Week 5.
Epistemological Constructivism: Heinz von Foerster

Bruno Clarke
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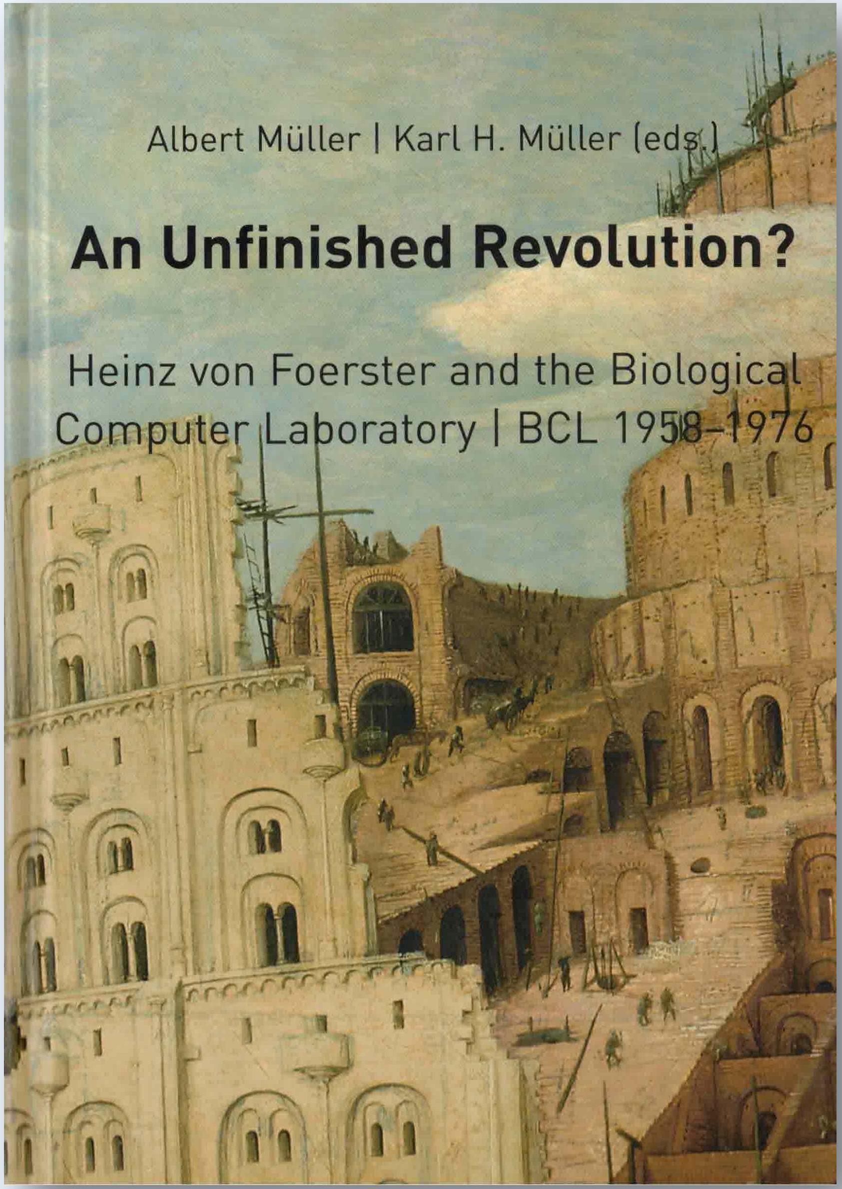

CYBERNETIC COUNTERCULTURES INTENSIVE

Week 5. Epistemological Constructivism: Heinz von Foerster

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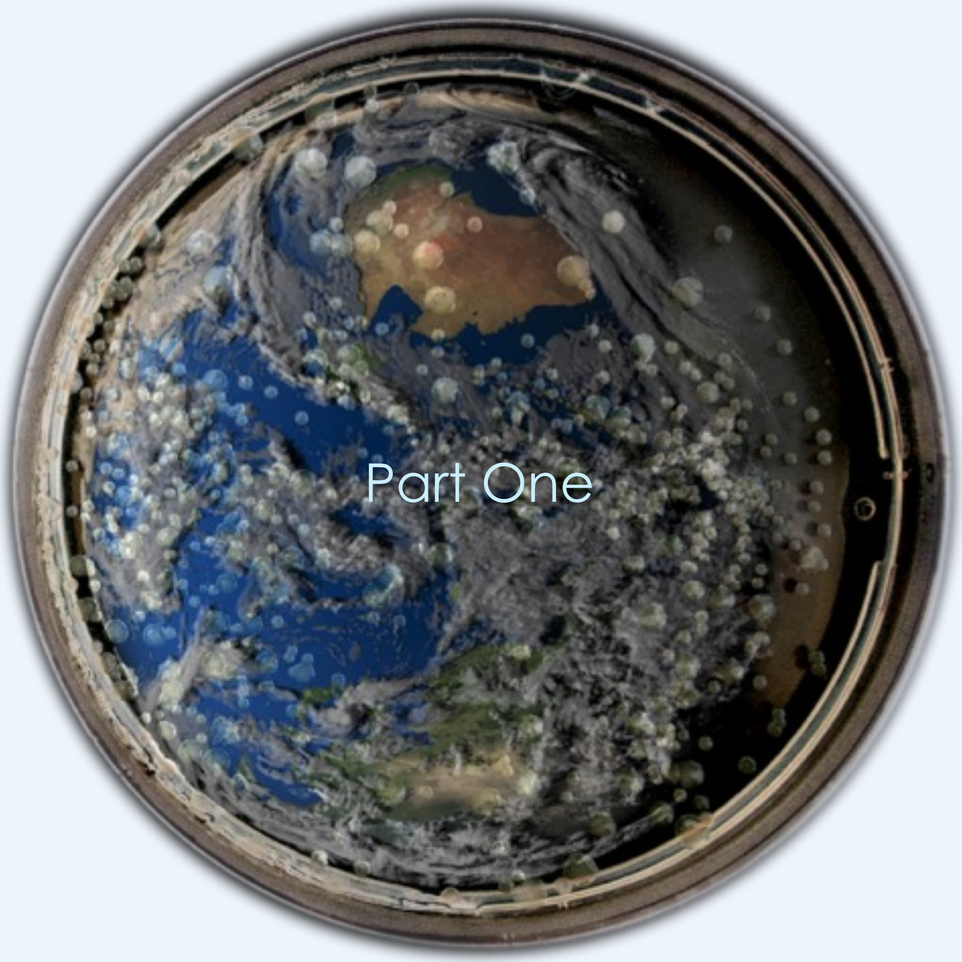
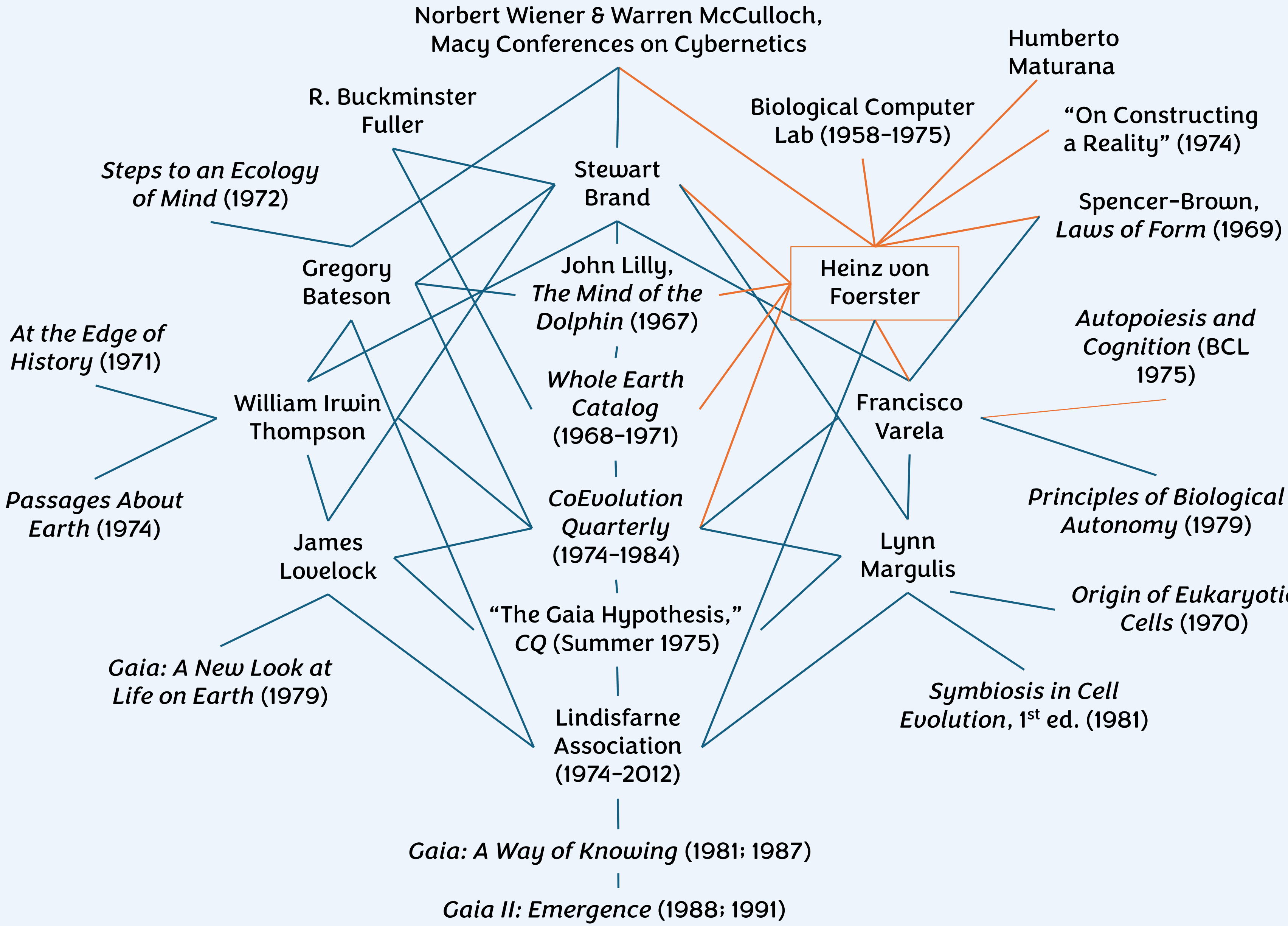


