekmgo so fascinating to you, personally? I know the answer that is in the Museum; because this is the "most recent" primate known to have lived in North America. Most Americans think of primates as very far away from North America, and part of the delight in finding lemur fossils in South Dakota, Wyoming and Oregon is the sheer surprise factor of any primates being here at all. But are there implications beyond that you see?

TF: Actually, early primates used to be very common in North America, particularly in the Paleocene and Eocene. To answer your question re: why I'm personally interested, I found a much older one some years ago, for example, that my mentor at the University of Alberta named *Micromomys fremdi*. It was interesting collecting primate fossils along the frozen banks of the Red Deer River and helped cement my paleontological foundation. I've collected dozens of them in rocks throughout western North America, such as in the Wasatch and Bridger Formations in Wyoming. What's interesting about Ekgmo is that this is the last solid record of it in North America.

SJ: How do scientists surmise lemurs got here? From South America up or from a land bridge down?

TF: As per above, primates have been here a very long time, and may have coexisted with dinosaurs . . . although the first records I'm familiar with date to about 60 Ma. By the Eocene, they were widespread and well established in Asia and Europe, here, and obviously Africa. What's interesting is how most members of the public assume they evolved in Africa and weren't elsewhere.

SJ: Which makes me wonder the next question. Where were the continents 24 million years ago (or longer)?

TF: If anything, the continental landmass that now includes Oregon was a little bit north of where it is today, during the deposition of the strata at Sheep Rock, but only by a few degrees at most.

SJ: In sum, what are the greater implications of the presence of Ekgmo?

TF: The presence of this final remnant of what was once a very diverse and abundant clade in North America is comparable to the status of the modern rhinos and tapirs: once the dominant members of the fauna, they've now dwindled to relict taxa on the verge of extinction. The modern "horse" was down to low diversity, too. That's of interest in and of itself: constantly shifting faunal patterns and distributions of species is a wonderful study. For us, being able to have precise stratigraphic refinement of this species (because of the presence of well-defined volcanic tuffs) is a tiny part of the big effort to "paginate the story": put things in sequence with precision. As a biostratigrapher, that's what makes this basin so splendid.

My e-mail to Chris Beard caught up with him in the field, so his reply, while brief, puts an evocative question mark at the end of our considerations here:

Dear Sandy:
I'm in the field in Myanmar at the moment. . . .The short answer is that my team has unearthed exciting new evidence about the geographic origins of Ekgmo in Asia. It must have dispersed to North America across the Bering Land Bridge, at a time when many people thought it would be too cold to support primates. This story is evolving very rapidly!
Chris Beard

When I shared Beard's e-mail with Ted Fremd, his response was, "I read Chris' quote with a bit of alarm re: 'The Bering Land Bridge." Not sure what he's discovered or what he's thinking; we do know that Chinese mammalian immigrants traveled across Beringia into this continent around 55ma, but it was hardly 'cold' then: it was a hothouse."

The mystery's afoot, Watson!

Evidently, I am not the only victim of a bite in the brain from Ekgmowechashala! Lemur fever has given me new knowledge about the depth and complexity of the John Day Fossil Beds, led me by the nose around the Internet, into basement library stacks, and out into the world to make new friends. Ted Fremd appends his e-mails with this apt quote from John Muir: "When one tugs at a single thing in nature, [s]he finds it attached to the rest of the world." I tugged at a lemur tooth, which created magnetic new patterns with new data in my brain.

What's biting *you*?

Works Cited

Beard, Chris. E-mail interview. 20 Nov. 2005. Curator and Head of the Section of Vertebrate Paleontology Museum of Natural History at the Carnegie Museum of Natural History.

———. *The Hunt for the Dawn Monkey: Unearthing the Origins of Monkeys, Apes, and Humans*. Berkeley: U of California, 2004.

Bishop, Ellen Morris. *In Search of Ancient Oregon: A Geological and Natural History*. Portland, OR: Timber Press, 2003.

Chapman, J. "Primate Molar Emerges from Fossil Beds." *National Park Service*. 24 Jan. 1998. John Day Fossil Beds National Monument (JODA). 20 Nov. 2005 http://www.nps.gov/joda/paleonews1.htm

Fremd, Ted. Personal interview. 17 Nov. 2005. E-mail interview 20 Nov. 2005. Paleontologist, John Day Fossil Beds Science Advisor, Pacific West Region U.S. National Park Service.

Hill, Richard L. "A Living Lab for a Fossil Past." *Oregonian* 10 Aug. 2005: Science C07. *Northwest Geology News*. Aug. 2005. The Oregon Department of Geology and Mineral Industries. 20 Nov. 2005 http://www.oregongeology.com/news&events/CondonCenter.htm

National Park Service. U.S. Department of the Interior. *John Day Fossil Beds*. N.p.: GPO 304-337/00104, 2004.

Rose, Kenneth D., and John M. Rensberger. "Upper Dentition of Ekgmowechashala (Omomyid Primate) from the John Day Formation Oligo-Miocene of Oregon." *Folia Primatologica* 41 (1983): 102-111.

Stevens, Wallace. "Anecdote of the Jar." 1953. *Selected Poems by Wallace Stevens*. 2nd ed. London: Faber and Faber, 1970. 36.

Zancanella, John. Personal interview. 23 Aug. 2005. Paleontology Program Coordinator for the Bureau of Land Management (BLM) in Oregon and Washington.

Sandy Jensen *is a Northwest native who was raised "East of the Mountains" in the middle of eighty acres of apple orchard. She has published across multiple genre lines, including poetry, fiction, academic, and creative non-fiction for twenty years. Her first book of poetry,* I Saw Us in a Painting, *was released by Walking Bird Press in 2006. She writes and teaches at Lane Community College, Linn Benton Community College, and Linfield College from her home in Eugene, Oregon.*

Peter Jensen *teaches writing and literature at Linn Benton Community College.*

Preparing Classroom Materials for Blind Students

Pat Sweeney

Imagine learning algebra or geometry without visual aids — no graphs, geometric shapes or colored pie charts. For blind students, passing the math classes required for an Associate's degree using only touch and the power of their minds presents a major challenge. The field of tactile graphics, where raised surfaces convey information such as graphs and diagrams, offers one resource for students and their instructors. Using recent advances in this field, the Disability Services department at Lane Community College provides improved classroom materials for the visually challenged.

History

At Lane, a Viewplus Tiger Pro Embosser prints raised dots on special paper to represent Braille lines.[1] Before the embosser was available, the preparer printed an image with any computer printer, and ran it through a machine that created impressions on expensive, heat-sensitive plastic sheets. The lines on this kind of paper were true lines instead of a series of dots, but the person doing the Brailling had to stamp dots on labels with a label maker and stick them on the plastic image.

Now, using Viewplus software, both the images and Braille labels are designed on the computer and sent directly to the embosser — a vast improvement over the previous stick-on label method.[2]

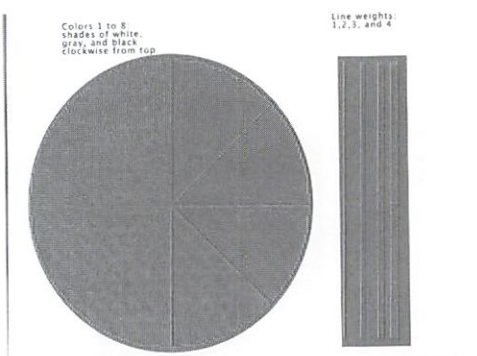


Figure 1: The Viewplus Embosser prints these textures and line thicknesses.

Considerations

Images commonly found in textbooks include tables, graphs, photographs and drawings. Simple tables often reduce to rows and columns, but graphs and pictures are more difficult to prepare.

In tactile graphics, there is a limited selection of colors, textures, and line widths available. Different dot heights and densities simulate different textures, and shades of gray and black. Parallel series of dots represent one or more line thicknesses (Figure 1).

The simplest graphic images to emboss are figures that consist of straight lines and circles. Many software programs such as Microsoft Paint and MS Word can create these basic shapes (Figure 2).

If an equation is available, graphing software such as Scientific Notebook will generate a graph (Figure 3).[3] Without an equation, drawing curves and irregular shapes freehand with a mouse is time-consuming and requires artistic ability. Another technique for creating dot-based images is to import a scanned image from a PDF file into the Tiger software and edit it. With this method, random dark spots called "noise" must be manually erased, major lines darkened, and the background lightened. Varying the contrast and brightness can also make bolder lines. Adobe Photoshop and other graphics programs have amazing capabilities for transforming images into simple black and white lines by highlighting the edges of a picture, where the colors change.[4] Dark, distinct lines

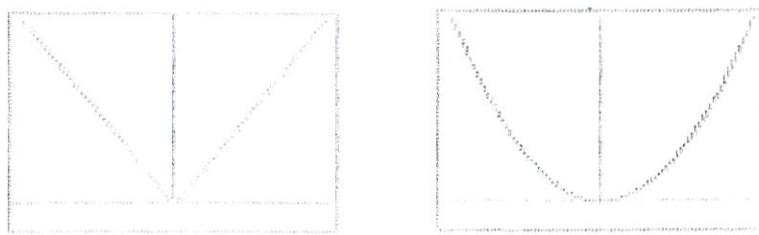


Figure 2: Simple lines or circles are easy to draw and emboss.

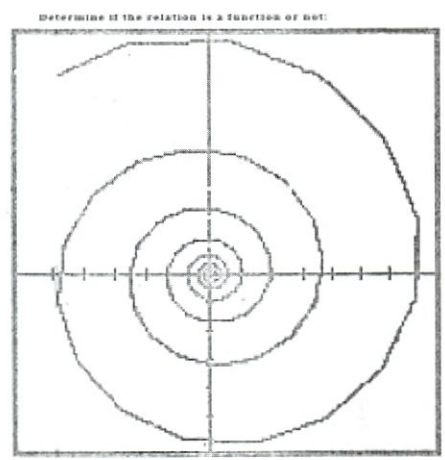


Figure 3: This polar spiral is easy to generate using Scientific Notebook software. It is difficult to draw freehand.

are easiest to emboss (Figures 4 and 5).

Figure 4: Note the dark background in this photograph of lightning.

The more complicated an image, the larger it needs to be so that the student can differentiate between the lines and shapes. Simple shapes on minimal grid lines with extraneous information eliminated convert to the most readable dot images. One way to improve clarity in this type of graphic is to eliminate some of the lines. Unfortunately, removing lines also removes information, and Disability Services staff are not the best people to select the critical lines in a math lesson. Ideally, the instructor and staff work together to identify the most important elements of a picture well ahead of the associated lecture.

In an image with labels, a blind student may confuse the Braille letters with the image itself, so text needs to be erased from inside the image and retyped outside of the borders. Lines and arrows can connect labels to the appropriate spot on a picture. If the Braille labels and arrows do not fit with the image on an embossed page, the text and images can be printed on separate pages.

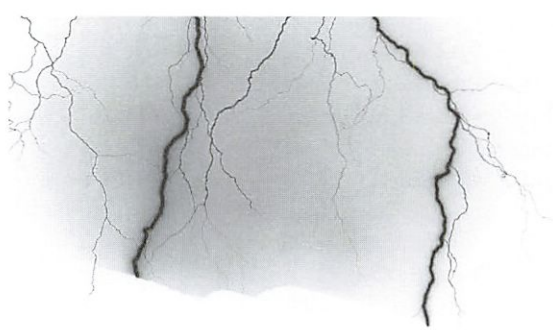


Figure 5: The lightning photograph of Fig. 4, with light and dark colors reversed, and the edges highlighted using Adobe Photoshop.

Recommendations

Instructors teaching blind students can simplify classroom material preparation by keeping the graphics simple, resisting the urge to take advantage of new technology that unnecessarily clutters handouts, and eliminating dark or textured backgrounds. Simple graphics that contain only essential information are much easier to convert to tactile graphics.

In addition, the more lead time the Disability Services department has, the better. Sometimes the staff can get embossed materials free or purchase them from third parties, but it takes time.

Conclusion

Close your eyes and imagine learning math without graphical images, or imagine studying anatomy without looking at a skeleton. Fortunately, there is technology that will help bring graphics to life and open new horizons for the visually challenged. There are still many challenges to overcome, yet by working with the current advanced graphics technology, it is possible to create aids for blind students to help them learn just about any subject.

Endnotes

[1]Lane Community College uses a Viewplus Tiger Pro Embosser with an ink attachment.

[2]Viewplus Software Suite comes with the Tiger Pro Embosser. The programs interface with Microsoft Word and Excel to convert text to Braille and send it to the embosser. Tiger Designer is a graphics program that uses printer files. Other printers on the market include the Juliet Brailler.

[3]Scientific Notebook, owned by MacKichan Software, Inc. generates mathematical graphs from equations.

[4]Adobe Photoshop CS level 9 edits photos and images.

Although **Pat Sweeney** *was born in Pittsburgh, she considers Oregon her home after living here for twenty-five years. She currently works as administrative support in the Disability Services department at Lane Community College, where she delights in playing with new technology. She has a B.S. in Math and an M.B.A. from the University of Pittsburgh, and is committed to lifelong learning. Her days revolve around work, exercise, education, and exploring life with her best friend, Martin. In spite of her love of technology, in the off hours she wanders the edges of Mt. Pisgah, the mountains, and the beaches to discover secret places to escape from the noise.*

A Hand Across the Digital Divide

J. D. Mackenzie

He recognized that look. She stood outside the door but wouldn't come inside. She'd look up the street one way, then down the other, as if she were waiting for a friend. She'd glance quickly into the lobby with an intense combination of curiosity and fear, then look up the street as if she didn't want anyone to catch on. She looked like she wanted to come inside, maybe had some business there, but was having trouble taking that first step.

He recognized that look. It'd been him in a past life.

Thanks to a watchful soul back then, he was spotted and greeted and more or less dragged into a new life on the other side of some big glass doors in another town. After three or four tries at college, he was running short of both dignity and perseverance. Fortunately, somebody saw his hesitation and persuaded him to step through the door and learn more. He did, and everything changed. Three degrees later, the roles were reversed.

So this is what empathy is. It starts with recognition and evolves into action.

He carefully went outside, stopped near her, and looked across the street into the afternoon sun shining down on the transit mall. "Beautiful day to be outside, isn't it?" Awkward but friendly.

She smiled back with the kind of smile you'd give your dentist right before the injection.

"I noticed that you seemed to be looking for something here," he said, "and I was wondering if I could help out."

She hesitated and looked away. "I was kind of thinking of taking a class, but it's been a while." He knew this was very hard for her. He resisted the impulse to respond right away.

"I've always wanted to go to college but it never worked out for me," she said. "Now I'm thinking I might want to start here."

"This is a good place for it. Know what you want to take?"

"Not really. It's been so long since I was in school, I just want to give it a try."

He thought about humoring her, challenging her about it being so long as a way of boosting her ego, but thought better of it. "You want to see some of the classes here? It'll just take a minute."

She hesitated again, like she'd practiced avoidance for a lifetime. "I work here and I can show you where to look." She smiled then nodded, and they both went inside.

When he headed toward the row of computers, she slowed and began to stiffen. "They told me on the phone that I can do all this on computer, but I'd rather not."

If he'd known her story, he'd have understood some of the reasons for her fear. He'd understand about the job she'd lost when her boss brought in new software and didn't bother to help his employees get the training they needed to operate it. He'd understand the ex-boyfriend who cheated on her using e-mail and chat rooms while she slept a few feet away. And he'd understand the time she'd accidentally deleted her teenage daughter's term paper when she shut down the machine for the night. Her bête-noir was grounded in real life experience.

But he didn't know any of that. All he knew was that she came here wanting to take a class but she'd rather not use the computer. He picked up a paper schedule of classes and began leafing through it. "What kinds of things are you interested in?" She wasn't sure, so they talked through a wide range of possibilities. There was a lot to choose from.

He began to understand that it wasn't so much that she feared computers, it was the idea of marshalling the courage to try something she really wanted and then failing at it. Of being the first in her family to go to college. Of making the wrong choice and picking a class she couldn't understand. Of having one more thing go wrong.

Finally, with a little encouragement, she decided she was ready to try a non-credit basic computer class. It didn't cost very much, it was a beginner level, and she could attend it in her neighborhood. "You're going to like your instructor." he said. "We both went back to school in our thirties and wanted to do something different. Frank's a nice guy, and he knows exactly what it's like to learn something new like computers."

Helping her choose a class was only part of the challenge. Getting her registered in the usual way took a little more effort. She definitely had a phobia of technology. When he mentioned ExpressLane, the online registration system, she took a deep breath and looked down at her shoes. For all of the advantages this technology offered, it also extracted a price from some, the price of dignity. It was a price she did not intend to pay at that moment. So he helped her get what she needed, old school, with a pen and a form and a little patience.

It wasn't that long ago he'd had his own digital disability moment. First year of graduate school, first term completed. And no report card. He waited for the mail to deliver something and started to get frustrated when nothing arrived. Finally, he called his department and asked when report cards would be ready. The office administrator said that grades had been submitted for all classes, undergrad and graduate, and they were all out by now. So he called the Registrar's office and spoke with a student intern

J. D. Mackenzie *writes short fiction well enough to have fun, but not well enough to quit his day job in the Continuing Education department at Lane Community College, where he has worked since 2004. His recent writing addresses the challenges adult learners face when working to overcome barriers to education and self-expression.*

who knew more about technology than she did about manners. She sounded about twelve and barely suppressed a giggle when he asked her about report cards. "We don't do that anymore. You need to go to the Web." The thought of not getting a report card in the mail had not occurred to him.

He flashed on a rich landscape of report card memories from back in the wonder years. Taking them home from school in a sealed envelope. Mostly having to explain what went wrong, and in some rare instances, what went right. Getting a signature, preferably from his mother, who did not believe in corporal punishment. The squeak of a trumpet on the high notes. Hearing new words on the radio like DaNang and Hanoi. A few days on the refrigerator under the overworked banana magnet. Cronkite and Bobby and MLK. Growing to detest his older brother, the suck-up, for getting better grades in harder classes. Fat redneck cops and fire hoses and snarling German shepherds lunging at kids his own age, whose only crime was wanting a decent education. Returning the envelope to school. Cities on fire on the black and white television. Back then, not even Elroy Jetson got his report card via the computer.

His memories were interrupted by the present, a good kind of interruption.

He took great satisfaction knowing that even in a world of powerful technical applications, it was still possible to ask for and receive help the old-fashioned way, a live person who could take the time to help another person register. At the same time, he was able to explain how it all worked, so the next time she could do it herself, on her own terms.

And when she came by a few months later, it was clear that whatever time it had taken was well worth it. She'd been transformed. Her smile entered the lobby a few steps earlier than she did. She had a laptop slung over her shoulder and had the look of someone in a hurry to get to something important. Her new life.

Información para residentes: El tratado de Guadalupe Hidalgo — Comedia del teatro histórico

Adrienne Mews

The Treaty of Guadalupe Hidalgo

The Treaty of Guadalupe Hidalgo (named after the town where it was signed in Mexico) officially ended the war between the United States and Mexico in 1848. The oldest valid treaty signed between the two countries, it was negotiated under an aura of conquest and superiority. Mexico lost half of its territory, although Mexicanos who stayed in the United States were guaranteed "enjoyment of all the rights of citizens." The treaty continues to be at once controversial and relevant to the lives of Mexican Americans, yet it is little known among both Mexican Americans and the general American public. During the Chicano Movement in the 1960s, the Treaty of Guadalupe Hidalgo was brought to the attention of the U.S. Supreme Court as Hispanos in northern New Mexico sought to reclaim their land rights originally cited in the treaty. Also, the Brown Berets, a militant youth group founded to protest educational inequality and police brutality, occupied Santa Catalina Island, off the coast of southern California, for twenty-four days, claiming that the treaty did not mention the islands as Mexican land ceded to the United States. Some current-day Chicano activists claim that rights of language are also part of the treaty and its amendments, although U.S. government authorities cite that there is no mention of linguistic or cultural rights. The fact remains that, to this day, Mexican Americans share a similar experience with many Native American nations who signed treaties with the U.S. government, only to have those stated agreements unfulfilled.

— *Jim García*
Chicano/Latino Student Program Coordinator, Lane Community College

Introductory Note

While the note to the director suggests the work can be advertised as a "play about love with a surprise ending," *Información para residentes* is a historical one-act play about the Treaty of Guadalupe Hidalgo, which includes a tongue-in-cheek, post-modern treatment of historical perspectives and theatrical devices such as meta-theater and

dramatic irony. But, as one character, Actor 2, asks, "¿No sería demasiado banal hablar de todo eso explícitamente?" *Wouldn't talking about all this explicitly be too banal?*

"The play's the thing." —*Hamlet*

Personajes

Gloria, una dramaturga/directora mexicana de 37 años

Felipe, el gerente del teatro, ex-esposo de Gloria

Actor 1 Actriz 1

Actor 2 Actriz 2

Actor 3

Rodrigo, actor

Alicia , abuela de Rodrigo, de 88 años

Isabel, hija de Gloria y Felipe

Escenario

Nota al director: Se puede anunciar la obra como "obra de amor con fin de sorpresa." La acción tiene lugar en un teatro en San Diego, California en el año 1998. El escenario casi vacío con una mesa grande con varias sillas. El gerente está sentado; agarra un guión y lo hojea. En seguida agarra otro y lo hojea. Sigue viendo varios textos por un rato. Después, suspira fuertemente y fija su mirada en la nada. Entra Gloria.

Escena 1

FELIPE: *(entusiasmadamente)* ¡Hola Gloria! A los años… *(se saludan)*

GLORIA: Felipe, ¿Qué tal? Pareces muy distraído, muy tenso.

FELIPE: Con los mismos problemas de siempre … No hay dinero para poner en-escena las obras que merecen una buena producción. El público sólo quiere ver obras para divertirse y relajarse y no para pensar. Bueno, ya sabes todo esto. Dime, ¿Qué tal estás? ¿Cómo está mi hija?

GLORIA: Te cuento que estoy fatal yo, pero Isabel lo está pasando muy bien. Pero, ¿sabes qué? Me preocupo mucho por su educación. Ayer me pidió que la ayudara con su clase de historia. Ella tenía que prepararse para un examen sobre la prim-

era mitad del siglo XIX en los EEUU. Así que nos pusimos a escribir una lista de todos los acontecimientos importantes de esa época. Y cuando mencioné la guerra contra México, Isabel me preguntó, ¿Pero, qué guerra, mami? Yo pensaba que a lo mejor ella se había olvidado de lo que había aprendido y me puse a buscar la parte sobre la guerra y el Tratado de Guadalupe Hidalgo en su texto. *(Se pone más y más emocionada mientras habla.)*

FELIPE: Ya sé lo que me vas a decir.

GLORIA: ¿Qué?

FELIPIE: Que no encontraste nada sobre la guerra en el texto.

GLORIA: Claro que no. Pues, entonces Isabel me contó que no se hablaba de nada de eso en su clase. Obviamente yo le expliqué todo. Después, no pude dejar de pensar en esa omisión increíble. Así que, como la ciudadana bien tímida que soy, llamé a su maestra. No puedes imaginar lo que me dijo.

FELIPE: ¿Que la guerra y el tratado no son partes del plan de estudios aprobados por el 'Board of Education' del estado de California?

GLORIA: ¿Cómo lo sabías?

FELIPE: Tú misma siempre me decías que soy pesimista.

GLORIA: Es cierto. Bueno, me puse bien enfadada y le dije que, como la mayoría de los estudiantes son mexicanos y aún ella, la maestra, también es mexicana, debería enseñar la historia completa.

FELIPE: *(Le interrumpe.)* Pero tú, como dramaturga con bastante experiencia en la escritura de obras históricas, ya sabes que no hay UNA historia completa. ¿Y eso no era precisamente el mensaje de tus obras?

GLORIA: Claro, hay una multiplicidad de historias, igual como hay perspectivas múltiples, y cada una tiene su propia función y sirve a … Pero , ¿Cómo es que siempre me distraes, Felipe? Te cuento algo que es sumamente importante para la educación de nuestra hija, y quieres entrar en una discusión teórica.

FELIPE: Discúlpame. Sigue.

GLORIA: Ella me dijo que estamos viviendo una época bastante anti-mexicano y anti-inmigrante y por eso, ella no puede hacer nada; tiene miedo de perder su trabajo. Ella cree que no tiene poder. ¡Qué terrible, ¿no? *(Felipe asiente)* Yo no podría vivir así, sin darme cuenta de mi papel en la sociedad, sin actuar según mis creencias.

FELIPE: Y por eso estás aquí, ¿no?

GLORIA: Me conoces demasiado bien, Felipe. *(Se abrazan por un instante, se sueltan, se miran y Gloria suspira. Gloria está visiblemente más relajada.)* Ya es hora de escribir otra vez. Quiero crear una obra, histórica por supuesto, sobre la guerra y el Tratado de Guadalupe Hidalgo.

FELIPE: Pensaba que dejaste de escribir obras históricas, que creías que al público no le interesa la historia.

GLORIA: Sí, tienes razón. Lo dejé. O sea, lo había dejado. Pero, no puedo dejar que mi hija y todos los otros niños de su edad aprendan la Historia sin saber nada de un acontecimiento tan importante. Tampoco puedo dejar que sea olvidado por el pueblo: ni por la gente mexicana, ni por ninguno de los residentes de este país. El olvido del pasado, eso es la pérdida de las memorias, es precisamente lo que permite los errores del presente. Siempre creía que la historia tiene efectos dramáticos en el presente, por eso pasé tantos años escribiendo obras históricas. Pero esta obra tiene que ser diferente.

FELIPE: Pero, la mayoría de tus obras tuvieron éxito, aún siguen teniendo éxito con el público y con los críticos.

GLORIA: Es que esta vez, no va a haber el mismo sentido de ironía dramática, por que esta vez el público, o por lo menos la gran parte de los espectadores, no sabe más sobre el tema que los personajes.

FELIPE: Ya entiendo. ¿Cómo se dará cuenta el público de que está viendo una versión alternativa de la Historia o mejor dicho, una interpretación histórica, si no conoce la versión oficial ni aún puede reconocer el asunto?

GLORIA: Por eso me preocupo. Tendré que intentar a llenar el vacío histórico, a recuperar las memorias del pueblo. Pero me parece bastante problemático porque ¿Con qué autoridad podría escribir una obra así yo? ¿Cómo podría seleccionar la información para incluir? ¿Cómo encontrar fuentes fiables? Me parece un proyecto casi inalcanzable. *(Se ve perpleja, casi deprimida.)*

FELIPE: "Casi" es la palabra clave. Es bastante difícil la propuesta, pero estoy seguro de que la puedes lograr. ¿Conoces el método de la creación colectiva de las obras dramáticas del grupo teatral 'La candelaria' de Colombia?

GLORIA: No lo conozco. ¿Tiene que ver con las obras históricas? *(Felipe mueve la cabeza, indeciso.)* ¿O ese grupo ya ha trabajado el asunto del Tratado de Guadalupe Hidalgo? *(Felipe niega con la cabeza.)* ¿Qué entonces?

FELIPE: Es que el colectivo utiliza un método genial en que todo el grupo de actores y el director investigan un tema. No sólo leen artículos sobre el asunto. También

les hacen entrevistas a individuos del pueblo, a historiadores, a sociólogos … de esa manera acumulan bastante información sobre el asunto con fuentes muy variadas. Y sólo después de haber hecho esta investigación colaborativa, empiezan a improvisar escenas para crear un texto para la obra. Me parece que esta manera de explorar el tema te puede servir.

GLORIA: *(muy animada)* ¡Qué idea tan perfecta – un trabajo colectivo! Siempre tienes la respuesta apropiada en el momento preciso. ¿Cómo lo haces?

FELIPE: Eres tú la que siempre me decías, *(exageradamente)* "Cuándo vas a sacarte la cabeza de ese libro? ¡No haces más que leer!" ¿No te acuerdas?

GLORIA: *(nostálgica, pensando, su mirada fijada en la nada)* ¿Cómo podría olvidarme? *(Felipe la mira con cara de enamorado, se acerca y acaricia su mano con la que ella se apoya en la mesa. Ella, sorprendida, vuelta a la realidad, lo mira y le tiende la otra mano.)*

Telón

Escena 2

Seis meses después. El mismo teatro. En el escenario los actores están sentados en sillas, más o menos en forma circular. Ellos hablan entre sí, se rien. Todos están de buen humor. Dos actores entran por la puerta; Gloria los saluda y señala al círculo donde se sienten los tres.

GLORIA: *(Se pone de pie.)* ¿Están listos para empezar de nuevo? ¿Todos estamos? *(Todos miran alrededor.)*

ACTOR 1: Falta Rodrigo. Le hablé hoy por la tarde y me dijo que estaría aquí. Me parece que llegará tarde.

GLORIA: Bueno, continuamos de todos modos. ¿Qué tal la investigación? ¿Encontraron más información útil? *(Momento breve de silencio. Todos se miran con ansia.)*

ACTRIZ 1: Nosotras hablamos con una colega mía de la universidad. Ella es profesora de sociología y se especializa en la situación de las minorías, de los chicanos en particular. Nos recomendó este libro Occupied America: A History of Chicanos. *(Lo muestra.)* Es una versión interpretativa de la historia que privilegia las perspectivas mexicanas y chicanas.

FELIPE: Me parece una fuente super buena. ¿Qué opinan los demás? *(Todos los actores asienten verbalmente o con la cabeza.)* ¿Qué tiene de nuevo?

