

WEEK 09

# Cybernetics, Counterculture, & Cyberculture

Sophia Liu, April 1, 2025

CS 195, Spring 2025 @ UC Berkeley, <https://cs195.org/sp25>

# Disclaimer

*This lecture was created for educational purposes as part of UC Berkeley's CS 195: Social Implications of Computer Technology. It examines the historical and cultural contexts that shaped the development of cybernetics and personal computing, including references to 1960s countercultural movements.*

*Any mention of political, social, or drug-related topics is presented solely for historical analysis and does not reflect endorsement by the instructor or the University of California, Berkeley.*

# PURPOSE

*We are as gods and might as well get good at it. So far remotely done power and glory—-as via government, big business, formal education, church—-has succeeded to point where gross defects obscure actual gains. In response to this dilemma and to these gains a realm of intimate, personal power is developing—-power of the individual to conduct his own education, find his own inspiration, shape his own environment, and share his adventure with whoever is interested. Tools that aid this process are sought and promoted by the WHOLE EARTH CATALOG.*

**“We are as gods and might as well get good at it.”**



**Stewart Brand**  
Editor of the *Whole Earth Catalog*



**First full-disk "true color" picture of the Earth**  
Subsequently used on the cover of the first *Whole Earth Catalog*.  
November 10, 1967

# WHOLE EARTH CATALOG

*access to tools*



Fall 1968

\$5

## FUNCTION

The *WHOLE EARTH CATALOG* functions as an evaluation and access device. With it, the user should know better what is worth getting and where and how to do the getting.

An item is listed in the *CATALOG* if it is deemed:

- 1) Useful as a tool.
- 2) Relevant to independent education.
- 3) High quality or low cost.
- 4) Not already common knowledge.
- 5) Easily available by mail.

This information is continually revised according to the experience and suggestions of *CATALOG* users and staff.

## PURPOSE

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## Understanding Whole Systems

Buckminster Fuller  
Cosmic View  
Full Earth  
Earth Photographs  
The World From Above  
Surface Anatomy  
Geology Illustrated  
Sensitive Chees  
A Year From Monday

General Systems Yearbook  
Synthesis of Form  
On Growth and Form  
Tantra Art  
Psychological Reflections  
The Human Use of Human Beings  
The Ghost in the Machine  
The Year 2000  
The Futurist

## Shelter and Land Use

The Dymaxion World of Buckminster Fuller  
Space Structures  
Tensile Structures, Volume One  
Dome Cookbook  
Good News  
Architectural Design  
The Japanese House  
Aucel Guides  
Alaskan Mill

Village Technology  
The Indian Tipi  
Tipis  
Aladdin Kerosene Lamps  
Man's Role in Changing the Face of the Earth  
Two Mushroom Books  
Organic Gardening  
ABC and XYZ of Bee Culture  
Universal Mill

## Industry and Craft

The Way Things Work  
Introduction to Engineering Design  
The Measure of Man  
Thomas Register of American Manufacturers  
New Scientist  
Scientific American  
Industrial Design  
Product Engineering  
Clearinghouse

Science and Civilization in China, Volume IV,  
Part 2  
Silvo Catalog  
Brookstone Tools  
Jensen Tools  
Miners Catalog  
Blasters' Handbook  
Direct Use of the Sun's Energy  
Structure, Form and Movement

Van Waters & Rogers  
Bookmaking  
Zone System Manual  
A Sculptor's Manual  
Creative Glass Blowing  
Buckskin  
Cut Beads  
Melrose Yarns

## Communications

Human Biocomputer  
The Mind of the Dolphin  
Information  
9100A Computer  
Cybernetics  
Eye and Brain  
Design for a Brain

Education Automation  
Intelligent Life in the Universe  
The McGraw-Hill Encyclopedia of Space  
Lafayette and Allied Catalogs  
Healthkit  
Modern Business Forms  
American Cinematographer

American Cinematographer Manual  
The Technique of Documentary Film Production  
The Technique of Television Production  
Auto Repair Manual  
Books  
Subject Guide to Books in Print  
Art Prints

## Community

The Modern Utopian  
The Realist  
Green Revolution  
Kibbutz: Venture in Utopia  
Dune  
Groups Under Stress

The Marck Manual  
Land for Sale  
Consumer Reports  
Government Publications  
The Armchair Shopper's Guide  
How to Get 20% to 90% off on Everything You Buy

## Nomadics

Innovator  
The Retreater's Bibliography  
The Book of Survival  
The Survival Book  
Survival Arts of the Primitive Paiutes  
Camping and Woodcraft  
Light Weight Camping Equipment and How to Make It  
Backpacking  
L.L. Bean

Recreational Equipment  
Gerry Outdoor Equipment  
Kaibab Boots  
Hot Springs  
The Explorers Trademark Log  
National Geographic  
Sierra Club  
The Narrow Road to the Deep North  
Trout Fishing in America

## Learning

Toward a Theory of Instruction  
The Black Box  
THIS Magazine is about Schools  
Cuisenaire Rods  
ITA  
LIFE Science Library  
Kaiser Aluminum News  
700 Science Experiments for Everybody

Edmund Scientific  
WFF 'N PROOF  
Dr. Nim  
We Built Our Own Computers  
American Boys Handy Book  
Pioneer Posters  
Sense Relaxation  
Zen Flesh, Zen Bones

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# FUNCTION

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**HIPPIES.**



**1967 Summer of Love**  
in SF's Golden Gate Park and  
Haight-Ashbury District

# HIPPIES.

From Wikipedia:

- rejected established institutions
  - criticized middle class values
  - opposed nuclear weapons and the Vietnam War
  - embraced aspects of Eastern philosophy
  - championed sexual liberation
  - were often vegetarian and eco-friendly
  - promoted the use of psychedelic drugs which they believed expanded one's consciousness
  - created intentional communities or communes
- ~~“the Man”~~, ~~“the System”~~, ~~“Big Brother”~~



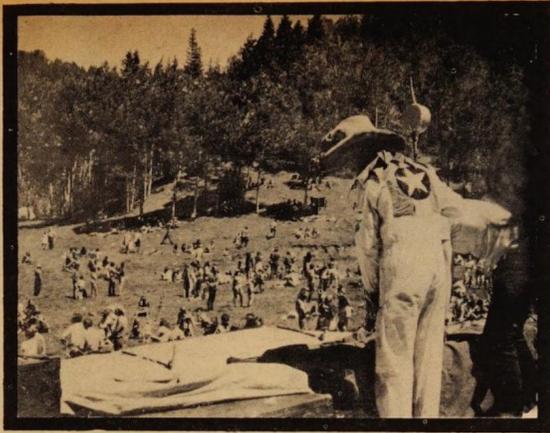
## “Furthur”

Ken Kesey and the Merry Pranksters' cross-country roadtrip bus



**Stewart Brand**

Editor of the *Whole Earth Catalog*  
Merry Prankster



At the starting line Hugh Romney mounts his bus.



Feverish last minute preparations aboard Further.

# THE GREAT BUS RACE

Winning Time 2:32. Who Won Is Debated.

Aspen Meadows, New Mexico. Summer Solstice, 1969

Hugh Romney, who mustered this 1000 in this mountain pasture, is announcing the start of the Bus Race and that a couple named John and Mary are somewhere around and must be found because they have the bubonic plague and require inoculation immediately. Everybody's pretty inoculated already; it's the spiciest part of the afternoon. The race was going to be one bus at a time against the clock, but Ken Kesey and others are maintaining that's a chickenshit race. It's got to be all at once.

The buses are Kesey's renowned Further, with a skeleton crew of Farmsters aboard, and the Hog Farm's fleet: Road Hog, Hospital Bus, Kitchen Bus, etc. The Motherfuckers' tight little bus is around but not in the race.

Everyone will go one trial run around the course: ¼ mile up the meadow, around the flag, and back downhill to the starting line. Majestically the line of buses staggers up the course. "I don't know about this," says Mike Hagen. "Further ain't got much brakes." The Hospital Bus is stalled half-way up the hill right where it's almost impossible to get around. Reportedly it also ran over a pup tent (unoccupied).

The survivors of the trial run line up. They're immense, these faded colorful wrecks filled with folly. People are climbing off, others are climbing on. It's a test of passengers as much as drivers. The mood is pure: fatalistic optimism.

And it's begun. Road Hog gets off first. Further is dragging. The air is filled with buses and exhaust and din. They wallow up the pasture like berserk pigs. As Further sways past the grounded Hospital Bus Kesey disappears over the windshield shouting orders to driver Bucavich. Over there in the bushes the Foot Swami from India is watching it all go by.

Further approaches the flag from the left. The Kitchen Bus with Romney on top is coming around the other way. They intersect, pass narrowly, and ram into opposite hillsides, then rev and back blindly toward each other. Frantic shouting gets them forward again. For a moment the entire solstice is tied in a sweet mad knot at the top of the pasture.

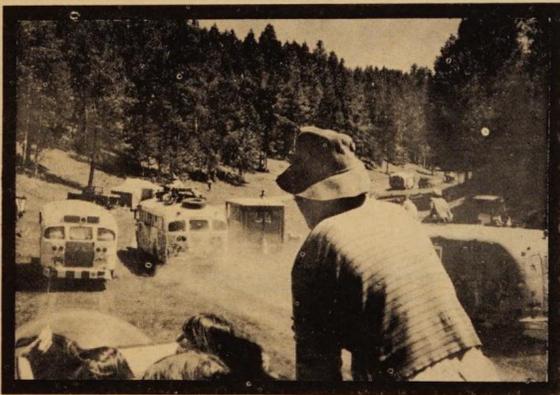
Bucavich gets Further around. The Kitchen Bus is still hung with a rear bumper gouged in the creek bed. Rocket, who's driving, surges again and gets it free. The buses swarm downhill. Hugh Romney's mouth is wide open, his toothless warning wailing down the pasture, "BEEE CARRREFUULLLL." At the finish line a thousand longhairs cheer and dodge.

Afterward, at the award-giving argument, Romney is saying, "A miracle. It's a pure miracle nobody was killed." Kesey is saying, "Two minutes thirty-two seconds. It's something to think about for next year."

Further ain't got much brakes.

The buses are Kesey's renowned Further, with a skeleton crew of Farmsters aboard, and the Hog Farm's fleet: Road Hog, Hospital Bus, Kitchen Bus, etc. The Motherfuckers' tight little bus is around but not in the race.

"The Great Bus Race", Nomadics, p. 245  
The Last Whole Earth Catalog (1971)



Barrelling toward the first turn Kesey has an excellent view of the rear of the Hog Farm fleet.



Tied up at the flag, Romney and Further pass in opposite directions. Fierce bus action is visible on the track below.

The Great Bus Race May Never End  
In the pursuit of truth via participatory journalism our reporter at the Great Bus Race drank fluid from a Donald Duck glass. Consequently he was too stoned to function and misrepresented some facts, such as:

- \* The Kitchen Bus is really the Just Bus
- \* The Hospital Bus is really the Us Bus (Just Us Buses)
- \* The other bus besides Road Hog is The Queen's Midtown Tunnel of Love Bus, and was the one which broke down.
- \* Rocket wasn't driving the Just Bus, Bob Redhat (narcoleptic from Ann Arbor) was.
- \* Bucavich isn't spelled Bucovich, it's spelled some other way.

Romney had lost his notes and was starting to make up facts and the reporter sensed that once again truth was drifting. Here are some other accounts. Perhaps they converge.

The Great Bus Race

c. 500 yards up the mountain, the same distance down, around a red flag marker and down past the swami's gathering place where they all sit and chant OM.

They're off we get a terrible start, next to last, 5 buses up the hill—Bucko at the wheel picks up steam, passes them all except the Road Hog—bouncing, bumping—we're scared as hell on top—the kids all love it—we lose our bell to the Road Hog—Get the Weather Vain from Just Bus. 2:29 the official record time.

Paul Sawyer



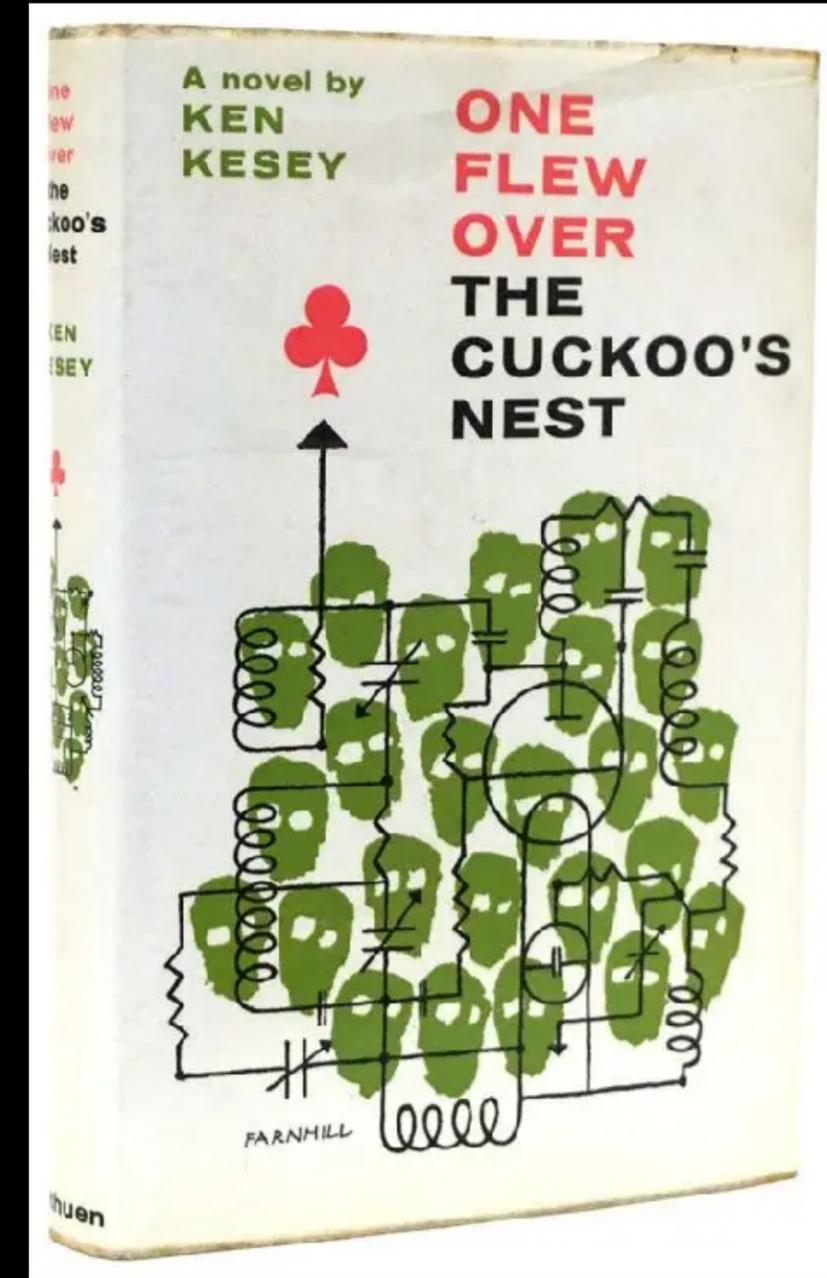
A few months later Hugh Romney became his own sequel, Wavy Gravy, who was last seen bussing out of East Pakistan just ahead of a civil war.

And in Aspen Meadow above Santa Fe the Great Bus Further lost her silver bell to the Great Bus Road Hog in the First Annual Summer Solstice Great Bus Race.

Ken Kesey  
9 Aug 69 ROLLING STONE

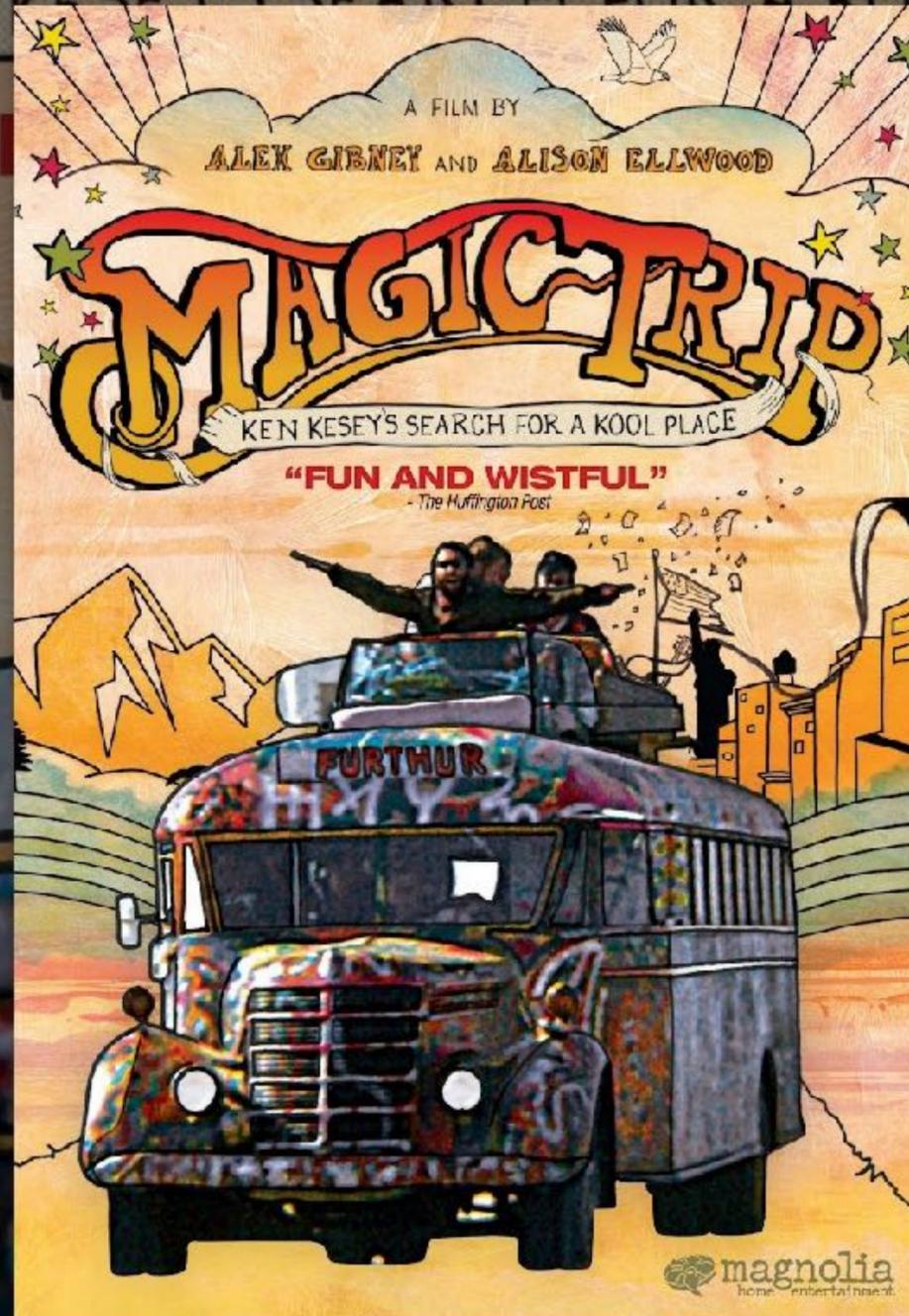
Obviously truth is not to be found in the past, nor likely in the future, next summer, when the buses race from Stonehenge to the Pyramids, maybe. Truth was good while it lasted.