The Cybernetic Countercultures Arrive at the Biological Computer Lab



Cybernetic Countercultures Network

The era of the Cybernetic Countercultures gained critical mass as the '60's gave way to the '70s. During this period, the inventive émigré cyberneticist Heinz von Foerster collaborated with a host of colleagues and students at his Biological Computer Lab to define and codify cybernetics' second-order turn. Concurrently, he also fostered Francisco Varela's intellectual and professional career. Varela spoke to his relationship with von Foerster in the introduction to *Observing Systems* (1981), Varela's selected edition of his professional articles.

Introduction

THE AGES OF HEINZ VON FOERSTER

by **Francisco J. Varela**

Like almost everyone who came into contact with Heinz von Foerster, I owe him a great deal of both learning and support. I say a great deal of learning because Heinz excels at being able to inspire others to think about deep issues which he can point to and express in substantious nutshells. His whole work is marked by this quality, which has a way of staying in one's mind and becoming good food for thought. I also owe him a great deal of support, because one cannot write about Heinz's work without, at the same time, having present his generosity and gentleness, so rare in contemporary academia. As he himself once told me, "To understand something, is to stand under it, so that you may foster its development." And he acted every word of that.

Heinz von Foerster, *Observing Systems*, intro. Francisco J. Varela (Salinas, CA: Intersystems Publications, 1981), 2nd edition, 1984.

The Viennese polymath and the young Chilean genius would share expatriate status as academic refugees from political intimidation during authoritarian periods in their respective societies.

Von Foerster's mother's line was Jewish. Heinz's own early professional years in the 1930s were precarious as a "Mischling zweiten Grades" (second-degree mixed-race) from a prominent bourgeois family. After the Nazis annexed Vienna, he moved with his wife and children to employed obscurity in Munich, as seen here, hiding in plain sight.

Source: Heinz von Foerster Archive, University of Illinois at Urbana-Champaign

Von Foerster polaroids,
@ 1950s

Von Foerster sought academic work in the U.S. at the end of the 1940s. His calling card, a short monograph in German, *Memory: A Quantum-Mechanical Investigation*, impressed the eminent psychiatrist and pioneering cyberneticist Warren S. McCulloch.

McCulloch assisted Heinz in securing a position in the electron tube lab in the Department of Electrical Engineering at the University of Illinois at Urbana-Champaign.

Moreover, as the 1950s began, McCulloch brought von Foerster into the ongoing Macy Conferences group alongside Norbert Wiener, John von Neumann, Claude Shannon, Gregory Bateson, and Margaret Mead.

Famously, McCulloch appointed von Foerster as the editor of the subsequent Macy transactions to improve his English. These acts of support helped mold von Foerster's broad training toward formidable cybernetic contributions, especially to its eclectic organic profile.

Warren S. McCulloch, 1947, University of Illinois, Medical School, Chicago, Illinois

New York Times,
July 13, 1958

Electronic 'Brain' Teaches Itself

The Navy last week demonstrated the embryo of an electronic computer named the Perceptron which, when completed in about a year, is expected to be the first non-living mechanism able to "perceive, recognize and identify its surroundings without human training or control." Navy officers demonstrating a preliminary form of the device in Washington said they hesitated to call it a machine because it is so much like a "human being without life."

Dr. Frank Rosenblatt, research psychologist at the Cornell Aeronautical Laboratory, Inc., Buffalo, N. Y., designer of the Perceptron, conducted the demonstration. The machine, he said, would be the first electronic device to think as the human brain. Like humans, Perceptron will make mistakes at first, "but it will grow wiser as it gains experience," he said.

The first Perceptron, to cost about $100,000, will have about 1,000 electronic "association cells" receiving electrical impulses from an eyelike scanning device with 400 photocells. The human brain has ten billion responsive cells, including 100,000,000 connections with the eye.

Difference Recognized

The concept of the Perceptron was demonstrated on the Weather Bureau's $2,000,000 IBM 704 computer. In one experiment, the 704 computer was shown 100 squares situated at random either on the left or the right side of a field. In 100 trials, it was able to "say" correctly ninety-seven times whether a square was situated on the right or left. Dr. Rosenblatt said that after having seen only thirty to forty squares the device had learned to recognize the difference between right and left, almost the way a child learns.

When fully developed, the Perceptron will be designed to remember images and information it has perceived itself, whereas ordinary computers remember only what is fed into them on punch cards or magnetic tape.

Later Perceptrons, Dr. Rosenblatt said, will be able to recognize people and call out their names. Printed pages, longhand letters and even speech commands are within its reach. Only one more step of development, a difficult step, he said, is needed for the device to hear speech in one language and instantly translate it to speech or writing in another language.

Self-Reproduction

In principle, Dr. Rosenblatt said it would be possible to build Perceptrons that could reproduce themselves on an assembly line and which would be "conscious" of their existence.