ACTRIZ 1: Primero, hay algunos detalles históricos que son hechos de verdad, pero no los hemos visto en ninguna fuente convencional. Por ejemplo, el autor enfatiza las estipulaciones del Tratado de Guadalupe Hidalgo en el que el gobierno estadounidense garantizó los derechos de los habitantes de Tejas – que hasta entonces era parte de México - a continuar a vivir según sus creencias religiosas, a preservar su cultura y su lengua, y además a mantener sus propiedades. Después de que el gobierno mexicano aprobó el tratado, el Senado estadounidense tachó toda esa parte sumamente importante del tratado.

ACTRIZ 2: Como resultado directo de eso la mayoría de la gente mexicana perdió su terreno ancestral.

GLORIA: Tenemos que encontrar una manera de incluir estos hechos y sus lazos al presente. *(Todos asienten.)* ¿Algo más?

ACTRIZ 2: Hay una narrativa sobre el contexto histórico de la invasión de parte de los norte-americanos que nos puede servir como nexo entre esta historia que nos parece tan lejana y la realidad actual.

ACTOR 1: ¿Cómo lo explica? Porque yo sólo pude encontrar una versión limitada de los motivos para la guerra. Fue una explicación desde la perspectiva anglo en la que se atribuye la guerra a la incompetencia del gobierno mexicano que supuestamente había rechazado la democracia y la justicia.

ACTRIZ 2: Es interesante porque había una muchedumbre de norte-americanos que inmigraron a Texas. Ellos fueron allá buscando oportunidades económicas: o se huyeron de los problemas monetarios de la Depresión de 1819 o fueron a aprovecharse de la tierra barata en los años 1820.

ACTOR 2: *(pensativo)* Cruzar la frontera para encontrar una vida mejor - Es igual a la situación actual de los mexicanos y de muchos latino-americanos ¿no?

FELIPE: ¡Qué conexión tan perfecta! Todos están visiblemente emocionados.

GLORIA: Es exactamente lo que imaginaba cuando concebí esta idea que ya es nuestra. Quería hacer resaltar la importancia y la influencia de la historia en lo actual.

ACTOR 2: ¿Pero cómo lo hacemos? ¿No sería demasiado banal hablar de todo eso explícitamente?

ACTOR 3: ¿Por qué no tratamos de incorporar el estilo fragmentario de Guillermo Gómez-Peña un poco? De alguna manera tenemos que conmover o provocar a la gente del público para que resulte en algo más que una producción simplemente entretenida ... para que inspire al público a considerar la política y a tomar acción.

FELIPE: Eso es lo que surgirá cuando empecemos a improvisar las escenas, o por lo menos espero que se desarolle así. El teatro siempre tiene impacto social igual como lo social impacta al teatro.

ACTRIZ 2: Lo que me preocupa a mí es cómo atraer a la gente a ver la obra. ¿No es verdad que a la comunidad ya no le interesan las obras puramente históricas?

FELIPE: *(Mientras camina alrededor del círculo de actores hacia Gloria, empieza a hablar. Termina su frases justamente cuando llega a su silla y coloca una mano en el hombro de ella.)* No sé. ¿Qué les parece si la anunciamos como "obra de amor" porque siempre habrá público para una obra romántica? ¿O aún como "obra de amor con fin de sorpresa"? Habrá aún más espectadores.

GLORIA: *(Lo mira con cara emocionada mientras él camina. Lo mira mientras ella habla, como si le estuviera hablando sólo a él.)* Me parece buena idea. La emoción verdadera es lo más importante ¿no? *(Momento de silencio. Gloria y Felipe se miran. Los actores se miran entre sí con caras sorprendidas. Suena un teléfono celular y rompe el silencio. Todos saltan un poco por el susto. Gloria, vuelta a la realidad, lo busca y contesta. Todos los actores escuchan la conversación.)* Bueno. *(pausa)* Hola, Rodrigo. ¿Qué tal? (pausa) Bien, estamos todos aquí. Te esperamos. *(pausa)* Claro, está bienvenida. *(pausa breve)* Nos vemos. *(Lo apaga y habla a todos.)* Llamó Rodrigo. Llega muy pronto y viene . . . *(con expresión confusa)* viene con su abuela. *(Gran confusión: todos empiezan a hablar a la vez.)*

Telón

Escena 3

Seis semanas más tarde. El escenario casi vacío. Dos actores vestidos de negro colocan un marco/contorno gigante de la pantalla de un televisor en medio del escenario. El contorno tiene un telón de colores negro, gris, y blanco escondido detrás del contorno de la pantalla. El público no puede ver el telón. Detrás del perfil del televisor colocan una mesa y dos sillas. Entra Gloria.

GLORIA: Ya estamos listos para ensayar la última escena. ¿Listos? *(Los dos actores asienten y salen del escenario. Actor 1 y Actriz 1 se sientan en las sillas con audífono y micrófono super modernos. Gloria se coloca a un lado.)* ¡Acción!

ACTOR 1: *(con voz de locutor exagerada)* Today the California State Senate voted 67-32 against the repeal of Propositions 187 and 209. Also, they voted to include language in the State Constitutions to ensure the prohibition of bilingual educa-

tion. As of January 1st, 2000, this bill written by former Governor, Pete Wilson, will make English the official language of all state business indefinitely. Now for the weather.

ACTRIZ 1: Along the southern coast, today we're expecting periods of . . .

GLORIA: Ahora el ruido. *(Se escucha el ruido borroso de un televisor que no funciona. Los dos actores de negro cierran el telón donde estaría la pantalla y lo agitan visiblemente. Se sacan la mesa y las sillas. Entran Rodrigo con micrófono, Alicia, e Isabel y se quedan de pie detrás de la pantalla. Los dos actores abren el telón y se para el ruido.)* Ya empiecen.

RODRIGO: *(Habla con micrófono)* Perdone la interrupción del programa fijado, pero tenemos un informe de emisora pirata sumamente importante para Uds. Estoy aquí con doña Alicia - no puedo mencionar su apellido - y ella nos va a dar una entrevista sobre los acontecimientos de la invasión de México por los Estados Unidos y el Tratado de Guadalupe Hidalgo. Bueno Señora, ¿Cómo ha llegado a entender este evento histórico Ud? *(Acerca el micrófono a ella)*

ALICIA: *(Vacila un momento, Rodrigo la anima con una sonrisa)* Mi abuela era niña durante los años de la invasión. Ella nació y creció en el norte de México, lo que ahora se llama New Mexico.

RODRIGO: ¿Y cómo era su vida, cómo vivía su familia antes de la guerra?

ALICIA: Ellos tenían poco terreno en el que sembraban maíz y otros granos para el ganado. No tenían mucho pero trabajaron la tierra bien. Toda la comunidad compartía el agua del río y el terreno para el ganado y se ayudaban entre sí. Tenían una vida muy sencilla pero mi abuela siempre recordaba esos años con nostalgia.

RODRIGO: ¿Entonces qué pasó después de la guerra? ¿Cambiaron sus vidas?

ALICIA: Mi abuela me contó que cambió dramáticamente. Al principio vivían igual. Vino un día un gobernador de México al pueblo que les explicó que según el Tratado entre los gobiernos, la tierra donde vivían ya era parte de los Estados Unidos, pero que no se preocuparan porque todavía mantenían sus derechos a la tierra, a mantener sus costumbres, y a continuar a vivir como siempre habían vivido. Muy pocos se fueron más al sur para vivir en México pero la mayoría se quedaba. *(Se emociona)* Aunque mi abuela apenas tenía trece años, tenía un novio que se fue con su familia y nunca lo vio más.

RODRIGO: ¿Y qué pasó después?

ALICIA: *(Se pone más y más sentimental mientras habla.)* Vinieron algunos hombres estadounidenses, hombres de negocios, al pueblo y ellos exigieron los títulos de las propiedades del pueblo. Como todas la familias compartían la tierra de la comunidad no había títulos y esos hombres recibieron los derechos a la tierra del tribunal estadounidense. Después construyeron alambrados para que la gente del pueblo no entrara en su terreno. Pero las familias, como la de mi abuela, ya no tenían donde sacar agua ni donde dejar apacentar el ganado. Además vino un recaudador de contribuciones que exigió que le pagaran los impuestos por su terreno. La familia de mi abuela no tenía dinero porque siempre habían vivido de la tierra. Entonces mi abuela, y todos sus hermanos buscaron trabajo en la cosecha. Trabajaron para los propietarios que habían robado la tierra de la comunidad. *(Empieza a llorar)* Pero nunca ganaron lo suficiente para pagar los impuestos y perdieron su terreno donde habían vivido por generaciones.

RODRIGO: *(visiblemente conmovido)* Gracias Alicia, por compartir su historia tan emocionante. Como se puede ver, el gobierno de los Estados Unidos no respetó los derechos de los habitantes de lo que era tierra mexicana. *(Se ha recuperado y ya habla de locutor otra vez.)* Ya vamos a hablar con Isabel, estudiante que no había aprendido sobre esta epoca tan importante de la historia porque no es "parte de los estudios aprobados por el estado de California". Isabel, ¿Tienes alguna pregunta sobre este asunto?

GLORIA: Ya te toca a ti, Isabel.

ISABEL: No puedo imaginar como sufrió la familia de doña Alicia. Me siento muy triste por eso. Quiero preguntarle a mi abuela sobre esto, porque ella sabe mucho. Ahora, por fin entiendo el dicho que siempre dicen los mayores, "We didn't cross the border; the border crossed us."

GLORIA: Y ahora el ruido otra vez, suavemente. *(Se escucha el ruido de la televisión otra vez, pero esta vez empieza lentamente y muy bajo, pero el volumen aumenta.)*

RODRIGO: *(como locutor)* Bueno, se nos acabó el tiempo. Les dejo con esto. Los nombres mismos de todas la ciudades aún ésta, *(Lo pronuncia exageradamente.)* San Diego, nos recuerdan de la herencia de esta tierra. No se puede ignorar el lenguaje español inherente en estos lugares. Aunque no se respetaron las promesas del Tratado de Guadalupe Hidalgo en cuanto a la tierra, ¿Todavía sería posible respetarlas en cuanto al idioma y a la cultura? . . . *(Ya no se escucha su voz por el ruido tecnológico.)*

Adrienne Mews *is a teacher, literary translator, and writer. She earned her M.A. in Romance Languages and her M.Ed. in Educational Leadership from the University of Oregon. Her translations have appeared in such publications as* Northwest Review *and the* Community College Moment. *She teaches basic skills in the Academic Learning Skills department at Lane Community College. When she's not teaching, translating, or writing, she loves spending time with her two-year-old daughter, Evelyn, who she is raising bilingually.*

GLORIA: *(Aplaude)* Creo que ya estamos listos para estrenar la obra. *(Se apagan las luces. Todos los actores salen al escenario. Felipe la abraza y la besa a Gloria muy emocionadamente.)*

FELIPE: Gloria, actuaste maravillosamente. *(Gloria está visiblemente confusa.)*

GLORIA: ¿Yo? *(Todos salen a recibir los aplausos y se inclinan.)* Pero, ¿qué . . . ? *(Se resiste a inclinarse pero lo hace.)*

ACTOR 1: Gloria, actuaste super bien. Te felicito.

GLORIA: (Todavía con cara de confusión) Te agradezco, ah *(vacila, no sabe qué llamarlo)*

Telón

The Internet Colonists of Room 15

John Butler

Introduction

When the *Moment* solicited articles on technology, I decided to share this piece written by my former Lane student, John Butler. John worked with children at Parker School in Eugene for a year as a cooperative education student and practicum teacher. His sophisticated use of technology invited students into the subject of history in a deeply personal way. When I watched him use technology with such expertise and to such great effect, I was inspired to make better use myself of the resources Lane offers for technical support. Joe Escobar, faculty webmaster, helped me to become confident enough to add several new tools to my repertoire; his continued support helps me to problem-solve as new challenges arise. Adult learners, like their younger counterparts, become most comfortable with new technology when introduced to it in a playful and non-threatening manner.

— *Merrill Watrous*
Instructor, Cooperative Education, Lane Community College

Most history teachers today embrace the Internet as a research tool. They educate their students about what constitutes a good online resource and about the moral and academic consequences of Internet plagiarism. However, as I prepared to teach a unit on the Colonial Era, I realized that technology could enhance instruction in areas other than research. My primary goal as a history teacher was to make my students connect to the history in every way possible. If technology could be a part of that solution, I was prepared to use it. I knew about teachers who had effectively used role-playing in their classrooms, but I felt that technology offered other advantages that I was excited to explore. Calling on my computer programming background, I decided to create my own computer simulation based on the colonial time period. For those readers who are thinking to themselves at this point, "I should turn the page; I'm not going to be programming my own simulation anytime soon," please remember that master carpenters who build beautiful homes don't make their own tools, either. All teachers have access to computer simulations and interactive historical "games"

online. I hope the story of my experience teaching history with the aid of a computer simulation will lead you to search out and evaluate these resources for yourself to use in your own classrooms.

The goal of my simulation was to help students learn about the socio-economic factors leading up to the Revolutionary War and the causes and effects of many of the important precursor events. I took advantage of what makes video games so popular with children — the ability to transform oneself into a virtual character — as a springboard for deep, connected, and genuine classroom thinking and discussion. One unique aspect of my software was that, as a teacher, I had complete control over what happened within the simulation. I knew that this would be key in connecting the simulation with classroom learning. For example, the week after I talked with my class about the Boston Tea Party and ensuing naval blockade, the same events occurred in the simulation, preventing the distraught and frustrated New Englanders from importing or exporting any goods. I wanted my students to live as colonists. When something "bad" happened to the colonists in the simulation I wanted to see anger, and when something "good" happened to them I wanted to see joy. I hoped to channel students' emotions into engaging and productive learning away from the computer.

I had high hopes for my simulation, but I also worried that my students might end up wasting too much time on what others might see as nothing more than a glorified video game. Could I justify my focus on technology to administrators, fellow teachers, parents, or even myself? In Todd Oppenheimer's book, *The Flickering Mind*, he bluntly states that when it comes to educational technology, "Many of its leading players live with elaborate illusions about what computers do." In fact, he coins his own term for this syndrome: "e-lusions." My greatest fear as a teacher was that I would fall for my own e-lusion, but I felt strongly enough that the potential benefits outweighed the risks.

A description of my simulation and how I used it in my classroom is in order. I randomly assigned each student to a team named for one of the three major colonial regions: New England, the Middle Colonies, or the South. To strengthen the connection to their virtual characters, I required students to create background stories about their characters to share with the group, including details about their family makeup, history, skills, and reasons for coming to the New World. I frequently played games away from the computer, based on the history lesson for the week, that pitted region against region. I hoped that the competition would increase students' loyalty to and pride in their own colonial region.

Once a week students logged onto a website that I created to participate in the online simulation. During each turn, students were able to import or export historically accurate goods from England (or foreign countries if they were lucky enough to have a smuggler on hand), purchase appropriate resources for their colony (such as land, simple machines, or sugar), build new products (including fish, lumber, rum, tobacco, indigo and cotton), and sell their newly "created" products. Random events occurred each turn that could drastically affect the player, such as a fire burning down part of his or her fields. The website tracked and stored the income and progress of each student and each colonial region. Which region was the richest soon became one of the hottest topics of discussion among the Internet Colonists of Room 15.

I did not plan to have my students hunched over computers for hours at a time. In fact, students' play time was limited to ten minutes a week. Even within this small amount of time I knew that my simulation could have profound effects on their learning experience.

I allowed my students enough time in the early stages to become attached to their online characters. Many became involved with the beginnings of profitable mercantile businesses or agricultural plantations. But it was time to put my simulation to the test. I announced that Britain was about to pass the first act that would affect the colonies directly. I announced dramatically, "And the name of the first act is . . ." Heads lifted up from desks, pupils narrowed, ears inched closer, and breathing fell quiet. "The Sugar Act!" Keep in mind that at this point in the simulation, the Middle Colonies had amassed huge quantities of wealth, primarily through the production of rum, and to produce rum, the students needed to import sugar. Sugar, that was about to be taxed by Britain. I will never forget what happened next. First, total chaos.

Students shouted out in anger, clapped their hands in joy, or relaxed in relief among a flurry of discussion and outcries. As the newly taxed Middle Colonists glumly shook their heads at the announcement, students from other colonies gave each other high fives and congratulatory handshakes. The wealthiest of the Middle Colonists stood up indignantly and in her most diplomatic voice proclaimed, "That sucks!" I laughed and answered back, "It does? How do you think the original colonists felt?" To which she replied, "They probably felt the same way, too!" All I had to say was "Sugar Act" and every student in the room knew instantly that this meant a tax on sugar, and more importantly, that the colonies who were going to be affected most were the Middle Colonies because they needed to import sugar to produce rum. They had put all the pieces together without any assistance from me. I couldn't help but smile.

The students were full of opinions and comments, and it was difficult to contain their energy. Thoughts and ideas flew around the room like a set of balloons open at

one end. The Middle Colonists hated the new tax, while the other colonists either didn't care, or felt that, as one student said, "the Middle Colonies deserve it because they're getting too rich." I had tried to foster loyalty to the individual colonial regions early on through outside games and activities, but this was more than I'd hoped for. One young girl asked me, "Did the colonies work together or were they rivals?" I turned the question back to her. "From what you have experienced so far in the simulation, have you worked together cooperatively with anyone from a different colony?" She and the rest of the class concluded that, at least at this point, the colonies were mostly rivals. Not only did the students understand this idea of regional individualism among the colonies, they were experiencing it for themselves.

A wise student soon asked a seminal question, "But . . . are there going to be any other acts?" I replied simply, "Gee, I don't know. In the simulation we just follow along with history, so I guess you could look in a history book to find that out." For the next few minutes every single student, from the TAG student on my left to the struggling remedial student on my right, madly searched for books in their desks or ran to the book cart to grab a history book, and then started to fly wildly through the pages. Never before had each and every student in my classroom been as excited about learning history. When I say each and every, I truly mean every student.

It was phenomenal, but now I had a choice to make. I could either ask all thirty students to close their books so we could get back to "real learning," or I could take advantage of their enthusiasm. I chose the second option and gave them page numbers for reference and a five-minute time limit to see what they could find out from the text. As they quietly read the books and whispered to one another, I walked around the room. Here is a small sample of what I overheard:

"Hey, look — the Stamp Act came in 1775 and the Sugar Act came in 1774, so I bet that's next!"

"Oh no, did you see the Townsend Acts? Look on page 274!"

"Who will they affect?"

"It looks like this taxes tea . . . Hey, that affects me! I import tea!"

The conversation was alive everywhere; they were hooked. But would this initial enthusiasm lead to greater learning? Was my simulation a success, or merely an e-lusion? Near the end of our colonial history unit, I tested students informally to see what they had gained from the simulation. I took thirteen major historical events represented within the simulation and placed the title of each one on a separate piece of paper. I divided students into teams based on their region and took each team outside, one at a time. I explained that their mission was to arrange all thirteen events in correct chronological order in the fastest time possible. The students had no idea what the

activity was until we got outside, so later teams did not receive an unfair advantage. I dropped the papers in front of the students, started the timer and waited with anticipation. I gave no advice or hints to the children, only saying, "Everything's correct," or, "You have *X* number of events in the wrong order." Keep in mind that we had yet to make an official time line in class or on paper, and no, we had not just finished a review of the material. In fact, I did this activity first thing after the students walked in the door from lunch. The fastest team arranged all thirteen events in correct order in forty-five seconds. The slowest team accomplished the task in just under two minutes. This was a group of fourth and fifth graders studying colonial America for the first time, not history majors. I later played the same assessment game with a group of pre-service teachers in a class I taught on educational technology. The fourth and fifth graders beat the adults hands down. More impressive even than these recorded times was the dialogue that took place between the students as they worked.

"No, the Tea Act can't come before the boycott, because that's why Britain made the tax!"

"Yeah, that makes sense; the Sugar Act has to come after the French/Indian War. Britain made that tax to pay for the war."

"No, no, no. The Sons of Liberty fought against the Stamp Act, not the Townsend Acts; that's why it was repealed!"

Needless to say I felt the simulation was a success. These were nine and ten year olds, and they were excited about learning history. In Room 15 you could ask any student what the economies of each colonial region looked like, and how, in combination with the various acts that Britain passed, that affected the choices the colonists made leading up to the Revolutionary War.

At this point, I think it's important to carefully dissect how I used technology in my classroom. I used it only to enhance, not replace, what I had to teach. Technology can't make a bad teacher good, but I firmly believe that, if used correctly, it can make a good teacher better. A key piece of my success with technology was that I used it as the origin of the learning and excitement instead of its destination. Students' time on the computer was just the beginning. The real learning happened after that, away from the computer. The Internet colonists in my classroom interacted with the simulation for only ten minutes a week. The rest of the time was spent doing other activities to solidify and fully develop their learning experience.

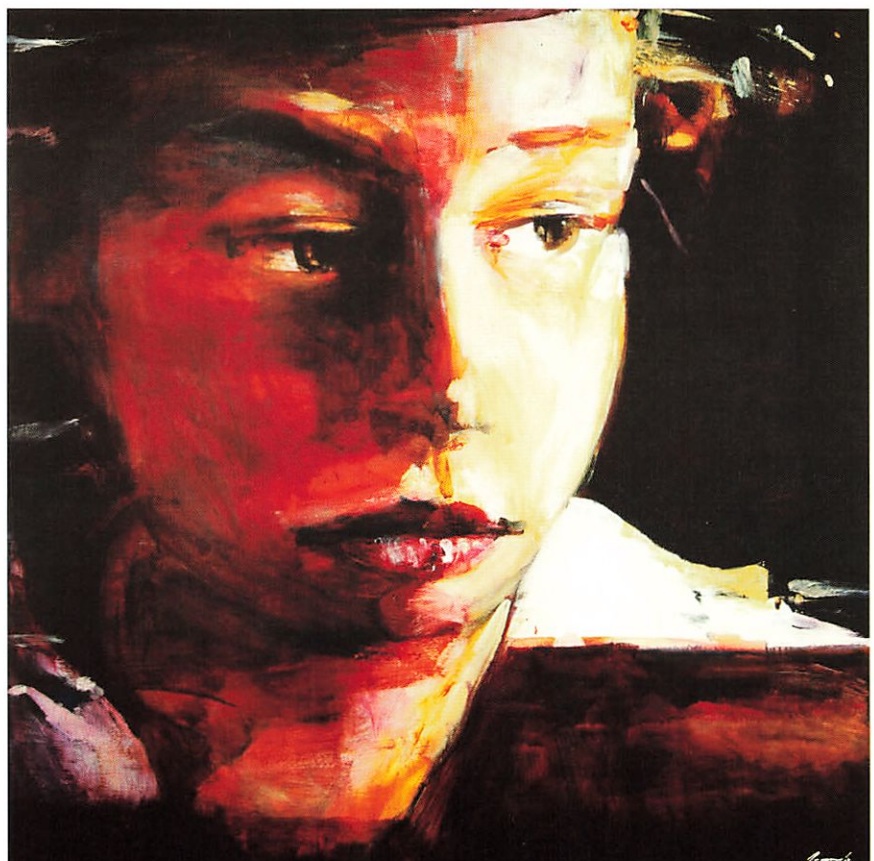
As teachers, our goal is to always find new and better ways to teach our students. As the Digital Age comes into its own, part of this strategy involves learning to use

John Butler *is currently president of his own software company, Like-a-lightbulb, Inc., located in Eugene, Oregon. He completed the Elementary Education program at Lane Community College, and has taught for various youth enrichment programs. He dreams of the day when he can leave his keyboard behind and focus on making more of a difference in children's lives.*

technology effectively. Let's look at a carpenter's toolbox once again. In it you'll find a hammer: a shaft of wood with a chunk of metal at one end. Useless on its own. Put it in the hands of a skilled carpenter, however, and this hammer can be used to build furniture, shelter, and works of art. Instead of constantly bashing our thumbs or trying to cut a piece of wood in half with a screwdriver, we need to look at the toolbox of technology, select the right tool and actively learn how to use it. Some might think that if a tool is not working the way it should, the tool should be thrown out and the user should revert back to the "tried and true" method. A word of caution: Remember that skilled carpenter? Without a doubt that skilled carpenter was once a new student in a woodshop class whose tilted birdhouse fell apart the first time a passing bird gave it a glance. All tools take time to learn to use effectively.

What does all this mean for you and your classroom? Should you rush out tomorrow to purchase the latest-and-greatest laptops, teach all future lessons online, and raid the library for books on computer programming? Absolutely not. The day teachers are replaced with Microsoft-certified technicians will be the day that all hope for our students is lost. However, as educators, we have a responsibility to ourselves and to everyone around us to reach the minds of our students in every way possible. For me, the key to unlocking my students' interest in history was technology. Did technology make me a better teacher? No. Did technology make learning more fun in my classroom? Certainly. Did technology allow me to engage my students and turn on that magic switch of intrinsic motivation? Undeniably. Did technology provide a way for me to enhance what I already had to teach? Yes. And I'm sure that the Internet Colonists of Room 15 would agree with me on each and every point.

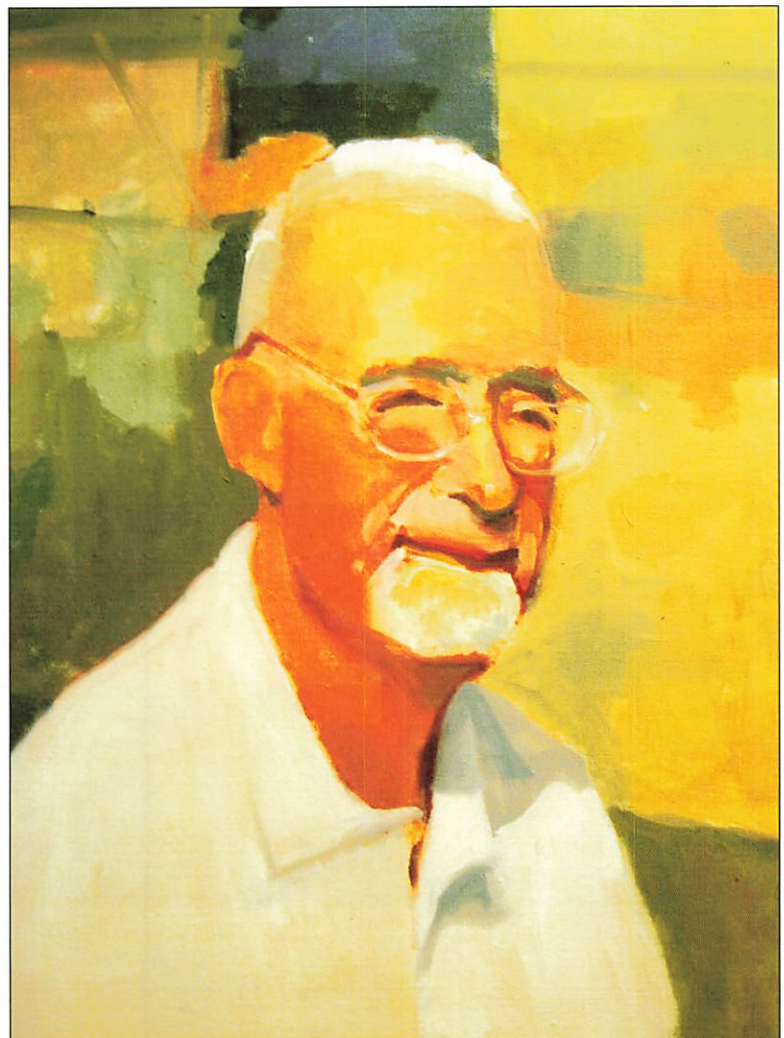
Adam Grosowsky:
Little Dutch Girl #5



Oil on canvas, 48" x 48"

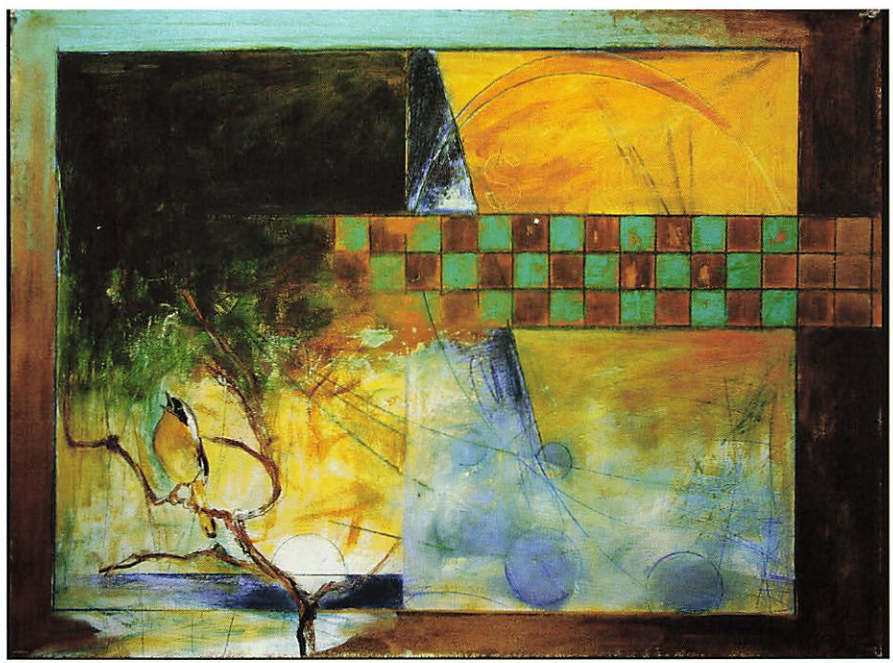
Jerry Ross:

The Engineer (Portrait of Federico Avignonesi)



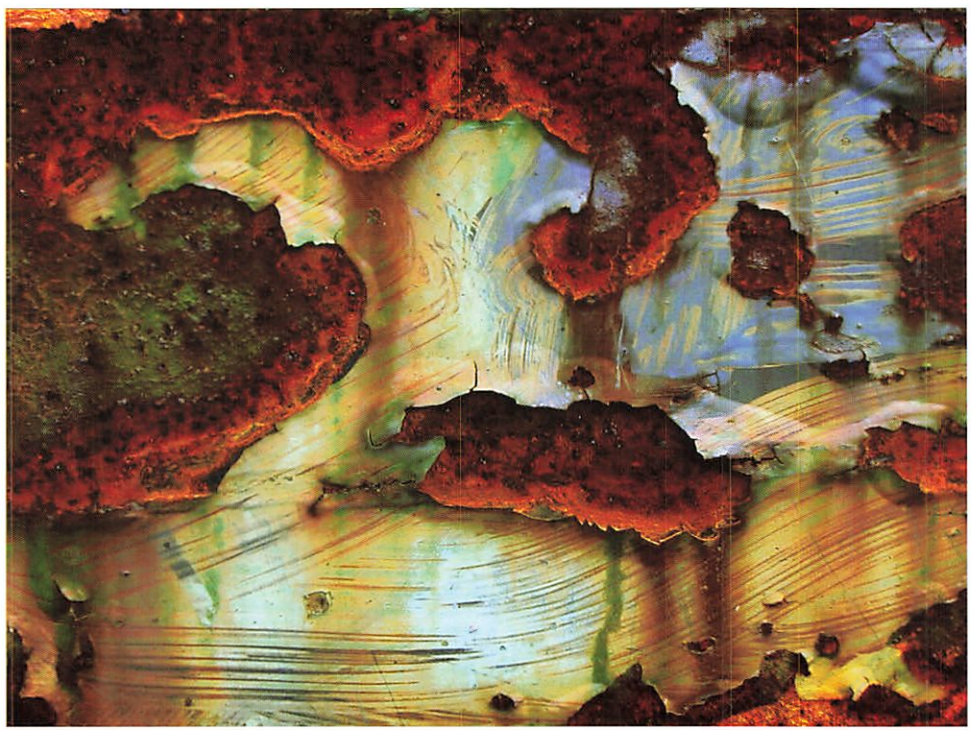
Oil on canvas, 20" x 24"

JS Bird: *Sunlight #2*



Mixed media on paper, 22" x 30"

Allen Arpadi: *Rust Good*



Digital photograph

Artists

Adam Grosowsky *grew up in Illinois, the son of two art educators. Noting his unruly intensity, a high school counselor steered him toward Evergreen State College in Washington, where he graduated in 1981. He went on to study printmaking at the Univeristy of Iowa, where he earned his M.F.A. in 1985. Near the conclusion of his studies at Iowa, he enrolled in an oil-painting class and abruptly exchanged his etching needles for a painting brush. Grosowsky dismisses much of the work seen nationally in the past decade as meaningless intellectualism, and has aligned himself with a small but influential group of realist painters who have continued to work as though conceptual art and deconstructionism never happened.*

Jerry Ross *was born in Buffalo, New York on May 11,1944. He is highly influenced by the Italian I Macchiaioli and verismo schools of art. As an arts activist in Eugene, Oregon, he founded the popular Salon des Refuses art show and DIVA. Local awards for his paintings include Mayor's Art show awards for "La Mamma: Portrait of Stephania Mastrocinque" and "Vedova di Guerra" (The War Widow). His many shows in Italy include a 2006 show at the Comune di Corsico in Milan, and, in 2005, a gold medal and rights to a one-man show in Milan. The jurors there wrote that Ross's work represented "a sort of naturalism founded upon a twentieth century matrix and a tonal type of chromatism with a strong, sculptural effect to construct a composed, poetic atmosphere."*

JS Bird *writes: "I consider myself a story teller. Throughout my career as a maker of images I have investigated narrative and allegory. I endeavor to create images that sing of the beauty of the world, celebrate the animal life I witness, and reflect spiritual awareness, mythology and male identity. I also see my work as a sensuous investigation of problem solving in the realm of color, shape, and surface; the form with which I tell the story. Hopefully, the images offer enough clues to allow the viewer entrance into the story, yet also be open enough so that the story changes with each viewer." See more of his work at www.jsbirdart.com*

Allen Arpadi *teaches mass communication and photography at St. Louis Community College at Forest Park in Missouri. He writes: "Unlike the painter who starts with a blank canvas and decides what details are drawn upon it, a photographer starts with a full scene in the camera's viewfinder and decides what details (shapes, shadows and colors) are removed. I am interested in taking away until only a small fraction of the original scene exists. The resulting image becomes very abstract and three-dimensional. The photograph becomes different with altered meaning. At the same time, hopefully, the original scene is still recognizable. In this close-up photograph, I recorded a very small section of peeling paint and rusty metal from the side of a building."*

Efficiency, Technology, Human Impact, and Language

Four Fragments from *The Garden of Peculiarities*

Jesús Sepúlveda

Editors' note: *The excerpts below come from a 143-page volume written in the vein of "green anarchy," a philosophy that espouses collective life in agrarian communities. This work has been called the "primary twenty-first century anarchist essay" and "a human- and plant-centered antidote to the globalist technocracy." The* Utne Reader *calls it "poetic" and says it "draws from the wisdom of indigenous people." We see it as an essay of observation, concern, criticism, warning and, ultimately, hope.* The Garden of Peculiarities *was published in its original Spanish as* El jardín de las peculiaridades *in 2002 by Ediciones del Leopardo, in Buenos Aires. The English translation was published by Feral House in 2005. The French edition,* Le Jardin des Singularités, *translated by Dmitri Fragata, will be presented this May in the Anarchist Bookfair of Montreal, and the author reports interest in German and Finnish versions. The fragments are numbered according to their place in the book.*

Efficiency (Fragment #4)

Efficiency is inflexible. An automatic collector on the bus processes only exact change to print a ticket; otherwise, it does not work, and it invalidates the operation. The automatic teller buzzes at a wrong button pushed and rejects the plastic card. This is the logic of efficiency, or the reason of inflexibility. In the same way, being indecisive is a sign of inefficiency, which marks and burns with the stain of the flexible.

The sap that flows through nature spreads without a stable base of identity. Rather it flows spontaneously, precipitately. It does not reproduce itself identically, and it rejects the molds of mechanization. This fluid is in constant movement. While the river runs, its particles have no possible replica. In this way, freezing a single drop, isolating it from the general flow, is an act against nature. Cloning nature in order to pour its double into a test tube is a reifying act. Nature is peculiarity itself and is fragile like every snowflake. Its spirit is flexible. The logic of standardization articulates itself instead through the mechanisms of efficiency. An experiment cannot make itself flexible; it requires a stable pattern that must be tested under inflexible conditions and coordinates. Life flows in an organic way, like the sap of plants; it is not a laboratory experiment under scientific control. On the contrary, it flowers with the flexibility of

a bud. Sap waters the world through each one of its peculiarities. Efficiency negates nature, given that it tries to impose a control panel over the garden, which sprouts spontaneously and organically. Efficiency expands and colonizes, ignoring all peculiarity. Because of this, its function is to construct categories that operate with the logic of taxonomic standardization. Thus it differentiates and creates sets while it negates the differences in these same sets, which cannot resist the light and organicity of their own peculiarities.

Reality is a garden of peculiarities forged from a constellation of other peculiarities, which at the same time disperse themselves in their own universe to the rhythm of the sap that flows and flowers. The fluid does not organize itself nor does it represent itself. It is only a flow. Everything that inhabits it is part of its own organicity, which grows in the constant movement of each unique and unrepeatable constellation. The organicity of change — which sometimes expresses itself like bubbles in boiling water — surfaces when humans concentrate their energy — which becomes self-reflexive consciousness — and corrects the course of daily events. But organicity is also natural and independent of consciousness. For example, global warming, caused by human technology, will make the planet cool down to counteract the frightening and artificial heat of fossil fuels. This will cause floods, tsunamis and even the disappearance of coastal population centers. To not understand this is to alienate oneself from the course of life that flows between each and every one of us. It is to fall into reification, that is to say, into the logic that situates subjects like dead matter in a control panel. This is the panel that turns the mechanized system on and off, negating with its measured tic-tac the permanent course of life.

Technology (Fragment #19)

The *instrumentum* is a mental device that modulates technological thinking. It operates like a tool and makes possible the mechanisms of technical operation. In Greek, the word *technê* has a double meaning: manufacture and revelation. The latter is the capacity to make the present apparent. For Heidegger, *technê* leads in two directions: toward technology or toward *poiêsis*. Art also makes the present apparent, but without the instrumental logic of efficiency, or the economic ideology of competition and comparison, whose core is based on transactions.

When art is removed from the institutional sphere to be reinstalled in the praxis of life, there will no longer be a separation between life and art. Of course, life should be lived as if it is a work of art. And art should be experienced in life: not in salons, libraries, museums, or the mausoleum-homes of the ultra rich. When art is practiced in life — and vice versa — there is no need for developing a *sui generis* art market that

promotes the mass production of art through mechanical means. Art is realized in an artisanal form, and it implies a genuine aesthetic appreciation. This appreciation is nothing more than the manifestation of a mental module different from instrumentalization that, in a certain sense, can still resuscitate the illusion of humanity. In the same way, aesthetic reason can be a hope. Otherwise, every other path — be it the freeways of instrumental reason or the prehistoric cavern birthplaces of symbolic, representational art — leads to total destruction; avoiding reification is desiring life. The representation of reality — as mediation between nature and consciousness — produces a reifying effect. Total reification occurs when this representation substitutes for reality. And so initiates an infinitely reifying escalation that is only stopped by death.

Symbolic art transformed artisanal aesthetic practice into a fetish, creating distance between *poiêsis* (the act of creation of the appearance of the present) and life (where the creative act expresses itself). By maintaining art and life in dissimilar spheres, instrumental thinking divests life of certain basic values like solidarity, integrity, dignity, tenderness, etc. In fact, sometimes it is only possible to find said values in art or in the vital praxis of unalienated life, fragmenting human life in a radical way and creating the basis for the production of a lucrative artistic market. In this way, the alienation of modern human life justifies itself and denaturalizes everything that comes from nature, naturalizing — as a counterpoint — the pipeline of alienation.

Human Impact (Fragment #22)

The impact of human life on the planet and all other living creatures is inescapable. The consequences of every single life are inevitable: we walk and we destroy. The destructive effect produced by our existence is amplified by instrumental reason. Instrumental reason is nothing less than a mental module that operates like bewildering ideology: it permits neither feeling nor understanding. Once entrapped in this framework, consciousness rolls up like petrified tissue. In order to sensitize oneself, it is necessary to explore the aesthetic. Art and poetry help us to see in the midst of alienation. Abolishing instrumental reason does not mean abolishing logical or analogical thinking, and even less so intelligence and practical capability. Analogy and logic coexist in nature and in the human mind as an inseparable whole. To associate, for example, the chirping of crickets with the purring of nature, like a happy and satisfied cat, is part of aesthetic thinking. Analogy is manifested through logical, intellectual and linguistic procedures, but its approach is aesthetic before it is instrumental, privileging the appreciation of the natural world and its beauty instead of the functionality of what can be extracted from nature. In order to abolish instrumental reason it is necessary to de-alienate oneself and to unlearn ideological and social training. This is a challenge

that must be focused on dismantling the tool that permits this training: the language that constitutes the subject.

Without language the notion of the subject vanishes. Instrumental, aesthetic and ethical reason — divided in separate spheres between economics and politics, art and poetry, ethics and religion — permitted the appearance of language. Instrumental reason, however, took control of language, thus generating the forms of exploitation of humans and nature imposed by civilization through a sophisticated system of division of labor. Anthropologists believe that that moment was the beginning of history, of agriculture and sedentarism. It may also have been the beginning of the slow process of the objectification of the subject and the acceleration of the expansive motion of civilization rationalized through the notion of progress. The Socratic maxim "know thyself" caused the subject to philosophically reify itself in order to transform itself into its own object of study. In addition, this meant the dissection and separation of the subject from reality; it converted itself into an entity apart, different and estranged from the whole formed by nature.

Language (Fragment #25)

Language fulfills a double function: it standardizes and imposes meaning, but it also liberates. Through language, the subject resists the objectification produced by instrumental reason through its standardizing practices: ideological categories, industrial monoculture, ranching, etc.

Conversation de-alienates and congregates, dismantling the systemic politics that tends toward individual isolation. Standardization, in contrast, cretinizes. In order to do this, it simplifies language, reducing our capacity to recognize reality. This simplification reduces itself to the Orwellian newspeak, which reduces consciousness and atrophies imagination. The subject is not consciousness in itself, just as language is not in itself communication. If we trust the results of science, it is possible to establish that writing appeared sixty thousand or more years ago. The calcareous marks left by Australian aborigines on rocks are proof of this. Obviously, this is not western writing, but the marks are meaning-carrying graphic inscriptions. It is also probable that language has always accompanied human beings, whether it was a form of guttural verbalization, which little by little became more clearly articulated, or as simple gestural communication. Some anthropological texts argue that language and symbolic thinking have existed for millions of years. The stone tools, which can be dated at two and a half million years, are evidence of the existence of rational mechanisms not only related to the symbolic, but also to biped biological evolution, to the use of the thumb and group organization. Marcel Griaule shows that for the members of the African Dogon

Jesús Sepúlveda, *a Latin American poet born in Chile, has lived in Eugene, Oregon since 1995. He is the author of five books of poetry and a book of essays. The second edition of his poetry book,* Hotel Marconi, *was recently published by Cuarto Propio in a bilingual edition, translated by Paul Dresman. His work has been translated into English, French, Portuguese and Finnish, and published in Chile, Argentina, Uruguay, Brazil, Bolivia, Colombia, Costa Rica, Mexico, the United States, Canada, Spain, Finland and Australia. He has been an instructor at Lane Community College, and currently teaches at the University of Oregon.*

community, from Mali, the first word enunciated by human beings was "breath." This suggests that the origin of language was not articulation, but breath itself. In effect, the peculiarity of speaking is characterized by the biorhythm of inhalation and exhalation in every human body. Speaking is as proper to and unique as the accent each one of us has in our own language.

The subject organizes its personality structurally. In this way the subject annuls consciousness, although it can also amplify consciousness through language. To create consciousness, therefore, means realizing our existence in the totality of the cosmos. Through consciousness we create the world. That is, we mark and point out events or issues which otherwise would remain in darkness or silence. Alienation, on the contrary, blinds, causing individuals to follow a track wearing blinders or to be enclosed in cubicles. Language is, therefore, a tool of indoctrination, but also a weapon of liberation. Under the present conditions of human, animal and ecological domestication, the alienating separation of the subject from totality can be seen as an irreversible process. Returning to a primitive state prior to articulated language implies unlearning languages (this is practically impossible without eliminating human beings from the face of the planet). Abolishing the notion of language, even without an exhaustive genocide of all humanity, is an unrealizable and sinister project. What's more, there is no guarantee that the instrumental aspect of symbolic thinking would not reappear at some moment in the development of life. And with it would resurge new forms of alienation and functional domination over nature and the normalizing control of human beings. Hoping for, thus, a utopian, synthetic construction of a primitive communist order based on hunting and gathering, which by extension guarantees the survival of only the strongest and replaces language with telepathy, also seems unlikely.

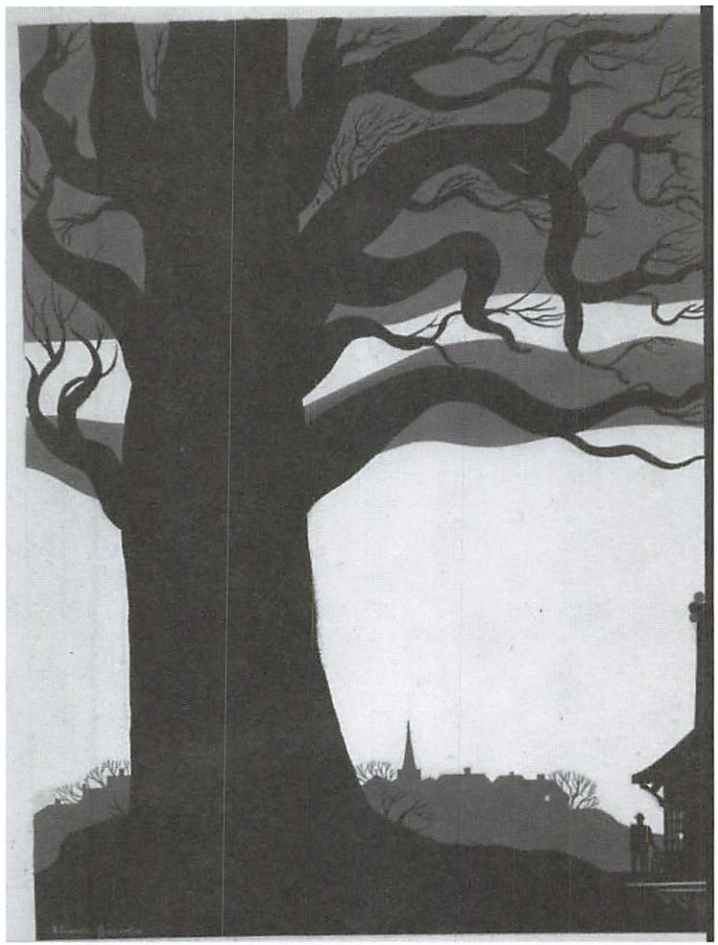
Life has lost its value through the symbolic control of instrumental reason. In alienated and alienating societies, only art and poetry can return the original value of life, given that the aesthetic sphere has been separated from the range of the vital. This separation is nothing more than a strategy of compensation for what has been lost. In order for art to give value back to life, it is necessary to destroy the divisive line between symbolic creation and existence, mixing life and the aesthetic in a single cycle. Thus, combating the symbolic with the symbolic implies a contradiction, but also the possibility of ideological emancipation and the abolition of instrumental reason. Orienting human activities toward aesthetic reason can correct the course of life across the planet and save many creatures — and ourselves — from total extinction.

Translation by Daniel Montero

Reading Together

Reading Together: Learning, Caring, and Community at Lane is a campus-wide project centered around a technology basic to education: books. Using two closely linked books, students explore issues connected with Lane's core values: Learning, Diversity, Innovation, Collaboration and Partnership, Integrity, Sustainability, and Accessibility. This year's theme "Navigating the Changing Terrain" is represented by Dan O'Brien's memoir *Buffalo for the Broken Heart: Restoring Life to a Black Hills Ranch,* and N. Scott Momaday's *The Man Made of Words: Essays, Stories, Passages.*

Students participate in Reading Together through a variety of activities and assignments that explore themes and issues raised by the shared texts. The project also sponsors readings, forums, and lectures for the college and broader community. The above drawing is by George Buhr, a student in JS Bird's intermediate drawing class. For more information on Reading Together, visit http://www.lanecc.edu/readingtogether



Elmer Jacobs

Any sufficiently advanced technology
is indistinguishable from magic.

— *Arthur C. Clarke*

Open Access, Open Source, and the Digital Divide: Connecting Some of the Dots

Brian F. Fox

Defining the Problem

When considering community colleges and technology, two factors are inextricably intertwined: open access and the digital divide. One of the long-standing goals of the community college system has been open access, a term meaning many different things to many different people. While a spectrum of definitions may be developed, most agree that community colleges should be accessible to all in their service district (however this might be defined) who meet the entrance requirements. Unlike universities and private institutions, community colleges are by design created to serve their communities, providing education to all who seek it.

Reviewing the current literature dealing with education and technology, one can not help but notice few topics engender more research and analysis than the digital divide. In a recent query of ERIC, 284 results were yielded for "digital divide" (ERIC, 2006). This topic surfaces time and again in discussions of the needs of the workplace, educational goals, technological literacy, and international competitiveness. The Digital Divide Council of Florida defines the digital divide as "an individual or community's lack of access to computers and online resources. The digital divide refers to a gap between those individuals who have reasonable opportunities to access technology tools and those that do not have such reasonable opportunities" (Digital Divide Council, 2002). According to a recent Pew/Internet report, one in five American adults have never used the Internet or e-mail and do not live in Internet-connected homes, and in general certain groups continue to lag behind: Americans age sixty-five and older, African-Americans, and those with less education (Fox, 2005). As technological skills and higher education are becoming increasingly required in the workplace, and higher education is becoming increasingly dependant upon computer and Internet technology, what is to become of those not learning and using these skills? Inevitably, they will become further and further marginalized within our society, as surely as illiteracy marginalizes citizens.

Attempts at Bridging the Digital Divide

A variety of solutions have been proposed and are currently being implemented across the nation. One of these is Community Technology Centers (CTCs), a U.S. Department of Education grant-funded project dedicated to creating community

centers with Internet-connected publicly available computers in poor and rural areas (U.S. Department of Education, 2005). While the department has funded other projects, these often tend to focus on instruction and innovative uses of technology in education (U.S. Department of Education, 2003) rather than access and availability to computers and the Internet.

A key public institution striving to serve the technological needs of lower income citizens is the public library system. A recent study reports that "99 percent of all U.S. public libraries provide free public access to computers wired to the Internet, compared to 25 percent ten years ago. Librarians overwhelmingly (71 percent) report that the most important impact of this service is providing Internet access to those who otherwise would not have it" (American Library Association, 2006). The study goes on to state, however, that despite increased demand for library computers, there has not been a corresponding increase in their budgets, leaving libraries unable to provide enough workstations and sufficient bandwidth for their users, particularly in poor and rural areas.

Other strategies include grant funding to furnish computers directly to lower income individuals. An example of this may be seen in the T.E.C.H. (Teaching Educational Computers for the Home) project, a state of Florida grant being administered by Santa Fe Community College in Gainesville, Florida (T.E.C.H. Initiative, 2006). Through this grant 200 low-income students and their families in Alachua and Bradford counties will be furnished with a computer, printer, modem, and paid Internet access for a year; software included on these systems includes MS Works 2006. The program requires attendance at a minimum number of training workshops and that a journal be kept regarding the use of the computers for educational purposes.

The Alternative of Open Source and Portable Applications

While the above programs are certainly a step in the right direction, the reality remains that many people in our society continue to lack adequate access to computers and the Internet, a situation that will negatively impact their ability to participate in higher education. At the same time, a growing number of higher education institutions, particularly four-year schools, are requiring all students to have their own computers (often that they specifically be laptops or tablets). While financial aid can in many cases be used to cover the cost of a computer, for many students this is increasingly becoming a burden in their pursuit of a degree and further adding to the rising debt levels of students in general, a situation that once again disproportionately impacts lower-income students. In an attempt to cut costs, many colleges are also closing or considering the closure of some of their campus computer labs, arguing that

students already have access to computers and the Internet, and that funds could be better spent as a result. As we have seen above, this is not necessarily the case.

Furthermore, proprietary software, such as Microsoft Office, places an additional burden upon students; on top of the need to have reliable access to computers and the Internet, students must also purchase expensive software. Additionally, those facilities providing public access to computers, such as public libraries and campus computer labs, must purchase site licenses for all of the computers hosting such software, increasing operational costs at a time of ever-tightening budgets for all public institutions. An example of this reality may be seen in the T.E.C.H. computers awarded to individuals in Alachua and Bradford counties in Florida (as described above). While the grant administrators hoped to include the MS Office 2003 suite on the computers, the cost of the licenses proved prohibitive. The reality is that most consumer PCs do not come with MS Office, necessitating that students purchase the software themselves or use campus computer labs — and we return to the problems previously described.

An alternative may be seen in the form of open source software. Wikipedia defines open source software as "computer software whose source code is available under a copyright license that permits users to study, change, and improve the software, and to redistribute it in modified or unmodified form" (Wikipedia, 2006d). Open source software is part of a larger movement known as Free/Libre/Open-Source Software, or FLOSS (Wikipedia, 2006b). The open source movement, largely through the work of volunteers and the donations and support of corporations such as IBM and Sun, has produced an amazing collection of software programs that include the Linux operating system, the Sakai and Moodle course management systems, GIMP (an image editing program along the lines of Photoshop), Nvu (HTML editor), Thunderbird (e-mail client), and Sunbird (calendar). Perhaps the most famous project to date is the Firefox browser (Firefox, 2006), which has actually managed to take a significant market share away from Internet Explorer (Linn, 2006). The OpenOffice (OpenOffice.org, 2006) suite provides word processing, spreadsheet, database management, and presentation applications, all of which are highly compatible with MS Office, allowing for MS Office file format import and export. Additionally, OpenOffice helped to develop, and supports, the growing standard of word processing format, OpenDocument, which is now being used in several European countries, the National Archives of Australia (Wikipedia, 2006c), and beginning January 1, 2007, the Commonwealth of Massachusetts will require it to be used in all state-affiliated offices (DesktopLinux.com, 2005).

While nothing is ever completely free (there will always be installation, training, and maintenance costs), open source software has clearly shown substantial savings

over proprietary software. If utilized in community colleges and higher education in general, these savings would cushion the blow technology upgrades are inflicting on ever-tightening budgets, and at the same time help to stem the ever-increasing costs of higher education for students. While proprietary software applications such as MS Office will continue to be required in software applications courses due to the requirement to prepare students for current workforce needs, their need on the whole across campuses could certainly be lessened, decreasing the need for large numbers of site licenses. An argument can be made that as public institutions, community colleges have a duty to search for free alternatives for software provided that they truly do provide acceptable substitutions to proprietary applications.

A project sharing many of these ideals is One Laptop Per Child. This U.S. based, non-profit organization was created by faculty members of the MIT Media Lab and is working to design, manufacture, and distribute laptops to needy children world-wide, with the goal of making them as inexpensive as $100 per unit (Wikipedia, 2006a). The operating system for these computers will be Linux, and all of the software for these computers will be open source.

Many of the projects aimed at serving the technological needs of lower-income people are looking to open source as at least a partial solution. At Santa Fe Community College, used computers not donated to local schools or other state agencies are sold in public auction; in order to comply with site licensing requirements, proprietary programs such as MS Office must be removed, and are being replaced by OpenOffice. The T.E.C.H. grant administrators have taken a similar approach; while the grant could not afford the cost of MS Office for each of the computers, instead settling for MS Works, students will be shown how to download and install software from the Web and will be doing so through the installation of OpenOffice. Not only will this demonstrate valuable skills, but it will also provide the grant recipients with a presentation application, something lacking in MS Works. Open source has increasingly been shown to provide legitimate alternatives to proprietary software, alternatives that are both free and open to alteration to fit the needs of individuals and/or institutions.

A further, related development is portable applications, which may be defined as "a computer program that you can carry around with you on a portable device and use on any Windows computer. When your USB flash drive, portable hard drive, iPod or other portable device is plugged in, you have access to your software and personal data just as you would on your own PC" (PortableApps.com, 2006). Many of the more popular open source programs have been converted to a portable format, with sites such as PortableApps.com providing the conversion and optimization of

these programs to improve their functionality as portable applications. PortableApps.com provides portable versions of OpenOffice, Firefox, Nvu, GIMP, and many other popular open source programs; recently, the service made available the Portable Apps Suite, a single file download that includes all of these programs and more as well as a taskbar-based menu to conveniently access the programs. Additionally, the U3 project, backed by several industry leaders in flash technology, provides conversions of both proprietary and open source software, but it does require a specially formatted USB drive to use their applications (U3, 2006).

Portable applications clearly provide further opportunities to help bridge the digital divide. For those students and individuals required to use public computer facilities, portable applications allow them to take their own programs — with their own customizations such as browser bookmarks, clipart, and custom dictionaries — and their files to work wherever they find access. Combined with CTCs, public libraries, and campus computer labs, portable applications provide great assistance to those not owning computers. However, in an attempt to maintain campus computer security, some campuses are not allowing students to run executable files from USBs. While securing campus networks is important, once sufficient safeguards are put in place, exaggerated fears should not stand in the way of students' needs.

Conclusions

Open source software can help control the rising costs of software for both students and institutions, helping to move institutions closer to the goal of open access. When combined with portable applications, these technologies can certainly help to bridge the digital divide. In order for this to be accomplished, however, colleges must make an effort to familiarize all members of the institution with open source programs through training and education. Without this, adoption will be slow if not actively opposed. Additionally, colleges must remain dedicated to protecting their campus computer labs in order to serve their lower-income students, always remembering that not all students have computers — and even those who do sometimes need access to public computers. Furthermore, campus computer labs and classrooms must remain flexible with regard to portable applications. If these and other efforts are not made, if some risks are not taken, then there will surely be those students denied access to higher education.

