

NOW WHAT?

Cybernetics, Design, and Society

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Cybernetics
Design
Value
Q&A



Cybernetics

Why cybernetics now?

~ WELCOME ~

to the Lunder Conservation Center, a place where visitors have the unique opportunity to see conservators at work in five different laboratories and studios.



*Go behind
the scenes...*

FRAMES STUDIO



PAINTINGS STUDIO



PAINTINGS LAB



PAPER LAB



OBJECTS LAB



Lunder CONSERVATION CENTER COMMENTS TOOLS RESOURCES ARCHIVE ABOUT CALENDAR VISIT

~ WELCOME ~

to the Lunder Conservation Center, a place where visitors have the unique opportunity to see conservators at work in five different laboratories and studios.




FRAMES STUDIO PAINTINGS STUDIO PAINTINGS LAB PAPER LAB OBJECTS LAB

Go behind the scenes...



[Smithsonian American Art Museum](#) | [National Portrait Gallery](#) | [Luce Foundation Center](#) | [Site Map](#) | [Privacy](#)


 [Printer-friendly](#)

 **Smithsonian**
Donald W. Reynolds Center for American Art and Portraiture
National Portrait Gallery
Smithsonian American Art Museum

Copyright © 2006 Smithsonian



Smithsonian American Art Museum
 Open daily: 11:30 a.m.–7 p.m.
Renwick Gallery
 Open daily: 10:00 a.m.–5:30 p.m.

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Luce Foundation Center

The Smithsonian American Art Museum's Luce Foundation Center for American Art is the first visible art storage and study center in Washington, D.C.

This innovative public space on SAAM's third and fourth floors offers visitors new ways to experience American art.

Take part in one of our [public programs and activities](#) or wander through our aisles exploring [paintings](#), [sculpture](#), contemporary craft pieces, and folk art objects.

Have questions? Museum staff members are available at the Luce Foundation Center information desk seven days a week to answer visitor questions and conduct tours. Or try our [free audio tour!](#)

WHAT CAN I SEE IN THE LUCE CENTER?

Browse the artworks currently on view in the Luce Center



Washington, DC artist Kristina Bilanick demonstrates screen printing for the Luce Local Artists Series

STAY CONNECTED!

Keep up to date with the Luce Foundation Center by becoming a fan on [facebook.com/americanartluce](#).

Sign up to receive email updates about Luce Foundation Center activities.

Share your pics and thoughts on [#LuceLocal](#)

Interested in volunteering at Luce? See [Volunteer Opportunities](#)

CONTACT THE STAFF

If you have a question or would like to schedule a tour, please contact the Luce Foundation Center information desk AmericanArtLuce@si.edu.

Bridget Callahan
 Luce Foundation Center Coordinator
CallahanB@si.edu

Anne Wilsey
 Luce Foundation Center Program Assistant
WilseyAK@si.edu

VISIT

[Visit the Museums](#)

[SAAM](#)

[Kogod Courtyard](#)

[Luce Foundation Center](#)

[Luce Programs & Activities](#)

[Luce Unplugged](#)

[Luce Scavenger Hunts](#)

[Luce Center Audio Tour](#)

[Lunder Conservation Center](#)

[Courtyard Cafe](#)

[McEvoy Auditorium](#)

[SAAM Store](#)

[Renwick Gallery](#)

[Calendar of Events](#)

[Museum Tours](#)

[Accessibility](#)

[Family-friendly Activities](#)

[Guidelines and Policies](#)

[Current Exhibitions](#)

ABOUT THE HISTORIC LUCE CENTER SPACE

The Luce Foundation Center occupies 24,000 square feet on the third and fourth floors of the historic Patent Office Building's west wing. Built between 1836 and 1862, the Patent Office Building is one of the oldest public buildings in Washington, D.C. The west wing was built between 1852 and 1857 under the direction of Thomas U. Walter, architect of the Capitol. It was in this space that the patent models, which had been submitted and rejected for patent, were on view to the public. During the Civil War, the First Rhode Island Regiment camped here, bunking in between the patent model cases. President Abraham Lincoln hosted his second Inaugural Ball on the building's third floor. Guests promenaded through the east wing to the south wing for dancing. Dinner took place in the west wing, where the 4,000 guests rushed en masse to the buffet tables, overcrowding them and causing quite a mess. In 1877, a fire destroyed the upper floors of the north and west wings and nearly 87,000 patent models. Adolf Cluss, who also designed the Smithsonian's Arts and Industries Building and Eastern Market, and his partner Paul Schulze oversaw the rebuilding of the damaged areas.

The Patent Office moved out of the building in 1932 and the Civil Service Commission occupied the building for the next 30 years. During the 1950s, the building avoided demolition with the help of D.C.'s budding historic preservation movement and in 1955 became a National Historic Landmark. Congress passed ownership of the building to the