Perceptron, it was pointed out, needs no "priming." It is not necessary to introduce it to surroundings and circumstances, record the data involved and then store them for future comparison as is the case with present "mechanical brains." It literally teaches itself to recognize objects the first time it encounters them. It uses a camera-eye lens to scan objects or survey situations, and an electrical impulse system, patterned point-by-point after the human brain does the interpreting.

The Navy said it would use the principle to build the first Perceptron "thinking machines" that will be able to read or write.

The early days of AI hype. Meanwhile, the meeting at Dartmouth College considered to have spawned the field of Artificial Intelligence—attended by John McCarthy, Marvin Minsky, Claude Shannon, and several others—took place during the summer of 1956. Within two years, early AI research was making headlines like this one, "Electronic 'Brain' Teaches Itself," blandly declaring the imminent arrival of AGI, artificial general intelligence, in an electronic artifact "named the Perceptron which, when completed in about a year, is expected to be the first non-living mechanism able to 'perceive, recognize and identify its surroundings without human training or control.'" Perceptrons would "reproduce themselves on an assembly line and . . be 'conscious' of their existence."

—And with the launch of the Biological Computer Lab that same year, the cybernetic reversal of the Cartesian schema (organisms explain artifacts, and not the other way around) is well in place. An article in the campus newspaper for December 5, 1958, "Von Foerster's 'Chap' Does Brainy Job," reports on an interview with the BCL director foregrounding the "Biological" designation of his lab and of its research goal to use nerve cells as models for the technological production of autonomous agency. In the Atomic Age one must expect the glitch in the article, misprinting *neutrons* for *neurons*.

—from Albert Müller and Karl H. Müller, eds., *An Unfinished Revolution? Heinz von Foerster and the Biological Computer Laboratory*

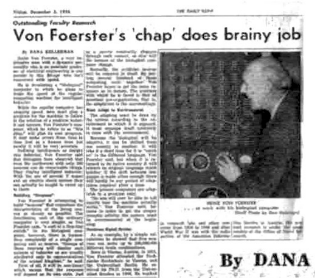


FIGURE 1-5

Heinz von Foerster at Work With His Biological Computer, Newspaper Clipping, 1958

By DANA KELLERMAN

Heinz Von Foerster, a very impressive man with a dynamic personality who is an associate professor of electrical engineering is one person in this jet-age who isn't concerned with speed.

He is developing a "biological" computer in which he plans to trade the speed of the regular computing machine for intelligent behavior.

While the regular computer has amazing speed, men must plan a program for the machnie to follow in the solution of a problem before it can operate. Von Foerster's computer, which he refers to as "this chap," will plan its own program. It may make errors from time to time just as a human does but mostly it will be very accurate.

Defining intelligence as insight into behavior, Von Foerster said that biologists have observed that even the earthworm with only 300 neurons can do remarkable things. They display intelligent behavior. With the use of several T mazes and an electric shock system they can actually be taught to count up to three.

Building "Neurons"

Von Foerster is attempting to build "neurons" that reproduce the characteristics of the living neuron as closely as possible. The functioning unit of the ordinary computer is very simple, as Von Foerster says, "a sort of a flop-flop switch." In the biological computer, however, there is tremendous complexity of a single computing unit or neuron. "Groups of these neurons will display such paterns of behavior as are usually attributed only to representatives of the animal kingdom," he said.

First of all, it will be non-linear which means that the response will depend on its own state. Just as a person constantly changes through each contact, so also will the neuron of the biological computer change.

Secondly, the artificial neuron will be complex in itself. By putting several hunderd of these computing units together Von Foerster hopes to get the same response as in nature. The problem with which he is faced is that of genetical pre-organization, that is, the adaptation to the surroundings.

Must Adapt to Environment

The adapting must be done by the system according to the environment to which it is exposed. It must organize itself interiorly to cope with the environment.

Because the biological will be adaptive, it can be shifted from one country to another. It will take it a short time for it to "catch on" to the different language, Von Foerster said, but when it is returned to its native country it will relearn its original language much quicker. If the shift between languages is made often enough there will hardly be any period of adaptation required after a time.

The present computers are adaptable to a program only.

"No one will ever be able to tell exactly how the machine actually works," Von Foerster said, because in order to get the proper synaptic activity the system must be overconnected at the beginning.

Neutrons Equal Brains

As an example, by a simple calculations he showed that five neurons can make up to 100,000,000 different brain combinations.

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A decade before the emergence of the Cybernetic Countercultures, von Foerster convenes the Symposium on Principles of Self-Organization at the University of Illinois at Urbana-Champaign on June 8–9, 1960. The theme of the symposium expands the remit of cybernetics insofar as *self-organization* is a natural (physical and biological) system phenomenon bidding for artifactual replication.

Ludwig von Bertalanffy
Frank Rosenblatt
Warren McCulloch
Stafford Beer

Gordon Pask
W. Ross Ashby
Von Foerster

—Von Foerster's intellectual humor. He frames his paper for the Symposium on Principles of Self-Organization with a self-deprecating paradox by declaring "the following thesis: **'There are no such things as self-organizing systems!'**" Playing across the cybernetic distinction between thermodynamic and informatic entropy, he submits the notion of a self-organizing system to the rigor of both thermodynamic and formal considerations.

For a close reading, see Bruce Clarke, "Heinz von Foerster's Demons," in *Emergence and Embodiment: New Essays in Second-Order Systems Theory*, ed. Clarke and Hansen (Duke UP, 2009).

1

On Self-Organizing Systems and Their Environments*

H. VON FOERSTER
Department of Electrical Engineering, University of Illinois, Urbana, Illinois

I AM somewhat hesitant to make the introductory remarks of my presentation, because I am afraid I may hurt the feelings of those who so generously sponsored this conference on self-organizing systems. On the other hand, I believe, I may have a suggestion on how to answer Dr. Weyl's question which he asked in his pertinent and thought-provoking introduction: "What makes a self-organizing system?" Thus, I hope you will forgive me if I open my paper by presenting the following thesis: "There are no such things as self-organizing systems!"

In the face of the title of this conference I have to give a rather strong proof of this thesis, a task which may not be at all too difficult, if there is not a secret purpose behind this meeting to promote a conspiracy to dispose of the Second Law of Thermodynamics. I shall now prove the non-existence of self-organizing systems by *reductio ad absurdum* of the assumption that there is such a thing as a self-organizing system.

Assume a finite universe, U_0, as small or as large as you wish (see Fig. 1*a*), which is enclosed in an adiabatic shell which separates this finite universe from any "meta-universe" in which it may be immersed. Assume, furthermore, that in this universe, U_0, there is a closed surface which divides this universe into two mutually exclusive parts: the one part is completely occupied with a self-organizing system S_0, while the other part we may call the environment E_0 of this self-organizing system: S_0 & $E_0 = U_0$.

I may add that it is irrelevant whether we have our self-organizing system inside or outside the closed surface. However, in Fig. 1 the system is assumed to occupy the interior of the dividing surface.

Undoubtedly, if this self-organizing system is permitted to do its job of organizing itself for a little while, its entropy must have decreased during this time:

* This article is an adaptation of an address given at The Interdisciplinary Symposium on Self-Organizing Systems, on May 5, 1959, in Chicago, Illinois; originally published in *Self-Organizing Systems*. M.C. Yovits and S. Cameron (eds.), Pergamon Press, London, pp. 31–50 (1960).