Brian Fox *is an associate professor in Business Programs at Santa Fe Community College in Gainesville, Florida, where he lives with his wife. He teaches software applications and Internet technologies as well as business English. His graduate studies focused on the management, economics, development, and implementation of distance education courses and programs. He is the author of several articles and has presented at League for Innovation and the European Distance Education Network conferences. His current academic interests include open source applications and the Web 2.0.*

References

American Library Association. (September 26, 2006). New study: Today's public libraries are thriving technology hubs that millions rely on for first or only choice for Internet access. Retrieved October 19, 2006 from the World Wide Web: http://www.ala.org/Template.cfm?Section=news&template=/ContentManagement/ContentDisplay.cfm&ContentID=138765

DesktopLinux.com. (2005). Massachusetts verdict: MS Office formats out. eWeek.com. Retrieved October 20, 2006 from the World Wide Web: http://www.eweek.com/article2/0,1759,1863060,00.asp?kc=EWNKT0209KTX1K0100440

Digital Divide Council (Florida). (2002). Frequently asked questions. Retrieved October 15, 2006 from the World Wide Web: http://www.digitaldividecouncil.com/digitaldivide/faqs.html

ERIC (Educational Resources Information Center). (2006). Search query. Retrieved October 15, 2006 from the World Wide Web: http://www.eric.ed.gov/ERICWebPortal/Home.portal?_nfpb=true&_pageLabel=Home_page

Firefox. (2006). Firefox central. Retrieved October 20, 2006 from the World Wide Web: http://www.mozilla.com/firefox/central/

Fox, S. (2005). Digital divisions. Pew Internet & American Life Project. Retrieved October 18, 2006 from the World Wide Web: http://www.pewinternet.org/pdfs/PIP_Digital_Divisions_Oct_5_2005.pdf

Linn, A. (2006). Microsoft releases new IE browser. AP. Retrieved October 21, 2006 from the World Wide Web: http://news.yahoo.com/s/ap/20061020/ap_on_hi_te/microsoft_s_web_browser_4

OpenOffice.org. (2006). Homepage. Retrieved October 20, 2006 from the World Wide Web: http://www.openoffice.org/

PortableApps.com. (2006). Homepage. Retrieved October 22, 2006 from the World Wide Web: http://portableapps.com/

T.E.C.H. Initiative. (2006). Homepage. Retrieved October 19, 2006 from the World Wide Web: http://inst.sfcc.edu/~business/ckachik/TECH/Index.htm

U.S. Department of Education. (2003). Digital divide projects. Retrieved October 19, 2006 from the World Wide Web: http://www.ed.gov/Technology/digdiv_projects.html

U.S. Department of Education. (2005). ED programs that help bridge the digital divide. Retrieved October 17, 2006 from the World Wide Web: http://www.ed.gov/Technology/digdiv.html

U3. (2006). Homepage. Retrieved October 22, 2006 from the World Wide Web: http://www.u3.com/

Wikipedia. (2006a). Children's machine. Retrieved October 21, 2006 from the World Wide Web: http://en.wikipedia.org/wiki/One_Laptop_per_Child

Wikipedia. (2006b). Free/libre/open-source software. Retrieved October 20, 2006 from the World Wide Web: http://en.wikipedia.org/wiki/FLOSS

Wikipedia. (2006c). OpenDocument. Retrieved October 20, 2006 from the World Wide Web: http://en.wikipedia.org/wiki/Open_document_format

Wikipedia. (2006d). Open source software. Retrieved October 20, 2006 from the World Wide Web: http://en.wikipedia.org/wiki/Open-source_software

Technology at Lane

SimMan, a realistic full-body patient simulator, is used by Lane nursing students to practice skills and procedures. This life-like, computer-controlled mannequin can display symptoms of a wide range of diseases, allowing students to perform procedures such as setting up and monitoring blood transfusions, starting an I.V. or taking blood pressure. Students can also monitor after-effects through SimMan's realistic programmed behaviors. Nursing instructor Julia Munkvold adds, "More than just skills, however, the interaction with SimMan (via audio voice feature) is extremely useful for student nurses. We keep Sim-Man's responses typical to hospitalized patients."

Sometimes It Might Be Necessary to Reinvent the Wheel

Amy Gaudia

> *Unless we change the direction we are headed in,*
> *we might end up where we are going.*
> — Chinese proverb

Many years ago when I was an impressionable middle school kid, we watched a strange movie, the name of which I've completely forgotten as well as most of the story and characters with the exception of one disturbing scene. *An old man inside his greenhouse is tending the last surviving piece of a once green growing world, while several people on the outside are angrily destroying the small structure. They break his windows, and consequently his heart, as we see an anguished face behind shards of glass.* Around that same time period many of us watched the movie *2001: A Space Odyssey* with its ominously metallic rectangular monolith that appeared prehistorically, then again and again, and into the future. Lately these images and their meanings circle hauntingly through the center of my being, fortunately only during my waking hours.

Green Earth... technology... invention... ecocide... green...

I suppose it was a natural innate evolutionary event when our early ancestors learned to make tools and use them, while lacking the ability to predict the long-term consequences. The discovery and development of agriculture is a perplexing example of technology run amok. It may also be natural and innate for people to race on ahead without considering the interconnected web of all living things, speedily harvesting the Earth and all its beings. If so, and if this means that we are now in the midst of another normal process of mass extinction, are we humans off the hook? I don't think so. For one thing, we still have underutilized brains and a seemingly infinite supply of imagination. A slippery expanse of perceptual territory is available for exploration, which sure as heck isn't going to save us, but it could be damn fun unraveling the dazzling mystery of it all.

What if the automobile had never become so popular and its use had been limited to emergency situations when the life of an animal or human was in jeopardy? Imagine a society where travel by foot was highly revered and celebrated, and bicycles

and wheelchairs were universally championed. Instead, we took a perfectly balanced solution — transportation via exercising the human body, and split it into two very challenging problems — declining health and an addiction to fossil fuel. What if we could change this course we are on? Perhaps our use of computers is following the same course. Ouch! Some will say, "Don't go there; the almighty computer will save us." And it might, if we could use it to build flourishing local economies and therefore eliminate our dependence on gigantic corporate producers of food and merchandise. It might, if we could use it to minimize our dependence on petroleum, which is the preferred method of fueling the delivery of all our worldly possessions, the juice that propels the meat industry that will pump you full of corn-fed beef then send you gasping into your doctor's office where you would be lucky if you got a prescription to go out and walk your dog!

If computer technology had a mind of its own (and maybe it almost does) what if that mind asked itself, "How can we continue to benefit from this amazing mechanism in a way that is durable to the point that it sustains us?" This could at least be our exit from the hardware/software trap of planned obsolescence, and so much more. Or nothing more. Maybe we just need to get out of the trap. I love those folks who have been in resistance. You know who I mean — your co-workers and older parents, for example, who still do not know how to perform simple tasks such as sending an attachment or downloading a PDF. This is honestly not a put-down. Absolutely not. The truth is, I secretly admire them and I believe they secretly know I do, because I believe that they are secretly, consciously or subconsciously, holding on to something very precious.

I like to see the little wheels turning inside people's heads when they are problem-solving, designing, scheming. What a great symbol for the imagination. Reinventing the wheel, as my title suggests, is not intended to mean that something is wrong with us, or that it is possible to reverse the current global crisis. Rather it means that something important may be missing or may have been left behind, something fundamentally vital that I am certain is retrievable. Like that unique sensation, physical and emotional, that arises when you actually use a pen and paper to write someone a letter instead of sending an e-mail. Like the way my mind used to wrap around a piece of soapstone when I carved it using a cheap set of small knives and chisels, my hands twisting, turning, pausing and gauging every chip as the sea turtle slowly emerged. Each one had a story as it gradually came to be, always with some surprise because carving is a mystery in itself. And the rock unpredictable. The turtle was always there in the soapstone, and all it needed was the careful removal of everything else around it. For certain my nifty new rotary tool will add precision and lessen the number of

injured fingers, but I hope I can hold on to the slow thoughtful indescribable hand-eye-mind-heart connection that is the gift of creativity, which is the gift in all of us, that should never be forgotten.

Imagination... turtles... remembrance... rock... turtles...

When is the last time you visited a wilderness area, or a meadow on your friend's rural property, or even a wooded reserve within the city limits? Many would agree, at least most of all my relations would agree, that there is a primordial drive to seek out these places, to know them and to feel them. However, it is likely that millions of children and adults prefer the ease and comfort of television nature shows. Some of them are wonderful, and I do watch them occasionally, but I fear that when days, months and years of videotaping get edited down to sixty minutes they become counter-productive. If you want to learn about animals and their habitats, if you hope for a chance meeting with some wild feathered work of art drinking from a deep blue pristine lake, you need to make an effort to go there and stay awhile. The interconnected relationships with our cohabitants in this web of life cannot be built on even the most superbly upgraded, ultra-flat, super-sized, high-definition digital display.

> *The more clearly we can focus our attention on*
> *the wonders and realities of the universe about us,*
> *the less taste we shall have for destruction.*
>
> — Rachel Carson

I still wonder about the teachings from the greenhouse movie. In particular, that one pure moment of deep grief that even now is quietly resting, yet always propelling. Ultimately I see the spoked wheel as a symbol for the community of all living things, the web of life that has always existed whether people honored it or not. What happens when it spins too fast? Who gets cast off? What happens to our vision? And, why do we care?

One fine summer day on a long lone walk, I stopped to gaze into a deep green forest, breathe it in, and listen. Wise Woman arrived and led me into a canyon, sat me down and peered into my eyes. Way down within she focused, further than anyone ever had before, though I did not know what is was that captured her attention. Then she reached forward; her hand passed through skin and bones and pulled out from my center a large chunky crystal, which she held before me. She showed me all its many facets and dimensions, the shimmering shiny prisms, rainbows, lines and shadows as I studied it from above, below,

and maybe from twenty different angles. For a moment I had the eyes of a bee. A thousand years passed. Then after a long embrace, when the sky turned purple and orange, she let me go while gazing again into my face and said,

"You know what to do."

And I did,

And still do, most of the time.

When I forget, I go to my favorite rock

And sit

And wait

For the wind

to greet me.

Amy Gaudia *has served on the faculty of Lane Community College since 1995 in the Adult Basic and Secondary Education department as instructor, tutor coordinator, division council representative and fun-meister. She has been teaching for over sixteen years, and has been an artist and musician in various capacities since she was in the womb.*

An Argument for Advancing Technology

Sasha Tavenner Kruger

> *If we had a reliable way to label our toys good and bad, it would be easy to regulate technology wisely. But we can rarely see far enough ahead to know which road leads to damnation.*
>
> — Freeman Dyson

Many people, even those in scientific and high-technology fields, have their misgivings about where technology is taking our society. Technology is the use of tools, from stone adzes to modern machinery, to achieve an end, but sometimes there are detrimental aspects to achieving that end. I have friends — in the final stages of receiving doctorates in chemistry and physics — who postulate that a state of advanced scientific knowledge or technology is key to the presence of what they see as inexorable social decay, and thus conclude that the use of technology, in general, is a bad thing. Bertrand Russell, a mathematician, philosopher, and one of the progenitors of the Pugwash conferences (which are dedicated to gathering influential individuals together to discuss the threat of nuclear weapons [among others] to all civilization) argued eloquently for nuclear disarmament on ethical and moral grounds. Rachel Carson, in *Silent Spring*, poignantly assessed the possibility that we could utterly destroy whole ecological systems through simple ignorance and willful disregard for the effects of our industrial processes and chemical releases into the environment. Each of these concerns is valid: that our society changes in a negative way in response to technological changes, that technology itself presents us with ethical dilemmas and quandaries, and that a blind application of technological developments can and has led to dramatic, sometimes irreversible, environmental damage. I argue, however, that the net benefits visited on us by the use of technology outweigh its undesirable effects. In fact, technology itself does not cause us be destructive. It simply enables us to be more efficient in the destructiveness we already engage in.

I asked my friends, "So, is technology *necessary* for social decay?" They had to own that they did not think so. "What is it about technology that is so bad, then? Why do you say there is a correlation?" One friend, the chemist, said, "I don't think it matters what the level of technology actually is. I think simply its presence is the determining factor." Those who think that technology causes social decay must think society is de-

caying in the first place, and that question is debatable. Each new twist in our cultural mores is by definition different than what came before, and there will always be people who think *different* is *worse*. Some consider a reduction in face-to-face communication to be a bad thing. Yet, our communications capability has expanded dramatically since the advent of digital media. I may not see my friends in person as often as I once did, but despite the fact that some of them live around the world, we are able to keep in touch via e-mail, and I feel our friendship is neither diminished by distance nor by the method we use to communicate. One demonstrably unfortunate effect of technology on society is that in literate societies memories are worse than in oral societies. However, a demonstrably positive effect is that birth control has contributed to women's rights in some areas of the globe.

In order to argue that technology is not a necessary precursor to perceived social degeneration I ask two basic questions, and posit answers. First, can social change (regardless of whether it is for better or worse) take place even among non-technology-using species? Yes — social interaction evolves among social species. Take orcas, for example. There are two well-known social types of Pacific Northwest orcas. One type, called "residents," consists of matriarchal family-pods, which travel together and protect one another. The other type, the so-called "transient" orca, often travels by itself and forms pods of unrelated individuals. In the resident orca pods, members of the pod remain members for life, while in the transient pods members come and go from the pod arbitrarily. Resident and transient orcas use the same feeding grounds but do not socialize with one another. These types may be in the process of diverging into different species, but the social split happened earlier. Orcas do not use technology in the sense of tool use, yet their social structure has changed with time.

Second, just because technology allows us to perform a particular task more efficiently (or at all in some cases), is that by itself a bad thing? I feel the answer is both "yes" and "no." I think it is not a bad thing in the sense that refining an already existing process yields better results: more food per acre, lower infant mortality rates, faster and more reliable means of communication, and so on. However, it is clearly possible for us to blindly increase our effectiveness while ignoring the consequences of our higher use of resources or the creation of ethical dilemmas. It is a question of seeing far enough ahead, as the Dyson quote indicates. In some sense we must ask, "What could possibly go wrong?" The next equally important step is sitting down and planning for the foreseeable possibilities. Necessary in this process is the ability to determine trivial versus important concerns, short-term versus long-term consequences, and intensity of consequences. If taking a dangerous drug will save my life in the short term, I will

take it. I'll put off being concerned with the resulting liver damage until later. The *intensity* of the two options is quite different: dead, or somewhat damaged.

This sort of trade-off often shows up in our use of technology. In Bangladesh, should they build a dam or die in floods? Nearly all of Bangladesh is low-lying, and the population is large enough that there is little hope of relocating people away from the floodplain. Bangladeshis farm to support themselves, so what happens if the silt from floods is denied to them by building dams? Are a few thousand deaths every few years (due mostly to the drinking of contaminated water after flooding) an acceptable price to pay for the continued ability of the farmers to grow enough food for the populace? Can water-sanitation technology be distributed evenly throughout the region, and would that solve enough of the problem that flooding is no longer a terribly dangerous prospect? Another example: What are the consequences of intensive food production? Higher population and greater use of resources come to mind. However, higher population allows specialization into areas such as medicine, transportation, and so on, creating an overall higher standard of living.

Technology is most often the means for detecting, delineating, and solving the very problems that technology creates. Environmental protection laws came into being after data showed that our depredations against the environment were having a profound effect on the natural world. Through technology we learn that fish populations are declining. We come to understand that top predators are dying of poisons ingested by humble life forms and transferred up the food chain, and that the effects of certain chemical reactions are changing the amount of UV-radiation reaching the planet's surface from the sun. Observations lead to disbelief, which leads to further testing, which leads to confirmation of the results, which leads to action to try to ameliorate the damage. In cases such as UV levels, we would not even be able to tell there is a problem without the use of advanced instruments and analysis. Had we had less technological ability in the 1970s and 1980s, we would not have started to understand the problem we had created until skin cancer rates around the world exploded.

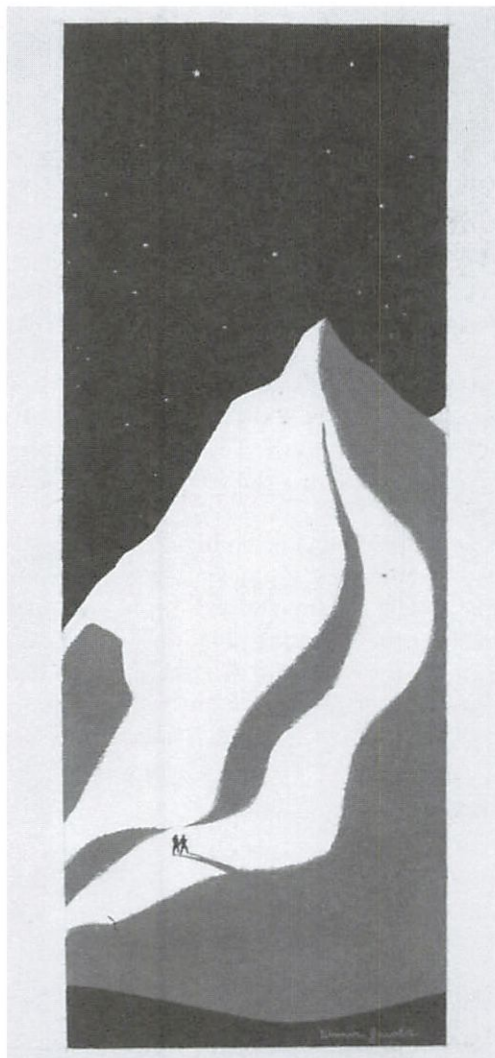
There are two problems with sustaining a level of high and increasing technology. The first of the two problems is our general inability to foresee, appreciate, or understand the chains of repercussion from technology use. Several examples have already been given. In general, technology can be the most effective tool to fix problems caused by the use of technology. The second is technology's creation of ethical quandaries. Should we clone humans? Is nuclear power efficient and safe enough to warrant generating an exquisitely toxic by-product that will outlast hundreds of generations? How does this compare to releasing thirty tons of mercury into the air every year by burning coal? It is necessary that we confront ethical questions as a society, preferably

before the technology those questions relate to becomes viable, in order to provide a low-conflict roadmap for its use. I envision this societal questioning process in the form of forums, debates, and widely-available written arguments. This type of confrontation and conversation enables typical citizens to have a say in where technology goes and what we allow ourselves to do with it. It also provides a catalyst for citizens to become better educated. Despite the problems, I feel that the benefits we gain from the use of technology outweigh the problematical aspects.

What benefits can technology give us? For one, technology allows for a complex society. In such a society, a subset of members can provide basic needs like food, clothing, and shelter for all members, ideally freeing up the time and energy of others to improve conditions for all. This is a self-feeding process: greater technology drives greater specialization, which drives the advancement of technology. In a basic survival situation, could electricity be discovered and put to use, for example, to heat and light homes? Could antibiotics be designed and created? Without an excess of resources, could any of us afford to form bonds with people outside our family and to help them when needed? In general, we need a surplus of time and energy to do that. Technology, and the advancement of technology, can help us solve problems we currently face such as global warming, over-population, and an insufficient resource-efficiency in maintaining our standard of living.

We can make enormous messes with the ill-considered use of technology, but technology also helps us better understand what we are doing and, in general, provides the solution to the messes. The betterment of all can be achieved through technology. The social structure we create, after making a mess and learning how to clean it up, leads to an improved quality of life for the majority of people. I'm not implying that making a mess is a desirable outcome, but in the absence of the ability to "label our toys good and bad," I believe that advancing technology (with as much forethought as possible) is superior to just staying where we are and never learning a better way to do things.

Sasha Tavenner Kruger *teaches physics part-time at Lane Community College. She recently graduated with a Ph.D. in physics from the University of Oregon. In addition to teaching, she is also a designer at a structural engineering firm. She writes short stories, knits, and practices Aikido for fun.*



Elmer Jacobs

Everybody gets so much information all day long that they lose their common sense.

Gertrude Stein

Technology At Lane

Chinuk Wawa

The Foundations of American Indian Languages course sequence is offered at Lane through the Language, Literature, and Communication division. The introductory linguistics courses examine the special features of Indian languages of Oregon, including the unique relationships between the language of a society and its culture.

The words below are from a course in Chinuk Wawa, a language spoken throughout the Pacific Northwest.

t'waX-XuNXuN; t'waXuN	Computer. Literally "Light, bright-brains"
Nunk Nakwshti pipa	Photocopying. Nakwshti means "Twice"
nanich-lerubon	Movie. Generic term, literally "Seeing-ribbon"
nanich-lakHaset	Television. Literally "Seeing-box"
LaXayam	Aloha! Literally "Hello/goodbye"
Ulali	Berries. Source of many place names, often spelled *Ollalie.*
Ili?i	1) Dirt, ground; 2) Land, country. The question mark, written without the dot under it, represents a strong glottal stop. Many place names, spelled *Illahi* or *Illahe,* come from this word.
saXali	High up, above, on top; upwards. The origin of Sahalie Falls on the upper McKenzie River. Accent on the first syllable.

Source: Jerry Hall, Lane Community College

Infrastructure as Landscape:
Complexity and Urban Coherence

Margaret Robertson

Introduction

Infrastructure has a fundamental but generally unacknowledged impact on the places around us. While in other historical periods it has been treated as cultural artifact and art form, cultures in contemporary developed countries tend to follow alternative approaches. Some urban designers strive for sanitized scenographic settings which keep working systems out of sight. Where infrastructural elements are large, designers focus primarily on function, typically leaving aesthetic potential untapped.

Three features of contemporary infrastructure are noteworthy. First, because of its ubiquity, scale, and geometry, infrastructure has significant potential to shape urban form. Second, making the technological circulatory system visible has implications for aesthetic perception, ecological awareness, and cultural regionalism. Third, with its energy and material flows, complexity, networked structure, and emergent properties, infrastructure shares properties with other complex systems including organisms, ecosystems, and computer networks.

Designers and critics have observed that concealing infrastructure cuts us off from reality, a condition we can ill afford, either psychically or ecologically. Attending to infrastructures as legitimate and visible landscape design elements can provide civic structure, create places that respond to their regional contexts, and help people reintegrate themselves into their particular bioregions and in the larger systems and processes of which they are a part. Scholars from fields as diverse as biology, mathematics, and computer information systems argue that all complex systems share certain features in common; these principles can inform urban infrastructure design, resulting in "living cities." This is a vast and complex condition which calls for complex thinking.

What is Infrastructure?

Infrastructure is a subset of public works, projects financed by public funds and constructed for the benefit of the general public. It consists of the basic facilities and services needed for the functioning of a community.

The etymology of the words *infrastructure* and *substructure* contain the same meaning: "the structure below." But in common usage, while *substructure* points to physical objects, *infrastructure* is about relationships and functions. It is the systems used

to transport people, goods, water, waste disposal, energy, and information. Contemporary infrastructure is the complex of technological support systems — including water supply, wastewater treatment, power, gas, communications, roads, harbors, and bridges — that underlie and make possible human culture.

Thus infrastructure can be seen as a social institution. It is the properly-functioning public landscape that "allows the private landscape to specialize and achieve individuality." (Jackson, 1970) One of the essential qualities of a town is that "it is a gathering together of people and utilities for the generation of civic warmth." (Cullen, 2002)

Nearly all infrastructure is made of flows. Several — electricity, water, and gas — are based on difference in pressure or its analogs; they may be laid out in a tree-like pattern or as an interconnected network. Biological metaphors are often used. In its simplest form, infrastructure is the veins and arteries of human society; it is nearly everything that isn't actually the skin and structure of buildings. (Knecht, 2006)

The Challenges

Invisible Infrastructure

Many of the technical underpinnings of urban life sink literally beneath our notice. It is sometimes only their absence, or their faulty design, that remind us of them. Almost all components of water distribution systems are out of sight, underground to avoid freezing.

Often designers are charged with screening or hiding infrastructure "in order to maintain the image of the untouched natural surroundings of an earlier era." (Strang, 1996) We may choose to hide our infrastructure as a way to conceal environmental guilt, preferring not to be "constantly reminded of our technophilic obsession." (Thayer, 1985) We also prefer to hide infrastructure for aesthetic reasons. Infrastructure as currently constructed is seen as ugly; we would rather enjoy its benefits but avoid its costs. Thayer (1985) points out that infrastructure is our connection with the earth, its processes, and its other inhabitants. "When we lose cognizance of infrastructure," he argues, "we lose any hope of understanding our place in the world . . . To hide infrastructure is to live in placeless illusion."

Visible Infrastructure: Lack of Coherence

Landscape paintings have become part of the mental structure through which we process our perceptions. (Lyndon, 1996) This perceptual filter leads us to see patterns we expect to see, and not to see parts of reality, e.g., infrastructure elements, that do not fit our image.

Familiarity breeds public indifference. Infrastructure's very ubiquity makes it invisible to us. (Kaufman, 1997) For example, power poles are one of the most common sights of the modern streetscape; there are 100 million of them in North America, almost as many as there are houses. (Hayes, 2005) Yet we seldom notice them. To test this, try to take a photograph of a well-regarded urban space; do you need to struggle to dodge "non-scenic" infrastructure elements in order to get a good composition?

When critics study urban form they look at and write about buildings and open spaces as if the smaller elements of infrastructure did not exist, no matter how large a share of the visual field they actually consume. These critics, and the authors of urban-design handbooks, act as if those details were not there.

When we develop a habit of selective non-seeing, we run the risk of atrophy of perception. The danger is that we do not know that we are not seeing; we become perceptually numb. Geographer J. B. Jackson suggests that commonplace aspects of our contemporary landscape could teach us a great deal "about ourselves and how we relate to the world. It is a matter of learning how to see." (Jackson, 1984)

A city without enough complexity is dead; if it has complexity without sufficient organization, it becomes chaotic and unlivable. Thus one reason for ignoring infrastructural elements is their chaotic arrangement, often caused by their installation as separate pieces of construction rather than as integral parts of the urban fabric. A charge leveled at Modernism is that by focusing only on objects and ignoring the relationships between them, urban landscapes became disconnected and haphazard. (Kunstler, 1993) "These places are dismal because the public realm that binds them together is degraded, incoherent, ugly, and meaningless." (Kunstler, 1996)

Visible Infrastructure: Inappropriate Scale

Another challenge comes as a result of inappropriate scale. Transportation infrastructure is typically plagued by such problems. The need to move large numbers of vehicles in an automobile-dependent society creates freeways and interchanges that completely dominate the landscape. Goods are transported by a vast network of trucking, and "the size of these vehicles creates pressure to widen all other roads and driveways." (Hayden, 2004) There is a tradition of aesthetic sensibility among highway designers, but this aesthetic judgment has been based mainly on what the road looks like from the driver's seat. Modern designers are beginning to develop methods for considering the view towards the road.

Size alone is not the issue. Parking garages are important elements of the urban landscape, often functioning as district gateways; they "may be the most important urban building type in medium-sized cities." (Linn, 1993) Older garages are often

out-of-scale and aggressive; newer garages, however, are becoming integrated into building design.

The electric power transmission tower, built of structural steel, is one of the least-loved objects in the industrial landscape. Yet it is built on the same principles as one of the most-loved vertical urban elements, the Eiffel Tower. (Hayes, 2005) They are similar objects; one is handled with sensitivity to surroundings and scale, the other not.

Visible Infrastructure: Function, Not Form, is the Rule

J. B. Jackson observed that the best urban complexes "recognized the need to integrate infrastructure, or civil engineering, with landscape, or architecture." (Jackson, 1984) Infrastructure is as critical to the quality of the urban environment as are buildings and open space, yet architects and landscape architects are rarely involved in the planning and design of it. (Knecht, 2006) Many decisions about how components are arranged on the land are based primarily on function and economy rather than fit. Power transmission lines, for example, are laid out in straight lines, often resulting in cutting of trees and "shattering the pastoral scene." (Cullen, 2002)

Particularly since World War II, designers and engineers "have separated function from form in infrastructure," regarding transportation, water, waste, and power as "mere utilitarian systems rather than cultural artifacts or forms of public art." (Morrish, 1985) However, an emerging trend seeks reintegration of art and function, with contemporary designers exploring "the diverse implications of looking to landscape and infrastructure as interwoven, reciprocal concepts." (Lyndon, 1996)

Infrastructure as Landscape: Some Approaches

Visible Infrastructure: Hide or Mask the Components

A variety of approaches to the challenges of infrastructure can be considered. For large, visible infrastructure elements, a common approach is either to screen or to camouflage. Some wastewater treatment plants, such as the West Point Treatment Plant in Seattle, use berms and vegetation to screen the facility from view and blend it with adjacent surroundings.

Water storage tanks have changed in style and role over the past century. Wooden tanks were once almost a civic institution. But modern monopod tanks are steel, mounted on a single stalk, and they do not generate the same feelings of affection. Some towns have tried to dilute their utilitarian character with banal humor by painting them to resemble a golf ball and tee, a baseball, a peach, a smiley face. Others have attempted to blend them with the sky by painting them swimming-pool blue. Many

electrical power pole insulators and transformers are painted with a gray color known as Skytone, to blend into the background when seen from below. (Hayes, 2005)

Cell phone towers present a new set of problems. Most of them are 150 to 200 feet tall, out of scale in residential neighborhoods and marring views. The problem is sometimes addressed through what is called stealth siting, hiding them on church steeples, smokestacks, and municipal water towers. In Arizona they may be hidden in artificial saguaro cacti, and in some regions artificial pine trees are the most popular costume.

Visible Infrastructure: Apply Design Principles

Some contemporary designers argue for infrastructure as landscape, which takes a more positive and less tentative approach. Since infrastructure is ubiquitous and fundamental to modern culture, this gives us the basis for viewing it as "a generator of urban form." (Strang, 2002) According to Morrish, the whole web of infrastructure should be conceived broadly, as not just utilitarian service systems "but as armatures for culture." (Morrish, 1985) Morrish argues that infrastructure as a basis for culture can perform three functions: it can serve as a repository for collective memory, as an orienting and pathfinding framework, and as "a curriculum of civic instruction on how to use and value this investment." It should be noted that higher urban density, valuable for a number of reasons including open space protection and transit efficiency, also requires fewer miles of infrastructure (Hayden, 2004) and offers opportunity for infrastructure coherence.