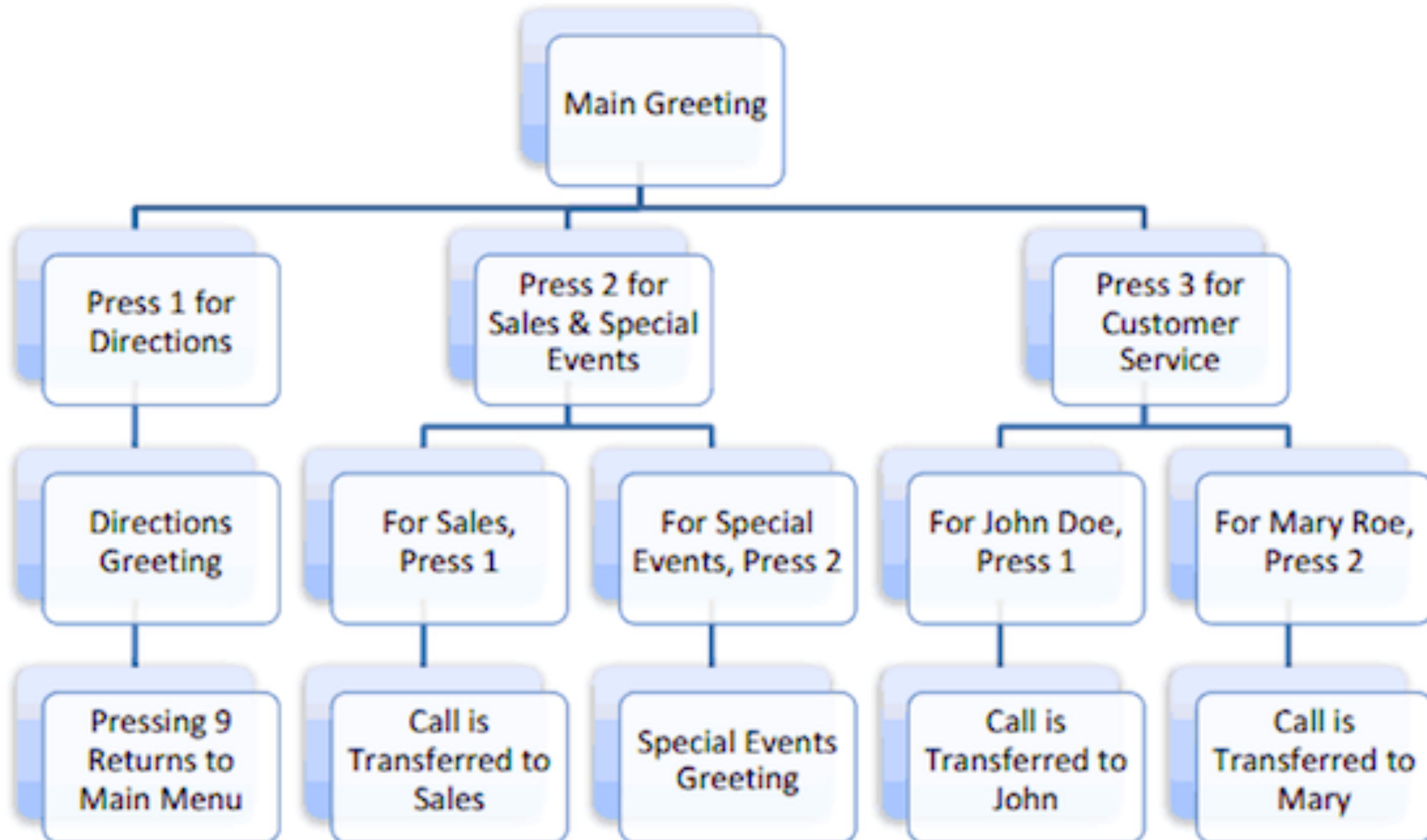


Solid Gold

`Funny cat`

Gobbledy Gook

Gobbledy Gook





HOME / PRODUCT CATEGORIES / SENSORS (234 PRODUCTS)

Sensors

- SORT BY:**
- Most Popular
 - Highest Price
 - Lowest Price
 - Alphabetical
 - Highest Reviewed
 - Newest
 - Oldest

- SUBCATEGORY:**
- Biometrics
 - Capacitive
 - Current
 - Environment
 - Flex / Force
 - Imaging
 - Infrared
 - Misc. Sensors
 - Movement
 - Proximity
 - Radiation
 - RFID
 - Sensor Kits

- REFINE BY:**
- SparkFun Original
 - On sale
 - In stock

- CUSTOMER REVIEWS:**
- ★★★★★
 - ★★★★☆
 - ★★★☆☆
 - ★★☆☆☆
 - ★☆☆☆☆

JUMP TO SUBCATEGORY:

- [Biometrics](#)
[Capacitive](#)
[Current](#)
[Environment](#)
[Flex / Force](#)
[Imaging](#)
[Infrared](#)
[Misc. Sensors](#)
[M](#)

1 2 3 4 5



Thermistor 10K
 SEN-00250
 \$0.75



Electret Microphone
 COM-08635
 \$0.95



Hall Effect Sensor - US1881
 COM-09312
 \$0.95



Gas Sensor Breakout - US1881
 BOB-08891
 \$0.95
 ★★★★★☆ 2



Optical Detector / Phototransistor - QRD1114
 SEN-00246
 \$0.95
 ★★★★★☆ 3



SparkFun Photo Interrupter Breakout Board - GPIA57HRJ00F
 BOB-09322
 \$1.50
 ★★★★★☆ 1