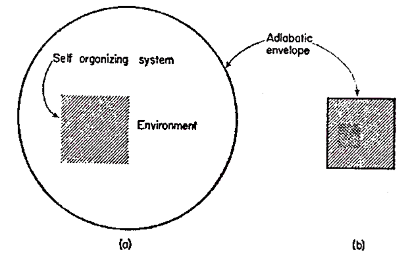


FIGURE 1.

$$\frac{\delta S_s}{\delta t} < 0,$$

otherwise we would not call it a self-organizing system, but just a mechanical $\delta S_s/\delta t = 0$, or a thermodynamical $\delta S_s/\delta t > 0$ system. In order to accomplish this, the entropy in the remaining part of our finite universe, i.e. the entropy in the environment must have increased

$$\frac{\delta S_E}{\delta t} > 0,$$

otherwise the Second Law of Thermodynamics is violated. If now some of the processes which contributed to the decrease of entropy of the system are irreversible we will find the entropy of the universe U_0 at a higher level than before our system started to organize itself, hence the state of the universe will be more disorganized than before $\delta S_U/\delta t > 0$, in other words, the activity of the system was a disorganizing one, and we may justly call such a system a "disorganizing system."

However, it may be argued that it is unfair to the system to make it responsible for changes in the whole universe and that this apparent inconsistency came about by not only paying attention to the system proper but also including into the consideration the environment of the system. By drawing too large an adiabatic envelope one may include processes not at all relevant to this argument. All right then, let us have the adiabatic envelope coincide with the closed surface which previously separated the system from its environment (Fig. 1*b*). This step will not only invalidate the above argument, but will also enable me to show that if one assumes that this envelope contains the self-organizing system proper, this system turns out to be not only just a disorganizing system but even a self-disorganizing system.

Von Foerster's rhetorical paradox underlines the following point: "the term 'self-organizing system' . . . becomes meaningless, unless the system is in close contact with an environment, *which possesses available energy and order*, and with which our system is in a state of perpetual interaction, such that it somehow manages to 'live' on the expenses of this environment."

Takeaways from “On Self-Organizing Systems and their Environments”:

- The importance of distinguishing between thermodynamic and informatic notions of entropy. (See next slide.)

- Distinctions are implicitly inclusive of what they exclude: the system/environment relation is also one of mutual implication.

- No system description is adequate without some account of *its* environment.

Sidebar. Thermodynamic vs. Informatic Entropy

—cf. Bateson, "Cybernetic Explanation":

"Evidently, the nature of 'meaning,' pattern, redundancy, information and the like, depends on where we sit. . . ."

Information theory translates the ratios of improbable order to probable disorder in physical systems into a distinction between signal and noise, or "useful" and "waste" information, in communication systems. In the development of this transposition, information, or "message-entropy," becomes a variably complex measure of message-probabilities, a measure *dependent upon the position of the observer of the communication system*. The observer can, for instance, assess the value of a message at its source by increase of order, *or* at its destination by decrease of disorder.

To summarize: In physical systems doing work by converting energy from one form to another, the *thermodynamic* entropy of the system is the amount of energy unavailable for further work, or "wasted," usually in the form of heat. In communication systems, the *informatic* entropy of the message is a measure of message-probabilities relative to one of several vantage points:

- at the *source*, where one observes the ratio of *actual* selections to *possible* selections;
- in the *channel*, considering the ratio of *signal* ("useful information") to *noise* ("waste information"); or
- at the *destination*, based on the ratio of *surprise* (improbability) to *expectation* (probability).

—from Bruce Clarke, "Information," in *Critical Terms for Media Studies*. Eds. W. J. T. Mitchell and Mark B. N. Hansen. University of Chicago Press, 2010.

Let's come back one more time to Maturana. As we saw in approaching autopoiesis, his ties to the Cybernetic Countercultures network were not through Stewart Brand's offices but by way of the BCL. In an interview conducted in 1998, Maturana underscored the biology of cognition as the central concern of his own research carried forward at the BCL. He was asked what he may have contributed to von Foerster's thinking:

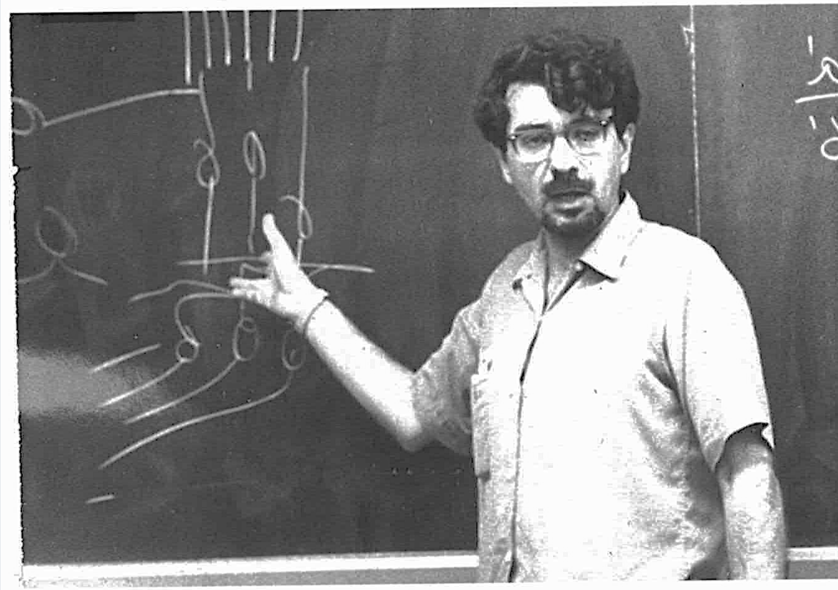


FIGURE 1-8 **Humberto Maturana, Lecturing at the BCL 1969**

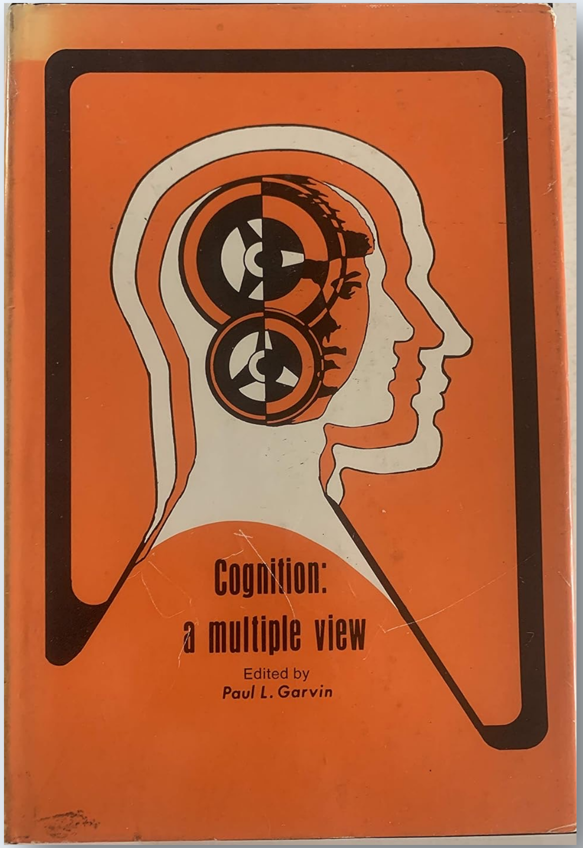
"What I think that Heinz may say is, that I came in a moment to the BCL in which my way of facing the questions about cognition in the domain of biology made a difference: introducing the observer as an active participant in the generation of understanding and in the process of explaining the observer. That was my concern: explaining the observer, not merely claiming, the observer is there, but explaining it. . . ."