—SB



# Ken Kesey

Author of *One Flew Over the Cuckoo's Nest* (1962)



Magic Trip (Documentary, 2011), 25:38-32:36



# “Can you pass the Acid Test?”

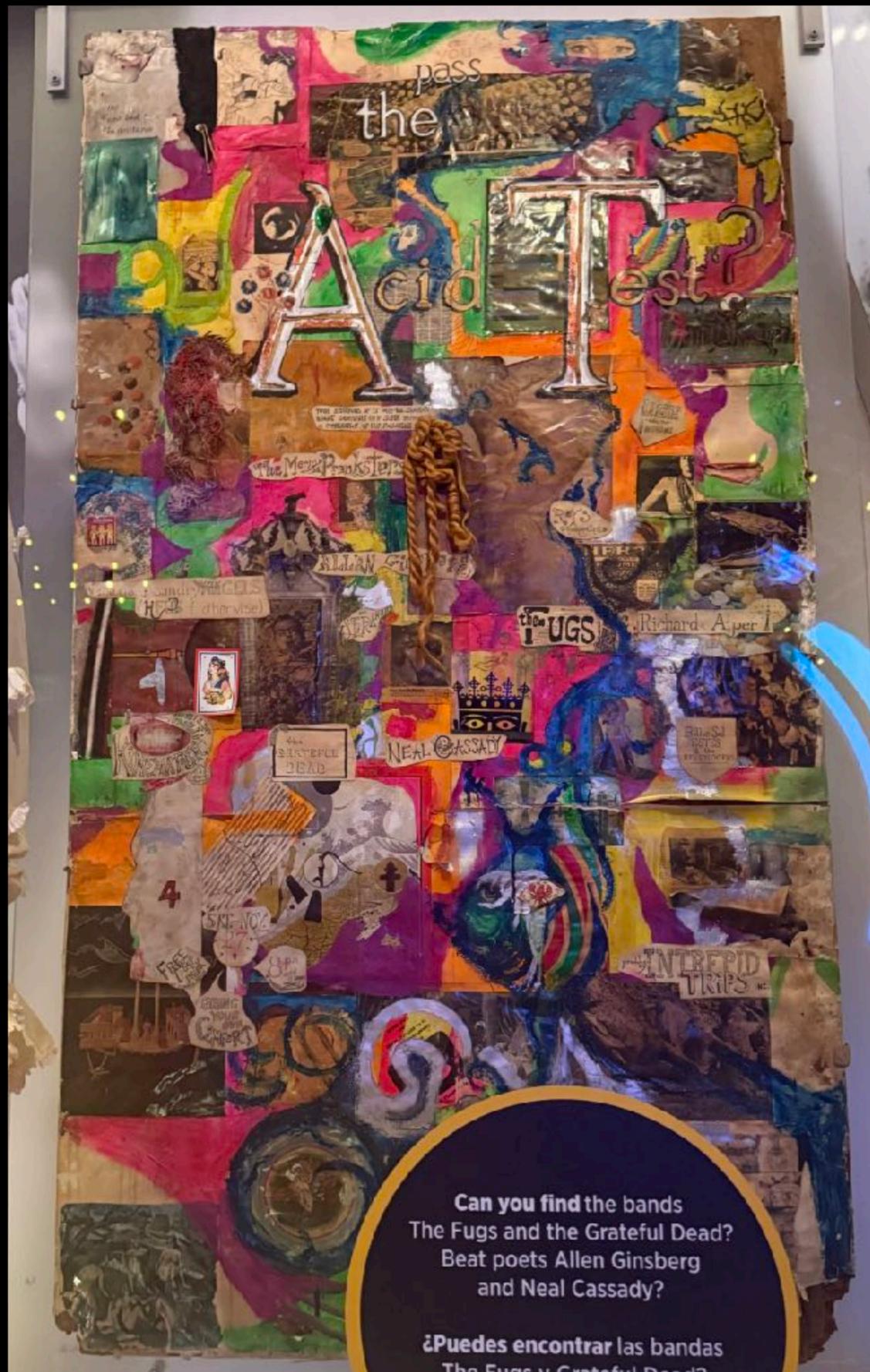
Mentioned:

- The Grateful Dead
- Neal Cassady (Further bus driver, subject of *On the Road* by Jack Kerouac)
- Allen Ginsberg
- Merry Pranksters

# “Can you pass the Acid Test?”

- Music from the Grateful Dead
- Strobe lights, day-glo paint
- SF Bay Area (Menlo Park, La Honda, Palo Alto, San Jose)
- Beat generation —> hippies

Image taken from my visit to the Smithsonian American History Museum in DC.



# The Merry Pranksters' "Humanoid Radio"

During one acid test:

"they were all high as hell..."

"[it] marked a weird attempt... to transcend distance and reach faraway minds with a single, disembodied signal... They were communication technologies through which humans could not only exchange information, but, at least imaginatively, merge with one another in a spiritually harmonious state."

Fred Turner, *From Counterculture to Cyberculture*, 2006



“to transcend distance and reach faraway minds with a single, disembodied signal... through which humans could... merge with one another in a **spiritually harmonious state.**”



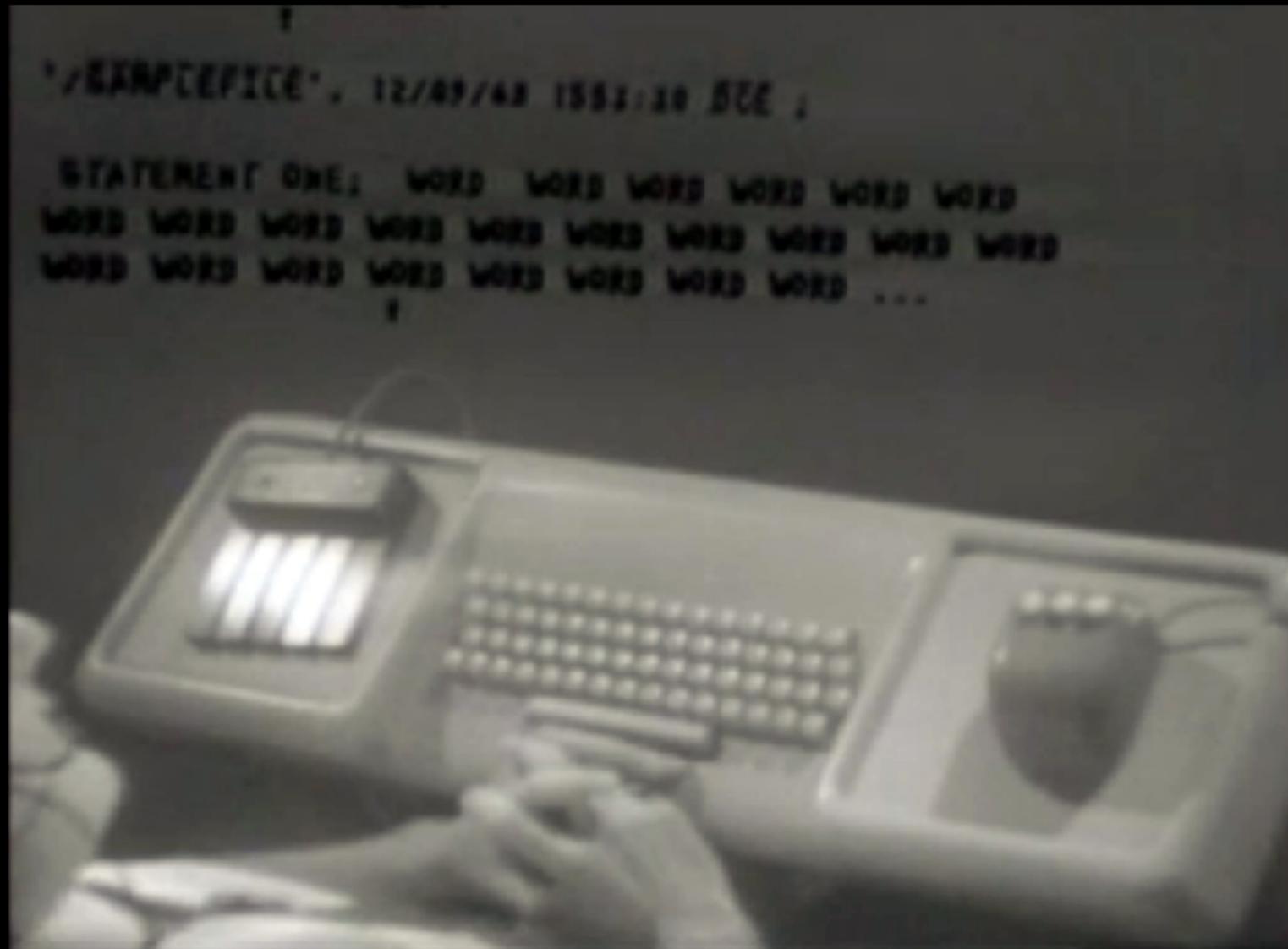
**The Mother of All Demos presented by Douglas Engelbart**  
At the ACM-IEEE joint computer conference, SF, December 9, 1968

# The Mother of All Demos

## SF, Fall 1968

First demonstration of fundamental personal computing elements:

- Windows
- Hypertext
- Graphics
- Command input
- Video conferences
- Computer mouse
- Word processing
- Dynamic file linking
- Revision control
- Collaborative real-time editor





## **Stewart Brand**

Editor of the *Whole Earth Catalog*

Merry Prankster

Mother of All Demos camera operator and presentation advisor

## Stewart Brand:

“Power to the people was a romantic lie, computers did more than politics did to change society.”

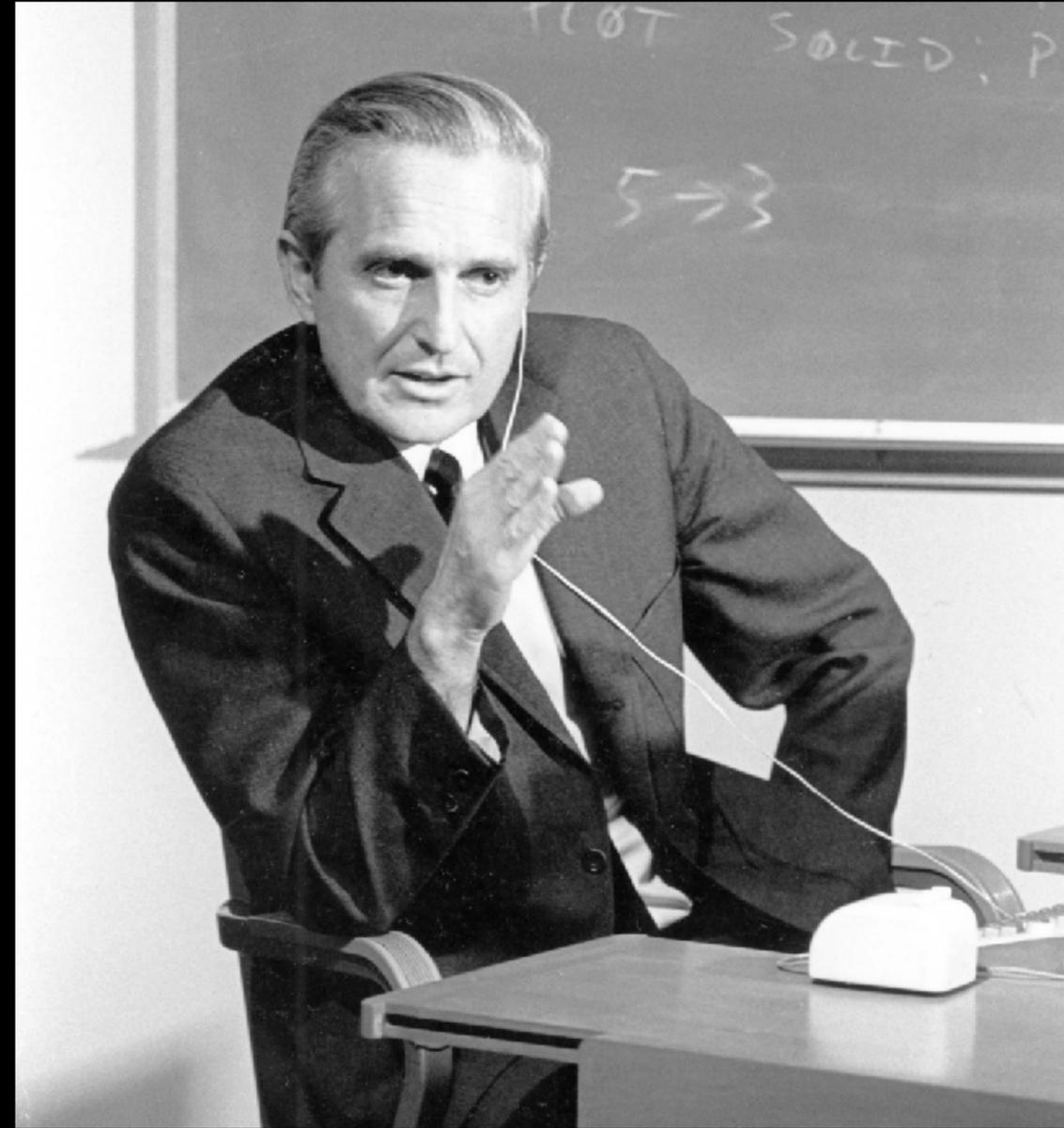
On the Stanford Artificial Intelligence Lab in an article for *Rolling Stone* in 1972: “the most bzz-bzz-busy scene I’ve been around since the Merry Prankster Acid Tests.”

“The freaks who design computer science” would wrest power away from the “rich and powerful institutions. Ready or not, computers are coming to the people. That’s good news,

**maybe the best since psychedelics.”**



**Stewart Brand**



**Douglas Engelbart**

Got to know each other experimenting with LSD at Stanford Research Institute's Augmentation Research Center (SRI ARC, funded by DARPA).

# The Mother of All Demos

SF, Fall 1968

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## Question:

Which elements do you think were inspired by the New Communalists (hippies)? Why?

Think Ken Kesey, Merry Pranksters, ...

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Which elements do you think were inspired by the New Communalists (hippies)? Why?

Think Ken Kesey, Merry Pranksters, ...

**Acid Tests**

**Humanoid Radio**

**Collective consciousness**

**Global village ...**

## The Mother of All Demos

SF, Fall 1968

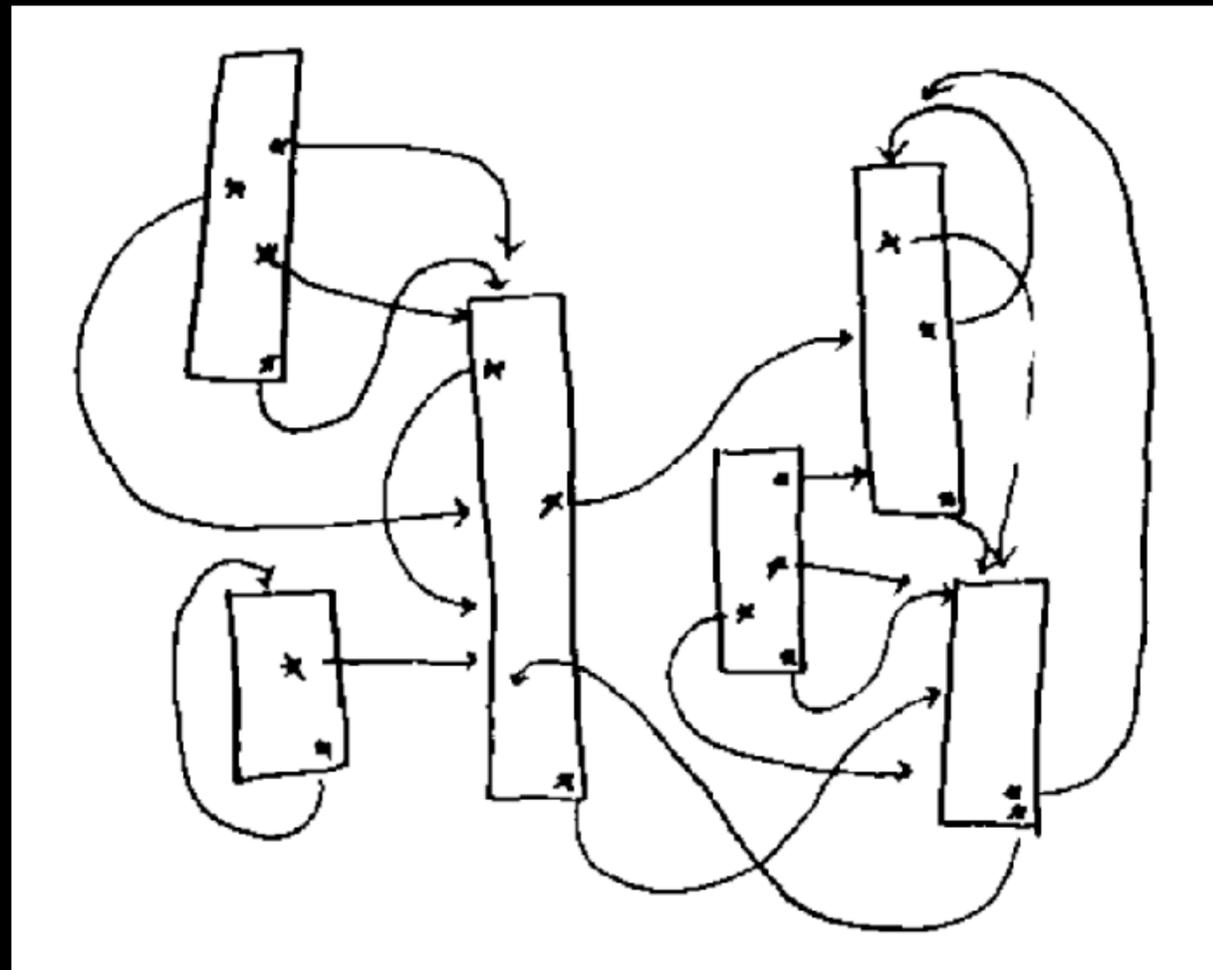
First demonstration of fundamental personal computing elements:

- Windows
- **Hypertext**
- Graphics
- Command input
- **Video conferences**
- Computer mouse
- Word processing
- **Dynamic file linking**
- Revision control
- **Collaborative real-time editor**

# “HYPERTEXT”



Mind expansion  
Consciousness altering  
Intellect augmentation

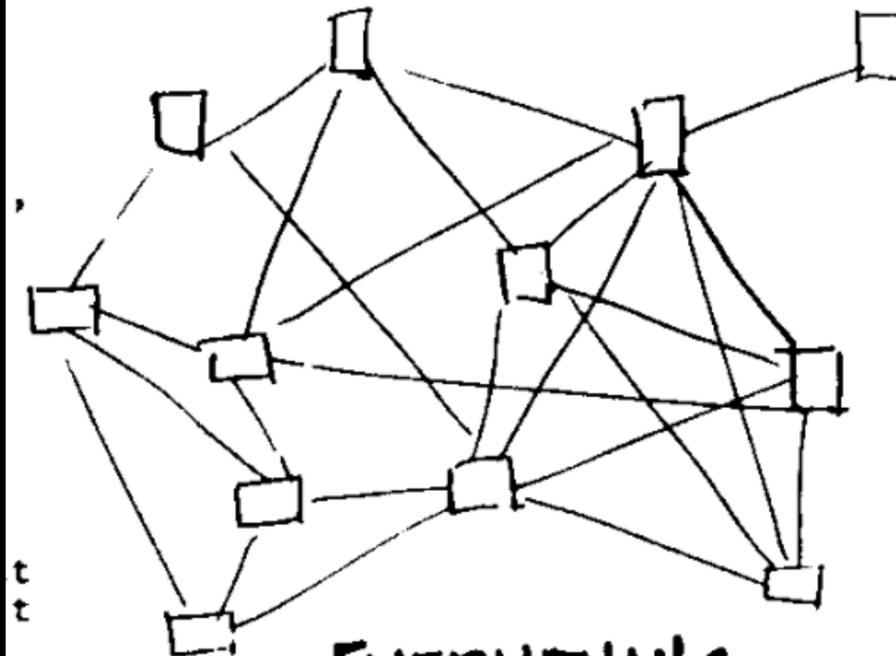


# HYPertext

By "hypertext" I mean non-sequential writing.