UHF RFID Tag - Adhesive (Set of 5)
 WRL-14151
 \$1.50



Temperature Sensor - TMP36
 SEN-10988
 ★★★★★☆ 16



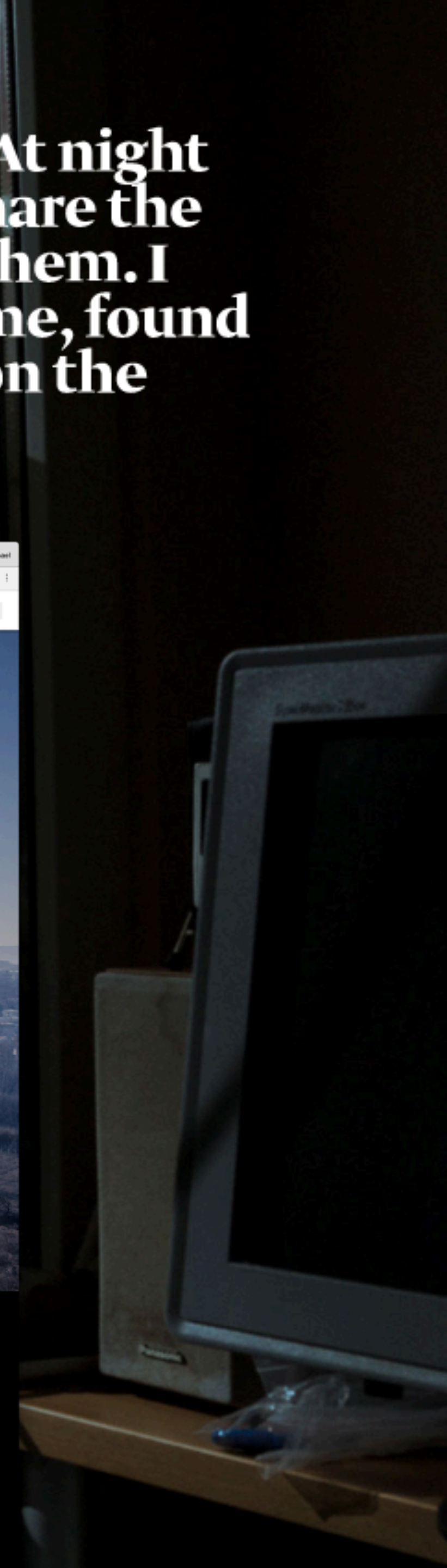
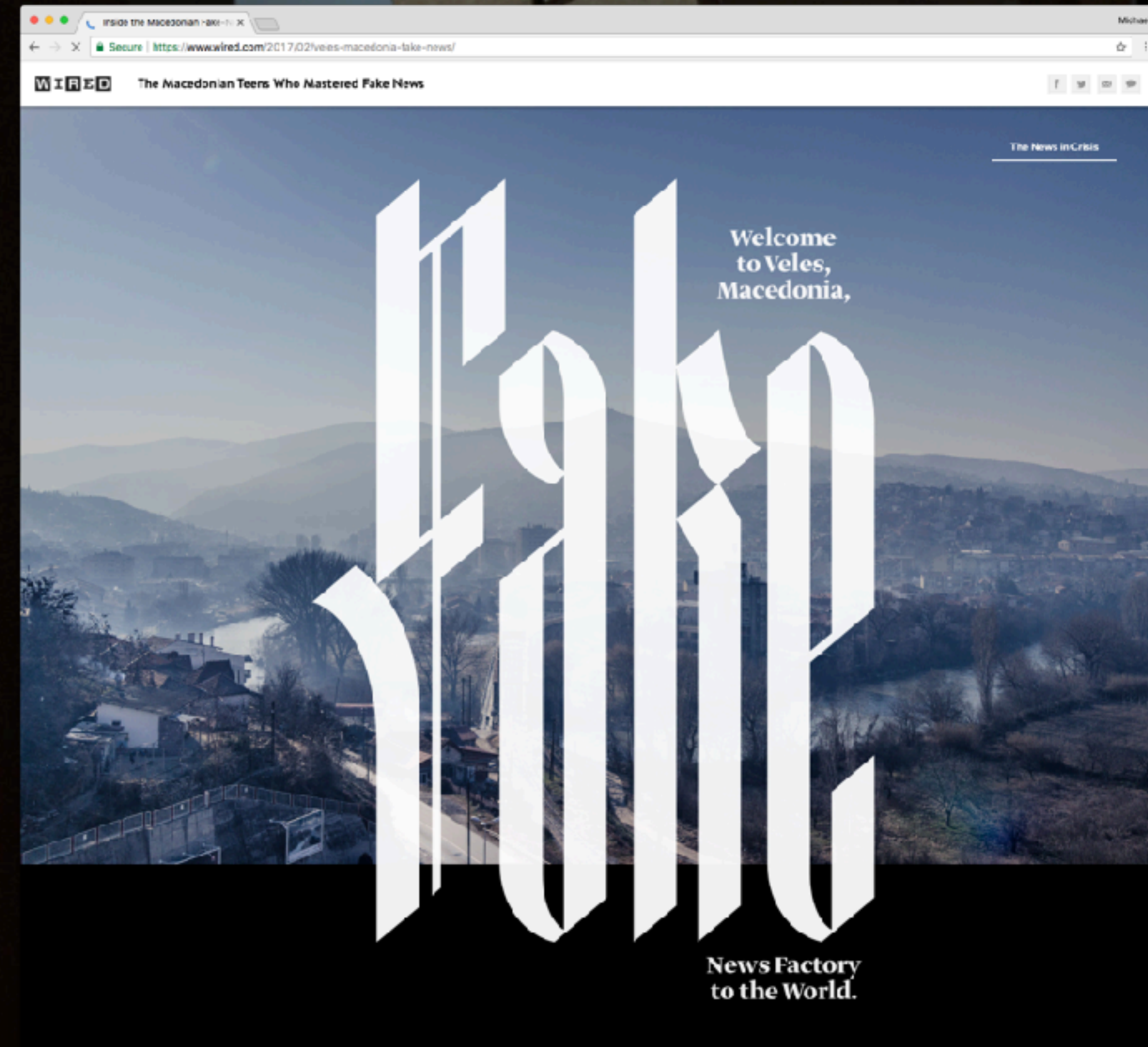


Cybernetics Conference

November 18, 2017

GAEA

Boris fed the beast with diligence. “At night I would make four or five posts to share the next day. When I woke up, I shared them. I went to drink coffee, came back home, found new articles, posted those articles on the website, and shared them.”



-75%

Newspaper Revenue

-50%

Journalists



“The thought process behind building the social media giant was: ‘How do we consume as much of your time and conscious attention as possible?’”

Interfaces → Systems

What is cybernetics, anyway?

Where did it come from?

In what sense is cybernetics about “control”?

Does it enable control of systems? Why is it a “tricky word”?

What are the most
important contributions
of cybernetics?