—Maturana goes on to recollect what he took to be a watershed moment in his interactions with the BCL, crossing a conceptual threshold from an earlier control-theoretical informational cybernetics to the cognitive reformation von Foerster called second-order cybernetics, spearheaded here by a recursive theory of biological form:

"When I came back in 1968 for a longer time . . . I put my emphasis on circularity, on the observer participating, on the distinction by an observer. . . . [Von Foerster] was still speaking in those days about information and information in the environment. I remember that during one of my first lectures in Illinois I said: **'Information does not exist, it is a useless notion in biology... because biological systems do not operate in these terms**, it is a useful notion for design for understanding systems that are very well specified, you may describe relations in these terms but living systems do not operate in those terms."

At that moment in the late 1960s, Maturana's biology of cognition helped to drive the formation of an organic cybernetics discontented with models borrowed from information theory that treated cognition representationally, as if it conformed to flow charts of telephonic apparatuses. Neocybernetics at the BCL reformulated the operation of cognition, in line with the biological organism itself, as a continuous construction, and as such, as a kind of open-ended organic computation.

Von Foerster's own cognitive turn toward epistemological constructivism reached full statement and maximum compression in the final remarks of his paper "Thoughts and Notes on Cognition," first published immediately following Maturana's "Neurophysiology of Cognition" (1970) in the volume *Cognition: A Multiple View* (1970).



Information Theory Upside Down, von Foerster-style.
In "Thoughts and Notes on Cognition," von Foerster directly rejected his prior, representationalist formulation—the one Maturana recalled in his interview regarding "information in the environment"—and revoked the ontological credentials of the information concept. Now information is no longer the freestanding transmitted input to a receiving apparatus – such as the sensory receptors of a nervous system or whatever – but an output or behavior internally generated by the neurological looping of cognitive processes.

Von Foerster's concluding statements in this paper may be examples of what Varela later termed his gift for expressing deep ideas in "substantious nutshells":

> Cognitive processes create descriptions of, that is, information about, the environment.
>
> The environment contains no information. The environment is as it is.

BC] That is to say, information is *not* the cause for which cognition is the effect, but quite the reverse: cognitive function is the biological-systemic condition for the possibility of describing the environment in the mode of information.

Some key points

- **Neocybernetics' epistemological constructivism is based on the recognition of cognition's biological contingencies.**

- In these early stirrings of neocybernetic formulations, information no longer exists *as such*, but is always the outcome of a prior cognitive process—an organic computation.

- Thus, "information" becomes the system-internal outcome of a cognitive loop, which process may then go on in a stable fashion to *attribute* its construction to a source in its environment.

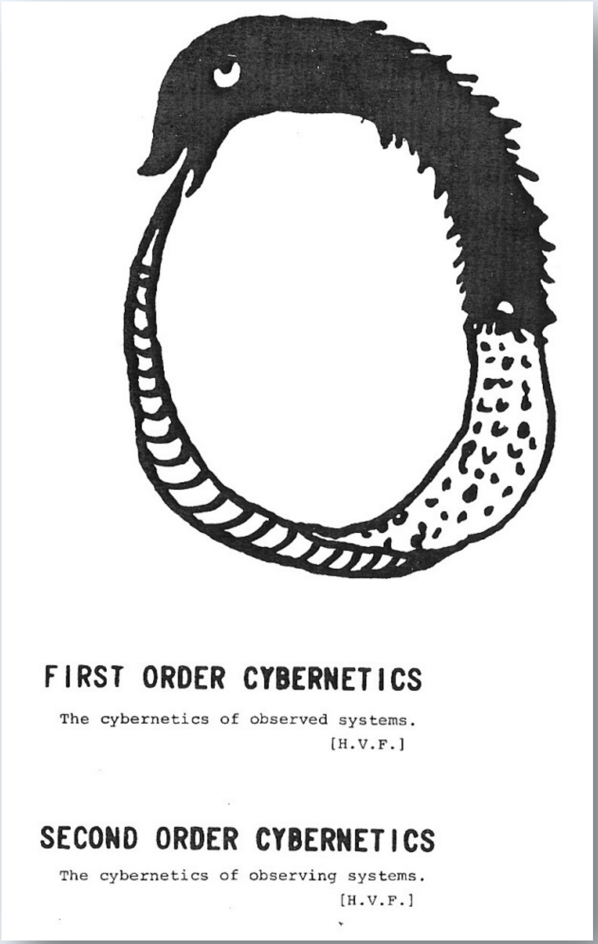
- Sensory and semiotic correlations may then strengthen the stability of that cognitive formulation.

—from Self-Organization to Second-Order Cybernetics:

Summing up some more: Written a decade before the self-referential or neocybernetic turn in his own work, "On Self-Organizing Systems and Their Environments" still resides in the milieu of first-order cybernetics. It is still large with the heuristic extension of Shannon's information theory as a relay between energy and information; physics and biology; thermodynamical, living, and computational systems.

For all that, this article prefigures von Foerster's later papers' epistemological turn toward matters of cognitive recursion, in synch with the simultaneous emergence of the concept of biological autopoiesis in the early '70s. As we saw the other week, von Foerster was literally the institutional midwife for that scientific and discursive event.

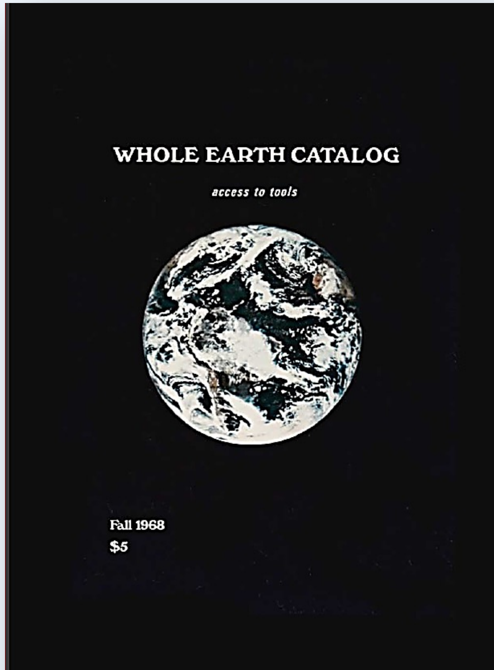
Von Foerster's later writings on "the cybernetics of cybernetics" take on the project of cybernetic discourse's taking itself as its own object, giving an account of itself. This is the "second-order turn" at the end of the '60s: Matters of circular form and operation can now cross between philosophical and literary treatment (think *postmodernism*) and scientific discussion. Mental capacities for *reflexivity* (*self*-consciousness) are no longer a mark of human exceptionalism but a particular case of systemic *recursion*.



In the early 1970s, at the BCL and on the West Coast, the radical gesture of this inversion of cognitive attitude, a stark departure from the truisms of objectivism, was a non-stop ticket departing the scientific mainstream for the Cybernetic Countercultures.

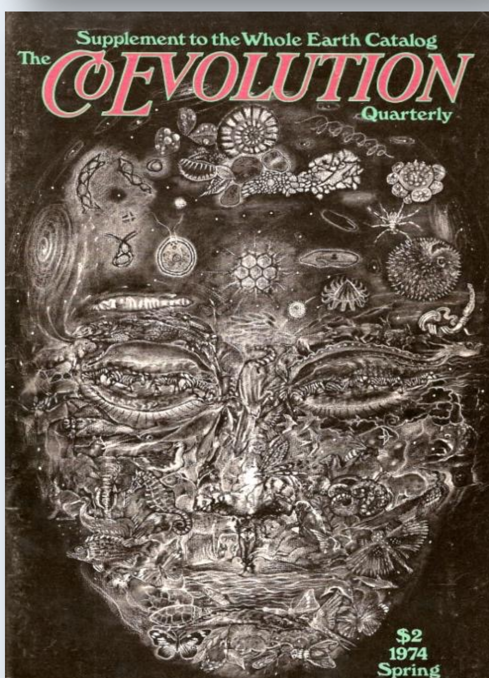
With the launch of the *Whole Earth Catalog* and its uptake at the Biological Computer Lab, the Cybernetic Countercultures have now arrived.

