

## “A Web Site Before Its Time” Navigating Cyberspace, Then and Now

By Jamie Hutchinson

As the PCS *Newsletter* makes its final transition to a place we call “cyberspace,” what better time to take a long view of that much used, little understood word and its implications for communicators?

According to *The New Oxford American Dictionary*, *cyberspace* originated in the 1980s (probably with William Gibson’s novel *Neuromancer*, though *NOAD* doesn’t say so), and is “the notional environment in which communication over computer networks occurs.” The term derives from *cybernetics*, a 1940s coinage by the mathematician Norbert Wiener, who wished to name the emerging, interdisciplinary science of control and communication in animals and machines, which he helped found. Wiener reached back for the Greek root of the Latin-derived *governor*, in the technical sense used in automatic control theory, and found *kybernan* (to steer) and its noun form *kybernetes* (steersman). For Wiener, the new science was symbolized in the image of a steersman guiding a ship: alternately reading his environment while adjusting speed and direction in a holistic, self-organizing, goal-oriented process. And that is how the ancient Greeks gave us the prefix we now use to denote just about anything high-tech.

So much for etymology. What about the actual place, *cyberspace*? Is it as imaginary as Gibson’s story? Is it

merely “notional,” as the dictionary tells us? And if there’s more to it, then what does that mean for communicators? For guidance, we turn to a group of university students who 31 years ago took an intensive seminar in cybernetics and made a book about it—what they called a “cybernetic book.”

Austrian-born physicist Heinz von Foerster was a junior participant in the meetings at which Wiener and other cybernetics pioneers outlined the new field. Von Foerster would go on to establish, in 1958, what became the de facto headquarters for cybernetics research in the United States: the Biological Computer Laboratory at the University of Illinois, which thrived into the mid 1970s on Pentagon grants. There von Foerster gathered students of all persuasions together with cybernetics luminaries from around the world in an educational environment that was itself a grand experiment in cybernetics. Whereas Wiener’s “first order” cybernetics bracketed the observer of a system, von Foerster’s “second order” cybernetics embraced the question of the observer, opening cybernetics to the input of social scientists, humanists, and artists, and vice versa.

The culmination of von Foerster’s teaching career was a two-semester

seminar during 1973–1974 in which the students produced a book, *Cybernetics of Cybernetics*, that attempted to introduce readers not only to the major ideas of cybernetics but also to a cybernetic process—in fact, the very process by which the book itself had been produced. Needless to say, such an approach to the production of a book led students to the outer limits of what could be achieved with the medium of paper.

*Cybernetics of Cybernetics* democratized the editorial function, though not quite in the individualized sense of many Web sites today, where anyone can publish anything without regard for the input of others. Editorial work was carried out by

a committee of volunteers who solicited and selected submissions for printing based on free and open discussion. The result is a collection of works by leading cyberneticists immersed in dialog with prose, poetry, photography, and illustration by students from a wide variety of majors. As with

a good Web site, the intelligent use of graphics makes the book a feast for the browsing as well as the reading eye.

Web sites are well equipped to reveal the processes of their own production by archiving old versions and incorporating interactivity for participants and readers. *Cybernetics of Cyber-*

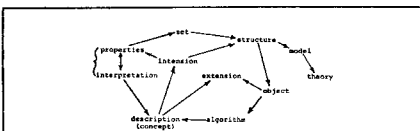
The tools of communication may come and go, but the job at hand remains the same.

MODEL

MODEL OF A THEORY IS A STATISTICAL MODEL THAT EVERY MEMBER OF THE THEORY BELONGS TO IN THE STRUCTURE. (L.L.)



L.L. [Lars Löfgren]



104, 173, 332, 424, 426  
properties, set.

Figure 1. Top: Page 333 of *Cybernetics of Cybernetics*. Cybernetician Lars Löfgren's definition of the concept "Model" appears at top, next to a thumbnail of his conceptual entailment structure. Below that is an illustration by student Rodney Clough; used with permission. Punch dots appear along the right margin.

Below: Löfgren's entailment structure as it appears in the *Metabook*. The words below the entailment structure are concepts unique to Löfgren's entries in *Cybernetics of Cybernetics*. The numbers tell on what pages Löfgren's entries can be found.

*netics* does the same within the strictures of traditional printing. Many materials are reprinted from a periodical, *The Cybernetician*, produced by the students about once a month during the school year. The periodical, as well as the final book, contains proposals from the students about what form the final product should take. A "Parabook" in the middle of *Cybernetics of Cybernetics*, set off from the rest by its heavier paper stock, contains much material about the book's form, content, and context, including a summary of seminar discussions throughout the year. Material that would normally go in the front or back matter of a book—list of contents, acknowledgments, author index, etc.—appears in the Parabook.