Systems



can be **Static** or **Dynamic**



which can be **Linear** or **Closed-loop**



which can be **Recirculating** or **Self-regulatory**

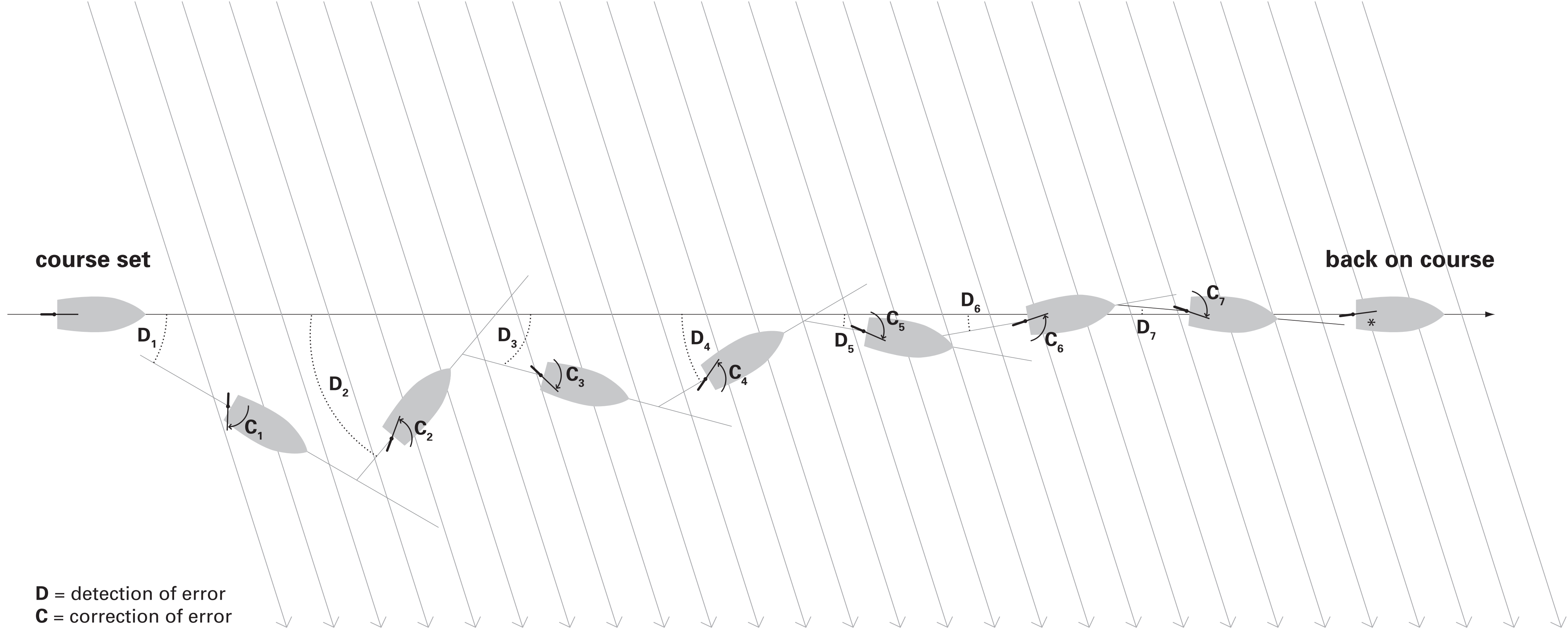


which can be **First-** or **Second-order**



which can be **Self-adjusting** or **Learning**

wind or tide



D = detection of error
C = correction of error

Detection of Error

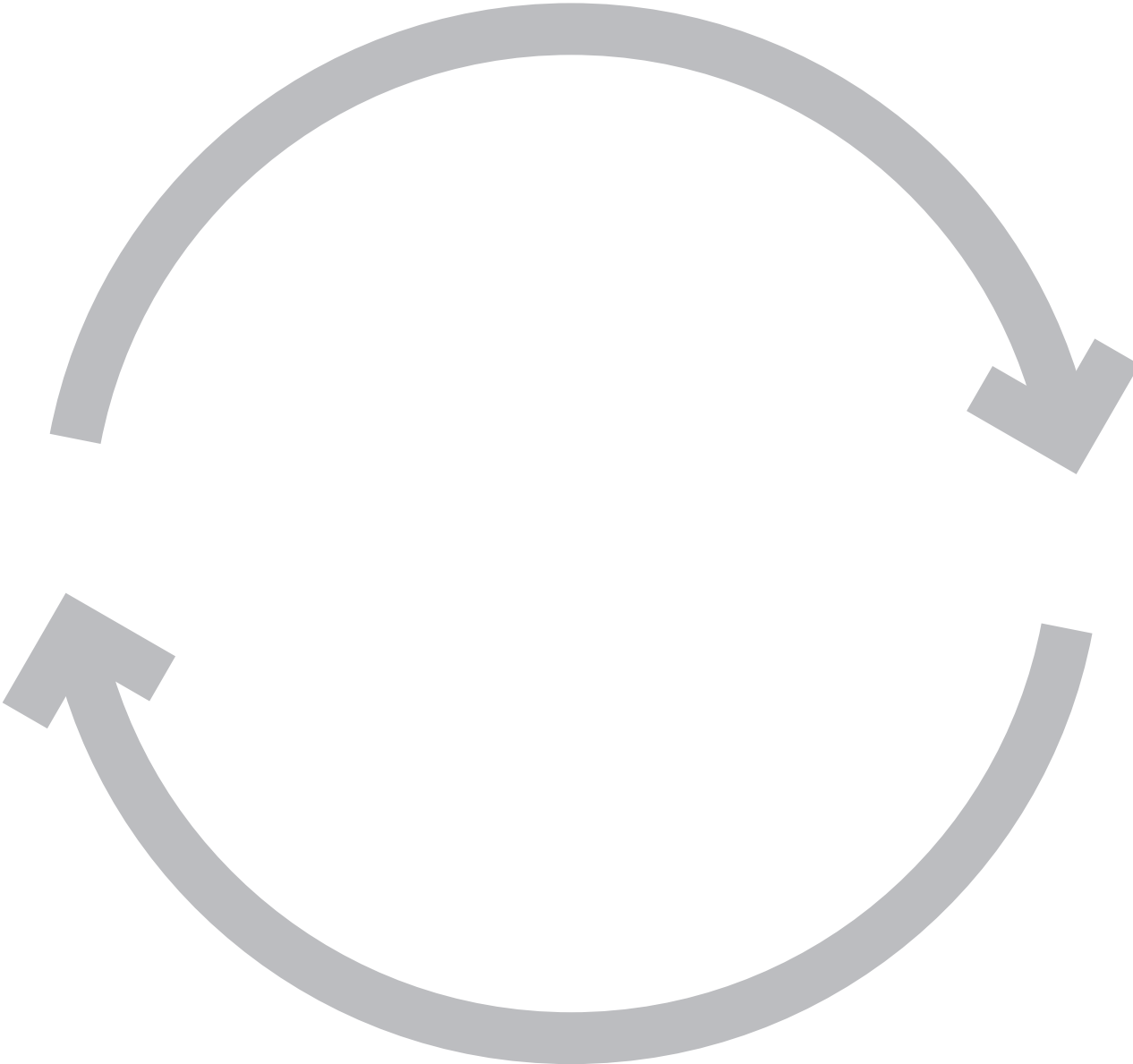
Compares heading with goal of reaching port