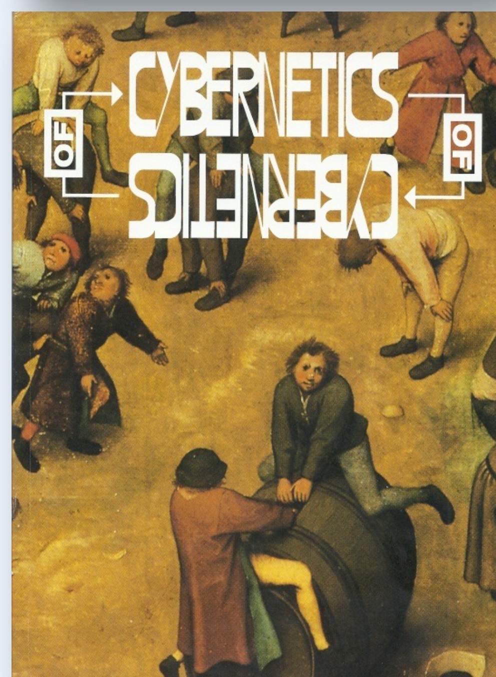
1968



BCL 1969

1974



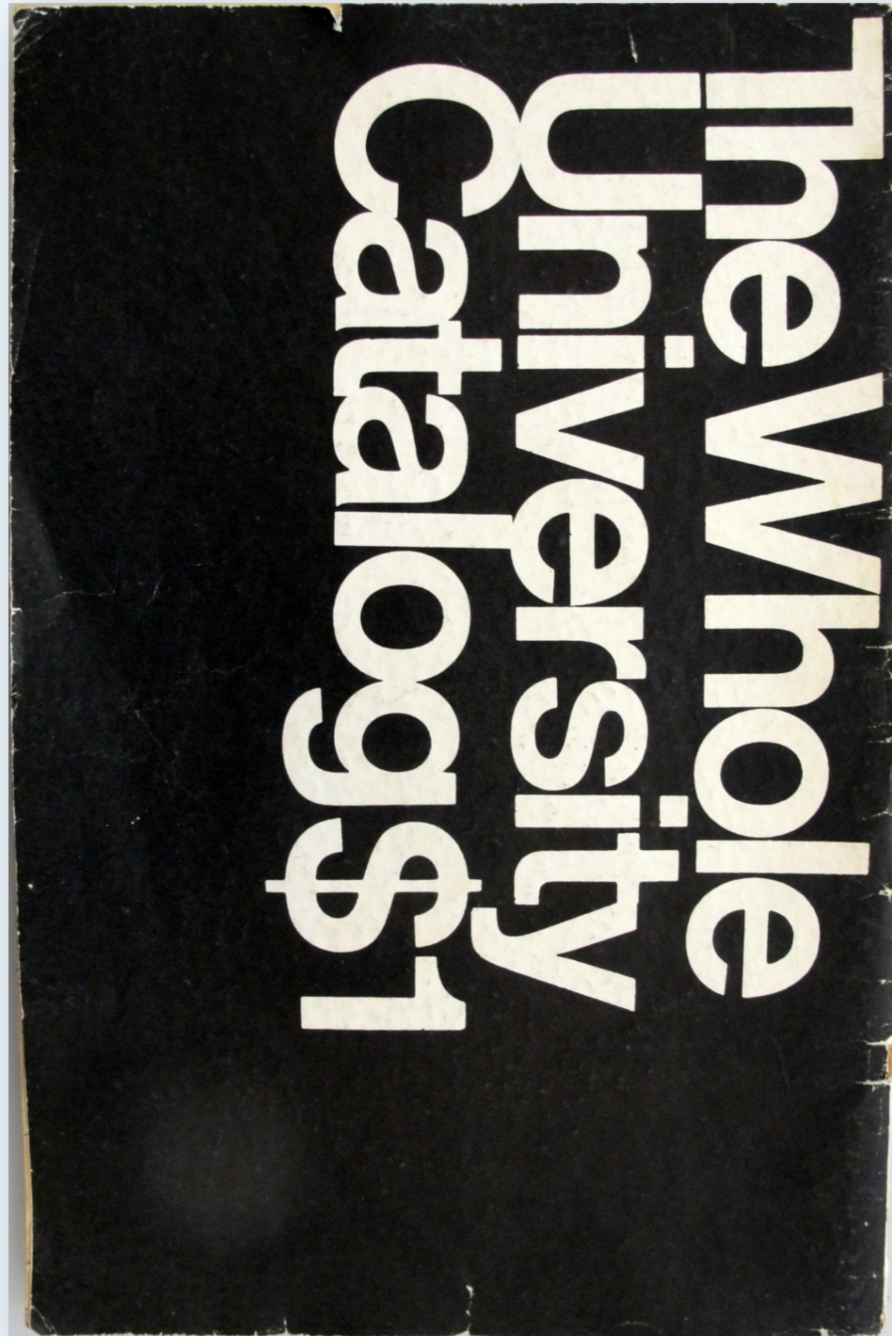


BCL 1974

The *Whole University Catalog* was a class project in the third semester of von Foerster's course in "Heuristics" at the University of Illinois, co-taught by von Foerster and Herbert Brün in Fall-Spring 1968-69 and led by von Foerster alone in Fall 1969.

Parents' displeasure at the *Whole University Catalog*'s edgy student-driven political content got von Foerster in some hot water with the university administration and the Illinois state legislature, which hauled him in to testify in his defense.

Like its West Coast model, the *WUC* also had multiple reviews of cybernetic texts, a section of its own dedicated to understanding whole systems.

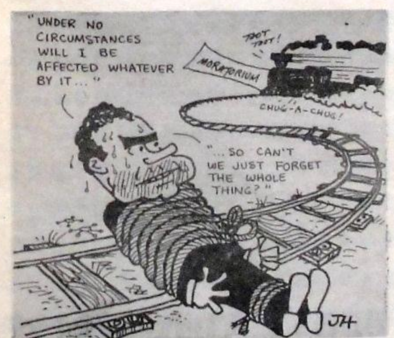


MORATORIUM ON ALL BUT PEACE

On October 6, 1969, the Faculty Senate, in an unprecedented and begrudging move, came out in support of the October Moratorium against the war in Vietnam. Students and faculty were given the option of participating in a Moratorium Day program during a designated half hour period. That was not quite enough for most students at the University of Illinois, for on October 15, thousands remained out of their classes to demonstrate their opposition to the policies of the present administration. Like millions of others around the country, they sent telegrams, participated in teach-ins, read the names of the war dead, listened to speakers, creamed the corn, canvassed the community, and marched..... marched in the nine thousands, in the name of themselves, in the name of the 44,000 Americans and many more Vietnamese who could not speak out on this day of protest.

October 15th was also a day of unity, as well as a day which polarized the political climate in this country. The participants in the Moratorium represented a unity that was new to this country, and its "generation gap". Housewives and children, students and oldsters, and even bussinessman and professionals ceased business as usual, and took to the streets to visually register their protest against American involvement in Vietnam. In its way the administration promoted more polarization, in an already divided America, by declaring that policy would not be dictated from the streets, and engaging in other inanities by calling the demonstraters impudent snobs. Instead of trying to "bring us together," the President clearly tried to isolate the anti-War Movement from the rest of the country through his great declarations to the "silent majority." In spite of Washington's unyeilding stance, work began for the month of November, the National Mobilization, and the months thereafter; for the sentiment is for peace........and PEACE NOW.