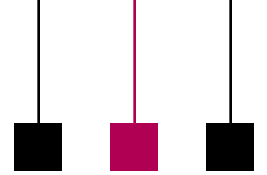
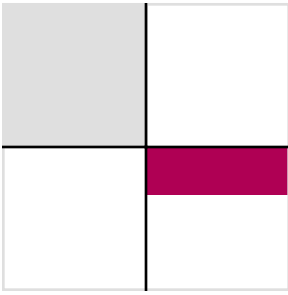
In addition to the Parabook, *Cybernetics of Cybernetics* comes with a "Metabook" whose purpose is "to help the reader discover and invent connections between the concepts, and the authors, of *Cybernetics of Cybernetics*." A small chapbook attached with Velcro to the inside back cover of the main

book, the *Metabook* comprises dozens of "entailment structures"—graphical representations of how cybernetic concepts are related in the thinking of various contributors to the book. Many of the interior pages of *Cybernetics of Cybernetics* are adorned with thumbnail versions of those entailment structures (see Figure 1).

Perhaps the oddest navigation tool in *Cybernetics of Cybernetics* is a row of dots—some solid, some open—printed along the margin of right-hand pages. Readers are advised to punch holes in the open dots (but not



Figure 2. Combining the geeky with the artsy, p. 194 (broadside orientation) of *Cybernetics of Cybernetics* introduces a table of entropies in a section about information theory. Students used props, such as bags over their heads, and varying poses to illustrate lengthy, dull lists of logarithms used in calculating uncertainty. Photography by Glenn Kowack; used with permission.



in the filled ones), which designate target pages. Then, by inserting a stylus in any open dot, the reader can go directly to the next target page related to the concept being addressed.

The student proposals and discussion about the layout and organization of *Cybernetics of Cybernetics* reveal a very forward-thinking group of communicators. One student submitted an elaborate proposal based on the idea of self-contained “bits” and “packets” of information, such as definitions or illustrations, interspersed with and providing connections between longer articles. Another student carried this idea forward in a diagram that supplemented the bits and packets with the entailment structures. Other published discussion expresses the students’ intent to make an “interactive” book, a “functional” book, a “network” book. Indeed, one seminar alumnus aptly remembers *Cybernetics of Cybernetics* as “a Web site before its time.”

By any truly cybernetic understanding of the term, von Foerster’s students were navigating *cyberspace* and knew it only too well. Whatever readership *Cybernetics of Cybernetics* may enjoy today must surely be struck by the same realization. (A thousand copies were reprinted in 1995 by Future Systems Publishers, so you never know where one might turn up.) *Cybernetics of Cybernetics*

reminds us that while the tools of communication may come and go, the job at hand remains the same.

*Jamie Hutchinson (jhutchin@uiuc.edu) manages the publications office in the Department of Electrical and Computer Engineering, University*

*of Illinois at Urbana-Champaign.*  
[Redacted text]

### Masters of Style

*(continued from page 17)*

ing the ball (document) take flight and add to the score (the number of successful documents).

On his last trip to the plate, against Jack Fisher of the Baltimore Orioles, Williams sent the third pitch into the right-field bullpen. John Updike describes that dramatic event in his extraordinary, must-read essay, “Hub Fans Bid Kid Adieu” (*Assorted Prose*, 1965): “[Williams] ran as he always ran out home runs—hurriedly, unsmiling, head down, as if our praise were a storm of rain to get out of. He didn’t tip his cap.” He just went into the dugout, refusing to

acknowledge the crowd’s wild cheering, its “cry to be saved.” As Updike puts it, “...immortality is nontransferable.... Gods do not answer letters” (p. 146). For Updike, “Williams’s last word [silence] had been...exquisitely chosen, ...a perfect fusion of expectation, intention, and execution...” (p. 147). Since I run no risk of being mistaken for a deity, I tip my Red Sox cap to the reader.

*Ron Nelson is a professor of English at James Madison University, Harrisonburg, Virginia 22807; +1 540 568 3755, fax +1 540 568 2983; nelsonrj@jmu.edu.*

I never associated today’s word [*calefacient*] with *nonchalant*, but I once had a clue. In the dark ages I worked as a typesetter for a printing company. One hot morning an apprentice sauntered in as teenagers do. I asked him why he seemed so nonchalant. His reply: “Too hot to act chalang.”

*Art Darwinu in AWADmail Issue 139, 10 October 2004*