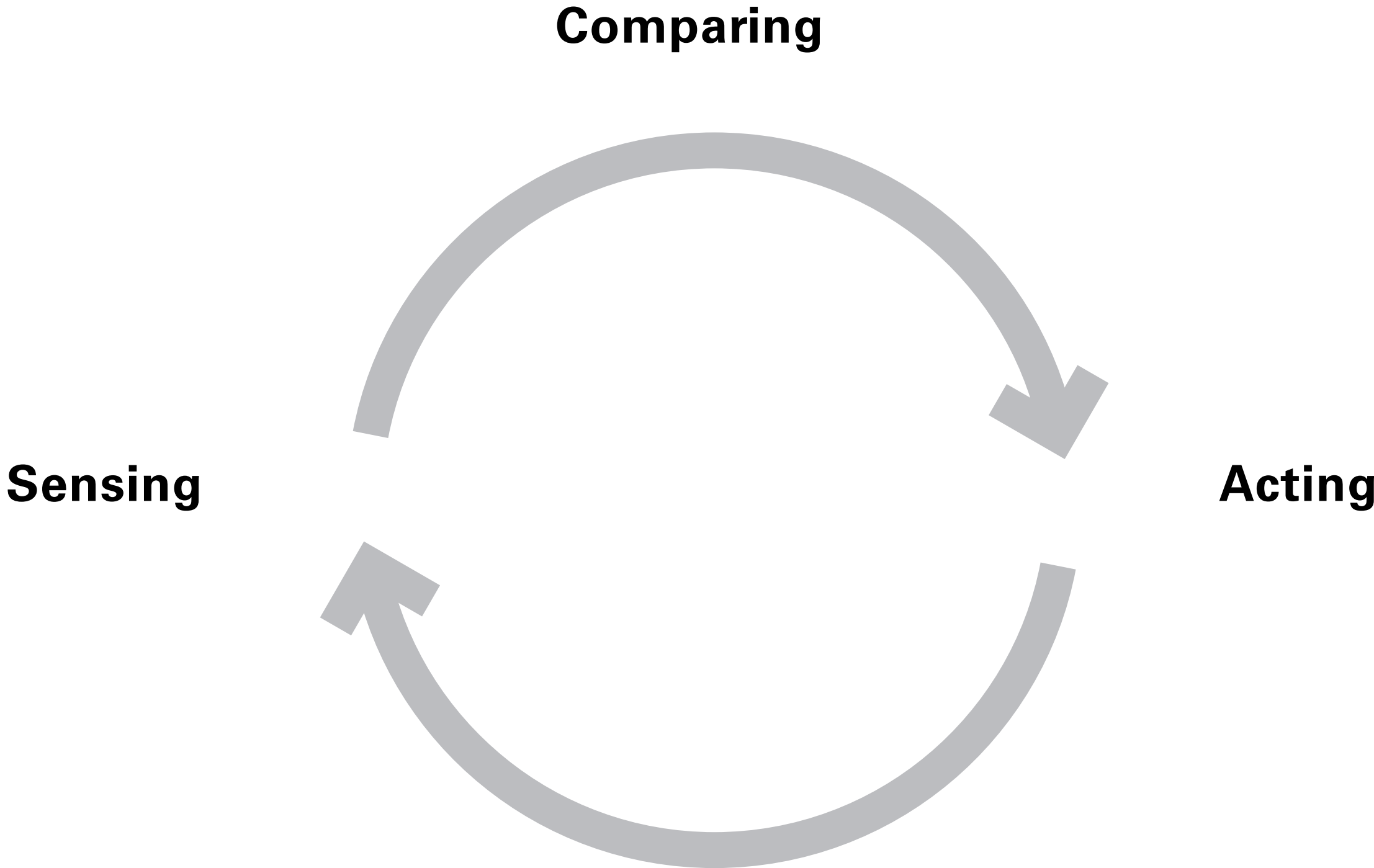
Correction of Error

Adjusts rudder to correct heading

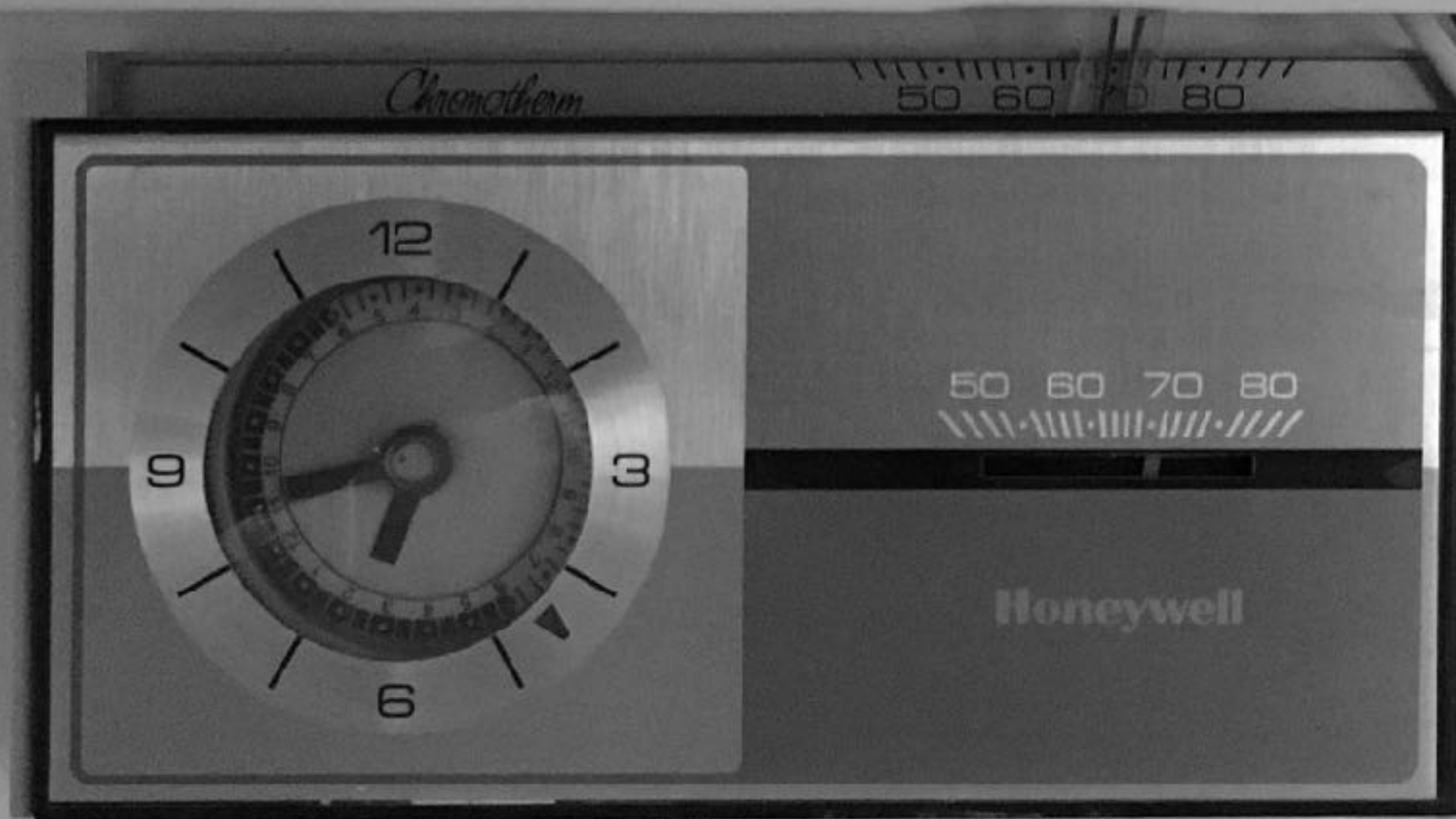
Feedback