6



Claiming that demonstrations would have no effect on his policies, the President called for a Moratorium on criticism, and got a moratorium.......but of a different sort.

6

the books

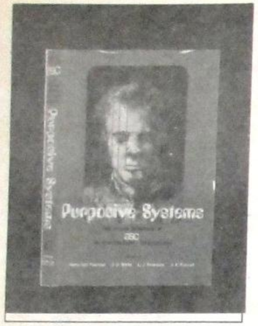
Herbert Brün

John Lilly

W. Ross Ashby

W. Ross Ashby

Warren McCulloch



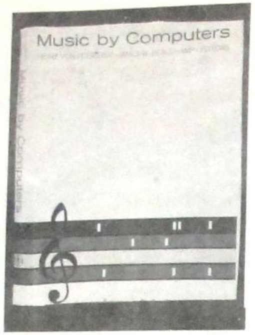
Purposive Systems
edited by Heinz Von Foerster et al., Spartan Books, New York, [illegible]

co-edited by von Foerster

Music by Computers
edited by Heinz Von Foerster and James W. Beauchamp, John Wiley & Sons, New York, [illegible]

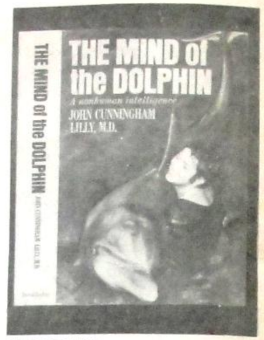
Western Man, and perhaps [illegible]

[illegible]



"It is one thing to aim for a particular timbre of sound and then to search for the means of making such sound and timbre audible. [illegible]" (H. B.)

[illegible]

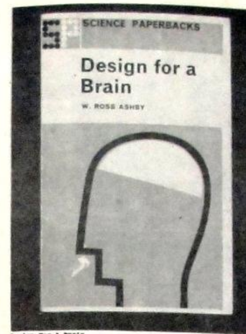


The Mind Of The Dolphin
by John C. Lilly, Doubleday & Co., New York, $5.95

Tired of the old guns, why don't you go out and meet a dolphin? Strange, perhaps, but in this book Lilly explains his attempts at, and his philosophy behind, establishing interspecies communication. Dolphins talk by telephone, and in one experiment a woman, Margaret Howe, actually lived with Peter Dolphin for ten weeks.

"'Communication is an exchange of information between two minds.' Thus for interspecies communication we start with the basic postulate that each dolphin has a mind."

[illegible]

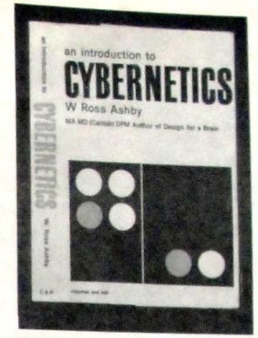


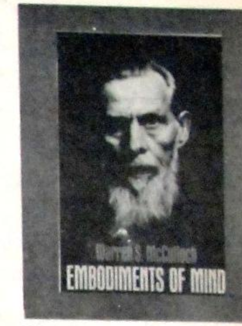
Design For A Brain
by W. Ross Ashby, Associated Book Publishers Ltd, London
and
An Introduction To Cybernetics
by W. Ross Ashby, Chapman and Hall Ltd, London

Individually complete, these two books form a natural unit. Introduction to Cybernetics is a tool usage book. The tool, cybernetics, is powerful and encompassing, offering a fresh approach to complex problems. Design for a Brain demonstrates this force; pondering how the brain produces adaptive behavior. Ashby presents a resolution by applying the leverage gained in using cybernetics.

"Cybernetics, too, is a 'theory of machines,' but it treats, not things, but ways of behaving. It does not ask 'what is this thing?' but 'what does it do?'" (I. to C.)

[illegible]





Embodiments Of Mind
by Warren S. McCulloch, M.I.T. Press, Cambridge, Mass., $12.50

This is a volume of selected writings by the late Warren McCulloch, a man who was a doctor, a philosopher, a teacher, mathematician, and poet. The majority of the book is a collection of his papers, which deal with neurophysiology, mathematics, cybernetics, and the logical mechanics of physical machines. Also included is a forty page section of his poetry. It is impossible to give any short description which will do justice to the contribution made in his papers. The pieces below are included to give a taste for the flavor of the man.

"...it should be particularly noted that McCulloch himself scrupulously avoids forcing his ideas into prematurely categorical form. Like some of the Greeks he knows so well, and like Wittgenstein, whom he does not know, he is a master of the technique of speaking in such a way as to set the mind of the cooperative and active audience into that motion which will lead him to insight. To members of his audience who are led to miss the point by their habit of expecting predigested conclusions, he is fond of saying: 'Don't bite my finger, look where I am pointing.'" (from the Introduction by Seymour Papert).

APPOINTMENTS

Yesterday:

Christ thought for me in the morning,
Nietzsche in the afternoon.

Today:

Their appointments are at the same hour.

Tomorrow:

I shall think for myself all day long.
That is why I am rubbing my hands.

Religion

58

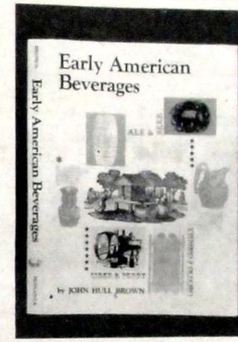
Man
Galloping into the northern lights
A sun
That will not rise.

If I addressed you at a time and place
More certain than this earth and memory,
Belittling so the brilliant wizardry
That beckons couriers to your bright face,

I should be guilty of my own disgrace,
For such explicit linking, you to me,
Would prove a gesture of humility
Too large for truth, too low for your embrace.

Clumsy the brain that speaks as brawn and bone
To wit that needs no signpost by the way
And hastens eagerly unto its own.

So take in silence what I would not say
Though I could crush the earth to so alone
And round whole centuries into our day.



Early American Beverages
by John Hull Brown, Bonanza Books, New York

This is a good guide to combining a love for antiquity with a love for drinking. The third product to add to the liquor is the pleasure of making it. The ingredients are all natural foods products available at any health store, but particularly at the health store in the 500 block of North Prairie, Champaign. Apparently, the original colonists thought drinking was healthy too: the Middle Colonies collected medicinal wine drinks like Antimonial Wine, Koumiss, a valuable wine of the Tartars, Barley Wine, Scurvy-grass Wine, and Turnip Wine, along with wines made from Ipecacuan, Iron, Rhubarb, Sacred Tincture, and Tobacco.

The simplest recipe of the first section of the book--the making of beer--first appeared in an 1847 guide called The Way To Live Well which, of course, is the best revenge.

> "COMMON BEER: Two gallons of water to a large handful of hops is the rule. A little fresh-gathered spruce or sweet fern makes the beer more agreeable, and you may allow a quart of wheat bran to the mixture: then boil it two or three hours. Strain it through a sieve, and stir in, while the liquor is hot, a teacup of molasses to every gallon. Let it stand till lukeward, pour it into a clean barrel and add good yeast, a pint, if the barrel is nearly full; shake it well together; it will be fit for use the next day."

The page with this instant beer recipe is then appropriately decorated with pictures of undecorated Norton Stoneware items: beer and ale bottles, jugs, jars, and crocks (as in the expression "half-crocked"). For modern practical purposes, the beer is best brewed in a porcelain pot preferably--for this recipe--holding about eight quarts. Get one at Huey's everything store, Five Points, Urbana.