The same design principles that apply to architecture and landscapes can also be applied to infrastructure. Elements should be proportional to their surrounding environment so that they are part of an integrated whole. Too-large elements are overpowering and destroy coherence; too-small elements lack the strength to contribute to coherence and become merely random. Cullen (2002) notes that common visible elements of the transportation and power distribution infrastructures are repetitive: traffic signs, light fixtures, power poles; he cautions that the great number of them "puts a premium on simplicity and clarity." This does not mean that minimalism is always preferable, just that visual coherence is.

Visible Infrastructure: Promote Multiple Functions

Perhaps the biggest immediate aesthetic gains can be made in the renovation of single-purpose utilities. (Strang, 2002) Examples include combining stormwater drain-

age, open space, and habitat; or power structure, wayfinding landmark, and education. In many situations infrastructure elements could be made as major landmarks.

Much current infrastructure is monofunctional. Urban freeways are an example. Their only purpose is to move cars, and no other activity can go on at their margins. (Kunstler, 1993) Could the freeway be reconfigured to become part of, rather than disconnected from, the urban fabric? An answer may lie in the principle of connectivity which is an attribute of complex systems theory.

Invisible Infrastructure: Clarity of Expression

Social critic Lewis Mumford criticized the City Beautiful Movement of the late nineteenth and early twentieth centuries for its dishonesty, its requirement for "the burial and concealment of all signs of industrial production and modern technical services." Mumford castigated architects for "ignoring the potential for making civil architecture from important, everyday elements of the city, such as water towers and subways." He argued that beatification "detracts from the realism needed for the colossal task of the renovation of the city." (Keeney, 2000)

Landscape architect Gary Strang argues that "the chaos of the contemporary city may, in part, stem from the fact that our tools — the great support systems of architecture and infrastructure — have no formal clarity that expresses their importance to society." (Strang, 1985) A place's hydrology "should be part of the basic armature of urban form," examples of which can be seen throughout pre-modern history. Some of the most profoundly moving landscapes of pre-industrial cities "were nothing more than the irrigation, domestic water supply, sanitary sewer, and flood control systems of the time." (Strang, 1996) Infrastructure can generate a system of regional landmarks, where "significant sources, paths, and transition points of our collectively owned resources [are] made legible in landscape." For example, a modern "water temple" marks the place where San Francisco's water supply from the Hetch Hetchy Reservoir surfaces before connecting to the city reservoir. The same could be done with oil and gas lines, marking their source and the point where they enter a city, "with structures that make their functions, and important position in society, legible. Invisible communications technologies could be expressed at transfer points." (Strang, 2002)

Other examples of clarity of expression can be found. The building and grounds of the Fairmount Waterworks, built in Philadelphia in 1815, have remained embedded in the civic life of the city. Built at a human scale, well-proportioned, with ample public access and honest about the function it served, it is an exemplar of semiotics. (Hood, 1996) Fire hydrants are elements that clearly mark function; as design elements they

"often achieve distinction by reason of their self-contained force as sculpture or vivid color." (Cullen, 2002) Paris Metro entrances are beloved landmarks; at the Franklin Street subway entrance in New York City, the lamps and vaulted canopy, when viewed head-on, "combine to look like a train pulling into the station." (Linn, 1993) At the Sun Valley power distribution station in Los Angeles, architects used a vocabulary of industrial materials to express function and unify a set of unrelated buildings; rather than trying to hide itself, "the fence creates a dancing horizon line on an otherwise flat suburban wasteland." (Linn, 1993)

Infrastructure has the potential to speak in symbolic as well as aesthetic languages. Bridges, for example, are elements that are clear about their function. "Bridges make connections; they bring people together." (Hayes, 2005) The bridge itself, far more than most industrial artifacts, is taken seriously as a work of art. Fine examples of formal clarity can be seen in the projects of the Depression-era WPA, which included bridges, power generation facilities, and public buildings.

Timidity is seldom a valid design approach. A few jurisdictions have faced the cell-phone tower challenge head-on; Fayetteville, North Carolina commissioned an antenna mast that became a swept-wing weathervane sculpture. Several European cities have created landmarks of their broadcasting towers, building a sculptural spire in the middle of town, often with observation deck and other tourist facilities. The CN Tower in Toronto is a sculptural creation claimed to be the "world's tallest building and free-standing structure" which is both broadcast tower and tourist attraction. (Hayes, 2005)

Opportunities to rethink the connections between services underground and life above ground will soon appear. Much of our underground infrastructure is near the end of its design life, in which a fifty-year cycle is common. The amount of funding available for infrastructure is likely to be far greater than that available for buildings and open space; these large budgets could be put to work. "Infrastructure rebuilding and repair offer opportunities for innovative changes." (Nassauer, 1997) Access and design expression can be built in as the system is rebuilt. (Knecht, 2006)

"One percent for the arts" legislation, found in many jurisdictions, can be applied to infrastructure. A highly instructive example is the 1988 Public Art Plan of Phoenix, Arizona, a plan for transportation infrastructure intended "to give Phoenix's increasingly aimless expanse a more coherent, comprehensible pattern." (Lebow, 1996)

Integrate with Living Ecosystems

Landscape architect William Wenk argues that infrastructure function and design can be reunited "only when we begin to view public infrastructure and the infra-

structure of nature as one." (Wenk, 2002) This implies, and requires, attention to specificity of place. Louise Mozingo argues for placing the rules of aesthetics in their functional context, of "uncovering the myriad of hidden processes that make cities work." (Mozingo, 1997)

Architect Malcolm Wells suggests that we as a society consider our values with respect to the earth, then over time align new or rebuilt infrastructure accordingly. How things look is often an indication of a society's values. Wells argues that because we have become so conditioned to seeing the current state as normal and acceptable, we miss the obvious fact that infrastructure is lethal to the non-human world. (Wells, 1994) In his watercolor essay, "Infrastructures," he proposes a "life-supporting infrastructure," a nature-based design that replaces current deadness with a green mantle reconnected with its green matrix.

Collecting and treating rainwater and runoff offers one of the most accessible solutions. An increasing number of sculptural examples can be found. Herbert Dreiseitl's popular 1999 Potsdamer Platz in Berlin collects rainwater from sixteen and a half acres of urban surface and circulates it through water carpets, water stairs, channels, and pools, in a rich but elegant display of sounds, patterns, and forms, with water itself the sculptural medium. In Portland, Oregon the sweeping stone-lined flume, circular basalt wall, and artful plantings of Robert Murase's 1997 Water Pollution Control Laboratory are part of a public pond that "gives sculptural form to a basic hydrologic process" while treating fifty acres of urban industrial runoff. (Thompson, 1999) Carol Mayer-Reed's Rain Garden at the Oregon Convention Center in Portland celebrates rainfall; water from five and a half acres of roof pours from steel scuppers, courses down spillways, and animates a series of pools defined by basalt columns, stone weirs, and rich compositions of streamside plants.

Perhaps one reason infrastructure typically seems so dreary, when it is visible at all, is that it lacks multiple layers of meaning and metaphor. It is what it appears to be, and there is nothing more to be discovered. Art, by contrast, often deals in metaphor. Metaphors offer resonance and layering of meaning. The "ecological web" is "a metaphor that will help us to see the world and the constructs we make within it in a more multiple, more 'natural' way." (Lyndon, 1996)

Complexity and Urban Infrastructure

Infrastructure as Complex Systems

Urban-planning critic Jane Jacobs wrote that an essential quality shared by all living cities is a high degree of organized complexity. (Jacobs, 1961) Conventional ideas

about infrastructure planning assume a simplified underlying order that can be realized through infrastructure development. However, the urban environment in which these systems are embedded is highly complex and adaptive, and requires modes of thought more aligned with complex systems theory. (Gifford, 1993)

Strang noted that infrastructure has come to resemble biological systems. "It is somewhat ironic that urban infrastructure has developed to such a degree of complexity that it has begun to take on qualities of nature itself and, therefore, presents the same threat of random catastrophe that nature does . . . Infrastructure, like nature, is resilient and adaptable, but is also unpredictable and uncontrollable." (Strang, 2002) Pattern and connectedness at a human scale have a basis in biology. "One purpose of pattern is to ground the building in nature and connect it to our bodies by imitating the ordering discipline of life forms, especially our own." (Hale, 1994)

Multiple writers have noticed that architecture, urban planning, civil infrastructure, evolutionary biology, and computer networks share the characteristics of general complex systems: complexity, adaptability, and emergence. Topologically, there is little formal difference between such systems. This being the case, it seems reasonable that the study of complex systems principles could provide us with potential design guidelines for integrating infrastructure into a living city. While the complexity of urban infrastructure can be a problem because of the possibility of incoherence, it also has potential because of its complex nature.

Connectedness

A school of thought gaining currency in landscape architectural theory is the view that "landscape" is far more than visual scenes, "but rather invokes the functioning matrix of connective tissue that organizes not only objects and spaces but also dynamic processes and events that move through them." (Wall, 1999) An effect of modern urbanization has been that traditional urban spatial typologies have become less significant than infrastructures and network flows. Connectedness is a key feature of living systems. Geographer James Kunstler (1993) observes, "A community is not something you *have,* like a pizza. It is a living organism based on a web of interdependencies. It expresses itself physically as *connectedness*." Infrastructure is a physical manifestation of community connectedness. The physical infrastructure of industrial society is "a membrane between the great and the small, between the collective and personal, things as close as our own skin and as remote as the distant future." (Buchwald, 2003)

Work by mathematician Paul Erdös states that after a certain number of connective steps in a set, a majority of the nodes — more than 80 percent — will connect rather suddenly. (Hoffman, 1998) We can extrapolate that the relative number of connections establishes how well a living city works.

Transportation infrastructure is an example. The transportation network — especially for small trucks — actually depends on connectivity and not on speed. (Salingaros, 2003; cf. any standard work on traffic engineering.) To accommodate all these connections, the transportation network must be multilayered and sufficiently fine-grained to allow many alternative choices. Superhighways severely reduce the number of available paths. These limited-access roadways could be reconfigured in urban centers to behave more like Parisian boulevards, with multiple points of connection.

Scale-free Networks

Another feature of complex systems is the prevalence of scale-free networks; familiar examples include neural networks and the Internet. (Buchanan, 2002) Over time the traditional notion of a hierarchical urban structure "has been largely replaced by a more polycentric, weblike sprawl . . . Emphasis shifts from forms of urban space to processes of urbanization that network across vast regional surfaces." (Wall, 1999)

We could envision a series of webs, each internally coherent, each with "formal clarity," and each with its unique scale and orientation. For example, one may express the electric power grid; another may be transportation routes; another may express water flows. These coherent webs, each legible, could be laid over each other. As in biological systems, they will interact in unpredictable and emergent ways, generating a new pattern which is greater than the sum of the individual parts.

Superimposing one grid over another of different configuration can provide multiple connectivity. The web has structural strength only when networks on different levels cross and overlap, providing cross-connectivity. When connections are forced to coincide they become singular (too many are concentrated along one path). Singular connections do not work because they overload the carrying capacity of the channel. (Salingaros, 1998) "The challenge for the contemporary city is how to superimpose competing connective networks in an optimal manner." (Salingaros, 2003)

There is a difference between visual connections and paths that connect physical flows or movement of people. Visual connections are necessary for orientation, and for creating a coherent picture of an urban setting. They are another form of web and do not always coincide with paths and roads.

Emergence

According to Jane Jacobs, "Urban life in dynamic cities arises almost spontaneously when a critical mixture and density of urban elements has been reached . . . This mingling must be fairly close-grained." (Jacobs, 1961) She was describing the property of emergence, a characteristic of living systems. Emergence can be seen experimentally

in a mixture of complex organic molecules (such as those from which life arose some four billion years ago): Any molecule can act as a catalyst, and it is not predictable which ones will. Computer simulations show a dramatic increase of reaction probability above a certain threshold of molecular variety, known as a "critical diversity." The autocatalytic threshold is reached suddenly at a point called the "phase transition." (Casti, 1994)

Architect Christopher Alexander, author of *The Oregon Experiment* and *A Pattern Language*, bases much of his work on emergence. He has taken the position that large complex systems cannot be produced by a conventional design process — either top-down or bottom-up. Instead, he says, they emerge from an extended and collaborative evolutionary process. Order and coherence come from the rules that govern this process. (Alexander, 2002) Alexander argues that this evolutionary process can be broken down into discrete steps, which may either preserve structure and wholeness, or destroy it. Structure and wholeness is articulated as a recursive system of centers. The essence of his vision is that all the elements in the manmade landscape "had to be viewed as orders of connecting relationships rather than as mere objects in space." (Kunstler, 1993) Wenk notes that while regional planning is important, so is infrastructure design at the site scale, "where changes can accumulate to produce landscape-scale patterns over time." (Wenk, 2002)

Water stepwells in western India were an example of coherent form resulting from an emergent stepwise process. Begun in the sixth century as simple holes dug to reach water, they became deep trenches dug in the earth, then lined by masons with elaborate masonry and stone stairs leading up from the water; they remained the state of the art in Indian water management for more than a millennium. These beautiful below-grade creations were "visible architecture that gave access to an invisible landscape of underground aquifers." (Livingston, 2003) When the water table was high, a visitor descended only a few steps to collect water or bathe. When the water table was low, the visitor descended as deep as nine stories, down a long staircase punctuated by porticoed landings. The stepwells became not only water sources but also gathering places, ritual sites, and religious metaphors.

Principles of Systems Theory

Mathematician Nikos Salingaros has developed proposals for urban coherence based on rules for geometrical coherence derived from complex systems theory. (Salingaros 1998, 2000, 2003) Equivalent proposals can be found in analyses of computer systems (Helland 2004, Veryard and Boxer 2005) and architecture (Alexander 2002). These geometric principles have implications for infrastructure design.

Couplings. Strongly coupled elements on the same scale form modules, which connect to form larger modules, like molecular building blocks. Elements isolated by either function or aesthetic impact, such as a single cell phone tower, are weaker than they are when juxtaposed, such as a bridge with a road. Each element should connect to its neighbors and to its context.

Diversity. Similar elements do not couple. Coupling works either by contrasting qualities, or via an intermediate (complementary) catalyst. In electrical current or fluid, flow occurs only between points of differing potential or pressure — a relevant metaphor for infrastructure, which actually includes electricity and fluid flows. Thus, subtle individuality should be introduced for each element. This is an appropriate application for "one percent for the arts" initiatives.

Boundaries. Modules couple via their boundary elements. A successful urban interface resembles either a permeable membrane with holes to allow for interchange, or a folded curtain with an edge that looks like a meandering river on a plain. Straight edges, straight lines, and flat unarticulated surfaces are poor transmitters of information; they block couplings and create isolation. Approaches should be found that introduce complexity to edges at a larger scale and introduce detail at a finer scale.

Forces. Forces are strongest on the smallest scale (cf. atomic force), weakest on the largest scale (cf. gravitational pull). Reversing them generates pathologies. If infrastructural elements are not coupled on the smallest scales, they can never support coupling on the large scale. A coherent urban fabric depends just as much on the materials and shapes of the smallest elements as it does on any higher-level connections. This requires scrupulous attention to every detail.

Organization. Long-range forces create large scale from well-defined structure on smaller scales. Rigid alignment can destroy short-range couplings. A row of identical shapes in a grid are in fact disconnected; some organic variation is required to maintain coherence.

Hierarchy. A system's components assemble progressively from small to large. This principle restates a concept already familiar to designers, who are accustomed to hierarchical circulation paths and hierarchical spatial sequences.

Interdependence. A higher scale requires all lower scales, but not vice versa. For example, an orderly arrangement of transportation channels will still not be coherent if the smaller-scale components, from feeder roads to support columns, are disconnected.

Decomposition. A coherent system cannot be completely decomposed into constituent parts. Systems cannot be assembled like Lego blocks simply by applying rules from engineering handbooks. Design must be interconnected.

Fractal Scale

These principles could be summarized by considering fractals — mathematical patterns that continue at all scales. Fractal pattern structure is found throughout the biophysical world, and can be applied to infrastructure design as well. Pattern that continues across scales provides coherence and connection. People need patterns that continue across our own human scale, the spaces near our own bodies. If gaps in the urban fabric occur at a larger scale, without connective substructure on the human scale, those gaps erase the fractal coupling. But coupling on the small scale does not necessarily lead to coherence on the large scale. Large-scale order occurs when every element relates to every other element in a way that contributes to overall order.

Conclusion

Infrastructure is both the fundamental support of modern human life and a physical manifestation of the social life we hold in common. It is an undervalued resource that has the potential to shape urban form. Infrastructure in the contemporary world shares a set of characteristics with other complex systems, including those encountered in the biological world. Complex systems theory can be applied to infrastructure design to generate patterns to which the human mind is innately wired to respond.

Bibliography

Alexander, Christopher. *The Nature of Order: An Essay on the Art of Building and the Nature of the Universe. Vol. 3: A Vision of a Living World.* Berkeley: The Center for Environmental Structure, 2002.

Ascher, Kate. *Anatomy of a City.* NY: Penguin Press, 2005.

Buchanan, Mark. *Nexus: Small Worlds and the Groundbreaking Science of Networks.* NY: W. W. Norton & Company, 2002.

Casti, John L. *Complexification.* NY: Harper Collins, 1994.

Cullen, Gordon. *The Concise Townscape.* Woburn, MA: Architectural Press, c. 1971 [reprinted 2002].

Flint, Anthony. "Creative Stealth." Landscape Architecture. 93(1), January 2003.

Gifford, Jonathan. "Complexity, Adaptability and Flexibility in Infrastructure, Economic Growth, and Regional Development.: The Case of the Industrialized High-Income Countries." Paper presented June 10, 1993 at an international workshop, "Infrastructure, Economic Growth and Regional Development" in Jànkàping, Sweden.

Hale, Jonathan. *The Old Way of Seeing.* Boston: Houghton Mifflin, 1994.

Hayden, Dolores. *A Field Guide to Sprawl.* NY: W. W. Norton, 2004.

Hayes, Brian. *Infrastructure: A Field Guide to the Industrial Landscape.* NY: W.W. Norton & Company, 2005.

Helland, Pat. "Urban Design and Service-Oriented Architecture." *Metropolis.* July, 2004.

Hoffman, Paul. *The Man Who Loved Only Numbers: The Story of Paul Erdös and the Search for Mathematical Truth.* NY: Hyperion, 1998.

Hood, Heather. "Serendipity on the Schuylkill: The Fairmount Waterworks." *Places.* 10(3), Summer 1996: 4-7.

Jackson, John Brinckerhoff. "The Public Landscape." In *Landscapes: Selected Writings of J. B. Jackson.* Ervin H. Zube, ed. Amherst: University of Massachusetts Press, 1970.

Jackson, John Brinckerhoff. *Discovering The Vernacular Landscape.* New Haven: Yale University Press, 1984.

Jacobs, Jane. *The Death and Life of Great American Cities.* NY: Vintage Books, 1961.

Jensen, Ron. "Artists and the New Infrastructure." *Places.* 10(3), Summer 1996: 58-59.

Jones & Jones. *Visual Impact Assessment for Highway Projects.* Washington, D.C.: American Society of Landscape Architects, 1979.

Kaplan, David H., Wheeler, James O., and Holloway, Steven R. *Urban Geography.* NY: John Wiley & Sons, 2004.

Kaufman, Sandra and Snape, Kevin. "Public Attitudes Toward Urban Infrastructure." *Journal of Public Works Management & Policy.* 1997, 1(3): 224-244.

Keeney, Gavin. *On the Nature of Things: Contemporary American Landscape Architecture.* Basel: Birkhäuser, 2000.

Knecht, Barbara. "Urban Infrastructure: The 'Out of Sight, Out of Mind' Mentality Is an Outmoded Concept." *Architectural Record,* February 2006.

Kunstler, James Howard. *The Geography of Nowhere.* NY: Touchstone, 1993.

Kunstler, James Howard. *Home from Nowhere.* NY: Touchstone, 1996.

Lebow, Ed, et al. "Place Debate: Revisiting the Phoenix Public Art Plan." *Places.* 10(3), Summer 1996: 52-63.

Margaret Robertson *teaches drafting courses at Lane Community College, where she is also chair of the Facilities Council and active in several groups promoting sustainability on campus. She holds a bachelor of landscape architecture from the University of Oregon and is a post-professional student in the master of landscape architecture program at the University of Oregon.*

Linn, Charles. "Focus On: Value-Added Infrastructure." *Architectural Record.* 181(6), June 1993: 136-139.

Livingston, Morna. *Steps to Water: The Ancient Stepwells of India.* NY: Princeton Architectural Press, 2002.

Lyndon, Donlyn. "Caring about Places." *Places.* 10(3), Summer 1996: 2-3.

Morrish, William. "Raising Expectations." *Places.* 10(3), Summer 1996: 63.

Morrish, William and Brown, Catherine. "Putting Place Back into Infrastructure." *Landscape Architecture.* 85(6), June 1995.

Mozingo, L. A. 1997. "The Aesthetics Of Ecological Design: Seeing Science As Culture." *Landscape Journal* 16(1): 46-59.

Nassauer, Joan Iverson, ed. *Placing Nature: Culture and Landscape Ecology.* Washington, D.C.: Island Press, 1997.

Salingaros, Nikos A. "Theory of the Urban Web." *Journal of Urban Design.* Vol. 3, 1998: 53-71.

Salingaros, Nikos A. "Complexity and Urban Coherence." *Journal of Urban Design.* Vol. 5, 2000: 291-316.

Salingaros, Nikos A. "Connecting the Fractal City." Keynote address, 5th Biennial of Towns and Town Planners in Europe. Barcelona, April 2003.

Steiner, Frederick. "Connecting Infrastructure to Deep Structure." *Places.* 10(3), Summer 1996: 60-61.

Strang, Gary. "Notes from Underground." *Landscape Architecture.* 85(6), June 1995.

Strang, Gary. "Infrastructure as Landscape." *Places.* 10(3), Summer 1996: 8-15.

Strang, Gary. "Infrastructure as Landscape." In Swaffield, Simon, ed. *Theory in Landscape Architecture: A Reader.* Philadelphia: University of Pennsylvania Press, 2002.

Thayer, Robert L., Jr. "Increasingly Invisible Infrastructure." *Landscape Architecture.* 85(6), June 1995.

Thompson, J. William. "The Poetics of Stormwater." *Landscape Architecture.* 89(1), January 1999.

Veryard, Richard and Boxer, Philip. "Metropolis and SOA Governance: Towards the Agile Metropolis." *Metropolis.* July 2005.

Wall, Alex. "Programming the Urban Surface." In Corner, James, ed. *Recovering Landscape: Essays in Contemporary Landscape Architecture.* NY: Princeton Architectural Press, 1999.

Wells, Malcolm. *Infrastructures: Life Support for the Nation's Circulatory Systems.* Cape Cod, Massachusetts: Underground Art Gallery, 1994.

Wenk, William. "Toward an Inclusive Concept of Infrastructure." In Johnson, Bart R. and Hill, Kristina, eds. *Ecology and Design: Frameworks for Learning.* Washington, D.C.: Island Press, 2002.

Technology and Desire

Anna Kate Malliris

When I was young, I was blessed (or was it cursed?) to have a father who loved words. He taught them to us as "real" words, which in our family meant being able to spell, define, and use the word in a sentence, and then twist its meaning to the outer limits. My first real word was "ubiquitous," and I learned to love these words ever since. Now it is too tempting; I must try to make "technology" into a real word. *Technology: Using knowledge to meet the goals desired by people.*

Technology surrounds us. Everything is clearer, brighter, more defined. I like the convenience of immediate information. I appreciate the ease that technology creates. For example, I like my digital camera. I'm not sure, however, that I know it always gives me exactly what I desire.

I remember when, after family vacations, my dad set up the slide projector so we could finally see the pictures that had come back from the developers. I remember the wait and anticipation were part of the joy. I loved the emotional rollercoaster ride as I saw how beautiful the lake looked at sunrise and how awful my hair looked after I'd gotten out of the tent.

Pictures I might have deleted from a digital camera live forever through the older technology as moments from long ago. The grainy, slightly faded quality places me in a time and space that is, in my memory, not so clear. A memory that, like the picture, has faded and softened. The colors remind me that perfection is fleeting, as is youth, beauty, and the brittleness of ego. It is the memories that I desire; the people, places and feelings that I intensely crave. I covet the wonder I felt when, on a trip to Europe, I took the wrong turn and ended up driving over the Swiss Alps. I recapture that wonder when I see the picture of my daughter on the roof of the car looking out over the world. The mountains may be faded, half of my daughter's face may be in the shadows and the film may be turning a little grainy. But that photo gives me what I desire.

Now, when I take digital pictures, I don't look at them right away. I come home, unpack, do laundry, rest, and ponder what I have seen. I force myself to wait and anticipate, sometimes for up to six months. I allow myself to crave that excitement of

seeing the memories captured in those unedited pictures. When I do look at the pictures, I don't immediately delete the pictures that, in the moment, might wound my pride or embarrass loved ones. I wait until the feelings of excitement and wonder have subsided, until I have the distance to forget the momentary challenge or exhilaration captured in each picture. It is then that the pictures give me the magic I covet, the magic of recapturing a moment that is funny, sweet, remarkable, or forgotten. Only then can technology, the wonderful knowledge that created digital cameras, fully meet my desires.

Anna Kate Malliris is Assistant to the Vice President for Instruction and Student Services at Lane Community College.

Erin Beth looking out over the world.

Elegy for Mother

Dan Armstrong

1

We spoke on the phone,
you and I,
each morning the last week
you were alive

as I wiped from my mind
the traces of dreams
from the night before

and poured my desperate
monologues into your ear,
the ear Nancy had laid the phone next to,

trying to crowd all my love for you
across
the miles, across
the years,

never receiving, of course,
any spoken words in reply,
always wondering what mark
my words had left on you,

stroke stricken and broken in love.

But the next to last time I called,
expecting the same mute listener
as before and before,

you answered my greeting
with a breathy rush of air
that almost said "Hi,"

full of a warm,
warm love that now is clear
meant "Goodbye."

2

What can you tell me now, Mom?
Speak to me from the grave,
and tell me true.

Tell me
what you mean to me,
what parts of me are built
in the pauses

between your rushes of words,
your frenzied, placating greetings
of countless strangers
in countless places
over countless years.

What was it with you and talk?

The coin of fear
in the face of threat?

The outpouring of a little girl's
grief reaching back
to her mother's grave face,
saying,
"Love me if you can,
I need your love"?

Or the simple Irish gift of gab
on hyperdrive
that Grandpa gave to you,
and you, in turn,
gave to me?

3

And what of your story
of the yellow rose?
The rose from heaven,
sent you as a sign
as you washed dishes
at the kitchen sink,

appearing by magic
as if in answer to a thought,

proof of your bond
with the Virgin Mary,
your namesake,
the emissary
from the garden of golden light,

where your dear mother,
Sophie, has slept for you
since you were three
in banks of yellow roses,

the rising and falling
of her deep, deep slumber
yellowing the roses
the more from year to year.

And do you remember
the single rose that you stole
with my Mary
from the Rose Garden on your visit?

You,
the high spirited Academy girl,
conspiring to steal a rose,
and Mary,
charmed to be your accomplice.

Was that the Virgin's rose,
Sophie's rose?

4

We whispered late nights
long ago, you and I,

as Dad slept darkly
under the edict of silence
that always fell
once he lay in bed,

the troll, as we knew him,
having slipped beneath the bridge
in monstrous dreams and ragged snores
that sawed the evening air.

We'd whisper about my dates,
what they wore
and where we went,
and what we did.

You, eager for the details,
dreaming of wearing
the just-right slipper,
and I, charmed to be your fair but

unprepared prince.

We whispered, too,
during all the days,
behind the ogre's back,
conspiring against longstanding
wrongs
and petty tyrannies
in hush-hush tones

and with knowing glances
shot his way as he sat
eating his measure of meat.

He must not know
but must have known,
and muttered brutish oaths
beneath his breath
and smelled my blood.

Once when you'd left,
as you rarely did,
to venture out on a day,
I saw him turn,
as if conjured,
into the hungry, watchful Wolf, waiting

in the wood
as you wended your way, unaware,
back to the house of whispers.

And there you stayed,
locked darkly in the tower,
to keep you true to him.

5

"The church was awash with yellow roses,"
Dave phoned to say:
yellow sprays by the Virgin Mary,
a massive yellow bank
in front of the altar,
and a single yellow rose
for everyone in every pew.

And so all the clan gathered
to see you one last time,
if only in the urn of ashes

as Mary and I,
thinking of you,
hiked Mt. Pisgah, our church
out here,

and measured the distance
to your church
back there,
so far away in so many ways.

Nancy, I'm told,
spoke the eulogy in a strong, clear voice,
trailing off
into husky tones
only at the end,
choking then in grief
for all of us,

even for us out here,
stepping over a fallen Douglas fir
and hearing the sharp cry of
the red-tailed hawk, circling far

overhead in the too-blue sky.

But you and I had already
said our last goodbye
that last morning I called you
before I got the call that you had died.

My last words to you before
"I love you, Mom, goodbye"
were a "Hail Mary,"
so strange to my tongue now,
we said together.

I, leading,
and you, in silence,
mouthing the words
in the stillness of your stroke.

Dan Armstrong
received his Ph.D. from Indiana University and taught at the University of Arizona, Oakland University, and Oregon State University before coming in 1991 to Lane Community College, where he teaches film studies and composition. Most of his research and publications over the years have been in film studies, but his passion is for poetry.

Technology at Lane

Computer Simulation and Game Programming

Who: Students interested in careers in video game programming, software engineering, or the airline, aerospace, science, medical and military industries.