## DOUG ENGELBART AND "THE AUGMENTATION OF INTELLECT"

Douglas Engelbart is a saintly man at Stanford Research Institute whose dream has been to make people smarter and bring them together. His system, on which millions of dollars have been spent, is a wonder and a glory.



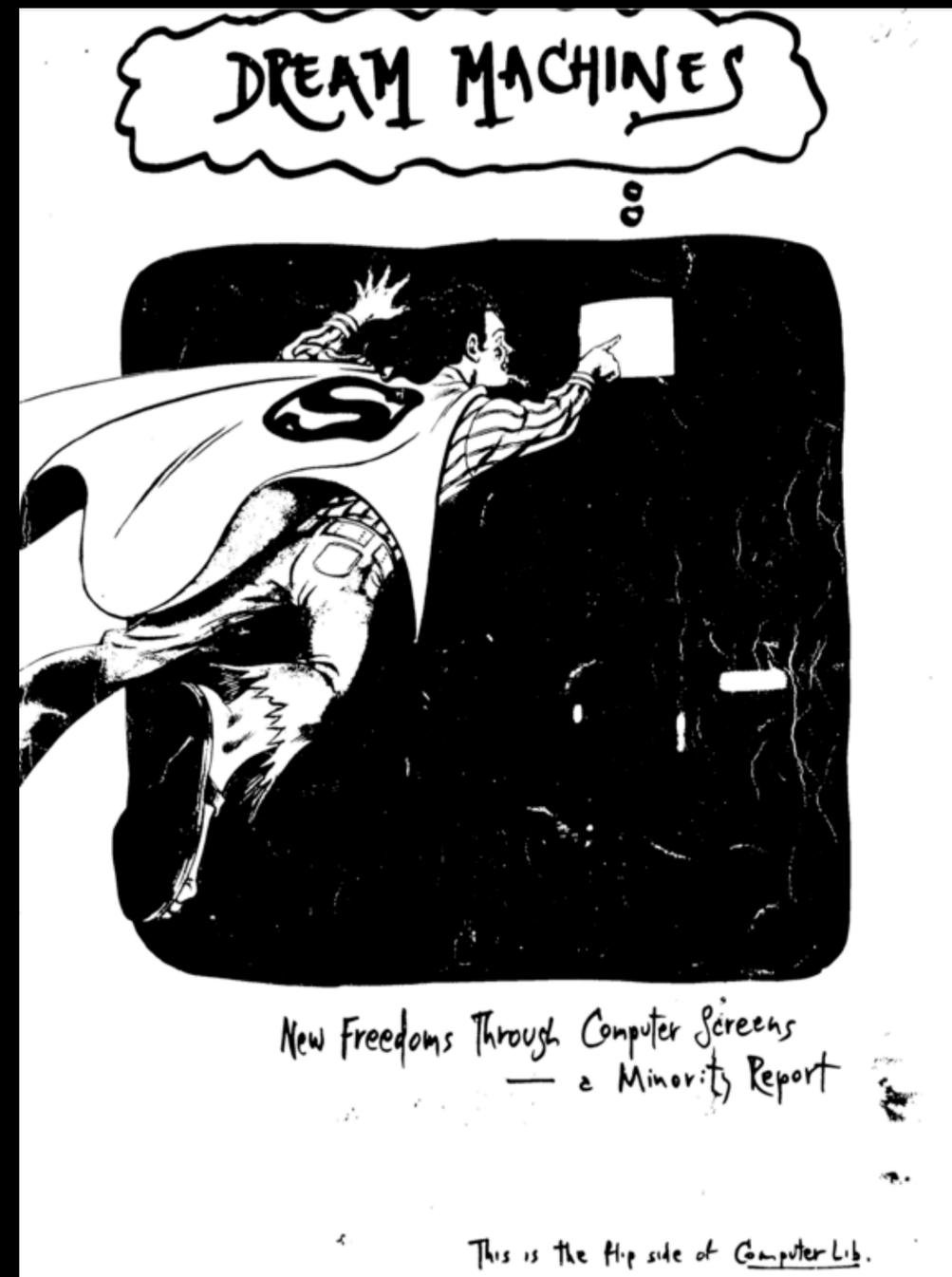
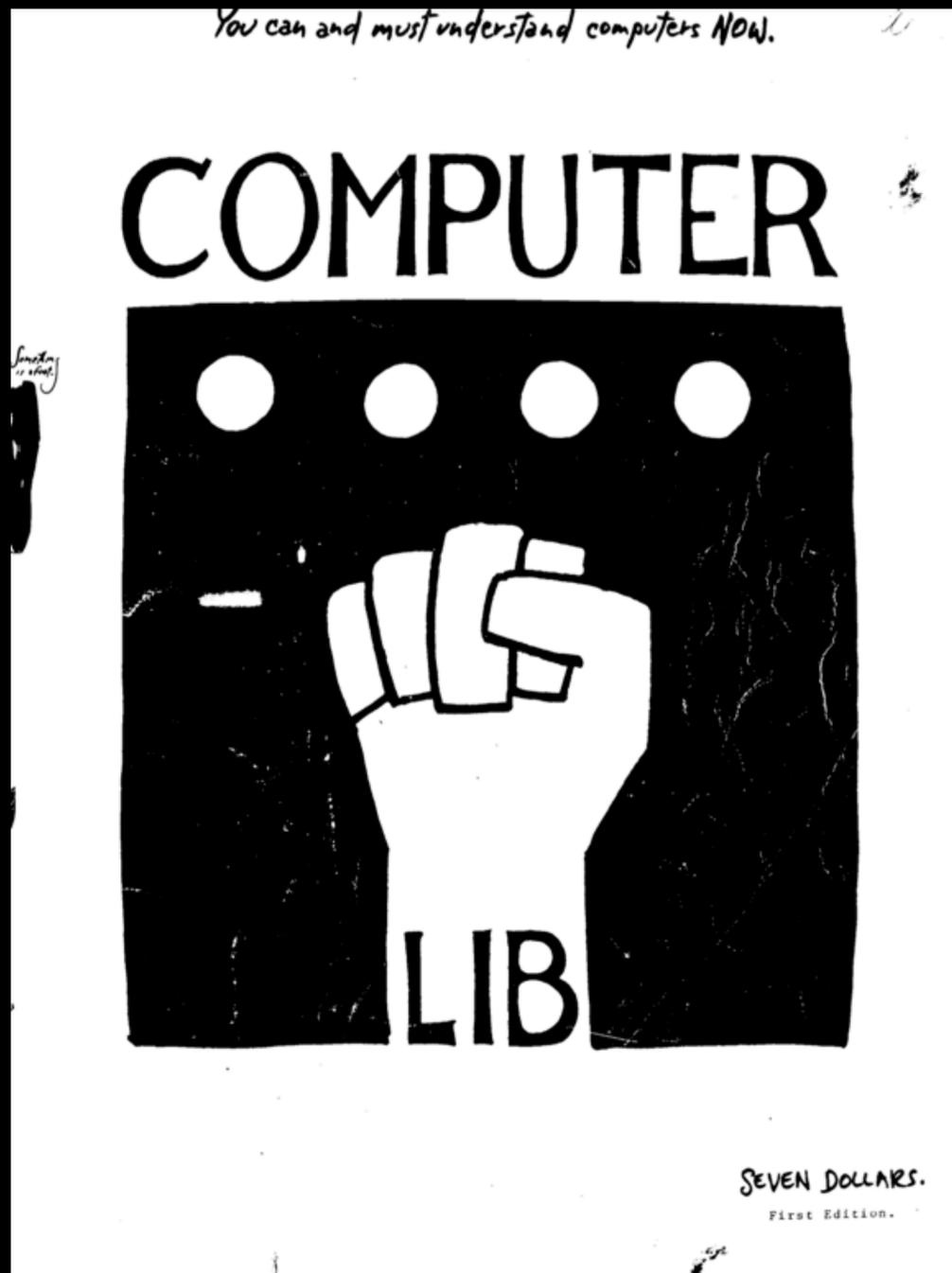
EVERYTHING  
IS DEEPLY INTERTWINGLED.

*In an important sense there are no "subjects" at all; there is only all knowledge, since the cross-connections among the myriad topics of this world simply cannot be divided up neatly.*

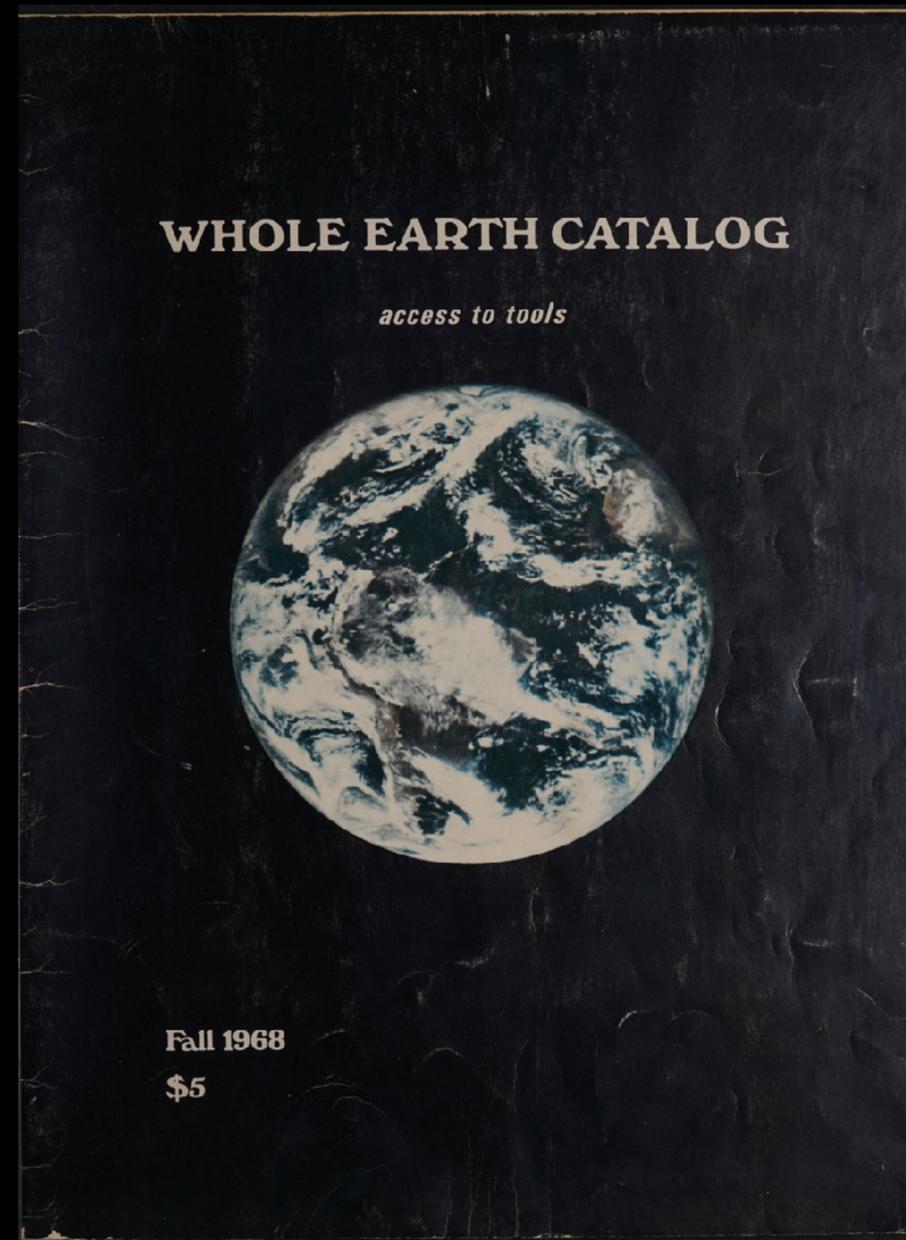
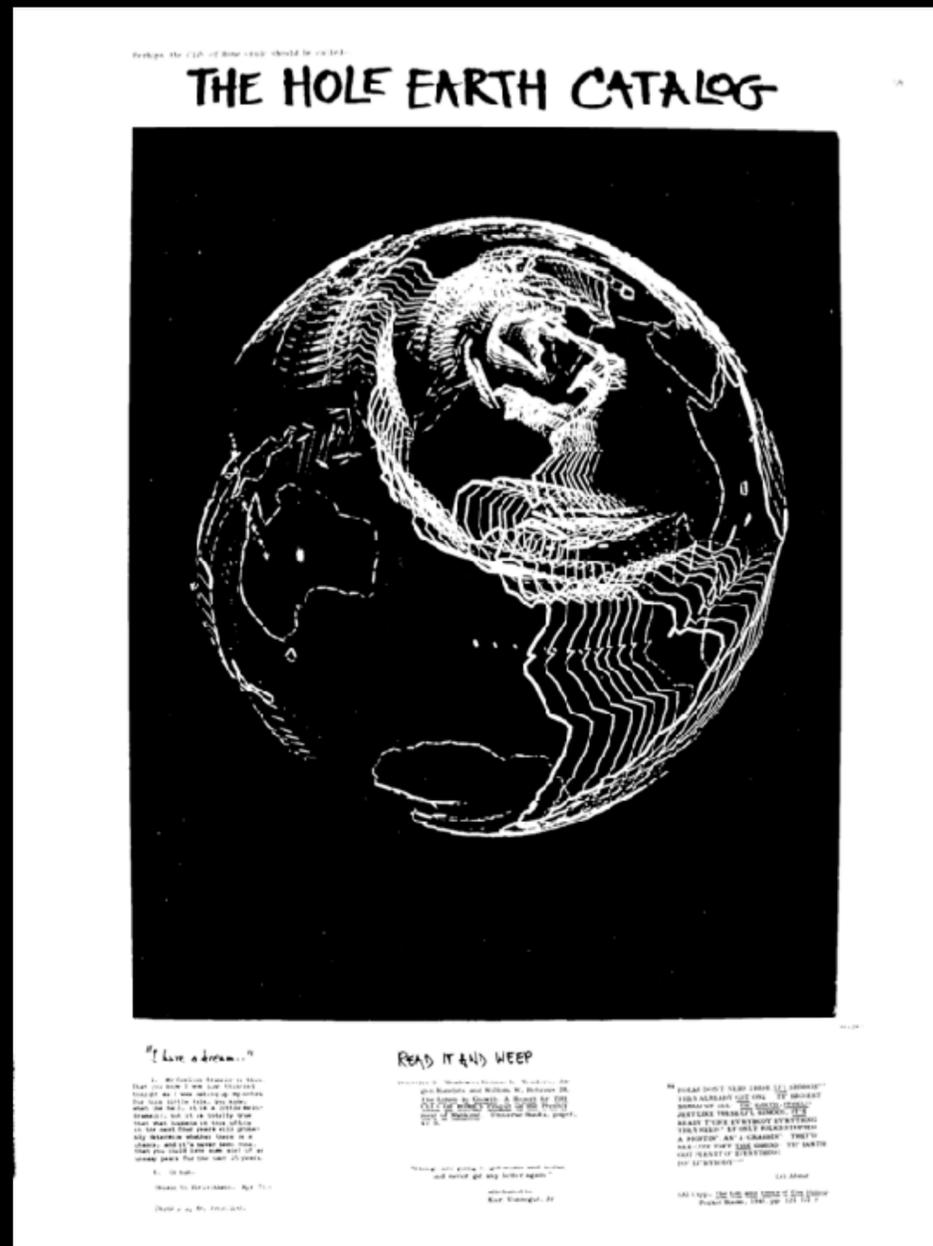
*Hypertext at last offers the possibility of representing and exploring it all without carving it up destructively.*

***Computer Lib/Dream Machines, Ted Nelson, 1974***

**"Hypertext at last offers the possibility of representing and exploring it all..."**



***Computer Lib/Dream Machines, Ted Nelson, 1974***  
“You can and must understand computers NOW.”



“The final inspiration for this book came from something called the *Domebook*, that tells you straightforwardly how to make Geodesic Domes. And of course I’m blatantly imitating, in a way, the wonderful *Whole Earth Catalog* of Stewart Brand.” - Ted Nelson, *Computer Lib*

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A Year From Monday

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Tensile Structures, Volume One  
Dome Cookbook  
Good News  
Architectural Design  
The Japanese House  
Audel Guides  
Alaskan Mill

Village Technology  
The Indian Tipi  
Tipi  
Aladdin Kerosene Lamps  
Man's Role in Changing the Face of the Earth  
Two Mushroom Books  
Organic Gardening  
ABC and XYZ of Bee Culture  
Universal Mill

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The Way Things Work  
Introduction to Engineering Design  
The Measure of Man  
Thomas Register of American Manufacturers  
New Scientist  
Scientific American  
Industrial Design  
Product Engineering  
Clearinghouse

Science and Civilization in China, Volume IV,  
Part 2  
Silvo Catalog  
Brookstone Tools  
Jensen Tools  
Miners Catalog  
Blasters' Handbook  
Direct Use of the Sun's Energy  
Structure, Form and Movement

Van Waters & Rogers  
Bookmaking  
Zone System Manual  
A Sculptor's Manual  
Creative Glass Blowing  
Buckskin  
Cut Beads  
Melrose Yarns

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The Mind of the Dolphin  
Information  
9100A Computer  
Cybernetics  
Eye and Brain  
Design for a Brain

Education Automation  
Intelligent Life in the Universe  
The McGraw-Hill Encyclopedia of Space  
Lafayette and Allied Catalogs  
Healthkit  
Modern Business Forms  
American Cinematographer

American Cinematographer Manual  
The Technique of Documentary Film Production  
The Technique of Television Production  
Auto Repair Manual  
Books  
Subject Guide to Books in Print  
Art Prints

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The Realist  
Green Revolution  
Kibbutz: Venture in Utopia  
Dune  
Groups Under Stress

The Merck Manual  
Land for Sale  
Consumer Reports  
Government Publications  
The Armchair Shopper's Guide  
How to Get 20% to 90% off on Everything You Buy

# Nomadics

Innovator  
The Retreater's Bibliography  
The Book of Survival  
The Survival Book  
Survival Arts of the Primitive Peoples  
Camping and Woodcraft  
Light Weight Camping Equipment and How to Make It  
Backpacking  
L.L. Bean

Recreational Equipment  
Gerry Outdoor Equipment  
Kaibab Boots  
Hot Springs  
The Explorers Trademart Log  
National Geographic  
Sierra Club  
The Narrow Road to the Deep North  
Trout Fishing in America

# Learning

Toward a Theory of Instruction  
The Black Box  
THIS Magazine is about Schools  
Cuisenaire Rods  
ITA  
LIFE Science Library  
Kaiser Aluminum News  
700 Science Experiments for Everybody

Edmund Scientific  
WFF 'N PROOF  
Dr. Nim  
We Built Our Own Computers  
American Boys Handy Book  
Pioneer Posters  
Sense Relaxation  
Zen Flesh, Zen Bones

Meditation Cushions and Mats  
Self Hypnotism  
Psycho-cybernetics  
A Yaqi Way of Knowledge  
Fundamentals of Yoga  
The Act of Creation  
The I Ching

# Understanding Whole Systems



Operating Manual for Spaceship Earth  
Buckminster Fuller  
1969; 133pp.