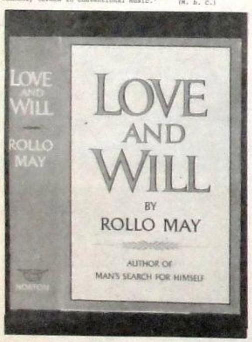
Mackenzie's 5000 Receipts, 1829 provide the recipes for Cider and Perry in Chapter II, illustrated by American paintings, "Cider Making in Long Island," by William M. Davis. Perry is made like cider, only from pears instead of apples. This section is a bit of a curiosity unless you have a press and understand such terms as "bung-hole".

Part III, Liquors and Cordials, presents the most exciting optomdilioused flower drinks and imaginable. If you can possibly forego Troubadours' Elixir (must roses, jasmin, and orange-blossoms), or Myrtle Cream (myrtle-blossoms and peach leaves), try a Pink Ratafia with two pounds of the petals of red pinks.

The rest of the book provides recipes for some fairly normal, familiar temperance drinks like ginger beer, and some favorite wines like chocolate, apricot, and gilliflower. There's one warm drink that sounds great for insomnia or winter, or both. It's called Oxford Nightcap (do you suppose Oxford scholars ...?) Mix:

> 1/2 tumbler tea with milk and sugar
> slice of lemon
> wine-glass of new milk
> wine-glass of rum or brandy
> beaten-up new egg

Happy Whatever ....



Love and Will
by Rollo May, W. W. Norton and Company, Inc., New York

A strong recommendation for this book has already come from the editors of Psychology Today magazine. Last August they devoted an entire issue to Love and Will. This was the only time they thought that a book warranted such coverage.

"The old myths and symbols by which we oriented ourselves are gone, anxiety is rampant; we cling to each other and try to persuade ourselves that what we feel is love; we do not will because we are afraid that if we choose one thing or one person we'll lose the other, and we are too insecure to take the chance."

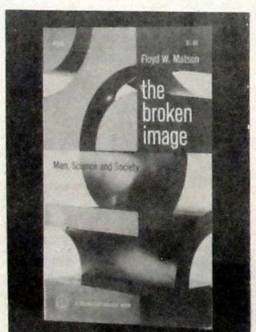
"Now it is no longer a matter of deciding what to do, but of deciding how to decide."

"The technologically efficient lover, defeated in the contradiction which is copulation without eros, is ultimately the impotent one. He has lost the power to be carried away; he knows only too well what he is doing."

"Cognition, or knowing, and conation, or willing, then go together. We could not have one without the other. This is why commitment is so important. If I do not will something, I could never know it; and if I do not know something I would never have any content for my willing. In this sense, it can be said directly that man makes his own meaning. Note that I do not say that he only makes his meaning, or that it is not dialectically related at every instant to reality; I say that if he is not engaged in making his meaning, he will never know reality."

"But there remains the old, bed-rock question, Does something, or some person, matter to me? And if not, can I find something or someone that does matter?"

58



The Broken Image
by Floyd Matson, Doubleday Anchor Book, New York, $1.45

Matson starts with Newtonian physics and traces man's gradual reliance on mechanistic deterministic principles to the present day. He is equally familiar with psychology, physics, political science, biology, and uses his skill to build an impressive history of the destruction of man's self-image as a free, independent agent. He then moves on to suggest new connections between the various disciplines which may recreate man's image. Of course, no one man could create a formula for opposing centuries of mechanism and Matson is no exception. But Matson at least gives us possibilities, and very clearly shows us how we got to our present de-humanized position.

"It is the primary thesis of this book, then, that the historic reliance of the social sciences upon root metaphors and routine methods from classical mechanics has eclipsed the ancestral liberal vision of "the whole man, man in person"--and has given us instead a radically broken self-image. The tragic history of the breaking of the human image parallels the disintegration of the inner sense of identity, the flight from autonomous conduct to automaton behavior, in the modern world."

Arnold Schoenberg Letters
edited by Erwin Stein, St. Martin's Press, New York, $8.75

In 1934 the National Broadcasting Company asked Arnold Schoenberg for his definition of music. Included in his reply was the following:

> I know a nice and touching story:
> A blind man asked his guide:
> "How looks milk?"
> The guide answered:
> "What's that white? Mention a thing which is white!"
> The guide:
> "A swan. It is perfect white, and has a long white and bent neck."
> The blind man:
> ". . . A bent neck? How is that?"
> The guide, imitating with his arm the form of a swan's neck, lets the blind man feel the form of his arm.
> The blind man (flowing softly with his hand along the arm of the guide):
> "Now I know how looks milk."

This collection confronts all readers, not only those having a musical background, with the challenge of the intellectual vigor of the twentieth century's most arresting musical mind. I have found it endlessly stimulating, amusing, enlightening, rewarding, and, at times, nostalgic.

> ". . . .Once, in the army, I was asked if I was really the composer Arnold Schoenberg. 'Somebody had to be' I said, 'and nobody else wanted to so I took it on, myself.'" (letter sent as a public reply to congratulations received on his 75th birthday)

Flatland
by Edwin Abott, Seeley and Co. Essex Street Strand, London.

Flatland written in 1884 has retained its relevance in the Space Age of 1969. The most fitting description is on the cover of the book which reads "a romance of many dimensions". Flatland takes you into a two dimensional world but allows you to transverse all other dimensional worlds.

"I call our world Flatland, not because we call it so, but to make its nature clear to you, my happy readers who are privileged to live in Space. Imagine a vast sheet of paper on which straight lines, triangles, squares and other figures instead of remaining fixed in their places, move freely about, on or in the surface but without the power of using above or sinking below, very much like shadows only with hard luminous edges and you will then have a pretty correct notion of my country and countrymen."

"Our women are straight lines, our soldiers and lowest classes of workmen are triangles, our middle class consists of equal sided triangles, our professionals are squares, nobility begins with six-sided figures."

"Suppose a person of the Fourth Dimension, condescending to visit you, were to say, whenever you open your eyes you see a plane and you infer a solid but in reality you also see a Fourth Dimension. What would you say to such a visitor. Would you not have him locked up? Well, that is my fortune and it is as natural for us in Flatland to look up at a square preaching the Third Dimension as it is for you Spacelanders to look up and look up a cube for preaching the Fourth Dimension."

". . . when the land of Three Dimensions seems almost visionary as the Land of One of None, when even this hard wall, that bars me from my freedom, these very tablets on which I am writing, and all the substantial realities of Flatland itself, appear no better than the offspring of a diseased imagination, or the baseless fabric of a dream."

Technicians of the Sacred
a range of poetries
from Africa, America
Asia, + Oceania

to say: face falls on face; face sees face
A knife, colored black against that put against it, which it was swallowed [illegible]
which it was tinted.

a loon
I thought it was
but it was
my love's
splashing oar

Edited + with Commentaries by
Jerome Rothenberg
Anchor Books, Garden City,
New York

Gift Estate
Bestow a gift on someone
to be repaid by an equivalent
countergift after a lapse of time.
Let as much as a year or more
elapse between payments.

When I come to
visit you,
do not fling me from your house
In my misery.
Sun, my father, moon my mother,
You might look at my face
where the tears of blood ran down.

Try opening the book at
random when you buy it. Results
are mystically interesting. Paperback:
$3.95 at the Union Bookstore (Poetry)

The centerfold of the *Whole University Catalog*, suitable for hanging on dorm walls. Cut on the dotted line.


United Press International

URGES LEGALIZING MARIJUANA: Dr. Margaret Mead testifying before Senate panel on drug prices yesterday.

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Meanwhile, in another place, heuristics of a different order . . .

Dr. Bruno slicked back in his black leather jacket on stage with Sha-na-na at the Woodstock Festival, early Monday morning, August 18, 1969