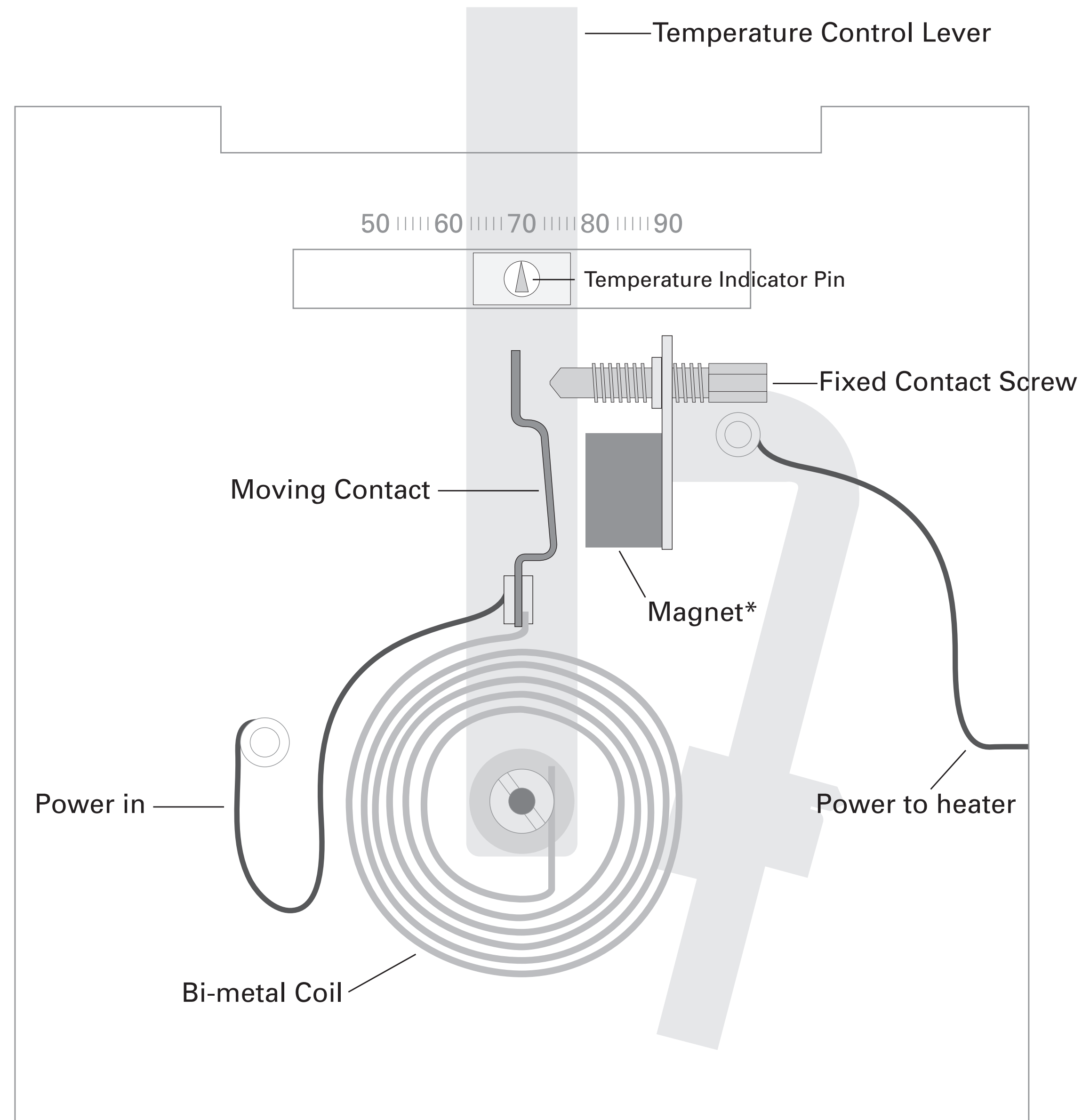
Ship's heading

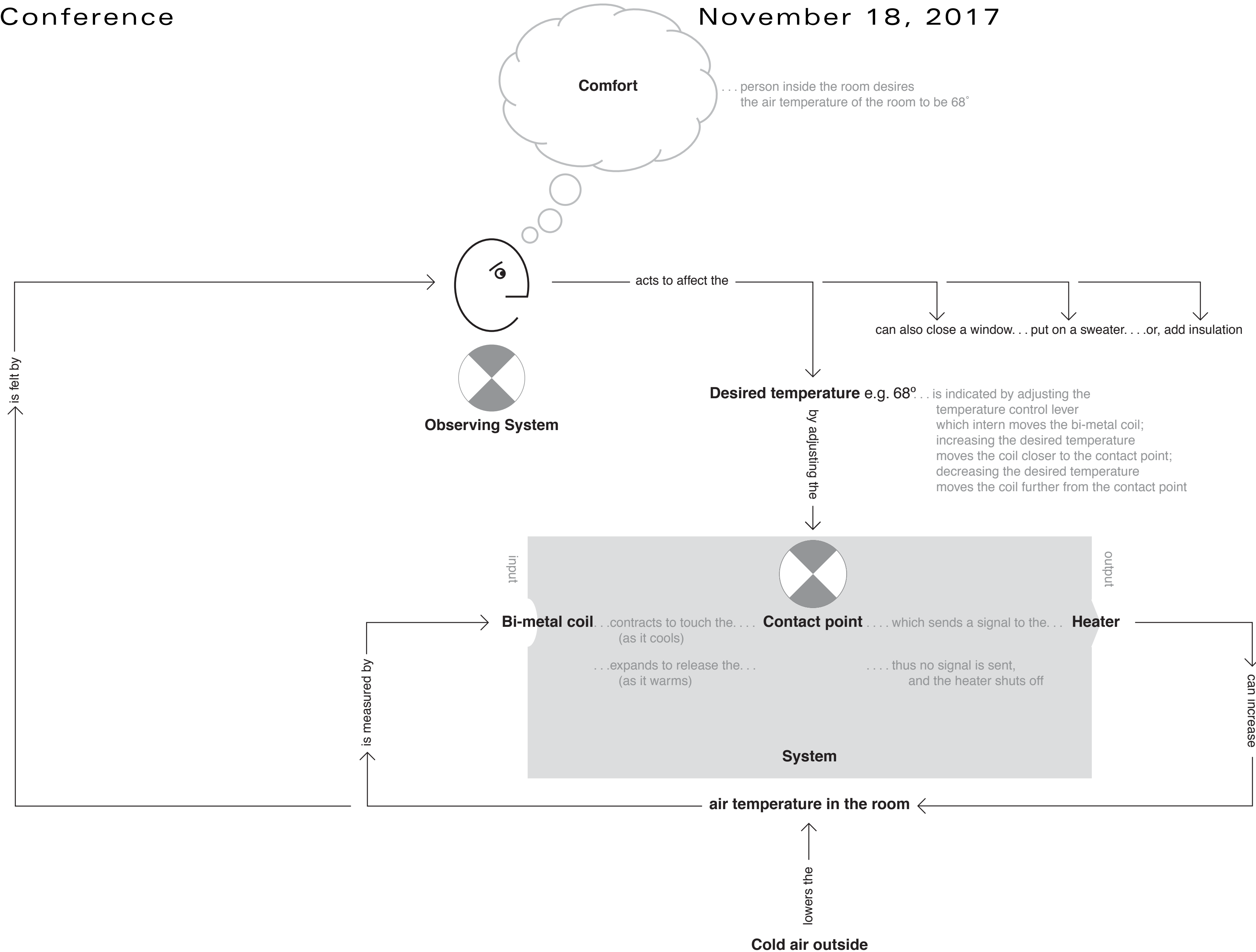












Result = EV Preserved
(system succeeds—"lives")