\$1.25 postpaid

from:  
Pocket Books, Inc.  
1 W. 39th St.  
New York, N.Y. 10018

or WHOLE EARTH CATALOG



Buckminster Fuller

The insights of Buckminster Fuller initiated this catalog.

Among his books listed here, *Utopia or Oblivion* is now probably the most direct introduction. It's a collection of his talks and papers from 1964 to 1967, at a bargain price. An *Operating Manual for Spaceship Earth* is his most recent, and succinct, statement. *Nine Chains to the Moon* is early, and openly metaphysical. *The Untitled Epic of Industrialization* is lyrical and strong. Ideas and Integrities is his most autobiographical, and perhaps the most self-contained of his books. No More Secondhand God is the most generalized, leading into the geometry of thought.

People who beef about Fuller mainly complain about his repetition—the same ideas again and again, it's embarrassing, also illuminating, because the same notions take on different contexts. Fuller's lectures have a raga quality of rich nonlinear endless improvisation full of convergent surprises.

Some are put off by his language, which makes demands on your head like suddenly discovering an extra engine in your car—if you don't let it drive you faster, it'll drag you. Fuller won't wait. He spent two years silent after illusive language got him in trouble, and he returned to human communication with a redesigned instrument.

—SB

*Utopia or Oblivion*  
R. Buckminster Fuller  
1969; 361pp.

\$1.25 postpaid

from:  
Bantam Books  
666 Fifth Avenue  
New York, New York 10013

or WHOLE EARTH CATALOG



My recommendation for a curriculum of design science:

- |                                  |                            |
|----------------------------------|----------------------------|
| 1. Synergetics                   | 7. Communications          |
| 2. General systems theory        | 8. Meteorology             |
| 3. Theory of games (Von Neumann) | 9. Geology                 |
| 4. Chemistry and physics         | 10. Biology                |
| 5. Topology, projective geometry | 11. Sciences of energy     |
| 6. Cybernetics                   | 12. Political geography    |
|                                  | 13. Ergonomics             |
|                                  | 14. Production engineering |

Here on Southern Illinois' campus we are going to set up a great computer program. We are going to introduce the many variables now known to be operative in economics. We will store all the basic data in the machine's memory bank; where and how much of each class of the physical resources; where are the people; what are the trends—all kinds of trends of world man?

Next we are going to set up a computer leading game, called "How Do We Make the World Work?" We will start playing relatively soon. We will bring people from all over the world to play it. There will be competitive teams from all around earth to test their theories on how to make the world work. If a team resorts to political pressures to accelerate their advantages and is not able to wait for the going gestation rates to validate their theory they are apt to be in trouble. When you get into politics you are very liable to get into war. War is the ultimate tool of politics. If war develops the side inducing it loses the game.

I was born cross-eyed. Not until I was four years old was it discovered that this was caused by my being abnormally farsighted. My vision was thereafter fully corrected with lenses. Until four I could see only large patterns, houses, trees, outlines of people with blurred coloring. While I saw two dark areas on human faces, I did not see a human eye or a hair-trap or a human hair until I was four. Despite my new ability to apprehend details, my childhood's spontaneous dependence upon open big pattern child hood persisted.

I am convinced that neither I nor any other human, past or present, was or is a genius. I am convinced that what I have every physically normal child also has at birth. We could, of course, hypothesize that all babies are born geniuses and get swiftly de-geniused. Unfavorable circumstances, shortsightedness, frayed nervous systems, and ignorantly articulated love and fear of elders tend to shut off many of the child's brain capability values. I was lucky in avoiding too many de-geniusings.

There is luck in everything. My luck is that I was born cross-eyed, was ejected so frequently from the establishment that I was finally forced either to perish or to employ some of those faculties with which we are all endowed—the use of which circumstances had previously so frustrated as to have to put them in the deep freezer, whence only hellishly hot situations could provide enough heat to melt them back into usability.

Utopia or Oblivion

To comprehend this total scheme we note that long ago a man went through the woods, as you may have done, and I certainly have, trying to find the shortest way through the woods in a given direction. He found trees fallen across his path. He climbed over those crisscrossed trees and suddenly found himself poised on a tree that was slowly teetering. It happened to be lying across another great tree, and the other end of the tree on which he found himself teetering lay under a third great fallen tree. As he teetered he saw the third big tree lifting. It seemed impossible to him. He went over and tried using his own muscles to lift that great tree. He couldn't budge it. Then he climbed back atop the first smaller tree, purposefully teetering it, and surely enough it again elevated the larger tree. I'm certain that the first man who found such a tree thought that it was a magic tree, and may have dragged it home and erected it as man's first totem. It was probably a long time before he learned that any stout tree would do, and thus abstracted the concept of the generalized principle of leverage out of all his earlier successive special-case experiences with such accidental discoveries.

To begin our position-fixing about our Spaceship Earth we must first acknowledge that the abundance of immediately consumable, obviously desirable or utterly essential resources have been sufficient until now to allow us to carry on despite our ignorance. Being eventually exhaustible and spoilable, they have been adequate only up to this critical moment. This condition-for-error of humanity's survival and growth up to now was extensively provided just as a bird inside of the egg is provided with liquid nutriment to develop it to a certain point. But then by design the nutriment is exhausted at just the time when the chick is large enough to be able to locomote on its own legs. And so as the chick pecks at the shell seeking more nutriment it inadvertently breaks open the shell.

A new, physically uncomparised, metaphysical initiative of unbiased integrity could unify the world. It could and probably will be provided by the utterly impersonal problem solutions of the computers.

Heisenberg's principle of "indeterminism" which recognized the experimental discovery that the act of measuring always alters that which was being measured turns experience into a continuous and never-replicable evolutionary scenario.

The gold supply is so negligible as to make it pure voodoo to attempt to value the world's economic evolution traffic through the gold-sized needle's "eye."

Brain deals exclusively with the physical, and mind exclusively with the metaphysical. Wealth is the progressive mastery of matter by mind.

Stepping forth from its initial sanctuary, the young bird must now forage on its own legs and wings to discover the next phase of its regenerative sustenance.

*Nine Chains to the Moon*  
Buckminster Fuller  
1938, 1963; 376 pp.

Unavailable until 1972



Since Yogi is a personalized art, the art dies with the person. The abstract power involved remains as real and true, always, but it cannot be made utilitarian in increasing continuity for the world in general. One's and his counterparts realized this and were unique in their refusal to apply this power to self ends. It was this personal limitation of the Yogi art which led the prosaic philosophers to search further. They sought a means of limitless articulation.

This phantom captain has neither weight nor sensorial tangibility, as has often been scientifically proven by careful weighing operations at the moment of abandonment of the ship by the phantom captain, i.e., at the instant of "death". He may be likened to the variant of polarity dominance in our bipolar electric world which, when balanced and unit, resides as abstract unity 1 or 0. With the phantom captain's departure, the mechanism becomes inoperative and very quickly disintegrates into basic chemical elements.

An illuminating rationalization indicated that captain's being phantom, abstract, infinite, and bound to other captains by a bond of understanding as proven by their recognition of each other's signals and the meaning thereof by reference to a common direction (toward "perfect")—are not only all related, but are one and the same captain. Mathematically, since characteristics of unity exist, they cannot be non-identical.

"Still further—over the microphone STEPPED-UP electrically this music enters a super-or-sub-sensorial wave-length frequency that makes it broadcastable, apparently BACK INTO THE UNIVERSE AGAIN, the full LATENT broadcast of which men, on ships at sea, an aviator in the air, or Julia Murphy in a city hotel, or the farmer's wife, can tune in upon, without any personal-equation dissemination by unwanted diverting human beings in their presence, and so hear the music of the universe that Bach heard years ago.

"Here is IMMORTALITY!"

"Darling,—that radiant flash of infinite understanding had flashed between Jorjessie and the X-lan—I can understand those houses all right."

Untitled Epic Poem on the History of Industrialization  
Buckminster Fuller  
1962; 227pp.

\$1.95 postpaid

from:  
Simon & Schuster, Inc.  
630 Fifth Avenue  
New York, New York 10020

or WHOLE EARTH CATALOG



However, man unconcernedly sporting mail on an express train, with unshattered faith that the engineer is competent, that the switchmen are not asleep, that the track walkers are doing their job, that the technologists who designed the train and the rails knew their stuff, that the thousands of others whom he may never know by face or name are collecting tariffs, paying for repairs, and so handling assets that he will be paid a week from today and again the week after that, and that all the time his family is safe and in well being without his personal protection constitutes a whole new sea of evolution—the first nearly "max" since the beginning of the spoken word. In fact, out of the understanding innate in the spoken word was industrialization wrought after millenniums of seemingly whitherless spade work.

*Ideas and Integrities*  
Buckminster Fuller  
1963; 318pp.

\$1.95 postpaid

from:  
Collier Books  
The MacMillan Company  
Order Dept.  
Front and Brown Streets  
Riverside, N.J. 08075

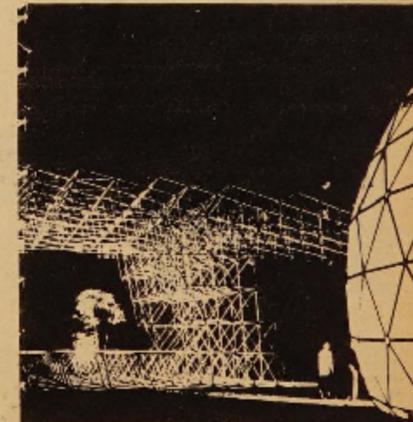
or WHOLE EARTH CATALOG



Standing by the lake on a jump-or-think basis, the very first spontaneous question coming to mind was, "If you put aside everything you've ever been asked to believe and have recourse only to your own experiences do you have any conviction arising from those experiences which either discards or must assume as a priori greater intellect than the intellect of man?" The answer was SWIFT and positive. Experiences had clearly demonstrated as a priori anticipatory and only intellectually apprehendable orderliness of interactive principles operating in the universe into which we are born. These principles are discovered but are never invented by man. I said to myself, "I have faith in the integrity of the anticipatory intellectual wisdom which we may call 'GOG.' My next question was, "Do I know best or does God know best whether I may be of any value to the integrity of universe?" The answer was, "You don't know and no man knows, but the faith you have just established out of experience imposes recognition of the a priori wisdom of the fact of your being." Apparently addressing myself, I said, "You do not have the right to eliminate yourself, you do not belong to you. You belong to the universe. The significance of you will forever remain obscure to you, but you may assume that you are fulfilling your significance if you apply yourself to converting all your experience to highest advantage of others. You and all men are here for the sake of other men."

I define "synergy" as follows: Synergy is the unique behavior of whole systems, unpredictable by behavior of their respective sub-systems' events.

(Fuller cont'd.)



# Understanding Whole Systems



Buckminster Fuller

*The insights of Buckminster Fuller initiated this catalog. Among his books listed here, Utopia or Oblivion is now probably the most direct introduction. It's a collection of his talks and papers from 1964 to 1967, at a bargain price. An Operating Manual for Spaceship Earth is his most recent, and succinct, statement. Nine Chains to the Moon is early, and openly metaphysical. The Untitled Epic of Industrialization is lyrical and strong. Ideas and Integrities is his most autobiographical, and perhaps the most self-contained of his books. No More Secondhand God is the most generalized, leading into the geometry of thought.*

*People who beef about Fuller mainly complain about his repetition—the same ideas again and again, it's embarrassing, also illuminating, because the same notions take on different contexts. Fuller's lectures have a raga quality of rich nonlinear endless improvisation full of convergent surprises.*

*Some are put off by his language, which makes demands on your head like suddenly discovering an extra engine in your car—if you don't let it drive you faster, it'll drag you. Fuller won't wait. He spent two years silent after illusory language got him in trouble, and he returned to human communication with a redesigned instrument.*

—SB

Operating Manual for Spaceship Earth  
Buckminster Fuller  
1969; 133pp.

\$1.25 postpaid

from:  
Pocket Books, Inc.  
1 W. 39th St.  
New York, N.Y. 10018

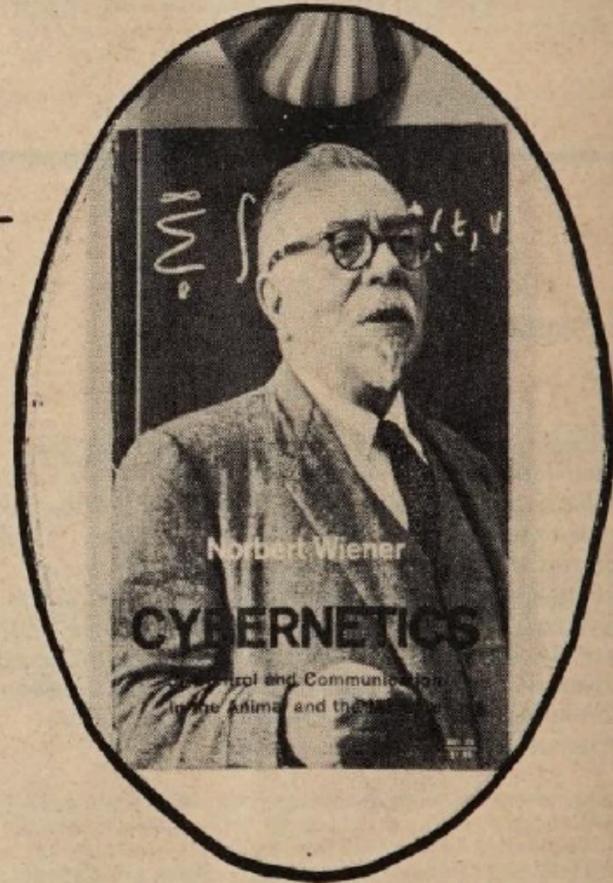
or WHOLE EARTH CATALOG

To comprehend this total scheme through the woods, as you may try to find the shortest way to a destination. He found trees fallen across crisscrossed trees and suddenly found a way was slowly teetering. It happened under a tree, and the other end of the teetering lay under a third great tree, the third big tree lifting. It seemed over and tried using his own muscles couldn't budge it. Then he climbed the tree, purposefully teetering it, and the larger tree. I'm certain that the tree thought that it was a magic home and erected it as man's first time before he learned that any structure extracted the concept of the general of all his earlier successive special accidental discoveries.

To begin our position-fixing about first acknowledge that the abundance is obviously desirable or utterly essential sufficient until now to allow us to continue. Being eventually exhaustible and only up to this critical moment. humanity's survival and growth is just as a bird inside of the egg is to develop it to a certain point. But exhausted at just the time when it is to locomote on its own legs. And seeking more nutriment it inadverts



**Buckminster Fuller**  
Systems theorist, futurist, inventor of the Geodesic Dome



Norbert Wiener

### CYBERNETICS

Control and Communication in the Animal and the Machine

*Cybernetics — or Control and Communication in the Animal and the Machine*

Norbert Wiener  
1948, 1961; 212 pp.

**\$1.95** postpaid

from:  
The M.I.T. Press  
Cambridge, Mass. 02142  
or  
WHOLE EARTH CATALOG

### The Human Use of Human Beings

*A proper sequel to his Cybernetics, this book is social, untechnical, ultimate in most of its considerations. Its domain is the whole earth of the mind.*

*Norbert Wiener is one of the founders of an n-dimensional inhabited world whose nature we've yet to learn.*

—SB

**The Human Use of Human Beings**  
Norbert Wiener  
1950, 1954; 288 pp.

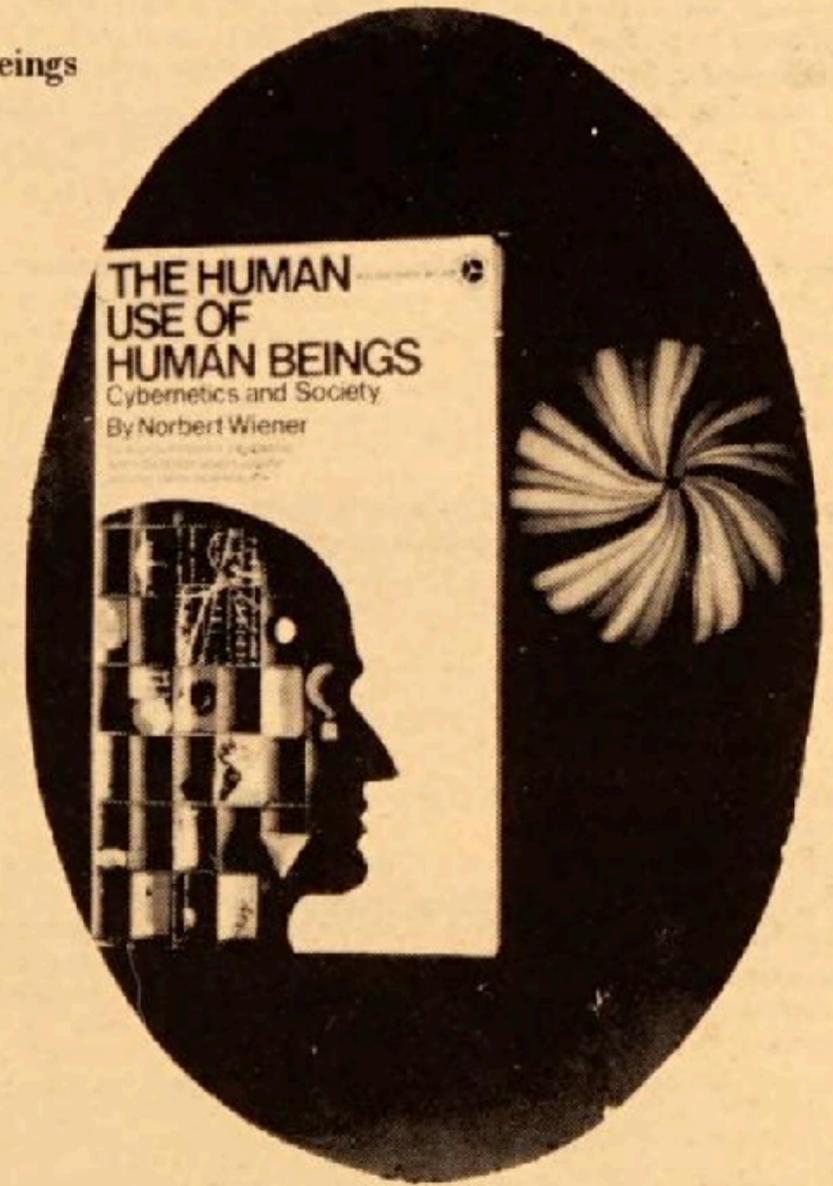
**\$1.45** postpaid

from:  
Avon Books  
250 West 55th Street  
New York, N.Y. 10019

or WHOLE EARTH CATALOG

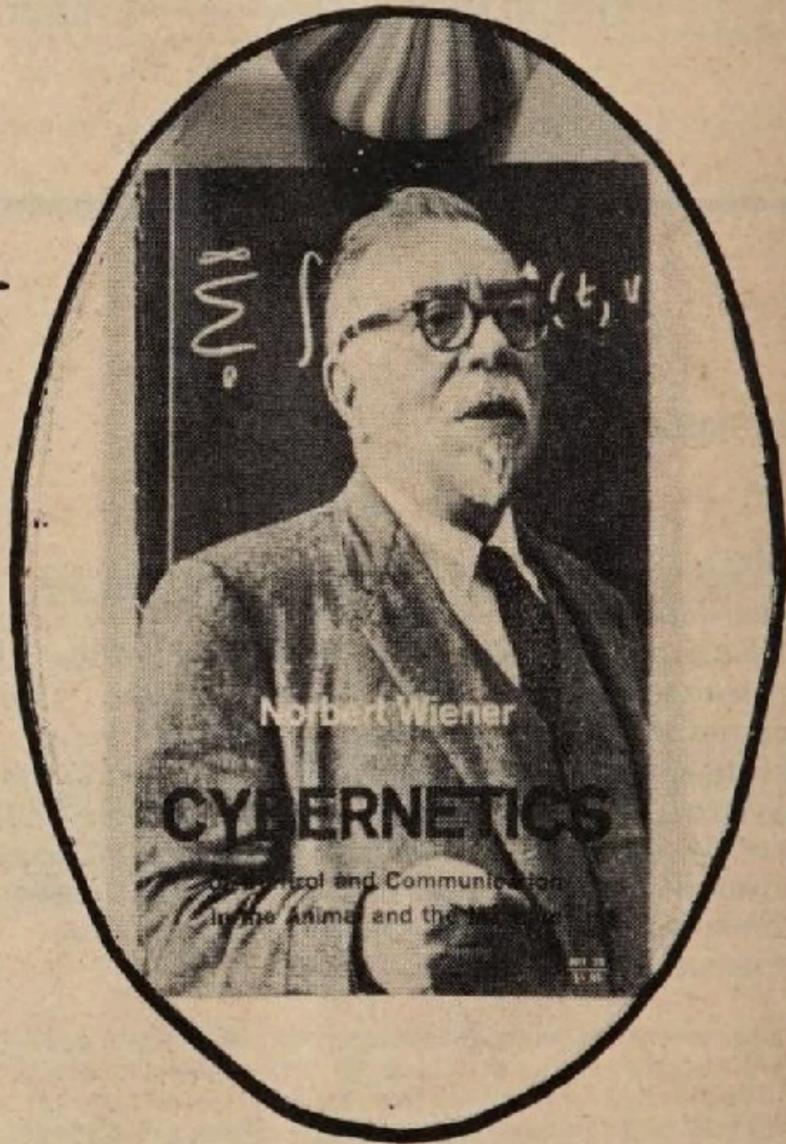
It is the thesis of this book that society can only be understood through a study of the messages and the communication facilities which belong to it; and that in the future development of these messages and communication facilities, messages between man and machine and between machine and machine, are destined to play an ever-increasing part.