What: Associate of Applied Science degree in Simulation and Game Development.

When: Beginning Fall term, 2007. (First-year courses began 2006-07.)

Where: Lane Community College Computer Information Technology Department.

Why: According to the Entertainment Software Association, whose members include Atari, Microsoft, Sony and Warner Bros., computer and video game software sales have almost tripled in the last ten years, with 2006 sales of $7.4 billion. The ESA also reports that 69 percent of American heads of households play computer and video games, 35 percent of American parents say they play computer and video games, 80 percent of gamer parents say they play video games with their kids, and 66 percent feel that playing games has brought their families closer together. The Oregon Labor Market Information System projects employment trends of nearly 130 annual openings each for computer programmer, software engineer, and related job categories — and a 19.7 percent statewide projected increase for the decade ending in 2012. According to CNN Money, being a software engineer is the number one ranking career.

How: Courses include a sequence in Computer Game Programming in C++ (a widely used programming language), Data Structures, and sequences in Simulation and Game Development. Students will also take the Discrete Math sequence 231-233. Students will not only have knowledge in gaming programming; they'll also have the skills employers are looking for in a multimedia environment, says program lead instructor Jim Bailey. "We are working to put as much knowledge and training in the two-year degree as we can," he says. "We'll be fine-tuning our curriculum to meet the gaming industry's needs."

Teaching the Art of Murder

Lance Sparks

In his essay, "The Simple Art of Murder," the great Raymond Chandler wrote, "The detective story . . . has to find its public by a slow process of distillation. That it does this, and holds on thereafter with such tenacity, is a fact; the reasons for it are a study for more patient minds than mine. Nor is it any part of my thesis to maintain that it is a vital and significant form of art. There are no vital and significant forms of art; there is only art, and precious little of that. The growth of populations has in no way increased the amount; it has merely increased the adeptness with which substitutes can be produced and packaged."

Not to argue with a grand master of his craft and a writer I admire tremendously, but the fact that detective fiction has such a large and growing audience is actually beyond fact. It is a kind of mystery in itself, yet one sufficient to inspire some fairly serious scholarship, not to mention a dramatic increase in both the production and packaging of detective fiction in print, television, film and the World Wide Web. It's probably safe to say that at any given time and in many places around the globe, thousands, perhaps millions, of people are in some way involved with the literature of detective fiction. Lately, too, we've seen a real burgeoning of academic studies of this genre at some very serious institutions of higher learning.

Why? Especially if, as Chandler says, detective fiction is not vital and significant art? For one, he goes on to say, "the detective story, even in its most conventional form, is difficult to write well. Good specimens of the art are rarer than good serious novels." And bad specimens abound today in piles of packaged schlock with preset popular themes, such as the rash of foodie mysteries, that fill the shelves of the mega-bookstores. If detective fiction is not vital art, then why do we accord it the kind of attention we usually reserve for serious art, the stuff we call literature?

The question we're asking is really twofold: Why is this genre consumed so avidly by its public, and why should it be studied seriously when so many truly profound issues compete for our time and attention?

The easiest answer to the first part of the question may be that some people find their pleasure in this art and not another simply because they do. More patient minds might ask what this reveals about humans' personal preferences generally. For example, why does one person crave chocolate and another despise it? Or, even though Big Macs are lousy food and offer more detriments than nutrients, why do so many people consume so many of them?

The answer to the second part of the question — What qualities of detective fiction make it worthy of serious study? — is more complex.

First, let's go back to the matter of quality. No matter how elusive this concept, we seem able intuitively to recognize it when we see it and to agree broadly that whatever it is, it's good. And even though, out of the hundreds of detective fiction titles published each year, only a relative few seem of very high quality, a rather surprisingly large number are quite good, and some of the best will rival the very best of fiction from any other genre. We see in the best detective fiction the best elements of the best writing of any kind:

Skilled and clever plotting. It was for this form of fiction that the blurb terms "potboiler" and "page-turner" were created. In the hands of top mystery writers, readers find themselves so deeply enmeshed in the intricacies of the tale and their emotional involvement so strong that they feel driven to reach the resolution without interruption. They defer sleep, postpone tasks, avoid such everyday obligations as food and family until they finally find out who, in fact, done it.

Rich and vivid descriptions. Readers can find themselves immersed in virtual worlds with such realistic texture that it could be said that the world of the book may be experienced with as much or even greater feeling than the "real" world. Often the mystery writer takes readers through places in their own cities or regions they might otherwise never go. Robert Campbell, for example, takes us on frequent tours of Chicago's oldest, dankest, funkiest sewers. Andrew Vachss' New York is a city of streets and alleys that make Kaminski's sewers looks like Disneyland. James Lee Burke has a love affair with the Louisiana Bayous so sweet and intimate that we can fairly smell the swamps and feel the mosquitoes bite. No writer in the world knows better or can evoke more clearly the horse barns, paddocks and race courses found in the work of Dick Francis. Peter Bowen in western Montana; Joan Hess in Maggody, Arkansas; Tony Hillerman's vast spaces, pale skies and spirit-dwelling mountains across the Four Corners of the Navajo Reservation; Umberto Eco's Middle Ages library and Candace Robb's fourteenth-century York; Jonathan Gash's East Anglia; Reginald Hill's London; James Ellroy's Los Angeles — these writers not only take us to a place, they take us *into* the place, sometimes more acutely than if we were actually standing there.

Superb characterization. Not only can we "see" the characters, we see into them, and sometimes we probe in our imaginations the kinds of minds that we would never wish or dare to probe in the real world. The best detective fiction writers create for us heroes so vivid and memorable that we wish they could exist — Sherlock Holmes, Lovejoy, Dave Robicheaux, Sam Spade, Kay Scarpetta, Spenser and Hawk, Perry Mason and Della Street, Lew Archer, Hercule Poirot and Miss Marple, Philip Marlowe,

Arly Hanks, Brother Cadfael, Travis McGee, Kinsey Milhone, Adam Dalgliesh, Lord Peter Wimsey, Stephanie Plum, Easy Rawlins, C. Auguste Dupin, Jimmy Flannery and so many more. They don't exist, of course, but we feel strongly that they should, that, as Chandler suggested, the world would be a far better place if they did.

The other side — perhaps we should call it the underside — of such rich characterization is that the best detective fiction can bring readers into close encounters with monsters of human depravity to rival any. Creatures like Thomas Harris' Hannibal Lecter or Conan Doyle's Moriarty are in some ways more vile than the dragons, sorcerers, ogres and trolls of fantasy fiction, or the frightening otherworlders and aliens of science fiction, simply because they are so genuinely human and, in some cases, because often their cruelty is not merely a part of their nature but consciously chosen. Sometimes, of course, we explore the inner workings, not of monsters, but of common beings caught in raptures of mundane human emotion — greed, jealousy, envy, fear, rage, deceit, corruption, lust — that lead the characters into the deepest morass and to the ultimate transgression: murder. The best writers in the genre open these minds to our exploration of their motives and machinations and, in the process, illuminate hidden places in our own hearts and minds.

Expositions of the profoundest themes in literature. Woody Allen has said that all literature actually works only two themes, love and death. Detective fiction puts these at the very core of the stories.

First, death — and often of the worst kind: murder. It may seem strange that we approach this crime with such awe and fascination, when in the real world human beings deliberately killing each other is so commonplace as to be almost mundane. Our history is filled with accounts of slaughter and intra-species mayhem so ghastly and on such a scale as to make a single murder seem trivial. Think of the Crusades, when, for hundreds of years, armies of the most holy and devout Christians, Moslems and Jews engaged in mutual butchery that claimed tens of thousands of lives, including those of women, children and the elderly. Or the Inquisition: While Columbus sailed the ocean blue to discover the New World, his sponsors, King Ferdinand and Queen Isabella, were initiating a program of religious purging that resulted in the systematic torture and execution of over fifty thousand people, most of them women, by burning at the stake. Not the worst murderer I know of in detective fiction could for a moment measure up to a day of the work of Tomas de Torquemada, the pious and righteous Grand Inquisitor. As a monster, even Hannibal Lecter is a midget compared to, say, Herman Goering. The destruction of the Indians of North and South America, the depredations of the slave trade, the murderous efficiency of the Holocaust, the first three seconds of Hiroshima and Nagasaki after the dropping of the atomic bombs

— if we want to delve into the mystery of human depravity, why do we not simply read as much of our own history as possible?

Perhaps the sheer enormity of murder on such grand scales somehow precludes our approaching it with our minds intact. And, I think, we know intuitively it is impossible to have any faith in finding justice for crimes of such magnitude. We cannot enter those realms of crime and emerge through a healing catharsis; the emotional harvest of reading real human history can only be, in large measure, bushels and pecks of despair, disillusionment and ennui.

Detective fiction, even the most technical of the kind we call "police procedurals," personalizes crime, sets it within a frame of reference where readers can find themselves and their own lives; hence, they can engage emotionally in both their fears and their relief from those fears. The reader not only encounters the crime but participates in the discovery of its etiology and expiation, sometimes through the solution of a puzzle, sometimes through seemingly inexorable processes that finally bring together the criminal and the pursuer. Both potentials (and other variants) offer a wide variety of pleasures that derive from and manage our tension and guide its release.

For all the pursuit of crime and criminals, there is almost always in detective fiction the counter-balancing pursuit of love. The primary character almost always has problems finding, establishing or committing to relationships, though there are some notable exceptions, particularly in wife/husband teams of detectives, like Hammett's Nick and Nora Charles. Often, our detective's love interest comes with severe complications: he or she sometimes becomes threatened by the criminals being pursued; sometimes the love object turns out to be the criminal or at least a serious suspect. But however roughly runs the course of love in any detective novel, love and the possibility of love are often critical subtexts to evil and the possibility of evil, hence a critical part of readers' deepest interest in the story.

As well as intricate and compelling plots, sharp characterization, vivid recreation of places and times, the profoundest delving into the deepest themes of love and death, the best detective fiction is impressive for elements of sheer craft:

- The ability to write plainly beautiful sentences that ring like bells in the reader's ear. The best detective fiction writers are among the best writers of any genre.
- Management of voices, ability to re-create the sounds of real people talking. Among the best practitioners of this craft is the grand master, Elmore Leonard. Another is the late Eugene Izzi, who captured the tone, style, accents and affect of characters living in the shadowy verges of our world: petty grifters, burglars, thugs, and lawyers.

- Extensive and meticulous researches in the re-creation of accurate realism. Patricia Cornwell's detailing of a post mortem is exquisite. In *Foucault's Pendulum* (clearly a mystery novel), the Nobel laureate Umberto Eco shows that he probably knows more about secret societies such as the Masons, Templars and Rosicrucians than any single person in the world. I wonder how many writers know as much about fish biology as James Hall, or about fishing as William Tapley? Scott Turrow's knowledge of law and legal procedure probably outstrips any other, including Earl Stanley Gardner, creator of Perry Mason.

A wide variety of styles unfold in detective fiction, from the classic novels of deductive reasoning modeled on Sherlock Holmes to the "hard-boiled" novels of Mickey Spillane, Raymond Chandler, Dashiell Hammett and Jim Thompson, to the truly "noir" work of James Ellroy and Andrew Vachss, to the sometimes riotously funny writing of Kinky Friedman, Janet Evanovich, Joan Hess, Carl Hiassen, and Oregon's own Richard Hoyt. Great detective fiction can frighten readers as profoundly as the best of the horror genre; it can dazzle, inform and amuse; it can take us through the whole panoply of human emotion.

Add up the columns. The sum, to my mind, tells us that if any literature is worth study; if, in Chandler's terms, detective fiction is not more "vital and significant" than any other literary art, it is at least equal in many respects, worthy of the kind of scholarly scrutiny we accord to the best literary efforts of the human mind.

In teaching this literature, I have found that my students engage as deeply as they might when we explore the murderous machinations of Iago in Shakespeare's *Othello* or the cynical manipulations of Mephistopheles in Goethe's *Faust*. The most important issues of human morality arise in discussion, and we grapple with the deepest questions of human nature. In fact, it often seems to me that students feel such enduring issues are somehow more easily accessed through detective fiction than through the halo of greatness that illumines Shakespeare or Dante. It doesn't hurt, of course, that the stories and characters appear as common to students as the characters they see nightly on television dramas — or the evening news.

It took over fifty years of film before academics accepted study of the cinematic art into the curriculum. That strikes me now as embarrassing, but it has taken even longer for colleges and universities to make room for the study of a genre that was originated by the great Edgar Allen Poe a century and a half ago. At last, though, teachers and students are afforded the opportunity to delve deeply into modern mysteries of human art and the human heart, according distinct pleasures and bracing encounters with horror — and the eternal dream of righteous justice meted to offenders and those they've offended.

Lance Sparks, *D.A. Disputed parentage (possible race mixing?), Deep South heritage, peripatetic youth and eclectic early education. B.A. (Honors), University of Nevada-Reno, creative writing, minor in dissipation. Doctor of Arts, University of Oregon, psycholinguistics and theories of education. Many publications, emphasizing food/wine/culture (documented oenophile), personality profiles, poetry, essays. UO faculty 1973-76, Portland State University 1976-80. Part-time faculty at Lane Community College since 1981; at Linn-Benton Community College since 1995. Various faculty recognition awards. Married to beautiful Kat Chinn, FNP, sharing small horde of daughters.*

The Invention of Printing: Information Revolution to Artistic Innovation

Printmaking processes were experimental technologies of their day. Before the invention of woodcut printing, visual and printed information was laboriously copied from originals, then copied from copies, with the risk of degrading the content with each successive generation.

Woodcut printing was invented in east Asia, most likely China in the eighth century, and came to Europe through the middle east sometime during the fifteenth century along with papermaking. This led to movable type letterpress printing which began an information revolution rivaled only by the invention of writing and by the Internet today. Gutenberg's bible, produced in 1455 in Germany, was so exquisite in its production and copies were produced so rapidly that it elicited fear among the populace who believed that printing must have been an invention of the Devil. Printed writings of Martin Luther in the sixteenth century helped to reform a corrupt church, diversifying Protestant traditions in Europe, and helped end the Middle Ages and usher in the Renaissance.

Hand engraving in metal, and later etching, both called intaglio printing, were also developed in fifteenth century Germany by metalsmiths who combined their techniques in decorating armor with printing imagery. In etching, acid-etched lines hold the ink, and the surface is wiped clean from the metal plate before printing. Etching produced images faster and more easily than metal engraving, and it created finer images than woodcut.

The invention of lithography in 1798 is attributed to Alois Senefelder, a struggling German writer searching for a cheaper means to print his works. Lacking a handy piece of paper, he transcribed his mother's laundry list on a slab of common limestone. On a hunch, he etched the limestone and printed it. Lithography is based on the principle that oil and water don't mix. The image areas accept ink, and the non-image areas are kept damp to repel ink.

Screen printing was developed in Asia during the first centuries A.D. The Japanese perfected this technique for fabric decoration. When the Japanese ended their isolation in 1853, Europeans were exposed to Japanese textiles and adopted the technique. This medium soon became the means for industrial and textile printing since it can easily produce large prints on many different surfaces.

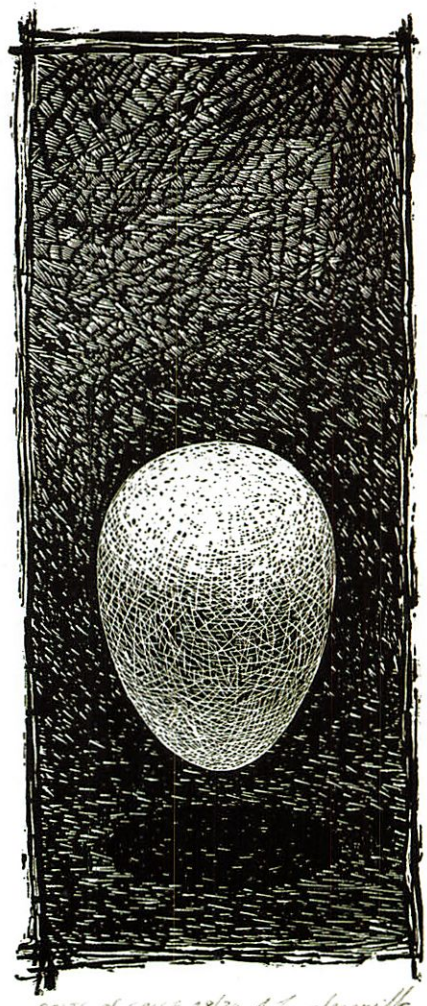
Antiquated print technologies often resurface in the fine arts and then remain as a common form of art making. The marks inherent in print techniques make it distinctive from other art media such as drawing and painting. Contemporary printmaking trends range from traditional to experimental, and often incorporate digital and photographic techniques. The definition of the fine art print has expanded from the limited edition print to include three-dimensional prints, installations, pieces made of modular parts, and artists' books.

Susan Lowdermilk

Susan Lowdermilk: *Allegory*

Wood engraving, 6" x 4"

Susan Lowdermilk: *State of Grace*

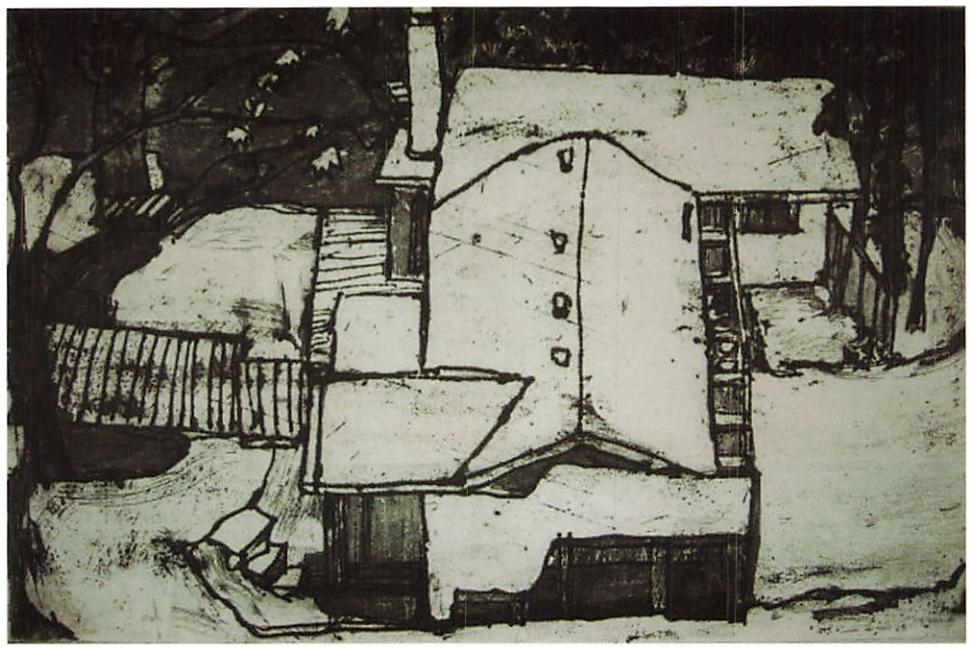


Wood engraving, 3 1/4" x 7 1/2"

Kristie Johnson: *Breaking Down*

Silkscreen and lithography 12" x 14"

Monique Belitz: *Wintertime*



Etching, 11 1/2" x 7 3/4"

Artists

Susan Lowdermilk *is a printmaker and book artist. She teaches art and applied design courses at Lane Community College. She actively exhibits her work both regionally and nationally, and her work is included in many permanent collections across the United States and abroad.*

Kristie Johnson *is an artist living and working in Oregon. A recent graduate from the University of Oregon with an M.F.A. in Printmaking, her works have been exhibited in regional galleries, shows, and museums. She has been a guest artist and lecturer, and her work has been featured in publications in the Pacific Northwest. She works in several media, including printmaking, fibers, illustration, sculpture and installations, and currently teaches art at Lane Community College. Visit her website at www.kristiejo.com*

Monique Belitz *was born in the Netherlands and moved to Germany when she was seven. She started painting seriously at age 14 and was creating her own oil paints at 17. The numerous exhibits of German Expressionist art in Munich, together with her love of seventeenth-century Dutch art, influenced her art strongly. She presently paints mostly in oil, and in watercolor during trips and the summer months. She also loves printmaking techniques such as etching, aquatint, drypoint, lithosketch, monotype and linocuts.*

Innovative Education Supports Sustainability

Tammie Stark

Introduction

A movement is afoot to increase awareness and move toward sustainability, the simultaneous achievement of economic, ecologic and social good. Sustainability is an attempt to reconcile human and non-human habitats. This movement is growing because it provides tangible ways to ensure that humans survive. From increased legislative action to augmented education, sustainability is on the rise. From an anthropocentric viewpoint — human survival — we can approach sustainability by discussing how we meet basic human needs of food, air, water and shelter. How we meet our needs, however, quickly becomes a very complex riddle in this globally interconnected world. One way to comprehend and teach this complexity is through the study of systems. The world can be viewed as an interconnected set of systems at varying scales. This train of thought also suggests that meeting basic needs, like sufficient clean water, must be an integral part of sustainability. The broad question this paper attempts to answer is: How and in what ways can we teach sustainability and sustainable resource use? It will leave you with further questions to ponder such as: Is behavior modification the answer, or do we need to change actual systems? However, in the main, this paper examines innovative education that supports sustainability and water resource management.

Sustainability is on the Rise

Sustainability is a hot topic from the state to local level here in Oregon, from business, government and educational perspectives. Businesses are learning to profit through sustainability by learning from others. For example, an early vanguard and teacher has been Interface, Inc., a large carpet manufacturer. Interface leases and recycles carpet tiles. According to Reuters News Source, "By reducing its waste, it has saved $231 million since 1995. . . . by cutting the amount of material in its carpet, even while making it more durable, it saved $113 million in four years beginning in 1995. Since 1996, Interface has seen its energy use in fabric production drop by 31 percent, while water use per square meter of carpet has fallen by up to 78 percent. Its use of petroleum-based materials has declined by 28 percent since 1994 — all because of its conscious approach to sustainable design" (Fromartz, 2004). Eugene-based Peterson Pacific, a manufacturer of equipment, incorporates sustainability initiatives

such as environmentally friendly products, efficient lighting, low waste, good wages with benefits and corporate accounting transparency. The twenty-five-year-old company has expanded from 20 to 185 employees and has a goal of reaching $100 million in annual sales by 2011 (Cooper, 2006). The business case for sustainability has clearly been made, giving companies a competitive advantage. This has caught the attention of government officials who are passing legislation to advance sustainability.

Legislative actions to promote sustainability exist at the state and local levels. Governor Ted Kulongoski herded through Executive Order No. EO 03-03: A Sustainable Oregon for the 21st Century, which complements the Oregon Sustainability Act of 2001:

> Oregon's economic recovery will be aided by establishing a commitment to lasting solutions that simultaneously address economic, environmental and community well-being. We should not continue to trade one essential aspect of well-being off against another, but we should take actions that will sustain Oregon's assets and put Oregon on the path to long-term prosperity in all aspects of life.

The Executive Order, the Sustainability Act, and the Sustainable Purchasing Policy, along with State Facilities Standards and Guidelines, will encourage state level actions that benefit people, place and profit simultaneously.

At a more local level in Eugene, Mayor Kitty Piercy initiated the Sustainable Business Initiative, and both the University of Oregon and Oregon State University have developed business-related sustainability education. Lane Community College offers an Introduction to Sustainability class, Green Chemistry and Energy Management programs, boasts a Sustainability Coordinator, Energy Analyst, and Recycling Coordinator, has a Sustainability Group as well as a Sustainability and Learning Committee and supports many other actions. As this concept gains traction in the business community, it also becomes favored in government. As stated in the Mayor's Sustainable Business Initiative, "Sustainability therefore can be thought of as the next logical step in society's thinking about how our economic systems should function" (2006, p. 18).

Clearly sustainability is on the rise as shown by the plethora of initiatives, actions and groups promoting sustainability and related issues. On the other hand, does the education exist to support its rapid growth? And how do instructors learn how to teach this emerging topic?

Sustainability Education Needed

In the Southern Willamette Valley of Oregon, formal and informal sustainability education for adults and children is growing. However, higher level adult education is business-centric, focused on sustainable development. While this type of education is important, it is crucial that we expand sustainability education to encompass the true meaning of sustainability. The most basic requirement in a definition of sustainability is the inclusion of people, place and profit. The sweet spot where sustainability resides is in the center where all three meet.

Getting to this tripartite confluence, however, can be tricky business. It is difficult to understand and even more challenging to teach. Can we use existing tools to elucidate this topic? Must we create new understandings to impart this knowledge? Are new ways of thinking required? May I suggest yes to all three questions. Indeed, all may be approached through one tool. Contemporary literature shows that the most crucial tool to teach sustainability is a deep-level understanding of holism. Other methods are emerging and will be briefly discussed as well.

The Foundation of Sustainability Education is Holism

In order to get to that sweet spot or tripartite confluence, we must first realize that attaining sustainability is complex, particularly complex and difficult if we only focus on the pieces of the puzzle, as we are traditionally taught. For instance, my previous training and professional career in finance did not show me how to incorporate social or environmental good into financial decisions. My sole puzzle piece was finance. Only later did I learn that I could do well while doing good (make money and create social/environmental good). Doing well while doing good requires a view of larger whole systems working together.

Whole systems thinking, also known as holism or systems thinking, allows us to see a broader view. I can see, for example, why I might *want* to do good (ensure my grandchildren have clean air, water and soil) and how I might *do* good (investing in socially screened mutual funds, buying local). My previous narrow view, focused on profit, by definition does not include quality of human or ecosystem life. It is no wonder then, that while we were looking at the pieces of the puzzle, the whole picture became hidden. No surprise then, that human management of the world did not focus on meeting the needs of people, place and profit simultaneously. Looking only at the pieces is a strategy beginning to be questioned and augmented by a holistic view.

Holism is a useful strategy because reality is a complex mix of interrelated puzzle pieces that function together. Holism helps us understand the world as it really is — not as one puzzle piece. "[T]he world is composed of patterns — of matter, energy, and life — that function as wholes whose qualities cannot be predicted by studying

any aspect in isolation" (Savory and Butterfield, 1999, p. 15). Indeed, because sustainability by definition requires us to incorporate three interrelated realms, most practitioners argue that holism is an essential element of sustainability education.

Holism allows us to see the processes, flows and relationships, scale, lag time, consequences, interdependence, cycles, feedback and perhaps, synergy. In other words, how the pieces are arranged, and how they interact and how one field of study impacts another. For example, how low-priced water affects behavior by encouraging waste, which in turn causes increased demand leading to a need for more infrastructure to deliver more water, which stresses the environment. Or consider how a ban on a commodity (drugs, ivory) decreases the availability, which increases the cost of the good, and thus makes it more profitable — especially for those with few other livelihood choices. Thinking about the entire system reveals hidden and dynamic patterns.

A strategy of holism requires viewing the world not as disconnected and disparate pieces, but made of "flexible, changing patterns" (Savory and Butterfield, 1999, p. 19). Understanding holism will help us realize that:

> Real security, peace, climate stability, fairness, prosperity, and environmental quality are not separable issues. To the contrary, they are different aspects of one issue, the conduct of the public business; and that, in turn, is part of a still larger whole, the global commons, indivisible by nation, tribe, religion, ethnicity, language, culture, or politics (Orr, 2004, p. xiii).

Whether we like to admit it or not, we live in a highly interconnected world and all actions have repercussions. Comprehending these consequences is possible by using systems thinking. It allows us to reveal and counteract negative consequences through increased sustainability. Holism allows us to approach the confluence of people, place and profit.

Water as a Metaphor to Teach Sustainability

The skills to achieve sustainability and good water management are often the same. Because water flows through and touches almost every aspect of life and production, it can easily be used as a metaphor to teach sustainability. And equally important, much research has been done on water education that can be used to help understand how to teach about sustainability. Some of the skills needed to sustainably manage water are transferable. The United Nations World Water Development Report (2003) reports on the skills necessary to effectively deal with the challenges we face in protecting our water supplies. It highlights the pervasiveness of water which flows through

"every facet of life, from health to agriculture, to industry and the ecosystem at large, [therefore] the knowledge and skills required to improved stewardship of this finite resource stretch across an extremely broad spectrum encompassing education, health, law, economics, communications, and science and technology" (p. 348). This cutting across and integration of disciplines requires education that differs from traditional pedagogy that is discipline-specific. Future sustainability experts and water management professionals alike will be required to understand and apply information that spans disciplines. Integrated resource management and efficiency will be but one approach used. Previous skill sets must be enhanced with new strategies to deal with our complex world. Fortunately, new skill sets and trends are emerging.

According to the same report, specific skills required include empowering all stakeholders; informed decision-making; fostering cooperative relationships between teachers, utilities, government and non-governmental agencies; conflict mitigation; and democratic participatory processes. Other important topics are: sources and uses of water, pollution prevention and management, sanitation, quality data, and leveraging indigenous knowledge. Some of these skills are not new, but most are not currently taught in our colleges. Like Einstein said, we cannot solve the current problem with the same thinking that created the problem, nor, may I add, with the same teaching methods. An augmentation of existing curricula and methodology seems necessary.

But how does one integrate sustainability into curricula? What steps might be required? What does it look like in the classroom? In the integration of sustainability a hundred stories exist, but one "correct" method does not. A multitude of tools, strategies and methods can be used depending upon the class, the teacher, the subject and the context.