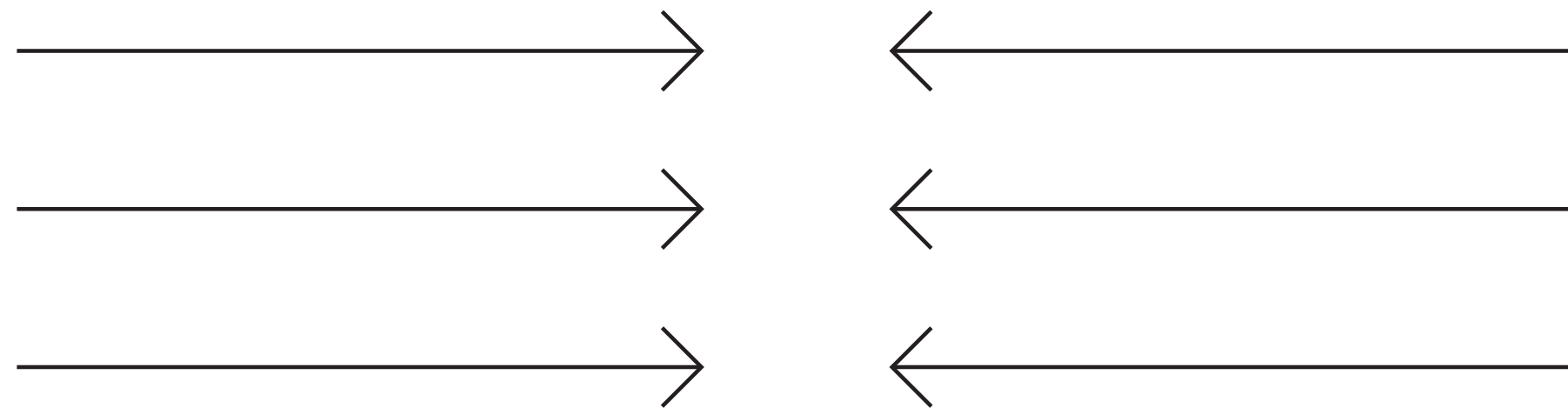
Variety in
Disturbance

Variety in
Response

Example: A



Example: B



Result = EV Destroyed
(system fails—"dies")