Messages are themselves a form of pattern and organization. Indeed, it is possible to treat sets of messages as having an entropy like sets of states of the external world. Just as entropy is a measure of disorganization, the information carried by a set of messages is a measure of organization. In fact, it is possible to interpret the information carried by a message as essentially the negative of its entropy, and the negative logarithm of its probability. That is, the more probable the message, the less information it gives. Clichés, for example, are less illuminating than great poems.



# Norbert Wiener

Originator of cybernetics, *The Human Use of Human Beings*  
("its domain is the whole earth of the mind." - Stewart Brand)



*Cybernetics — or Control and Communication in the  
Animal and the Machine*

Norbert Wiener  
1948, 1961; 212 pp.

**\$1.95** postpaid

from:

The M.I.T. Press  
Cambridge, Mass. 02142

or  
WHOLE EARTH CATALOG

**cybernetics:**  
from the Greek word  
“kubernetes” = steersman

“the science of control and  
communications in the animal  
and machine” - Norbert  
Wiener, *Cybernetics*, 1948



cybernetics



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Concept art



Female



Futuristic



Human

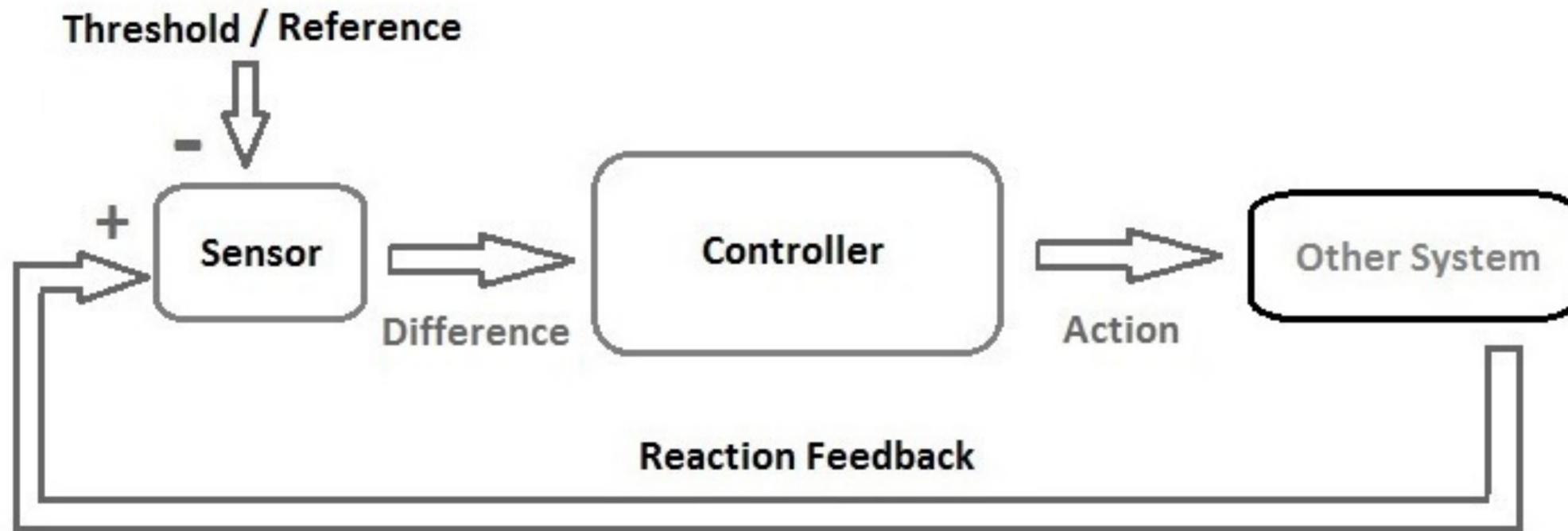


Star wa

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**fantasy**  
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**anime**  
**concept art**  
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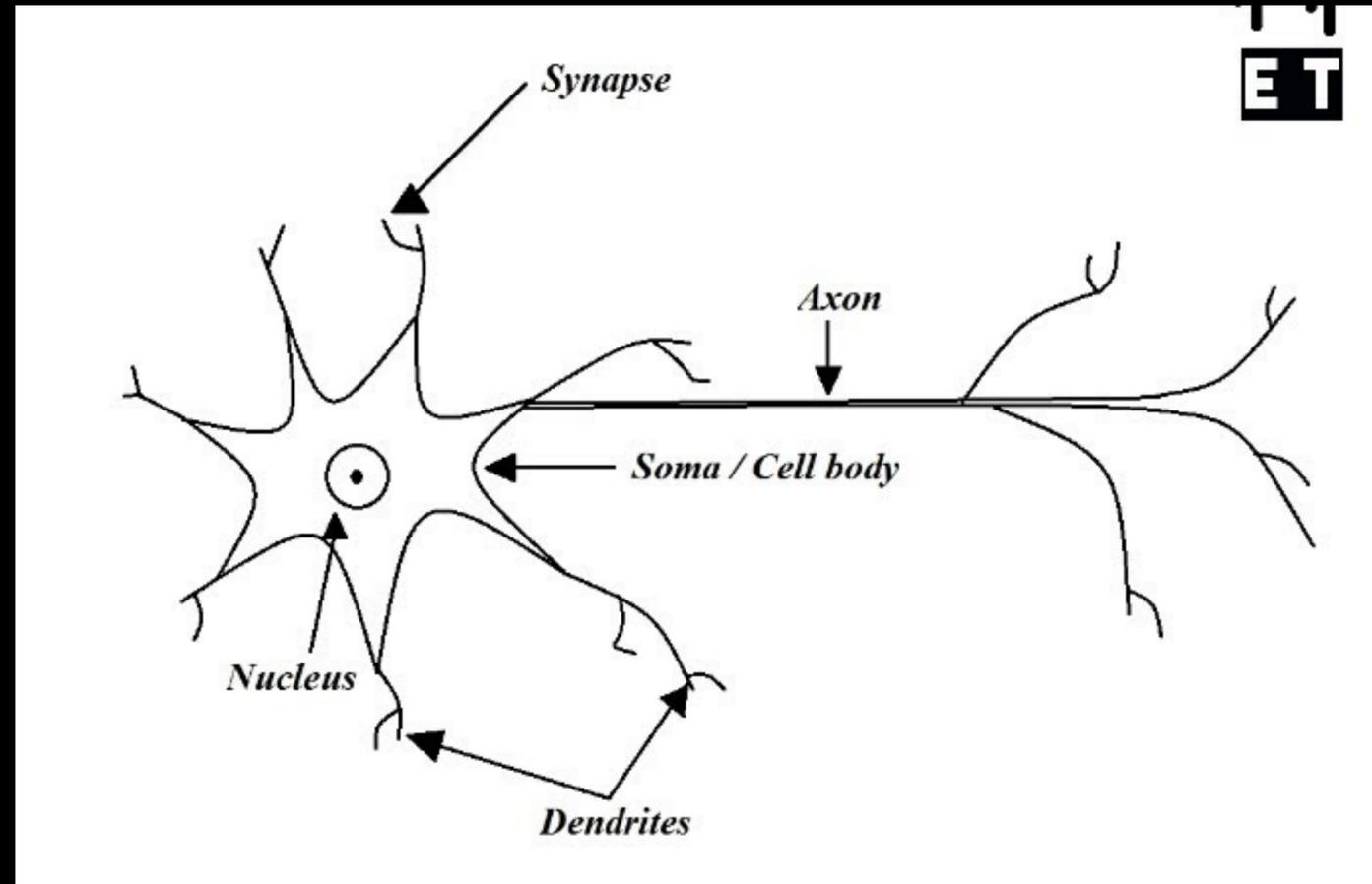
# Understanding Whole Systems



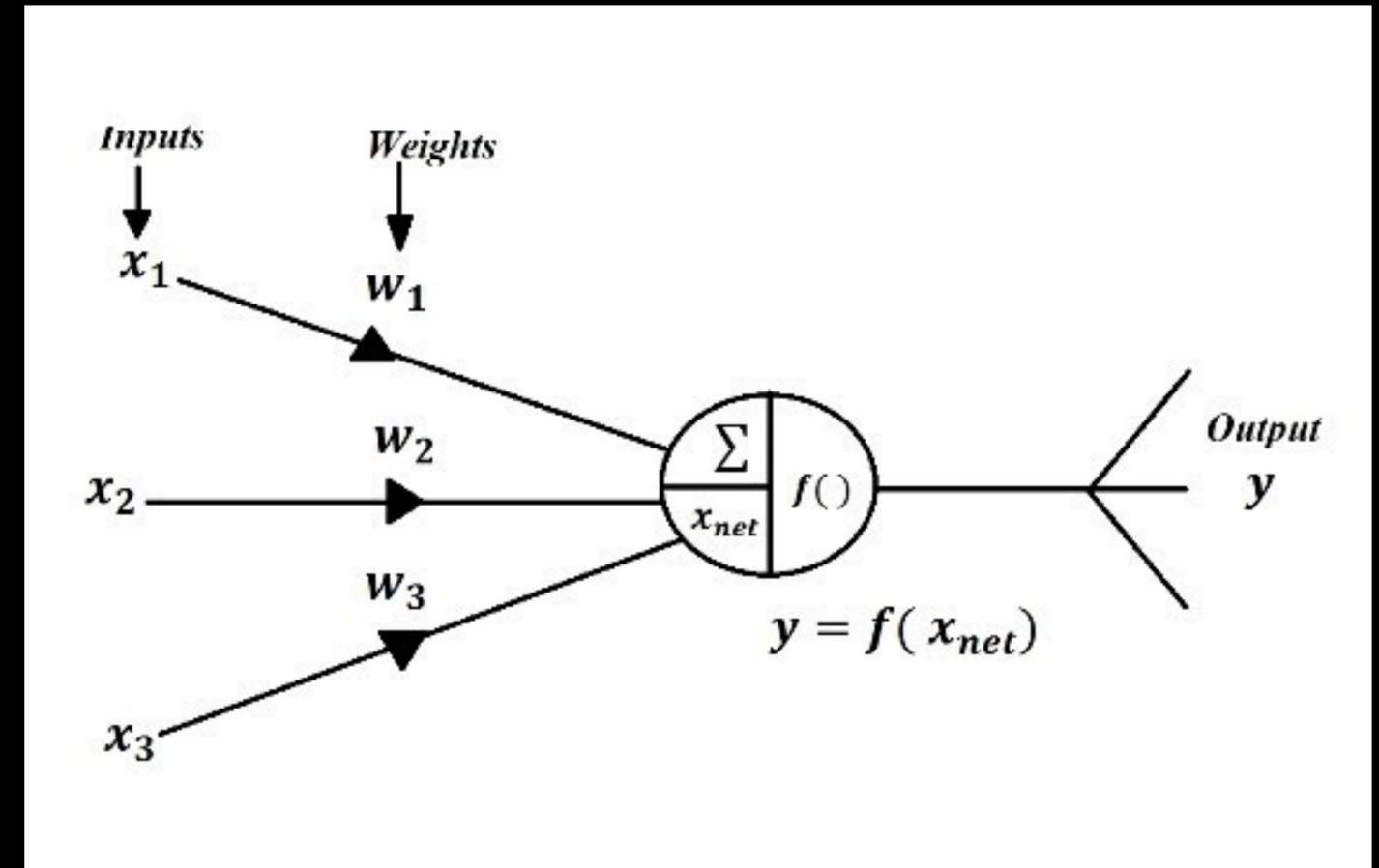
**A Cybernetic Loop**

Governed by **feedback**.