Fortunately, successful stories exist that can shed light on the seemingly nebulous goal. Two rich sources are 1) *Sustainability on Campus: Stories and Strategies for Change* (2004) by Barlett and Chase, and 2) the *AASHE Digest 2005: An Annual Review of Campus Sustainability* (American Association of Sustainability in Higher Education, www.aashe.org). Geoffrey Barlett and Paul Rowland discuss The Ponderosa Project at Northern Arizona University, one of the oldest infusions of sustainability into curriculum (Barlett and Chase, 2004). Some of the program-level strategies included bringing in additional minorities to environmental fields where they worked on real-world problems, forming of interdisciplinary teams to assist faculty to infuse sustainability into a wide range of classes, a requirement that faculty redesign one course to include the concepts, and financial incentives. A few of the classroom-level methods employed are rewriting English curriculum to include diverse genres of environmental texts, and achieving a balance between action and theory as well as content and pedagogy. The

methods translated into actions in a Medieval art class such as readings that demonstrate how plants could be used to treat illness, examination of deforestation and reforestation of France in the 1200s due to high wood use in stained glass art, and the harm pollution can do to works of art. The authors discuss an Introduction to Archaeology class in which the students study the Black Mesa Project in small groups to ponder the Natural Step principles (a sustainability assessment tool). New content and new teaching methods are used in these initiatives. "These faculty found that examining issues of sustainability does not mean giving up vital content. Rather, focusing on these issues is a way of making material immediate and relevant to student experience" by using interdisciplinary and "systems-oriented approaches" (p. 99-100).

The *AASHE Digest* highlights a multitude of additional strategies such as Harvard Business School's Corporate Social Responsibility program for executives. The program aims to increase the "knowledge, skills, tools, and frameworks to integrate social responsibility as part of their corporate strategy, drive it throughout the organization, and, ultimately, leverage corporate social responsibility for improved business performance" (p. 2-2). The *Digest* not only lists curriculum infusion projects, but also institution-level change, green buildings used for teaching, professional opportunities in the field and other university initiatives. These publications are the gold standard for those interested in this topic. These documents and the following additional tools reflect a trend that sustainability education must be action-based rather than passive.

Additional Tools to Teach Sustainability

To teach sustainability will require not only systems thinking but also collaboration, pluralism, sustainability assessment, and global consciousness. Whether the issue is water security, food security, access to other resources, or advancing sustainability, the education needed is quite different from and builds upon traditional pedagogical practices. Other new skills necessary for instructors include envisioning the big picture, connecting disparate topics, and innovation.

Innovative Pedagogy

Some strategies may need honing while new techniques are added. For example, we all know we need to improve the lecture. "We make more productive use of our class time if we break our lectures into chunks of no more than 10 or 15 minutes" ("Challenging and Educating," 2006). Blocks of time give students an opportunity to process and connect information from multiple and disparate sources.

Other innovative and emergent new models include: a campus ecosystem model (using the whole campus as a classroom); peer education; collaborative learning / learning through sharing; service learning and experiential models; and interdisciplin-

ary learning. Single factor strategies proven successful are: leveraging group norms, encouraging a willingness to sacrifice, modeling the desired change, connecting action at the community level with direct contact to citizens, direct appeals, securing verbal or written commitments, and cognitive dissonance (Fishbein and Ajzen, 1980; McKenzie and Smith, 1999).

Human behavior, however, being based upon many simultaneous and perhaps conflicting factors, seems mostly swayed through the use of multi-pronged programs (Stark, 2005). It makes sense that dynamic multifaceted issues must be met with a combination of approaches that change over time. Hanna (1995) puts it well: "holistic, physical, cognitive, and affective experience may be valuable in promoting a personal relationship with nature and a positive ecocentric attitude toward wilderness and the environment" (par. 45). Some approaches used in tandem that have proven efficacious are: revealing contextual barriers and benefits, knowledge of issues, knowledge of action strategies, locus of control, incentives, verbal commitment, sense of responsibility, and information with feedback

One approach used by McKenzie-Mohr and Smith (1999) to foster behavior change to more sustainable action is community-based social marketing, which is:

> Identifying barriers and benefits to a sustainable behavior, designing a strategy that utilizes behavior change tools, piloting the strategy with a small segment of the community, and finally, evaluating the impact of the program once it has been implemented across the community (p. 15).

Again, these strategies are best used over time in combination based upon context and culture. Traditional behavioral science often points to education, information provision and marketing. Individual behavior may be affected by these methods, but a "new wave of innovative and collaborative work on campuses across the nation aims at integrating curriculum across disciplines, with the non-academic world and with nature with a goal of encouraging cultural transformation toward sustainability" (Stark, 2005).

One of the oldest examples of this work is the University of California at Berkeley's Energy and Resources Group (ERG), an "interdisciplinary graduate program . . . centered on shared learning" that focuses on current problems and how the campus could respond (Barlett and Chase, 2004, p. 108). Richard Norgaard describes the group's characteristics as asking good questions, pragmatism, curiosity, a belief that they could affect the future and dispensation of assumptions. The program was designed as a student training ground, but also as a way to sustain faculty, and it succeeded in opening

up "whole new realms of questions . . . most of them beyond the territory claimed by any of the disciplines" (p. 108). The ERG evolved from energy to broad social issues and created alumni who could pose sophisticated and deep environmental questions. Michigan State University, conversely, used other tools. Some examples used to approach sustainability are: sense of place, local food and farming, guest speakers, campus tours, reflection exercises, integration of the campus into the classroom, and of course much discussion.

Ultimately, an infusion of sustainability as a way of life rather than just a way of thinking must be the goal. Some faculties effect institutional change in addition to transforming individuals and cultures through innovative pedagogy like integrated curriculum and green buildings used in curriculum. The ERG prepares students to "ask the new, broader questions while providing them with sufficient disciplinary understanding to pursue systemic answers (Bartlett and Chase, 2004, p. 109)." Integrating curriculum with the built environment to model sustainability reveals interconnections to provide a holistic perspective. It focuses on "teaching interpersonal skills, critical thinking, cooperative working and collaboration, problem solving and the ability to call on multiple disciplines to get the job done (Stark, 2005)." Or as stated by Hoback (2004):

> We must show our students how to make the connections between and within specialized areas that will enable them to think for themselves and make decisions based on multiple perspectives and the analysis of data. . . integrated curricula helps students to solve problems in their own world through research and critical reasoning (p. 16-17).

Stepping back, we can see that making connections to disparate topics through asking the broader questions can be accomplished through the use of systems thinking and other pedagogical methods. Systems thinking requires that we broaden our thinking to see that the world is made of complex interlinked systems. Using holism allows us to apply multi-factor education methods and assess how they are working. It teaches us flexibility and reminds us to focus on the truly crucial issues of our world, like providing for the basic needs of all in perpetuity.

Summary

Coping with a dynamic, interactive and a deeply interconnected world is what we do everyday. However, as yet, there is no book on how to live life in such a world while creating more good than causing harm. Nor does a text exist on how to teach others to

live life in such a world. Perhaps this is good, since it may very well take us all, working from every angle possible, to even approach sustainability. What is known, however, is this monumental mission called sustainability must be approached through multiple methods that are different than previous strategies. New and innovative formal and informal education is needed. Some attempts will succeed, some will fail, but we must have the courage to try. We must support all attempts, whether we understand them fully or not. In order to protect what we have, we must raise awareness about sustainability across the board to avoid an ill-planned reaction to a crisis. Enhanced and innovative education at colleges and universities can be used as a leverage point to bridge the gaps between the natural and built environment, between theory and practice, and between disciplines. These gaps must be bridged if we hope to make progress in natural resource management, sustainability, or maintaining our high quality of life. It is now our job to step up to the plate, look around and play a new type of ball game.

Sources

AASHE Digest: An Annual Review of Campus Sustainability. (2005). American Association of Sustainability in Higher Education. Retrieved October 30, 2006 from http://www.aashe.org/publications/digest.php

Adams, J. & Slater, T. (2002, March/April). Learning through sharing: Supplementing the astronomy lecture with collaborative-learning group activities. *Journal of College Science Teaching,* 31, 6.

Barlett, P. G. & Chase, G. W. (Eds). (2004). *Sustainability on Campus: Stories and Strategies for Change.* Cambridge, MA: The MIT Press.

Cases in water conservation: How efficiency programs help water utilities save water and avoid costs. Environmental Protection Agency. Retrieved October 7, 2006 from www.epa.gov/watersense/docs/utilityconservation_508.pdf

Challenging and supporting first-year students. (2006, October). *National Education Association Higher Education Advocate,* 24, 1.

Cooper, M. (2006, 12 March). Sustainable standards? Whole Foods' downtown plan at heart of debate on land use principles. *The Register-Guard.* Retrieved October 30, 2006 from http://www.registerguard.com/news/2006/03/12/a1.sustainability.0312.p1.php?section=cityregion

Franco, R. W. (2002). The civic role of community colleges: Preparing students for the work of democracy. *Journal of Public Affairs,* VI, Supplemental Issue: Civic Engagement and Higher Education.

Fromartz, S. (2004, 2 November). Newbiz: Beyond Profitability Lies Sustainability. Reuters News Service. Retrieved October 30, 2006 from http://www.planetark.com/dailynewsstory.cfm/newsid/27951/story.htm

Hanna, G. (1995). Wilderness-related environmental outcomes of adventure and ecology education programming. *The Journal of Environmental Education,* 27, 1.

Hoback, M. (2004, September). Curriculum Integration: Best Practices (Doctoral dissertation, Antioch University Seattle, 2004).

House unanimously passes Walden legislation to enhance water management, conservation, agriculture across Oregon: Jackson, Deschutes, Jefferson & Wallowa County Projects Benefit. (2006, 26 Sep-

tember). Press Releases. Retrieved October 19, 2006 from http://walden.house.gov/index.cfm?FuseAction=PressReleases.View&ContentRecord_id=294

International: Billions face water shortages, crisis looms. (2006, 17 August). The Financial Express. Retrieved August 18, 2006 from http://www.financialexpress.com/fe_full_story.php?content_id=137530

Kosesan, R. (2005, August). Oregon's 2005 Legislative Session. Water for Life, Inc. Retrieved October 19, 2006 from http://www.waterforlife.net/resources_session_2005.htm#sb731

Langone, D. (2006, 10 August). DeFazio applauds decision on disaster declaration for salmon fishers. Press Release. Retrieved October 19, 2006 from http://www.defazio.house.gov/081006EGRelease.shtml

Maben, S. (2005, 18 September). Picture this: Future growth. *The Register-Guard,* p. A1, A16.

Management of water: Solutions — the municipal challenge, The. Environment Canada. Retrieved August 18, 2006 from http://www2.ec.gc.ca/water/en/manage/effic/e_solm.htm

Mayor's Sustainable Business Initiative. (2006, August). City of Eugene. Retrieved October 19, 2006 from http://www.eugene-or.gov

Money sought for inventory of state water. (2006, 5 April). *The Register-Guard,* p. D3.

Monitoring of water in the works. (2005, 30 May). *The Register-Guard,* p C6.

Orr, D. (2004). *Earth in Mind: On Education, Environment, and the Human Prospect.* Washington: Island Press.

Partner agencies Metro Waterways study information. Metro Waterways, A study of the Eugene-Springfield metropolitan region. Retrieved October 11, 2006 from http://www.metrowaterways.org/study.html

Savory, A. & Butterfield, J. (1999). *Holistic Management: A New Framework for Decision Making.* Washington: Island Press.

Stark, T. (2005). Testing the efficacy of workshops to increase water issues awareness. Unpublished manuscript, Antioch University Seattle.

Sustainable Oregon. (2003, 17 June). Executive Order No. EO 03-03: A Sustainable Oregon for the 21st Century. Retrieved October 19, 2006 from http://www.sustainableoregon.net/execOrder/sustain_eo.cfm

Tolley, S. G., Everham III, E. M., McDonald, M. R. & Savarese, M. (2002, March/April). The campus ecosystem model: Teaching students environmental stewardship. *Journal of College Science Teaching,* 31, 6.

United Nations World Water Development Report, The. (2003). *World Water Assessment Programme: Water for People Water for Life.* Barcelona, Spain: United Nations Educational, Scientific and Cultural Organization and Berghahn Books.

Water: Is it the "Oil" of the 21st Century? Hearing before the Subcommittee on Water Resources and Environment of the Committee on Transportation and Infrastructure, United States Congress. (Testimony of Dr. Peter H. Gleick in Pacific Institute, 2004). Retrieved August 18, 2006 from http://www.pacinst.org/publications/testimony/gleick_june_2003.htm

Tammie Stark *(B.S. in Finance and M.A. in Environment and Community) teaches at Lane Community College, is a rainwater harvesting consultant and leads the Rainwater Catchment pilot program for Eugene Water and Electric Board. Her expertise includes sustainability education, rainwater harvesting, stormwater management and water security. Tammie served on the LCC Sustainability Panel, taught at the University of Oregon Sustainability class and participated in the UO HOPES Stormwater Solutions Panel. She is currently on the Oregon Stormwater Solutions Team and LCC Sustainability and Learning Committee. In her spare time she likes to read, bird watch and sing in the Eugene Russian*

The Distribution Revolution

Jefferson Goolsby

Six years ago the millennial odometer clicked over and the doomsday predictions of collapsed computer systems dematerialized like RAM data on a restart. At that time the corporate mandarins of the self-canonized music industry were locked in what was deemed a life-and-death struggle against the evil forces of peer-to-peer file sharing, incarnated in Napster, Inc. How peculiar and ironic it seemed to watch the incorrigibly exploitive recording industry lament being taken advantage of. Hadn't music labels screwed musicians and artists for most of the twentieth century? Weren't the corporate labels simply getting their just dues, and might not peer-to-peer distribution be the dawn of a new era for musicians?

Opposite the music industry stood Napster's free distribution of music and the questions its presence posed. If no one is paying for music, how will musicians and composers get paid? What will happen to music? Shouldn't people pay for product? Shouldn't creative works produced from a lifetime of dedication to the arts — or even on a creative whim for that matter — be justly paid for?

A three-day recording industry conference held at California State University, Chico, in 2000 included panel discussions between Napster representatives and the Recording Industry Association of America (RIAA), the legal arm of the music industry. Attendees of the gathering got to see first hand where creative artists stood in this battle of evil against evil.

After three days of discussions and watching the two opposing interests joust and debate, a noticeable pall and unease crept over the musicians and composers in attendance. In the hallways during breaks, talk revolved around how not once had either Napster or the RIAA discussed the artists. Not once had they talked about what was at stake for the performer or the writer. Not once had either of them mentioned the interests of the people whose plates they were eating from.

There was a strong sense among the conference attendees that if this conference represented the breadth of the discussion, then the only absolute that could be determined with confidence was that the musicians, artists, writers, and composers of the world would for the duration of the upcoming century continue to get screwed.

During the second half of the twentieth century, the recording industry consolidated its music production monopoly. If a musician wanted to record music that more than a dozen people would hear, he or she needed to be "chosen" by the indus-

try. Under this strict control of production it developed that there was no need for an open music distribution system: since only industry titans were producing, only industry titans needed to distribute. So the industry took control of distribution as a side project.

Since the early 1990s, however, the personal computer has progressively democratized the means of production for music. Today, any kid can sit in his dimly lit bedroom and produce high quality recordings, ready for sale. There has been a parallel production revolution for digital video running just a few years behind audio. Marx must be dancing in his grave — to an iPod, most likely — as the multi-million dollar means of production houses find themselves competing with tools bought off the shelf at Circuit City.

On the heels of this means of production revolution, Napster arrived with a blindside kick to the head of the music industry's side-monopoly, means of distribution. The Internet was still too slow for the larger-sized video files, so the initial fight was to be waged over the smaller audio files. Too late to prevent the kid in his bedroom from producing high quality music, the industry sought to retain control of the market by preventing that kid from distributing his work. "He can't be stopped from producing, so let's stop him from selling."

This obstruction of distribution can be seen most clearly in the industry's refusal to create a trackable revenue model for Internet distribution by the common person — i.e., a publicly available watermark and auto-pay system that can track and charge for downloadable or streamable files. The industry instead focuses on proprietary control systems while fighting fierce legal battles against Internet distribution at corporate and consumer levels, suing peer-to-peer software designers along with teenagers and grandmothers with copyrighted ditties on their hard drives. The industry's message has been simple: buy the CD from a store at the price we dictate or we'll sue you.

For several years the digitizable industries have struggled to prevent a publicly useable, revenue-configurable distribution system from coming into play. The problem in a nutshell is that if Jimmy can yodel an amazing rendition of "Mary Had A Little Lamb" and distribute it online using a nickel-per-listen payment model, his revenue stream becomes independent of the middle-man industry. Great for Jimmy; bad for the industry. At a million hits — a not uncommon number on YouTube — Jimmy could yodel himself $50,000 towards his college education. The industry, still charging a buck a song, needs the ninety-five cents of gravy to survive. Jimmy doesn't.

Compounding the industry's problem of (lost) control of means of production and distribution is an attendant shift in the aesthetic of production qualities. Hissy music and pixilated video are creating a new aesthetic sensibility with a fast growing audi-

ence. There is an immediacy and directness found in home music and video that can trump the cumbersome and excessive gloss of multi-million dollar studio work. This shift in content aesthetic can be compared to the response of late 1970s punk music to the over-ripe production schlock of mid-70s arena rock. We might call this new sound and picture aesthetic "neo-proletariat punk."

It was bound to happen, and the Apple Corporation got there first. Using iTunes and the iPod along with negotiated contracts with members of the RIAA, Apple began selling downloadable music at old-market valuation — a buck a song. The RIAA bought into the deal because Apple offered restrictive data encoding and the industry just couldn't resist making equivalent profits for distribution without production. The iTunes system is rife with problems: its AAC compression technology is proprietary; the inflexible pricing structure of one dollar per song is industry-dictated; and its catalogue is music label based — no home production music without a so-called "legitimate" label contract is allowed. Despite these malignant shortcomings, the iTunes structure has nevertheless managed to move the industry one balky step towards online distribution.

Comcast, Inc.'s efforts to bring relatively fast broadband to the average home — and not that piddly DSL stuff, either — laid the groundwork for YouTube, where more than 100 million videos are watched daily. While the "open pipe" world of live, real-time data flow is still a few years off, the simmering hunger for the next level of content — video — is clearly seen in the willingness of tens of millions of people to watch pixilated approximations of life in a three- by two-inch square on a computer screen.

In August 2006 the *New York Times* reported on the mysterious guitarist "funtwo" whose video of himself sitting in his bedroom playing Pachelbel's Canon had been posted online by a friend. At that time the young man, who turned out to be a twenty-three-year-old Korean named Jeong-Hyun Lim, had received over seven million viewings of his five minute and twenty-second video. Without a revenue model this young guitarist received zero compensation for his efforts, and only a modest opportunity to leverage his fifteen minutes of fame into better rewards.

Had there been an accessible, flexible revenue model, however, say a dime-per-view charge, Mr. Lim would have earned more than $700,000 for his performance. Even if a music label had by some freakish miracle been able to deliver the same number of sales, the per-view charges would have needed to be ten times higher for Mr. Lim to receive the same income. The label would keep 90 percent for administration and production, and consumers would pay a dollar instead of a dime.

The October 2006 purchase of YouTube by Google, Inc. represents another chink in the armor of distribution. Google's confidence in YouTube was bolstered by working agreements reached with several members of the RIAA for a revenue model that pays whenever a work is used, a sort of "on-the-fly-and-after-the-fact" licensing system. Unfortunately, there is little mention of using this model to pay the creators of the works. Once again, the corporations are cutting up the pie without cutting in the artists.

The latest salvo in the industry's fight to prevent individual distribution is the effort to pass legislation that would end "net neutrality" and award privileged broadband access to the highest-paying customers. The intent of this kind of law is to create a tiered system that offers special distribution access for established industries and their VIP cronies. The goal is — as usual — to retain control of distribution within the corporations. Right where they want it, and right back where we started from.

The only solution for consumers and artists alike is a publicly available tracking and payment system that allows any individual to configure individualized use and payment terms for creative works, independent of industry parasites who would jack up the price to line their own coffers. Consumers gladly pay for product when the price is fair and the exchange legitimate.

Helpful but not necessary would be legal access to an "on-the-fly" price model such as YouTube is developing for the use of re-sampled materials. To keep the ball rolling, artists and individuals need full and equivalent access to online distribution without being slow-laned into oblivion by privileging broadband access for corporations and cronies.

Most importantly, the artists need to be moved to the top of the list. The people who do the creating need to not just be given cursory inclusion — as they were last century — but moved to the top of the distribution food chain. The Internet is here to allow it, and any manipulation of the structure through restriction or law would be fraudulent.

Meanwhile, the music industry will need to continue working its way through the five stages of death and dying as developed by Elizabeth Kubler-Ross. We've seen the denial, and then the anger, and now they are transitioning into bargaining. Here's a heads-up: in the next phase the industry will feel depressed for awhile, and finally accept their own death, then pass away. At that point we shall all gather together to bury them — online, of course — and then the rest of us can go on living, creating, giving to the community, and getting fairly paid.

Jefferson Goolsby *is an instructor in the Media Arts department at Lane Community College. As a video artist, musician and songwriter, he anxiously awaits the advent of a digital distribution system that will allow everyone in the world to offer creative works at true free-market valuation. He lives in Eugene, Oregon.*

The Words of Mathematics

Art Peck

Back in grade school we each encountered fractions for the first time. Almost universally, we were told to memorize the names of the parts of the fraction: the top number is called the "numerator," and the bottom number the "denominator." No further explanation. Most of us lacked the critical thinking skills at that age to ask, "Who made up these words? What do they actually mean? Why should we know them? Wouldn't 'top' and 'bottom' do just as well?"

I had not thought about these questions for years until their answers came to me during my Waldorf School teacher training as an adult. It turns out these two strange words do have literal meanings, and their meanings are actually quite relevant to the way we work with fractions.

Both words are Latin in origin. You might even be able to figure out their meanings yourself based on other similar words in English. "Numerator" resembles the words "numerical," "enumerate," etc. And sure enough, it translates into something like "number-giver." (A Latin teacher friend of mine informs me that "number-maker" is more accurate, but I prefer my own loose translation.)

The meaning of "denominator" is a bit more elusive, but can be found in similar words such as "nominate" (to put forth someone's name) and "denomination," which we use to classify things like dollar bills and religions. The best literal translation I have is "name-giver." Interesting that the bottom part of the fraction is not really a number at all, but a code for classifying what kind of fraction it is. Thirds are very different things than hundredths.

In the fraction 3/5, for example, the number 5 serves to name or classify the fraction as being about fifths. The number 3 serves the straightforward function of telling us that there are three of those things. This is useful when one is trying to add fractions. Suppose you have 3/5 of one pie, and 1/4 of another pie, and the restaurant manager wants to know how much pie is left. It would be handy to have one expression to describe that amount of pie, but since they are measured using different denominations, it isn't easy to just lump them together yet. The key is to first re-name those fractions

so they are of the same type but still maintain their value, a process we call finding the lowest common denominator. There is an art to this which I won't go into here other than to say that since 4 and 5 both go into 20, we can now think of those portions as 12 twentieths and 5 twentieths. That makes a total of 17 twentieths.

The whole process may still seem intimidating to some, but if I have to jump through some uncomfortable hoops, it makes a world of difference to me to understand why I must jump through them. Perhaps next I will take on words like geometry, radicals, squared, or even the term mathematics itself.

Art Peck teaches math at Lane Community College.

Faculty Professional Development

Lane Community College Faculty Professional Development (FPD) offers a range of programs including short-term leave for conferences, courses and workshops; sabbatical leave (both paid and unpaid) for professional projects; discipline contact funds to support professional memberships, subscriptions, and books on pedagogy; career support for professional/technical faculty; Faculty Connections, for new faculty orientation and mentorship; and faculty evaluation and teaching support.

As part of the Fall Inservice activities, faculty who have taken a sabbatical during the previous year present reports on their work throughout the day to an open audience. The following pages offer excerpts from three sabbatical reports given in recent years.

To view the full text of many sabbatical reports, see http://lanecc.edu/fpd

Deconstructing Elmer: An Inquiry into the Life and Times of Elmer Jacobs

Thomas Rubick

Editors' note: *The following two excerpts are from a sabbatical report on Elmer Jacobs (1901-82) a Chicago illustrator, painter, lecturer and designer who worked through the middle of the twentieth century, a time of great technological and social change in America. "His career spanned one of those less-than-glamorous transitional periods in the histories of design and illustration," Rubick writes. "Still, he was a twentieth-century design pioneer . . . He was a founding member of two significant organizations, 27 Chicago Designers and 9 Illustrators. He was an outspoken advocate of the value of design in business. And he produced much work in his career that transcended the workmanlike and professional."*

Jacobs the Modernist

One of the defining characteristics of Chicago design in the mid-twentieth century was the influence of modernism. While the famous New York Armory Show of 1913 is discussed at length in the history books, little mention is made of Chicago's Art Institute exhibition of the show in the same year.

According to an article by Paul Kruty, ". . . the Armory Show came as a shock to most Chicagoans, provoking a raucous response ranging from moral posturing and parody in the press to honest outrage." Nevertheless, he continued, the show "prepared the ground for such influential design as Frank Lloyd Wright's Midway Gardens (1914). . . ; the founding of the Arts Club in 1916; and the growth of Chicago's many radical exhibition societies of the 1920s."

Even more significant in terms of graphic design was the founding of the New Bauhaus in Chicago in 1937. The German art school, Das Staatliches Bauhaus, was, of course, the most influential force in twentieth-century art and design education. As Phillip Meggs wrote in *A History of Graphic Design:*

> It created a viable, modern design movement spanning architecture, product design, and visual communications. A modernist approach to visual education was developed, and the faculty's class-preparation, and teaching methods made a major contribution to visual theory. In dissolving fine and applied art boundaries, the Bauhaus tried to bring art into a close relationship with life by way of design, which was seen as a vehicle for social change and cultural revitalization.

Formed in 1919 and closed by the Nazis in 1933, the Bauhaus entered its prime during the tenure of Laszlo Moholy-Nagy. The Hungarian Constructivist joined the Bauhaus faculty in 1923 and soon became the major influence in exploring and introducing students to the possibilities of photography, film, typography and graphic design.

It was a major coup, therefore, when the Association of Arts and Industries brought Moholy-Nagy to Chicago in 1937 to form the New Bauhaus. Although it closed after a year due to financial problems, Walter Paepke of the Container Corporation of America lent his support to the school and it reopened as the Institute of Design in 1939.

In his interviews and in his *Who's Who in American Art* bio, Jacobs made a point of emphasizing his connections to both the New Bauhaus and the Institute of Design. He claimed to have studied under Moholy-Nagy, Gyorgy Kepes, and Horst Schroeder. He also boasted of turning down offers to teach at the New Bauhaus and the Institute of Design.

Evidence for these claims, however, is hard to come by, and to an extent the claims themselves defy reason. In 1937, when the New Bauhaus opened its doors, Jacobs would have been thirty-six years old, with twenty years of professional experience behind him. It seems highly unlikely that he would have returned to school in the middle of his career.

The records seem to support this supposition. According to Catharine Bruck, University Archivist at the Illinois Institute of Technology, there is no record at all in their archives of Jacobs, either as a student or a teacher.

Jacobs' own archive in the Newberry Research Library does substantiate a connection to Kepes, but it appears to be minor. In 1942, as part of an Art Directors Club of Chicago effort to get designers involved in the war effort, Jacobs took a sixteen-week course in the principles of camouflage "under the guidance of Mr. George Kepes."

How this got transformed into being "a student of Kepes," with its implication of receiving a Bauhaus education, seems a matter of public relations puffery. What probably is true, however, is that Jacobs, a self-taught designer in a highly competitive field, was extremely sensitive to what was happening in design and art. He recognized the importance of modernism and did his best to incorporate its style and its tenets into his own work.

It may not be simply a coincidence, then, that it was 1937, the year Moholy-Nagy came to town, that Jacobs began his campaign to reshape his professional life. The New Bauhaus marked the end in Chicago of what was referred to as "commercial

art" and the beginning of "graphic design" (a term first coined by W. A. Dwiggins in 1920).

Commercial art was an umbrella term covering a number of activities — lettering, lay out, paste-up, engraving, photography, etc. — all of which were basically considered crafts. However, modern design movements in the early part of the century promoted the idea of the designer as an artist, an engineer, a partner in manufacturing and business, a shaper of culture, and an agent for social change — in short, a professional.

As Hayward Blake, a Chicago designer, explained in describing the difference between his generation and Elmer's, there simply weren't design schools when the commercial artists came of age. "They were all layout guys who learned on the job." Blake's peer group (which included such Chicago luminaries as Morton Goldscholl, John Massey and Art Paul) learned design in the Bauhaus tradition from the Institute of Design. They not only had a different way of looking at the design process, they had a different way at looking at the design profession itself.

Jacobs the Traditionalist

> A lot of extreme modern [art] today is experimental and will enrich the art of tomorrow, and a lot is phony.
>
> — *Elmer Jacobs,* Colorado Spring Gazette, *1951*

> We need awakening and art is capable of arousing us. Now I mean ART REFLECTING THE FINER THINGS OF LIFE [sic], not defeatist art which searches to uncover the ugly things.
>
> — *Elmer Jacobs from text for speech on art*

For all his attempts to jump on the Modernist bandwagon and despite his sincere recognition of the movement's value, Jacobs was also a traditionalist. In a newspaper article entitled "Much of Today's Art Called Phony by Famous Illustrator," he made it clear exactly where he felt modern art crossed the line:

> There has always been a stirring up in art. About 1800 the work of artists had become so photographic that a terrific revolt occurred. Picasso, Cezanne and others were active in this. The whole aspect of art changed. Brighter colors were used, there was more terrific action, dynamic effect. The sincere modern painter has taken on the

Thomas Rubick
has been a Program Coordinator of Graphic Design, lead instructor, and cooperative education coordinator at Lane Community College since 1988. Before that, he was an adjunct professor at the University of Oregon for five years. He has a B.A. in English from California State University at Long Beach and an M.A. in Visual Communications from Kent State University. His journey to investigate Elmer Jacobs has taken over ten years and has led him halfway across the country. In the process, he has gained a new appreciation for the role of Chicago in the history of graphic design. He has also learned to embrace his Inner Research Nerd.

> good aspects of these extremists and this has enriched their work. The good, sound painters, however, have never lost sight of the fact that art is for the people. A lot of extreme modern [art] today is experimental and will enrich the art of tomorrow, *and a lot is phony.* [italics added]

About his own work, Jacobs said, he preferred simplicity over photographic realism. One story he told in interviews illustrates his respect for the power of minimalism in activating the imagination of the audience:

> . . . it all started when a movie "short" showed a Chinese Theatre, in which a play was being acted out against a bare setting. Horses, swords, were sticks! Children as well as grown-ups (for the movie showed audience too) were enjoying this show without props . . . tremendously.

Jacobs deliberately left out extraneous detail in his illustrations in order to intensify the emotional reality he was communicating. However, in a sentence that clearly shows where he drew a line in the dirt, Jacobs also said, "The painting that is simplified will have a wide appeal, if it is not distorted."

In an article in the *Rockford Morning Star* in 1948, he elaborated, ". . . a work of art, to be useful as a cultural thing, must be pleasing to the eye — it cannot be offensive or distortive [sic]."

In other words, Jacobs embraced the idea of reductionism in modern art but he couldn't get beyond the idea that art basically needed to be faithful to the real world. In the late 1930s, Jacobs' abhorrence of "the offensive or distortive" led him to join The Society for Sanity in Art, a Chicago-based national organization of patrons and artists who vehemently opposed European modern art. While a member for just a few years, he did exhibit one of his Carolina paintings in the First National Exhibition of the Society in May, 1939. Records indicate that he was not a part of any subsequent exhibitions.

Getting to Know Painting Media
(from a work in progress)

Satoko Motouji

As a painter, I often wondered why major media such as oil and watercolor developed in specific times and in specific places. Oil painting was invented during the Renaissance period and has endured as a major painting medium in Europe for the last five hundred years. In Asia, artists used water-soluble materials (especially ink) for thousands of years until oil painting was introduced from Europe. I focus on these two major materials for painting, rather than on other media such as encaustic or tempera, which over time became much less significant or have ceased to be used.

The physical experience that the painters have with some specific media parallels the intellectual and emotional trends of their time. Today, for example, the use of electronic media reflects our lifestyle and modes of thinking. It seems that choices of media in artistic expression go beyond coincidental availability of materials and methods. The use of particular media requires artists to make conscious choices, and how they choose to convey their ideas reflects the mentality of the times in which they live.

I use both oil and water soluble media, but I don't work with watercolor and oil on the same day. In fact, I usually concentrate on one medium for weeks or months at a time. Each material demands a very different approach physically and psychologically; I not only have to change my way of using the medium but also my mode of thinking in the process of painting. I often treat my relationship with the different media like a human relationship. There is an ongoing dialogue between the painter and her medium, and I sometimes anthropomorphize the oils and inks I use.

Oil may seem like a person who is set in her ways, yet when you work with it, you realize this medium can be a patient companion who will wait for you until you accomplish certain goals. Oil makes the pigment stand and does not dry right away; it allows me to contemplate the slow movement of the paint spread on the canvas. If some parts seem less than satisfactory to me while in the process of creating a work of art, I can make changes relatively easily. I can also manipulate the surface slowly, and do not have to hurry as with fresco painting to accomplish certain effects in a limited time. Also, in oil painting, I can analyze the results mid-painting and go back and correct some mistakes up to a certain point.

On the other hand, while the result of watercolor painting seems to be fluid, soft and free, I realize the stubbornness of it. When I paint on the wet surface of the paper, the pigment moves as if by its own free will. It flows like a river, with ease but also with incredible force. To work with this powerful medium, I have to surrender myself. It

Satoko Motouji *was born in Kyoto, Japan and began studying drawing and painting at age eighteen from a professional artist in Japan. Simultaneously she studied English literature at Ritsumeikan University in Kyoto. She came to the United States in 1980, and earned a post-baccalaureate in Art History. She then received an M.F.A in Painting from the University of Massachusetts in 1985. She started teaching at Lane Community College in 1986, and continues to be active in her studio art.*

is like dealing with a person with strong convictions and charisma. If watercolor pigment moves and starts creating its own images which are different from my original intent, I often have to give up my original direction and stay with the flow. There is not much room to change what has been done on the surface of the paper. It is a delight to work with, but at the same time I must be flexible to accept the demands it makes of me. However, once I understand its characteristics and treat it respectfully, watercolor gives me an ecstatic and otherworldly experience. It is a dance between the medium and me as a painter. Similarly, in the use of ink on paper, each mark is immediately imprinted and I have to accept the traces I make and work as best I can with what I have created previously.

My experience as a painter convinces me that there is a strong connection between the painter's choice of media and her intellectual view of the world, just as the content of one's artwork relates to the prevailing philosophy of one's specific time. This phenomenon might be even stronger during periods of great change, such as when artistic explosions occurred during the Renaissance in Italy, and in China during the Northern Sung Dynasty. In both, there was a revival of ancient philosophy; people viewed their world quite differently from the way it had been viewed in the preceding time. Did the invention of oil painting in Renaissance Italy relate to the way people thought about how man learned and what his place was in the cosmos? Why did Chinese literati artists prefer to paint with ink on paper rather than oil on canvas? Did the Northern Sung literati artists' view of the world influence their choice of this particular medium?

While on sabbatical I approached these questions from the point of view of a painter. I focused on a painter's relationship with her materials and not the content of the artwork. I studied to familiarize myself with the media in question; I took tempera and fresco painting workshops. I physically worked with each medium so that I might gain insight into the relationship between the media and the artist.

I also read the history and explored the nature of each medium. Then I considered how the physical characteristics of oil and ink relate to the cultural contexts of the two different times and places. Why did oil become such a powerful painting material, powerful enough to maintain its status as the major medium for more than five hundred years in Europe? Why was ink, which was invented early in the history of Chinese art, chosen as the significant medium by the literati artists in China, Korea and Japan for centuries? By gaining both intellectual and physical knowledge of various media, I hoped that I could begin to answer these questions.

Editors' note: *The back cover of this issue presents an illuminated letter "O" by Satoko Motouji.*

Recipes for Writers
(from a work in progress)

Anne McGrail & Andrea Stover

Recipe: A Five Minute Autobiography with a Lie in It

Prep Time: 5 minutes

Class Time: 50 minutes

Ingredients: Writing paper for each student.

Procedure

Step 1: Ask students to take out paper. They will have five minutes to write an autobiography that tells their entire life story, so instruct them to think about the big, defining moments and characteristics of their life. The only requirements are that they write what they are willing to share and the autobiography *must have one lie in it.* They will be reading their stories aloud with the goal of fooling the rest of the class, who will have three guesses as to which is the lie.

Step 2: Time the students for five minutes, giving them a one-minute warning so they can get a lie into their story if they haven't already. Since this is an icebreaker, it's important not to get bogged down in giving too much more time to write.

Step 3:

Small group option: When time's up, ask students to get into groups of six and read around. Each student should introduce themselves before reading. When each is finished reading, the other students guess which statement is the lie. Ask the writers not to say which is the lie until all three have guessed. Students have three guesses and then the writer "confesses" the lie.

Whole class option: If time permits, ask the entire class to read and listen together. This activity works beautifully in a large group of new students who do not know each other. Each reader introduces her/himself. Ask the three people to the right of the reader to introduce themselves and then guess which detail is the "lie." By the end, each student feels they know something important about at least three students.

Five minutes of writing should take between one and two minutes to read, and students can guess the lie in thirty seconds or so, for a total of about three minutes per student. We have had thirty students write and read aloud with three guesses in a total of ninety minutes.

Why We Do This

Icebreakers are valuable ways to begin any class, and this one allows students to dive into their writing while reflecting on their own lives. Including a lie allows them also to add some play into their writing. When other students guess, they often guess the wrong thing, which gives each student insight into the remarkable lives each of them has. It also adds humor to the class, a sense of discovery, openness and developing trust.

Note to the Instructor on Time

This is a terrific icebreaker, but it is time consuming, which is why the small group option is included here. However, this helps build a class culture from the beginning in which all students hear from one another, and have the experience of hearing each other — and having the entire class be their audience. If this is important to you, may choose to take two entire class periods.

Credit

This recipe was inspired by Aaron Zimmerman, director of New York Writers Coalition (www.nywriterscoalition.org) which offers creative writing workshops in New York City for people from groups that have been historically deprived of voice in our society.

Recipe: Exploring Learning Dispositions

Prep Time: Five minutes to distribute paper. 20-30 minutes to decide on/read an issue as a case study.

Class Time: 50 minutes

Ingredients: Large post-it notes and whiteboard or newsprint and markers or blackboard and chalk.

Procedure

Step 1: Divide the class in half, and ask one group to stand on one side of the classroom, and the other group to stand on the other side. Depending upon the numbers, divide each of these groups into pairs or workable small groups. (2 minutes)

Step 2: Introduce the following two critical dispositions to students: Skepticism (doubting, questioning authority) and Open-Mindedness (believing, being receptive) Tell the first large group that for the rest of this class period they are to fully embrace a skeptical disposition. These are the "doubters." The second large group is to embrace an open-minded disposition. They are the "believers." (3 minutes)

Step 3: Pose one of the following scenarios to the students. You can choose a quite neutral scenario and also one that is controversial. Feel free to make up a scenario of your own. (15 minutes)

1) A car dealer urges you to buy a new electric car. It's the first electric car on the market, so you have no previous history to draw from. The car costs twice as much as a conventional car, but the dealer tells you that you'll make up the cost in savings on gas. As a group make a list of as many reasons you can think of to either challenge (if you are a doubter) or accept (if you are a believer) his proposition. Write each reason on a large post-it, on newsprint, or on the board.

2) The president of the United States announces that our military needs to infiltrate another country in order to liberate its people from a brutal tyrant. As a group, make a list of as many reasons you can think of to either challenge (if you are a doubter) or accept (if you are a believer) his proposition. Write each reason on a large post-it, on newsprint, or on the board.

Step 4: When groups have had enough time to develop reasons, ask them to report back to the class. Alternate between dispositional groups to hear one reason at a time. Discuss both the merits and the possible limitations of each disposition, helping students to recognize when and where a particular disposition can be most useful, and encouraging them to develop both dispositions. (15 minutes)

Step 5: Explain to students that their assignment will be to write a short (500 word) essay in which they argue the issue from their original assigned disposition — either a skeptical or open-minded point of view. Whichever stance they take, they must take into account at least one of the arguments put forward by the opposing disposition. They must take that point seriously, and point out its value and the specific reason why it still isn't strong enough to change the writer's mind. (5 minutes)

Step 6: Now that students have the assignment, give them the opportunity to circulate around the room to collect arguments on the post-its, newsprint, or blackboard that they may want to include in their paper. (10 minutes)

Why We Do This

We want students to recognize their own critical dispositions and develop capacity in different dispositions. Receptivity and skepticism are both essential in order to explore and evaluate issues. Students can recognize and expand their repertoires and become sharp critical thinkers. By assigning critical dispositions *to* them rather than allowing students to choose a "believer" take or a "skeptical" take on the issue, we expect that students will have to stretch beyond their comfort zones.

Credit

This recipe has evolved from different scholars' work. Peter Elbow uses the "believer and doubter" language in his writing classes. Richard Paul and Linda Elder encourage the development of different intellectual dispositions for critical thinking.

Recipe: "This I Believe"

Prep Time: Instructor time to read and select pieces from the National Public Radio "This I Believe" project on www.npr.org (varies to 30 minutes). Ten minutes for computer set up on day of class.

Class Time: Two class periods.

Ingredients: Instructor will need one in-class computer with Internet access. Students need access to Internet to complete homework assignment.

Procedure

Step 1: Select three or four pieces from "This I Believe" and have the class listen to them. The pieces on this radio show are moving, concise, personal, and concrete. Their beauty lies in the possibility of hearing the voice of the author, seeing her/his picture and also reading the text. Discuss the style of each piece as well as what makes them successful. If you have time, work through some exercises on the site, and point out that the site invites everyone to publish in their project. Go over the Writing Tips offered on the site. (20 minutes)

Step 2: For homework, ask students to listen to more selections on their own and to pick the one that they find most interesting. Prepare a worksheet to guide them in producing a one-minute presentation. Following is suggested text.

One Minute Presentation of "This I Believe"

Student Presenter:_____

Author: _____

Site address and date accessed:_____

Title_____

1. Give a very brief summary of the piece you chose.

2. Cite a passage you find compelling.

3. Give your personal response to the passage, explaining why you chose it and why it matters to you.

4. Be sure to practice your presentation to make sure you don't go over one minute.

5. Prepare a list of three ideas for your own "This I Believe."

Step 3: During the next class, students give their one-minute presentations in class (25-30 minutes or more). The next step is to move closer to their own "This I Believe" essay. Break students into pairs and ask them to share their lists of ideas from their worksheets; they are then closer to making a selection based on peer feedback. Be sure to have them check the Writing Tips section on the NPR website. (25 minutes).

Step 4: Assignment for next class: Tell the students to write their own "This I Believe" piece, noting that the length is restricted to 350-500 words (2-3 minutes spoken).

Andrea Stover *(left) and* **Anne McGrail** *have been colleagues and friends for more than twenty years. Andrea is Associate Professor of English and Director of the Writing Program at Belmont University in Nashville, Tennessee. Anne is an instructor of English and Learning Communities Coordinator at Lane Community College. While they attended different universities for their doctorates, they worked on their dissertations together during summer writing retreats; they have presented papers together twice at the Conference on College Composition and Communication. In 2006, Anne spent her sabbatical in Nashville working with Andrea on their book, whose working title is* Recipes for Writers.

The combination of compelling beliefs and brevity is what makes these pieces "sing" on the page.

Step 5: On the due date, ask students to share their work with each other by reading aloud. Each essay should take no more than three minutes. Reiterate to students that that all contributors on the site speak for just three minutes. This discipline is an important one to learn, and fosters the "latent editor" in students.

Step 6: Celebrate! Encourage or require students to submit their work to "This I Believe," according to the Writing Tips offered on the NPR website.

Why We Do This

This exercise helps students recognize the importance and difficulty of concision, and gives them active practice in it.. It is very hard to write about something as important as a central belief in only 350-500 words! Also, as the Writing Tips on the website stress, students learn that the piece will only be effective if it is drawn from a specific, concrete instance in their lives. An abstract word like "faithfulness" means nothing unless it is paired with a specific story. Finally, students learn how to write for two real audiences who will be interested in hearing what they have to say — their peers, and the editors at NPR . . . and possibly listeners to NPR.

Credit

This recipe was inspired by the NPR "This I Believe" project on www.npr.org

Readings and Reviews

Technology, Anarchy, and Transcendence

A review of Thomas Pynchon's Against the Day

Thomas Pynchon's sixth novel, the comic epic *Against the Day* (Penguin Books, 2006), opens at the Chicago World's Columbian Exposition of 1893 — the "fabled White City", Pynchon calls it — a perfect icon of America's dream of a utopian technological future at the dawn of the twentieth century. Here we meet the Chums of Chance, a Tom Swift-like club of youthful adventurers straight out of the pages of a teen science-fiction series. They fly the enormous airship "Inconvenience" across the globe, following the orders of a mysterious High Command, using the most advanced technology for the good of mankind. Quickly, though, Pynchon complicates his narrative by informing us that the Chums are in fact fictional characters from a book series — i.e. "*The Chums of Chance at Krakatoa, The Chums of Chance Search for Atlantis*" (6) — and they are only able to interact with the "real" characters of the novel's fiction at certain opportune moments. "The Chums of Chance could have been granted no more appropriate form of 'ground-leave' than the Chicago Fair, as the great national celebration possessed the exact degree of fictitiousness to permit the boys access and agency. The harsh non-fictional world waited outside the White City's limits . . ." (36)

On the bright streets of the White City we also catch glimpses of the inventor of electrical technology Nikola Tesla, and the Archduke Ferdinand of Austria, whose death at the hands of an anarchist gunman triggers the outbreak of World War One. We also meet Merle Rideout, the photographer and alchemist of light, whose life and family will intersect throughout the book with those of the main protagonist, Webb Traverse. And we encounter the industrialist Scarsdale Vibe, whose evil designs also drive the complex plot.

The main story of the novel spins a multi-generational saga of betrayal and revenge worthy of Quentin Tarentino. The children of the Traverse family are haunted by the literal and figurative ghosts of their father, Webb Traverse — by day a union miner and engineer in Colorado, by night the infamous anarchist bomber Kieselguhr Kid. Webb is killed by two company ruffians hired, we discover, by the nefarious tycoon Scarsdale Vibe, who is carrying on his own war against the anarchist movement in America. The brothers do then what brothers in any revenge drama must, each in his own way tracking his father's killers across the American west, deep into Mexico, and

finally across Europe as World War One begins, seeking to avenge Webb's death. Their travels and travails form the main architecture onto which Pynchon hangs his caustic commentary on capitalism, anarchism, science, and technology.

Explosive conflict between anarchism and capitalism fills the novel. Webb Traverse is a union man, an anarchist, and the patriarch of a clan of railroad dynamiters. Though the book is overtly political in action, direct political statement is almost always spun through the voice of a character. The anarchist "Ratty" says, "Central governments were never designed for peace . . . The national idea depends on war." (938) And Flaco, another anarchist, proclaims, "The more oppressive the state is, the closer life under it resembles death." (372) Violence and death pervade the story, and war, as a looming threat and finally a background reality, hangs like a bloody curtain behind the storyline. There is no doubting, however, where Pynchon's sympathies lie. The anarchists are the heroes, though seldom the winners, in his world, and Scarsdale Vibe epitomizes all that they, and Pynchon, oppose. As well as ordering Webb Traverse killed, Vibe hides Tesla's discoveries forever from the public. When he speaks to the "Las Animas-Huerfano Delegation of the Industrial Defense Alliance (L.A.H.D.I.D.A.)" near the book's end, the bitterly ironic message is unmistakable. Vibe says, "Of course we use them. . . . We harness and sodomize them, photograph their degradation, send them up onto the high iron and down into mines and sewers and killing floors . . . we harvest from them their muscle and eyesight and health. . . . Of course we do. Why not? They are good for little else . . . We will buy it all up, all this country. Money speaks, the land listens, where the Anarchist skulked . . . we fishers of America will cast our nets of perfect ten-acre mesh, leveled and varmint-proofed, ready to build on." (1001)

Science and technology form a second major thread of the novel. Pynchon sees a kind of mysticism at the heart of science, an urge toward the absolute, toward Truth, a surrender to the purity of abstract knowledge that is like the surrender into sex and into death, into the bliss of a final understanding. Particular technologies become fetishes for this experience. The V2 rocket in *Gravity's Rainbow* serves this symbolic function. In *Against the Day* light and electricity, time, the aether, vorticism, and abstract mathematics all have a mystical pull on various characters. Webb Traverse's son Kit succumbs to this mystical experience in the form of electricity. "It could have been a religion, for all he knew — here was the god of Current, bearing light . . . here were Scripture and commandments and liturgy, all in this priestly Vectorial language. . . ." (98) Time, light, and electricity recur continuously in the text, both as scientific principles of physics and as metaphors for mystical experience.

For example, the famous Michelson/Morley experiment on the speed of light becomes the pivotal event that turns Merle Rideout into a photographer, a kind of alchemist, and a mystic of light. And in one scene near the book's close the imagery of light, electricity, and time come together in the presence of many fetishes of technology. Chick Counterfly, one the Chums of Chance, meets an aged Merle Rideout in his research facility. "It was the lab of every boy's dreams! Why the place even *smelled* scientific — that long familiar blend of ozone, gutta-percha, solvent chemicals, heated insulation. The shelves and benchtops were crowded with volt-ammeters, rheostats, transformers, arc lamps whole and in pieces, half-used carbons . . ." (1035)

Here Chick encounters a final fantastic use of light. Merle and his partner reveal a machine which, with the help of a strange, red crystal, can bring still photographs back to life. Merle has begun to understand his mission is to bring all the photographs he can back into light, restoring life to the dead images, giving the subjects back their humanity which technology has frozen, setting them into motion, helping them move forward into the future. It was "as if all the information needed to depict an indefinite future had been there in the initial 'snap,' at some molecular or atomic fineness of scale whose limit, if any, hadn't yet been reached. . . ." Chick responds to this revelation, "It might be something wrapped in the nature of Time itself." (1038)

Despite its length and complexity, this is one of Pynchon's most readable and accessible novels, comparing with *V* in the pull of its storyline and *Vineland* in its human warmth. The nineteenth century pop fiction style he wears here is less jolting and thick than the eighteenth century diction of *Mason and Dixon.* While still sexual and in some ways perverse, this novel would have an R rating where *Gravity's Rainbow* was X. For those familiar with Pynchon, all his usual idiosyncrasies are here — oddball songs interrupting scenes, and bizarre character names that hover just outside the range of meaning: Darby Suckling, Webb Traverse, Scarsdale Vibe. Endless punning and playfulness have always marked Pynchon's style — he creates a sect, "the priesthood known as the Hallucinati," and alludes to Star Trek and New Age beliefs. A search for a mysterious crystal with magical properties, Iceland Spar, ties several of the plot lines together. Even the Chums of Chance moniker reminds us of TV's *Dukes of Hazzard*, especially when translated into Italian, "Gli Amici Dell'Azzardo." (243)

Pynchon's prose, returning from the flatness of *Vineland* and the stilted eighteenth century persona of *Mason and Dixon* to the richer and more poetic style of *Gravity's Rainbow,* often becomes unmoored from the narrative, lifting into flights of imagination above the visible detritus of ordinary experience (the "Day" of his title), into lofty invisible realms of thought, much like the airship Inconvenience, "flying into grace." If his Faulknerian sentences can be difficult to follow, they also wander toward great

discoveries, tossed off almost as asides — like a desert explorer who, lost and thirsty, happens across a never-before-seen wonder of the world, but, pressed on by the concerns of survival, soon forgets he has seen anything at all.

Pynchon is at heart a satirist in the spirit of Jonathan Swift and a magical realist like Gabriel García Márquez. But Pynchon's range has grown broader with each novel, capable now of evoking moments of poignant human emotion in the midst of his comic romps: a girl seeking and finally finding the mother who abandoned her at birth, a cautious encounter of former lovers and their new partners, even Chick Counterfly, one of the Chums at yet another intersection of fictional fiction with fictional reality, finding his own father by purest chance. And when he asks his father to join him for supper aboard the Inconvenience, Pynchon describes the father's response in this way, "Surprisingly after their years apart his father's face was not as unreadable as Chick might have expected. 'Well, Thought you're never gonna ask.'" (1039) Perhaps it is a more mature Pynchon who can be as simple, understated, and touching as that in the midst of this demanding, disturbing, and hilarious novel.

K.Z.

Not Necessarily Science Fiction

The prophetic novels of H. G. Wells

If you grew up in America in the twentiethth century, chances are you've heard of H. G. Wells. Chances are that you have read or seen a movie version of one or more of his books. Chances are you thought of them as science fiction, fantasy, pure imagination. And chances are that you were wrong.

Wells' books were not necessarily science fiction, but rather efforts to consider the future based on an understanding of the past. He immersed himself in science and history, identified patterns and trends throughout the ages, projected those patterns and trends into the future, then speculated on the world as it might be. This kind of work was, he said, an "attempt to forecast the human future as a whole and estimate the relative power of this and that great system of influence."

This approach is most apparent in his trilogy of what are sometimes called the prophetic novels: *When the Sleeper Wakes* (1899), *A Story of Days to Come* (1899), and *The Time Machine* (1895).

Most of us recognize *The Time Machine*, perhaps the best known (along with *War of the Worlds* and *The Invisible Man*) of Wells' many books. In it, the protagonist invents and uses a machine that takes him forward in time, whereupon he returns to his

contemporaries in Victorian London to report what he has seen. The salient episodes include a visit to the year 802,000, in which he meets a society of childlike creatures called *Eloi*, who are supported and served by an underground network of machinery and nearly blind creatures called *Morlocks*. The balance of this distinctly two-class world is maintained by a coldly practical ritual that occurs each month during the new moon.

Later episodes involve encounters with small kangaroo-like creatures who have disturbingly human features in head and hand, and are hunted by three-foot water-dwelling centipedes; a visit to 30 million years after his time, shortened when he is stalked by giant crab-like creatures on a barren landscape; and finally to a seemingly dead planet inhabited solely by an octopus-like apparition.

Wells would later say the scenes in *The Time Machine* were "mere fantasy based on the idea of the human species developing about divergent lines." The future imagined in the other two books, however, was "essentially an exaggeration of contemporary tendencies." Both take place around the year 2100, in a world of "higher buildings, bigger towns, wickeder capitalists and labour more downtrodden than ever and more desperate." Speed, size and ever more extreme behavior were the order of the day, he continued. "It was our contemporary world in a state of highly inflamed distension."

He wasn't entirely off the mark. A mere hundred years after these speculations, a number of technical and social scenarios described in the stories have become fact: cars replacing trains, not only television sets but the mindless chatter of their content, automatic doors and conveyor belts, and a world connected by electric cables that isolated all who were not plugged in. As to our development on moral and ethical grounds, let the reader decide where recognition might bring a chuckle — or shock.

Taken as a whole, the three books invoke a world view that set the stage for a number of authors to follow. The impressive list of twentieth century speculative fiction classics — among them *Brave New World, 1984, Fahrenheit 451,* and Zamyatin's *We* — owe if not a debt then certainly homage to Wells' attempts to responsibly project history into the future.

The point here is not to identify who was first or more accurate in their predictions or guesses about how things might be. Rather, we might consider that the course of our activities is not just a matter of cause and effect, but also how we might influence those activities by an awareness of both causes and their effects. Wells, in 1934 reflecting on a speech he gave to the Royal Society some thirty years earlier, wrote, "I insisted that we overrated the darkness of the future, that by adequate analysis of contemporary processes its conditions could be brought within the range of our knowledge and its form controlled."

Humankind, he said, "was at the dawn of a great change-over from life regarded as a system of consequences to life regarded as a system of constructive effort." He reminded his readers that he did not say the future could be foretold. ". . . but I said that its conditions could be foretold."

Every age has its overriding concerns. Optimism, though, in one form or another, seems necessary to all. Without our ability to imagine that things can be better than they are, we risk forfeiting our ability to make them so. As Wells concluded in his Royal Society talk, published in 1902 as *The Discovery of the Future*, "All this world is heavy with the promise of greater things, and a day will come, one day in the unending succession of days, when beings, beings who are now latent in our thoughts and hidden in our loins, shall stand upon this earth as one stands upon a footstool, and shall laugh and reach out their hands amid the stars."

S.M.

Elmer Jacobs

This instrument can teach, it can illuminate; yes, and it can even inspire. But it can do so only to the extent that humans are determined to use it to those ends. Otherwise, it is merely wires and lights in a box.

Edward R. Murrow, 1958

Community College Moment: Call for Submissions

The *Community College Moment* invites articles, interviews, photographs, artwork, academic and creative writing, and other original work relevant to the community college mission and environment. Submissions should provoke meaningful, progressive inquiry that will appeal on a local and/or national level to an educated, but not specialized, audience. Each issue of the *Moment* may be thematically organized, all or in part, providing multiple perspectives on a given topic. Past themes have included Technology & Society, Sustainability, Diversity, and Peace.

The *Moment* is open to a variety of submission formats, including: articles (under 5000 words; languages other than English welcome), sabbatical research summaries, plans and reflections on innovative pedagogies, artwork (paintings, photography, sculpture), choreographic projects featured through photographs, musical compositions, etc., fiction and poetry (relevant to *Moment* audience), works-in-progress (provocative ideas not fully worked out), collaborative projects, and web-based and multi-media projects. We also invite submissions of short reviews that offer insight on books and other materials relevant to our audience. Queries welcome.

2008 Theme: Democracy

In addition to submissions on any topic relevant to the *Moment's* audience, we invite works addressing our 2008 theme, Democracy. In its most basic sense, democracy means "ruled by the people." But is it that simple? We welcome works that address a broad and inclusive notion of democracy: its relationship to individual, social, cultural, and economic needs; its application to teaching and governance in our institutions; and its relevance to the future generation of leaders now in our classrooms. In a time when words are manipulated with ever-increasing dexterity, what exactly does democracy mean? What are the challenges, risks, responsibilities and benefits of a democratic model? And where does the community college fit in a democratic society?

Submissions are accepted year-round. Check our website for full submission guidelines and further information on special themes and deadlines.

https://teach.lanecc.edu/ccm

Mailing address: Community College Moment, Lane Community College,
4000 E. 30th Avenue, Eugene, OR 97405, attn: Steve McQuiddy

Back Cover: Illuminated letter "O" adapted from fifteenth-century design of Fra Angelico, by Satoko Motouji, studio arts faculty at Lane Community College.

Our busy age does not
always have time to read,
but it always has time
to look.

Théophile Gautier, 1858