# Understanding Whole Systems



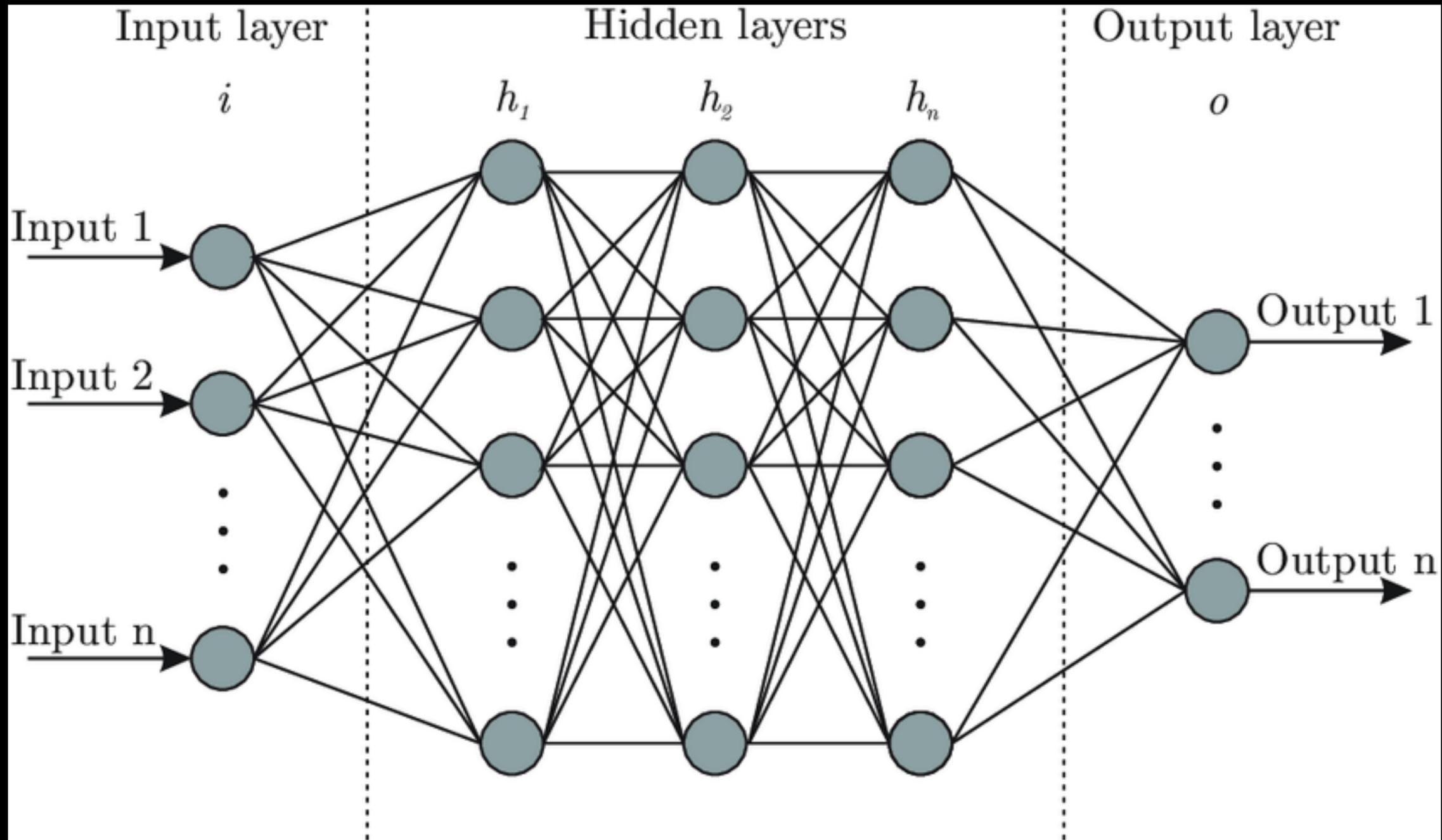
Biological neuron



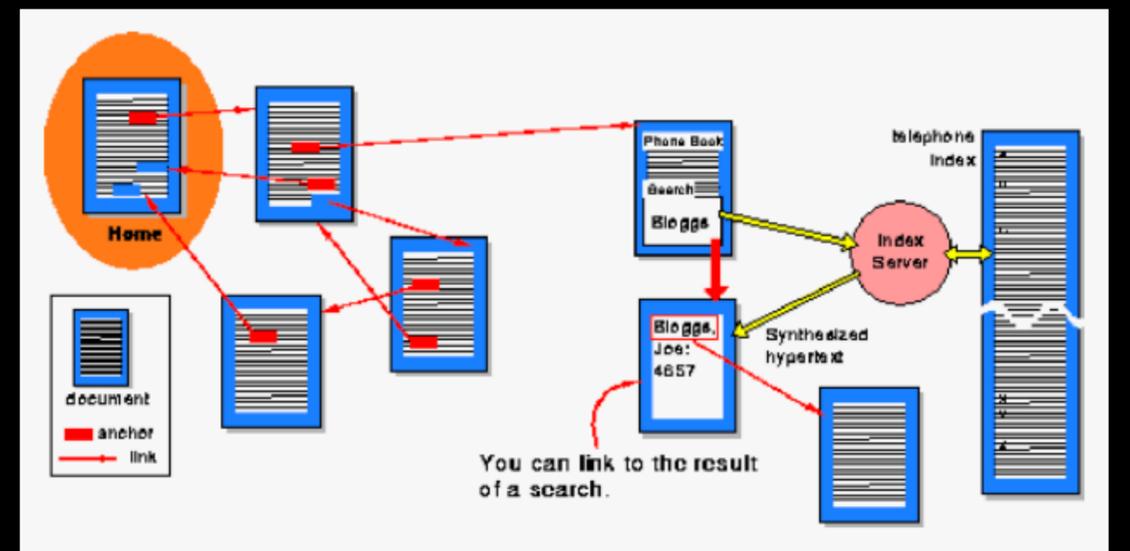
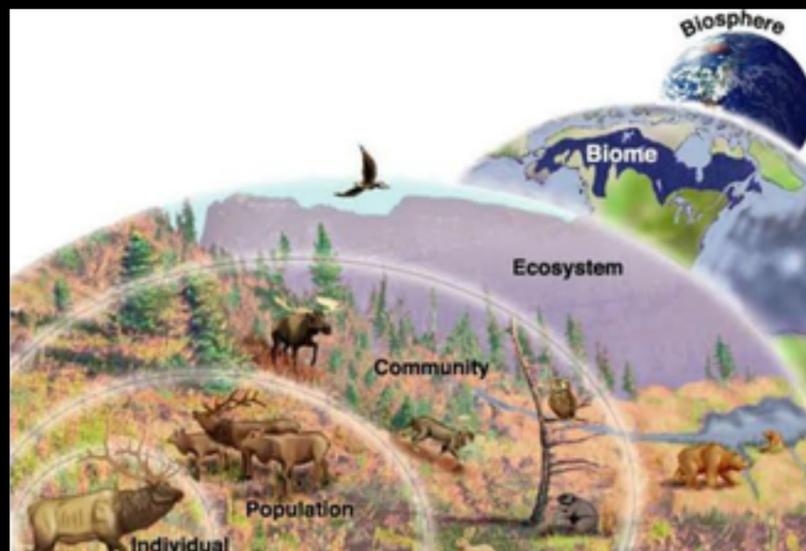
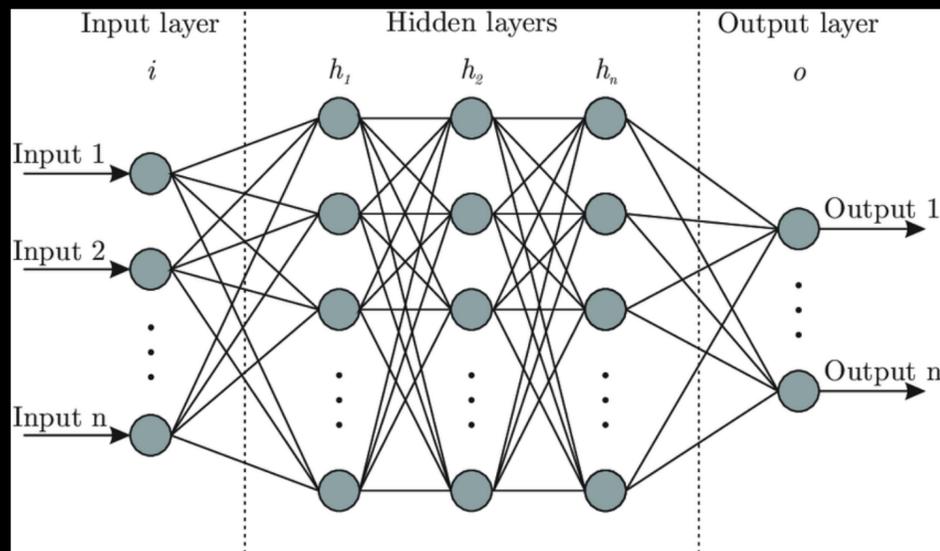
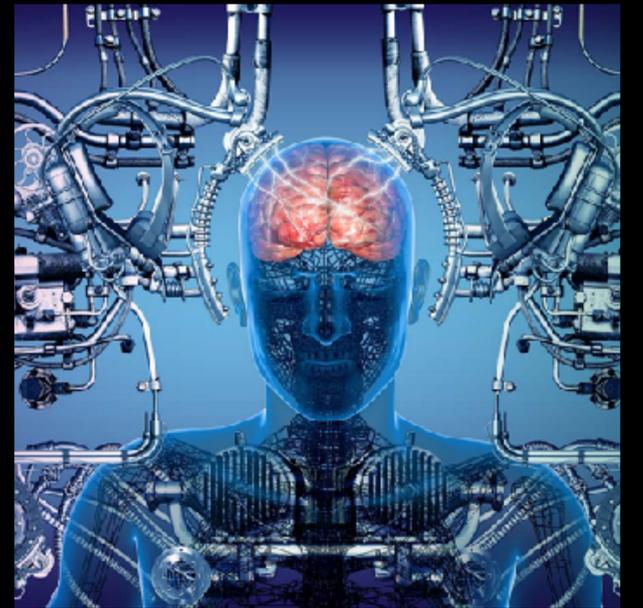
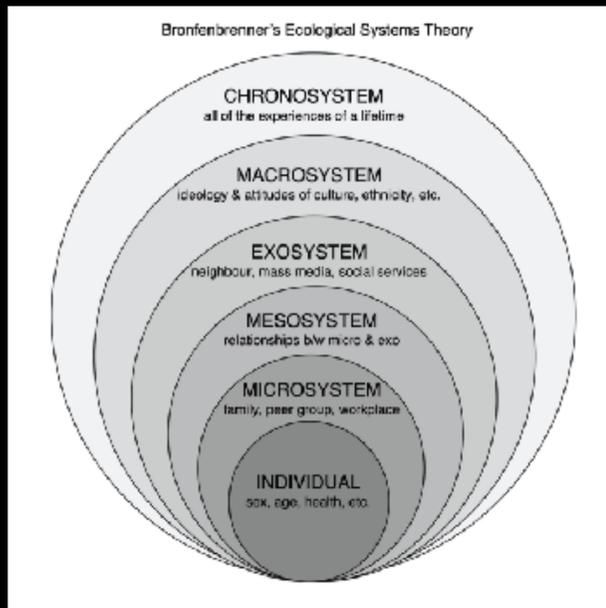
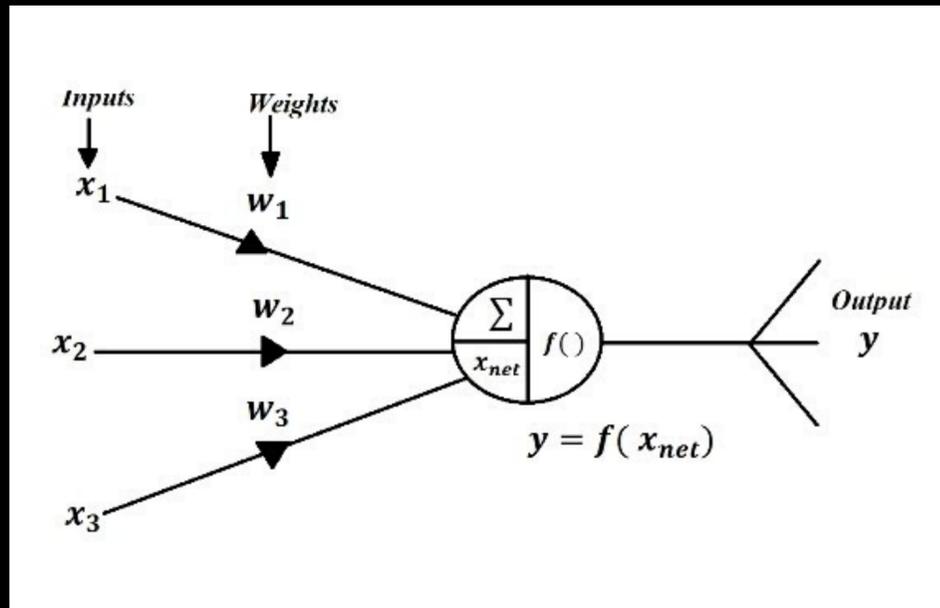
Artificial neuron

**Warren McCulloch**  
neuropsychological cybernetician

# Understanding Whole Systems

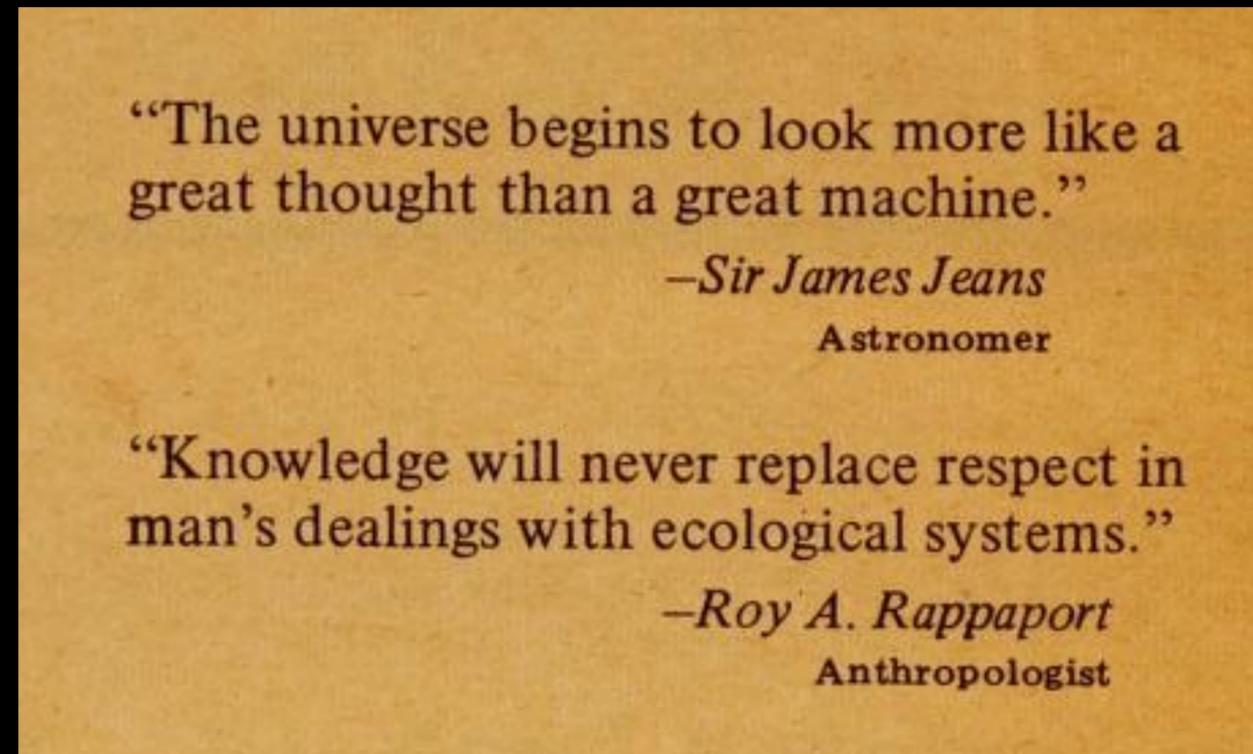
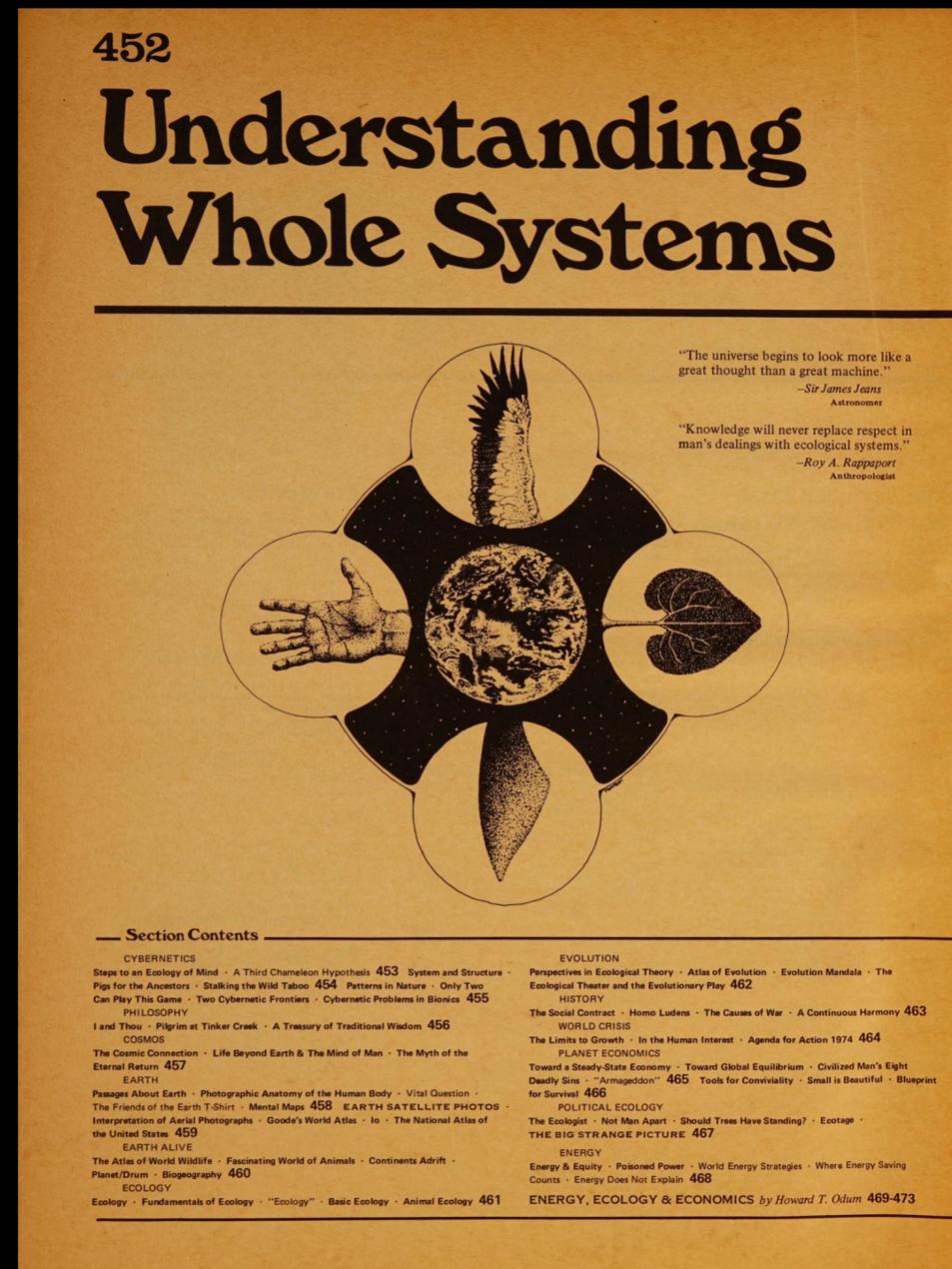


# Understanding Whole Systems



engineering, ecological, economic, biological, cognitive, and social systems

# Understanding Whole Systems



engineering, ecological, economic, biological, cognitive, and social systems

A satellite photograph of Earth from space, showing the Americas in the center. The landmasses are brown and tan, surrounded by blue oceans and white clouds. The image is set against a black background.

# Understanding Whole Systems

# WHOLE EARTH CATALOG

*access to tools*



Fall 1968

\$5

# WIRED

July 1997

ການ ດົນ ສາຍ

**Cypherpunks  
plot world  
liberation**

**Fighting  
for the New  
Economy  
at Treasury**

**Moira Gunn**

**Where  
computers  
go to die**

**Dave Winer:  
Is Java bad?**



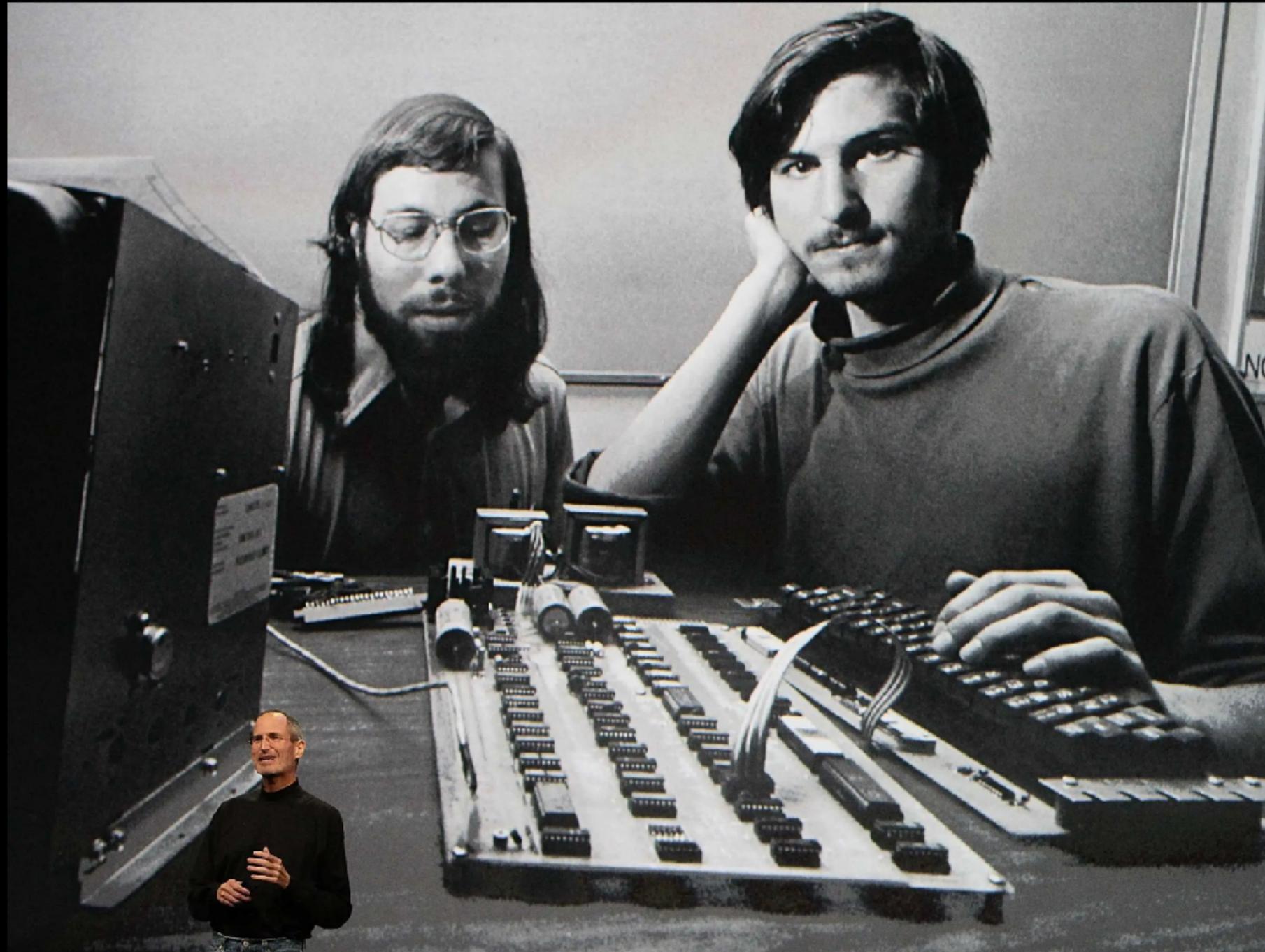
**We're facing  
25 years  
of prosperity,  
freedom,  
and a better  
environment  
for the whole  
world.**

**You got  
a problem  
with that?**

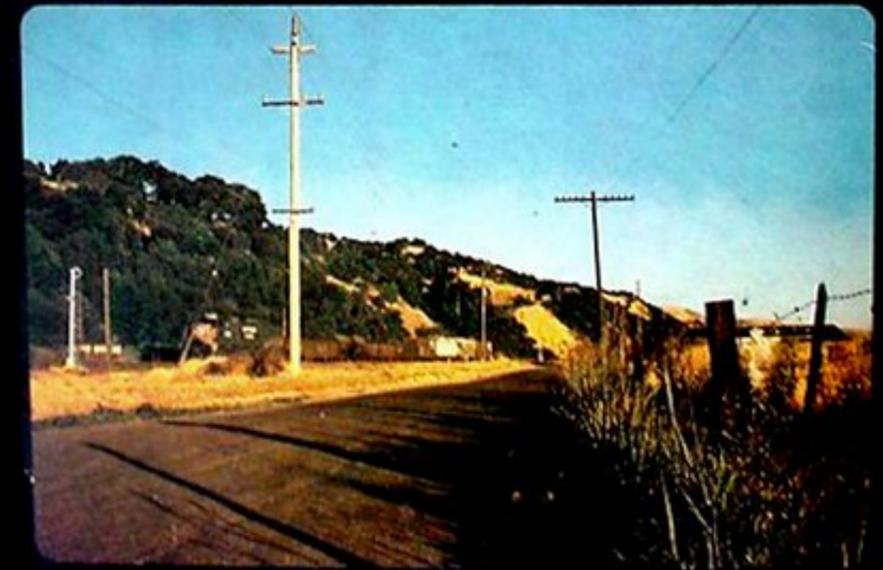
# THE LONG BOOM



**The Mother of All Demos presented by Douglas Engelbart**  
SF, December 9, 1968, Stewart Brand camera operator in Menlo Park

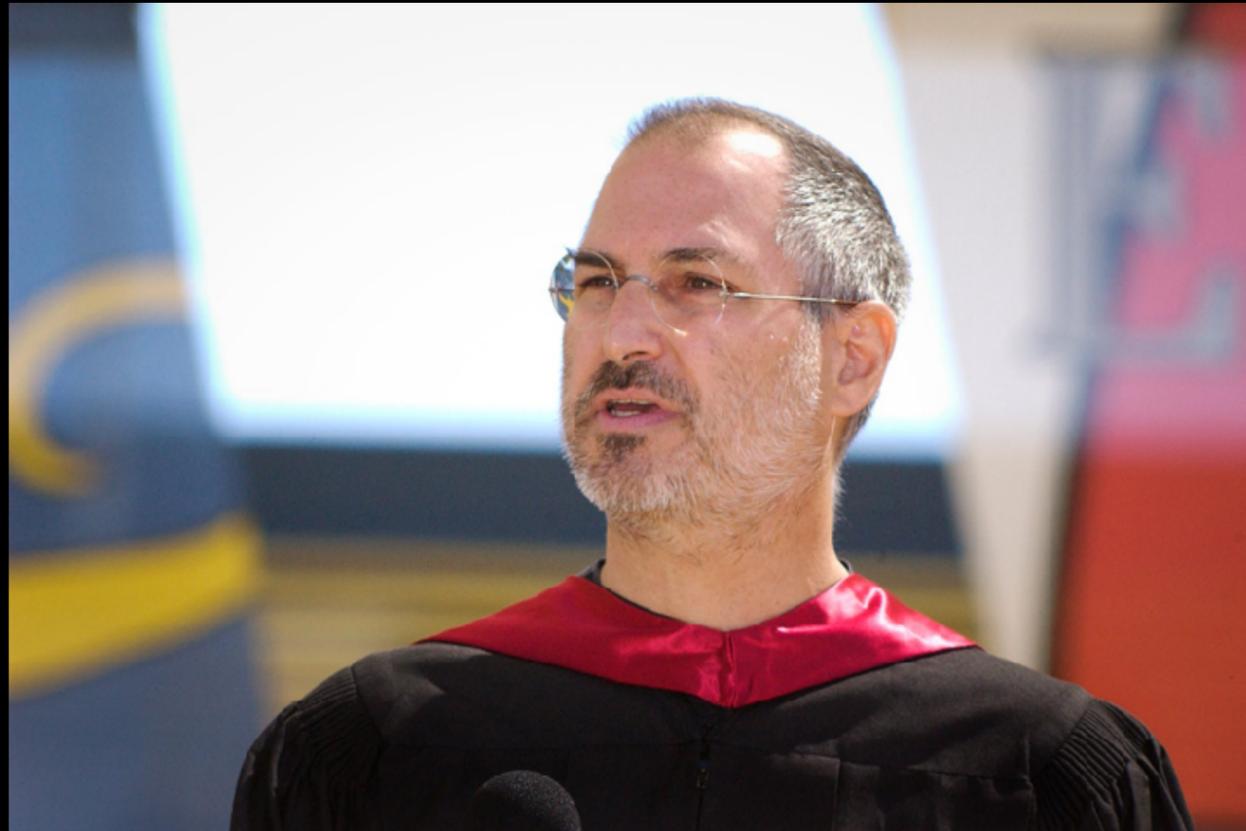


Stay hungry. Stay foolish.



## Steve Jobs

*Whole Earth Catalog* = “sort of like Google in paperback form”



Steve Jobs' Stanford 2005  
commencement address

**“When I was young, there was an amazing publication called the *Whole Earth Catalog*, which was one of the bibles of my generation ... It was sort of like Google in paperback form, 35 years before Google came along. It was idealistic and overflowing with neat tools and great notions.”**

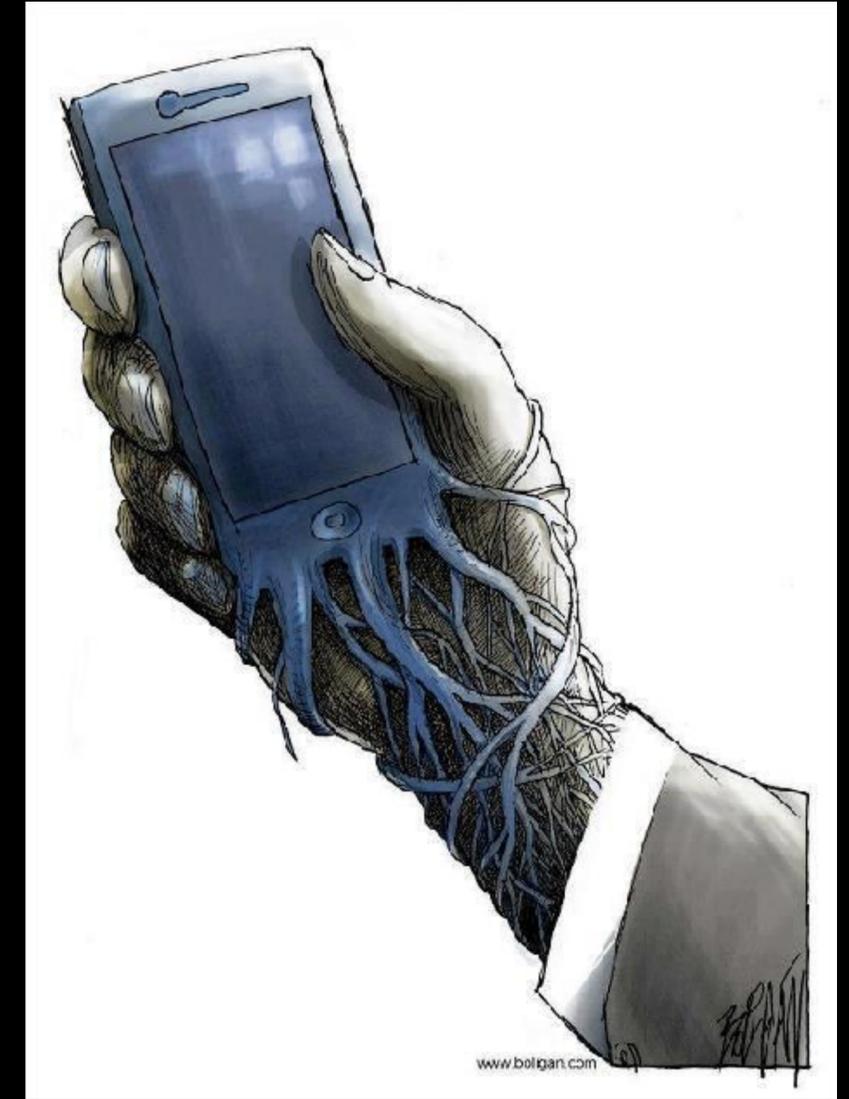
**“It was idealistic and overflowing with neat tools and great notions.”**  
**Computing was and is supposed to be empowering.**  
**What went wrong?**

Discuss! :)

# Computing was and is supposed to be empowering. What went wrong?

- disagree with premise of question - internet is reflection of society we already have, misleading, reflection of society itself
- computing is empowering but institutions with a lot of power create attention economy, internet allows communication all over the world, monopolized by social media companies better than individuals - society also reflects internet, accelerates things society also does
- so idealistic of development of tech, tech for military advantage, using naive hippies' tech for military technologies, consolidate wealth, played idealistic people as pawns for their agenda
- make construction faster - dynamite —> atomic bomb; computing not used for evil is naive, saying that something went wrong is a very strange question; it is what has happened in history over and over again; society did what it always does
- invite wall street people into the equation, that culture, tech bros, see that a lot more in the last 10 years, moving away from original goals in academia, berkeley research - grants funding, hot topics (90% of cs research is LLMs), funding from companies - where money comes from

# Understanding Whole Systems



***Understanding Media: The Extensions of Man, Marshall McLuhan, 1964***

A medium or “any new technology” is “any extension of ourselves.”

“The medium is the message.”

## the "algorithmic gaze" affects everything you see online

we're losing so much aura



ADAM ALEKSIC

FEB 18, 2025

650

17

72

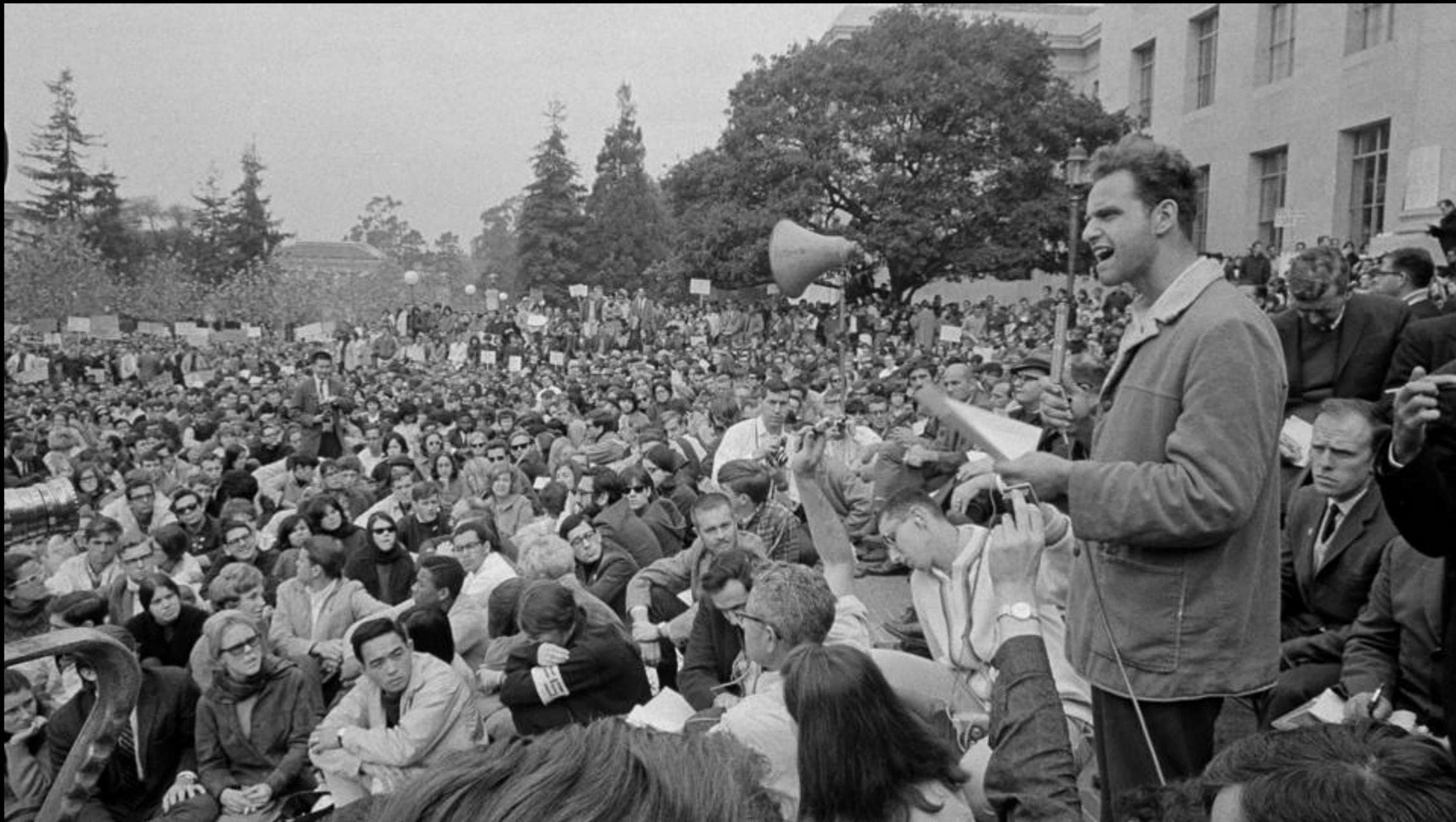
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Adam Aleksic (@theEtymologyNerd):

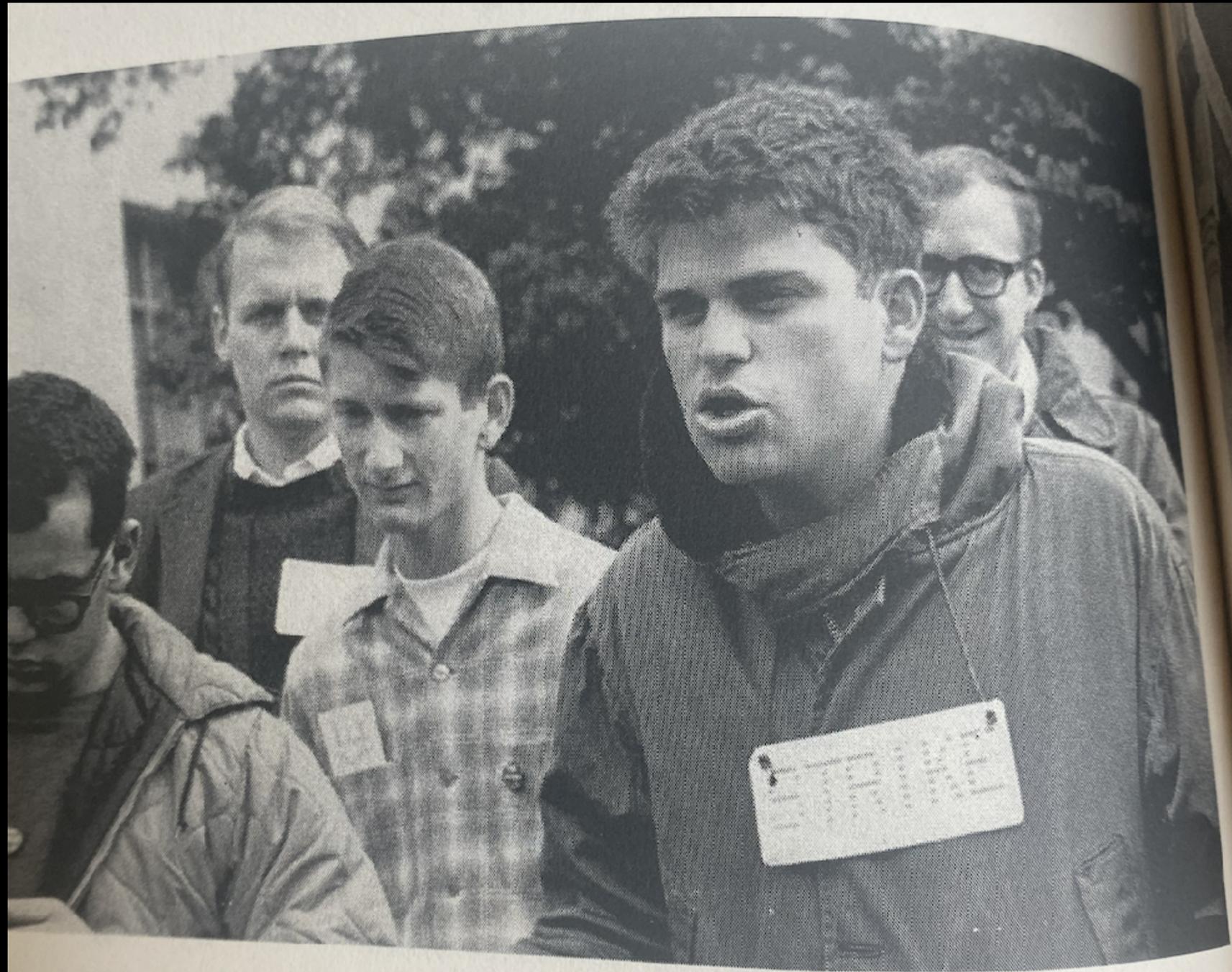
“The Wired writer Leo Kim argues that this goes back to the fact that **we’re all cyborgs**. In the same way that our bodies are part of who we are, so too have **our phones become a functional extension of our minds**. We feel naked when we go anywhere without them, and to use them is to project our consciousness into the delicate haptic experience of thumb on screen. As such, we feel much closer to our phones than we do our computers or TVs, and enter a kind of “flow state” of media consumption when interacting with them. The rest of the world blurs away as **we enter a tender, individualized connection with this unique part of ourselves.**”



**Free Speech Movement (FSM), UC Berkeley, 1964-65**  
New Left, Civil Rights Movement, Anti-Vietnam War Movement



“There's a time when the operation of the machine becomes so odious, it makes you so sick at heart, that...you've got to put your bodies upon the gears and upon wheels...and you've got to make it stop. And you've got to indicate to the people who run it, to the people who own it, that unless you're free, the machine will be prevented from working at all.” - Mario Savio, Sproul sit-in address, December 2, 1964



**“Do not fold,  
spindle or  
mutilate.”**

PLATE 2. Free Speech marchers at Berkeley wear computer cards as signs of protest, December 1964. Photograph by Helen Nestor. Used by permission of the photographer and by courtesy of the Helen Nestor Collection, the Oakland Museum of California.

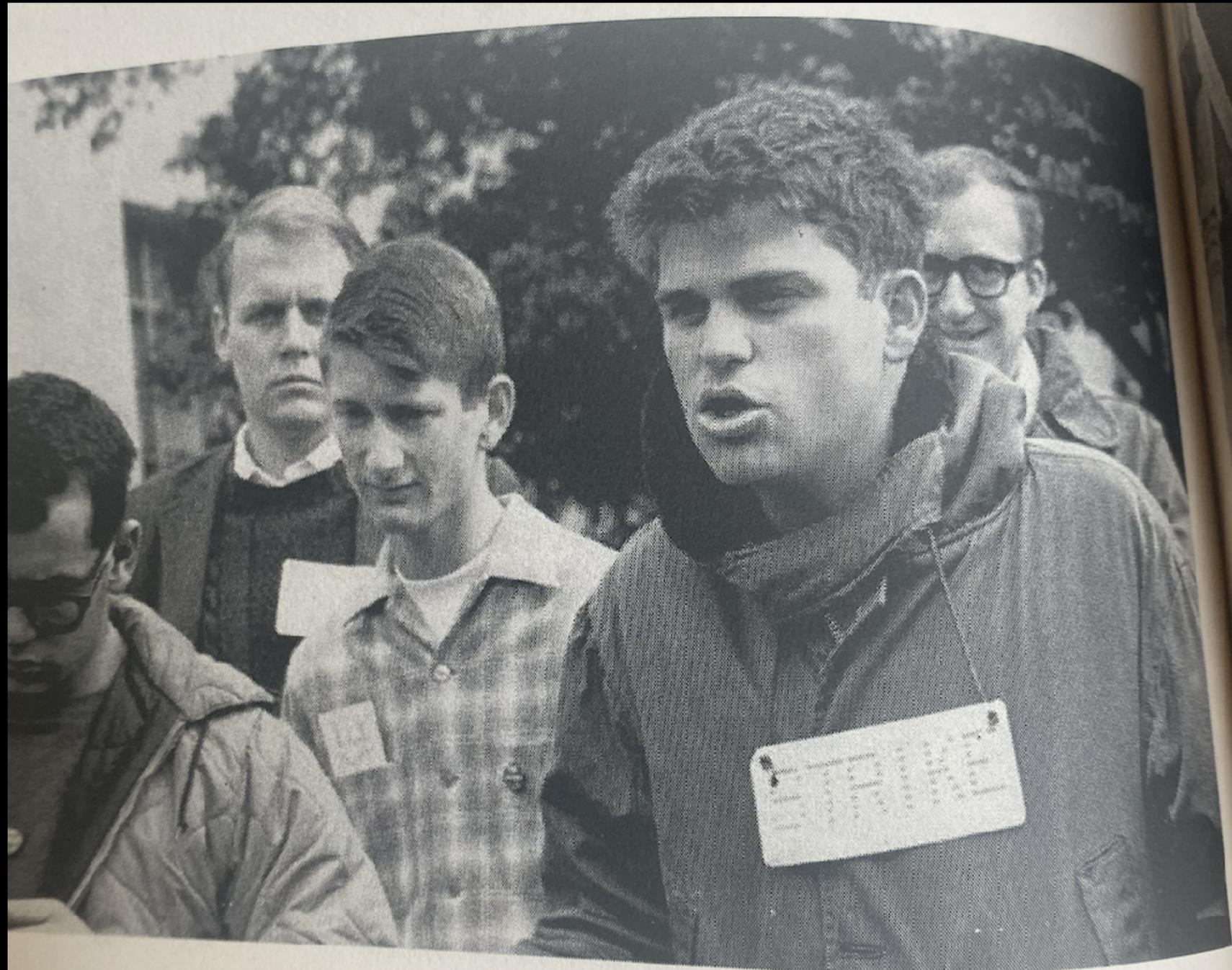


PLATE 2. Free Speech marchers at Berkeley wear computer cards as signs of protest, December 1964. Photograph by Helen Nestor. Used by permission of the photographer and by courtesy of the Helen Nestor Collection, the Oakland Museum of California.

**“Do not fold, spindle or mutilate.”**

Punch cards used for class registration = symbol of information machines

The student in the “mass university of today” feels that it is “an overpowering, over-towering, impersonal, alien machine in which he is nothing but a cog going through pre-programmed motions--the ‘IBM’ syndrome.” - Hal Draper, FSM activist, 1964

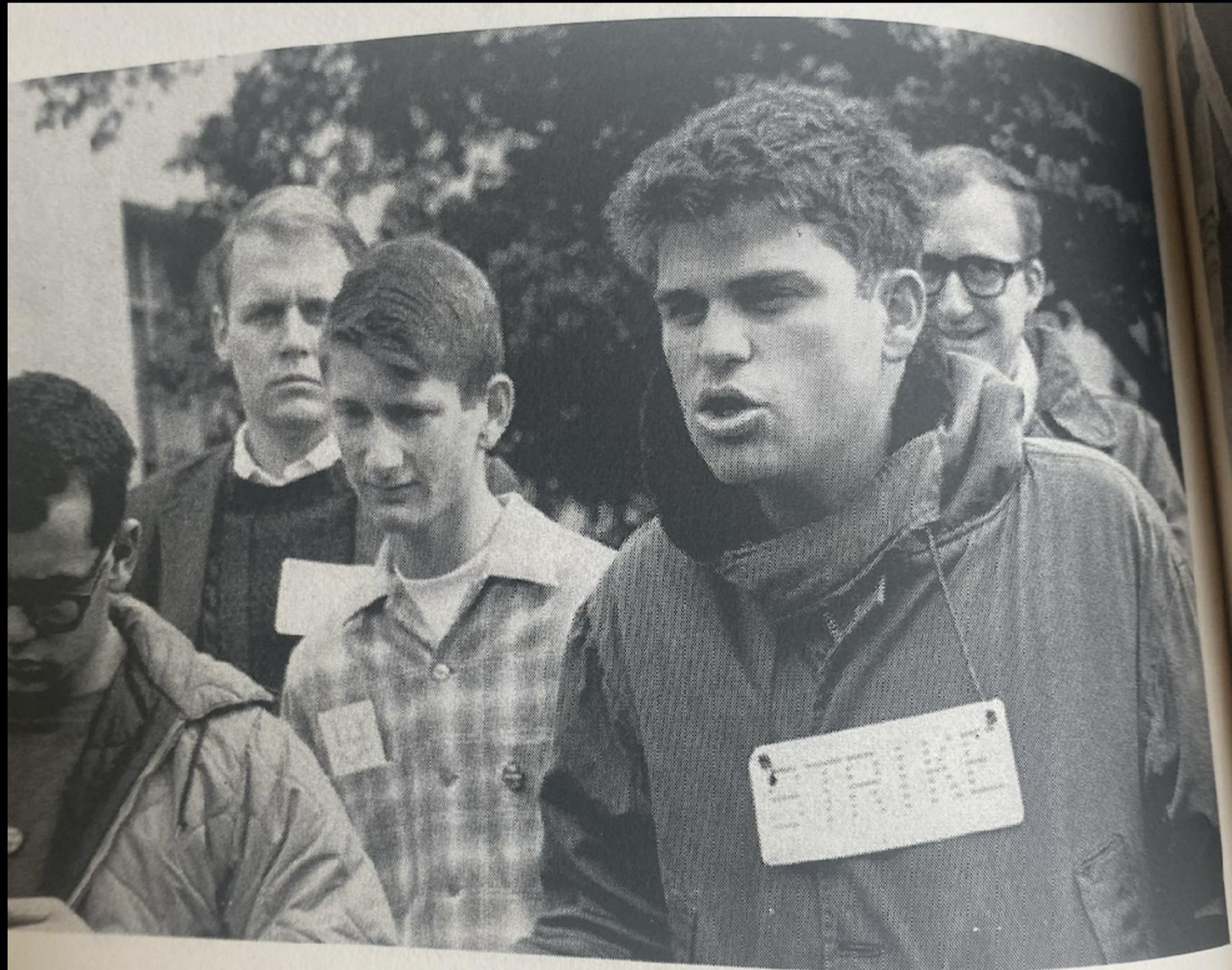
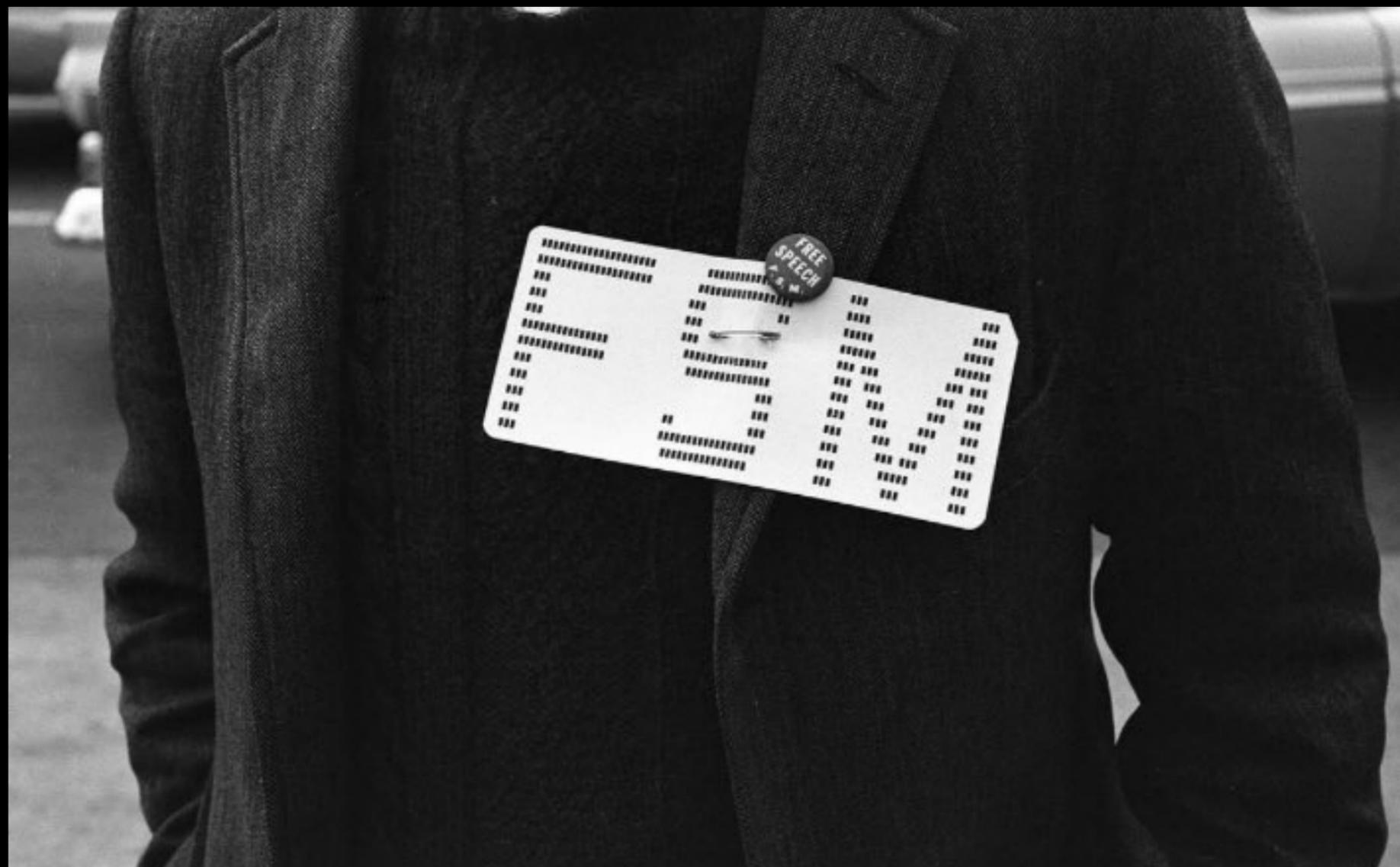


PLATE 2. Free Speech marchers at Berkeley wear computer cards as signs of protest, December 1964. Photograph by Helen Nestor. Used by permission of the photographer and by courtesy of the Helen Nestor Collection, the Oakland Museum of California.

**“Do not fold, spindle or mutilate.”**

**POLL!**

Do you feel like the "mass university of today" is "an overpowering, over-towering, impersonal, alien machine" in which you are "nothing but a cog going through pre-programmed motions--the 'IBM' syndrome."?

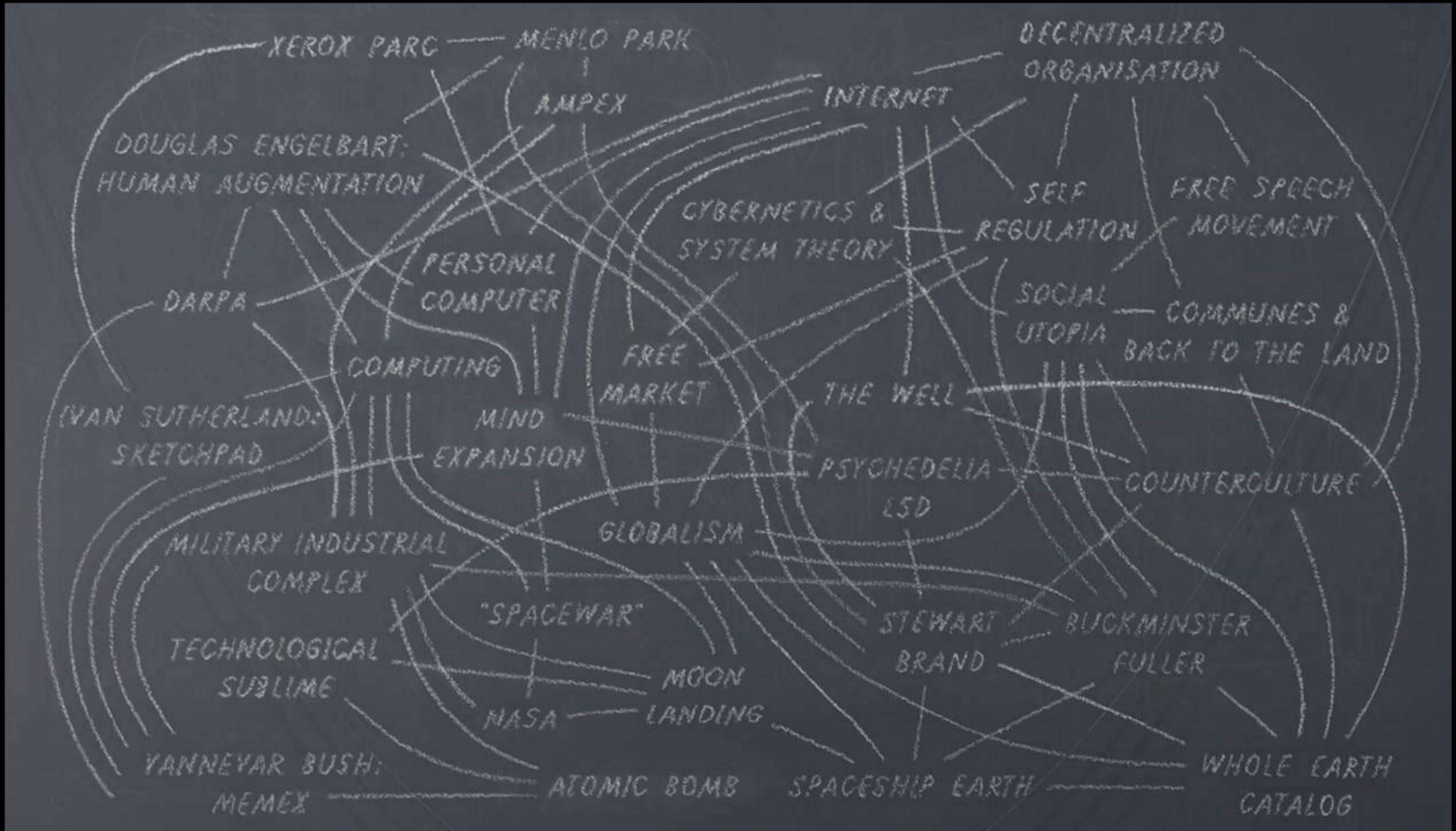


**“Do not fold,  
spindle or  
mutilate.”**

Punch cards represented anxiety about corporate technology, the information society, “Big Brotherism”, and automation.



We have our own collection of Catalogs at the Environmental Design Library!



Jürg Lehni & Wilm Thoben, Two Legacies, 2014  
All Possible Futures, SOMArts, San Francisco



**This is OUR history!**

**and future...**

# Silicon Valley.





An aerial photograph of Silicon Valley, showing a dense landscape of industrial and residential buildings, roads, and green spaces. In the background, there are rolling hills and mountains under a clear sky. The text "Silicon Valley." is overlaid in the center in a white, serif font with a slight drop shadow.

# Silicon Valley.

# PURPOSE

*We are as gods and might as well get good at it. So far remotely done power and glory—-as via government, big business, formal education, church—-has succeeded to point where gross defects obscure actual gains. In response to this dilemma and to these gains a realm of intimate, personal power is developing—-power of the individual to conduct his own education, find his own inspiration, shape his own environment, and share his adventure with whoever is interested. Tools that aid this process are sought and promoted by the WHOLE EARTH CATALOG.*

**“We are as gods and might as well get good at it.”**

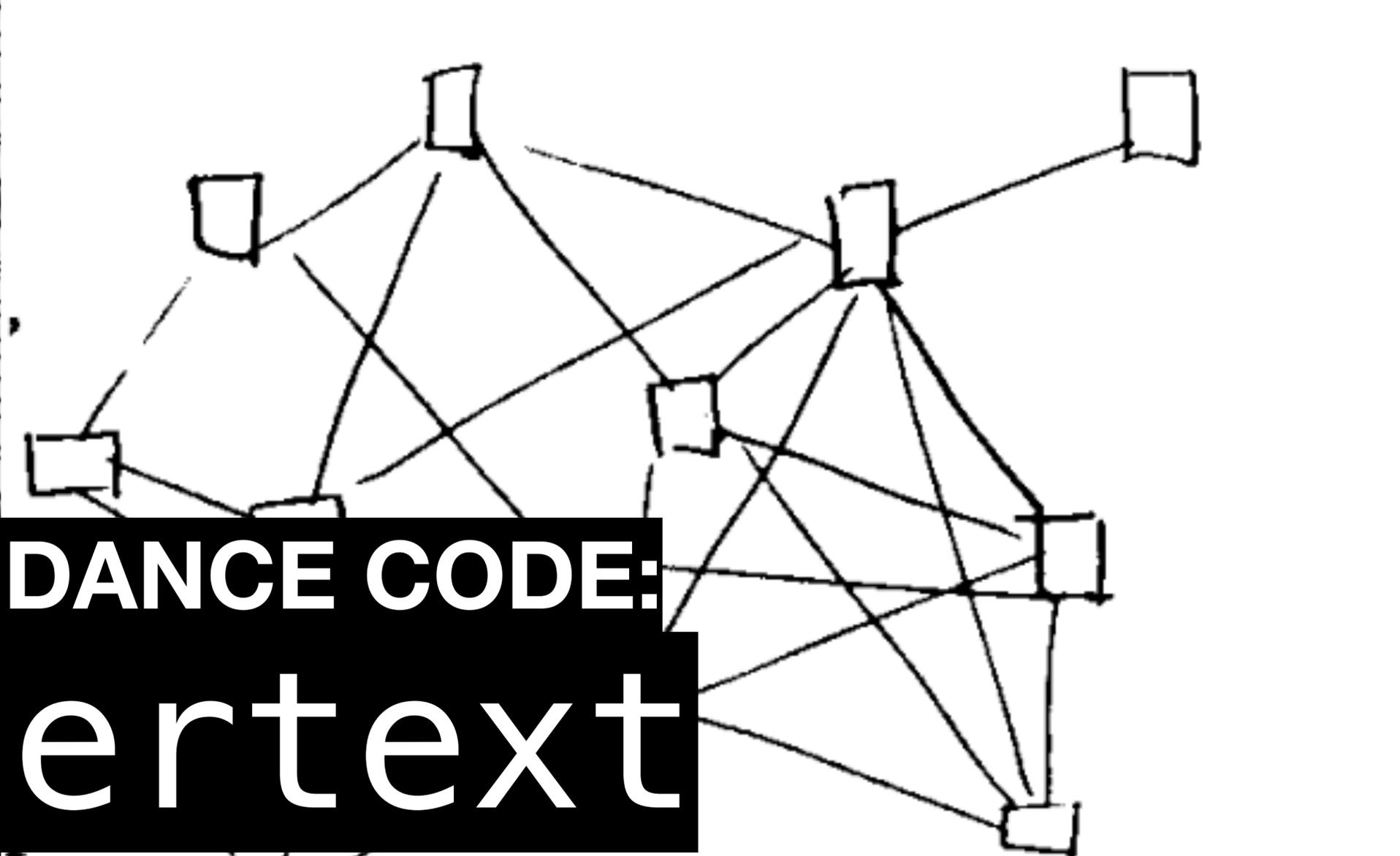


Thank you,

**Matthew Berry!**

Berkeley Media Studies Lecturer

Media Studies 168



**ATTENDANCE CODE:**  
**hypertext**



**EVERYTHING  
IS DEEPLY INTERTWINGLED.**

*In an important sense there are no "subjects" at all; there is only all knowledge, since the cross-*