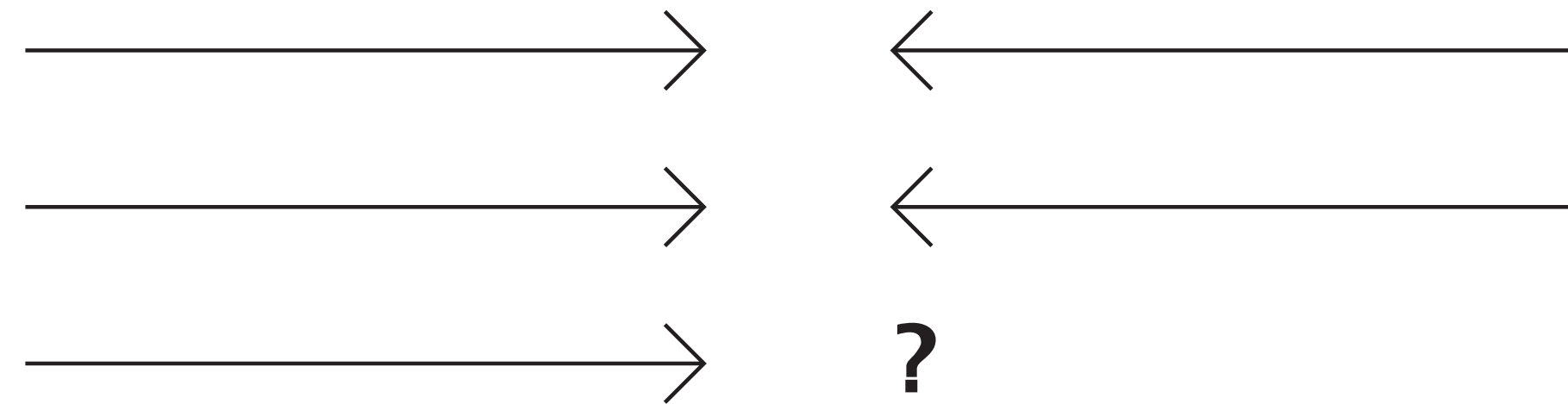
Variety in
Disturbance

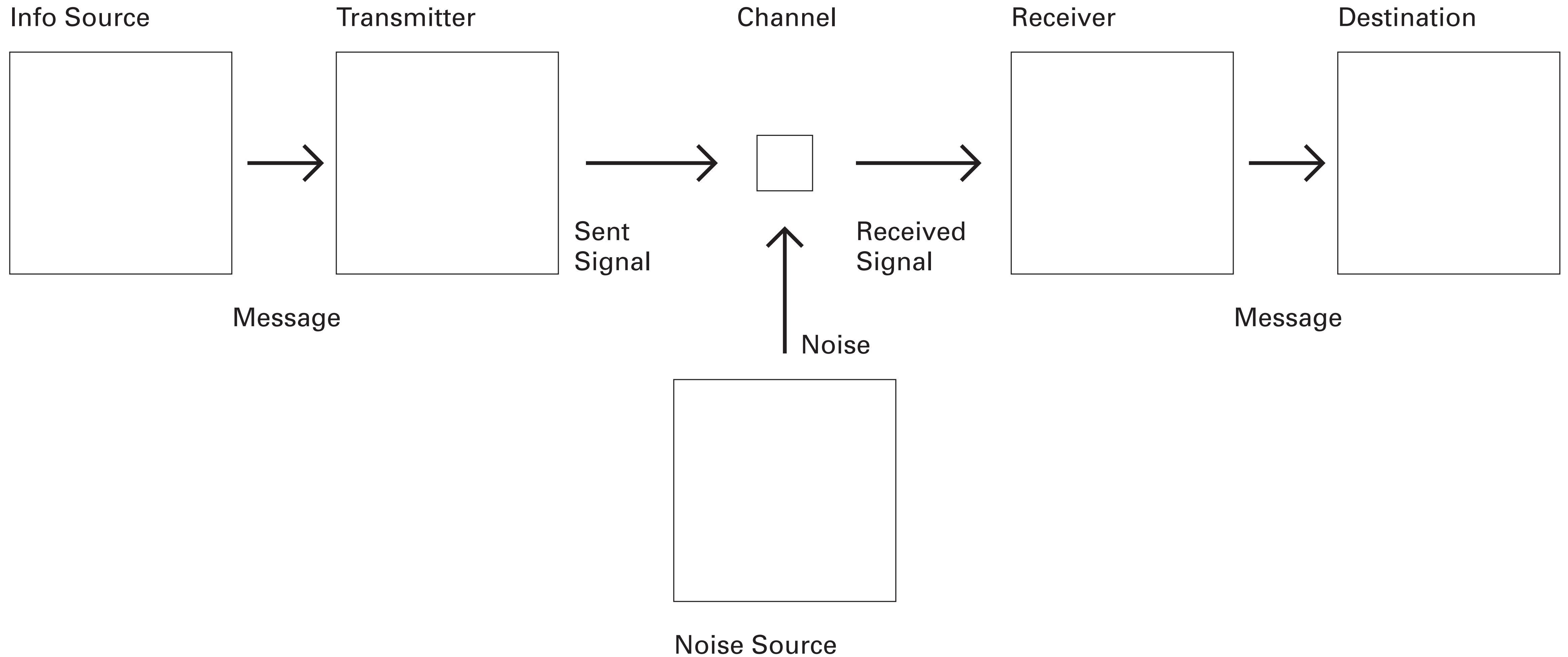
Variety in
Response

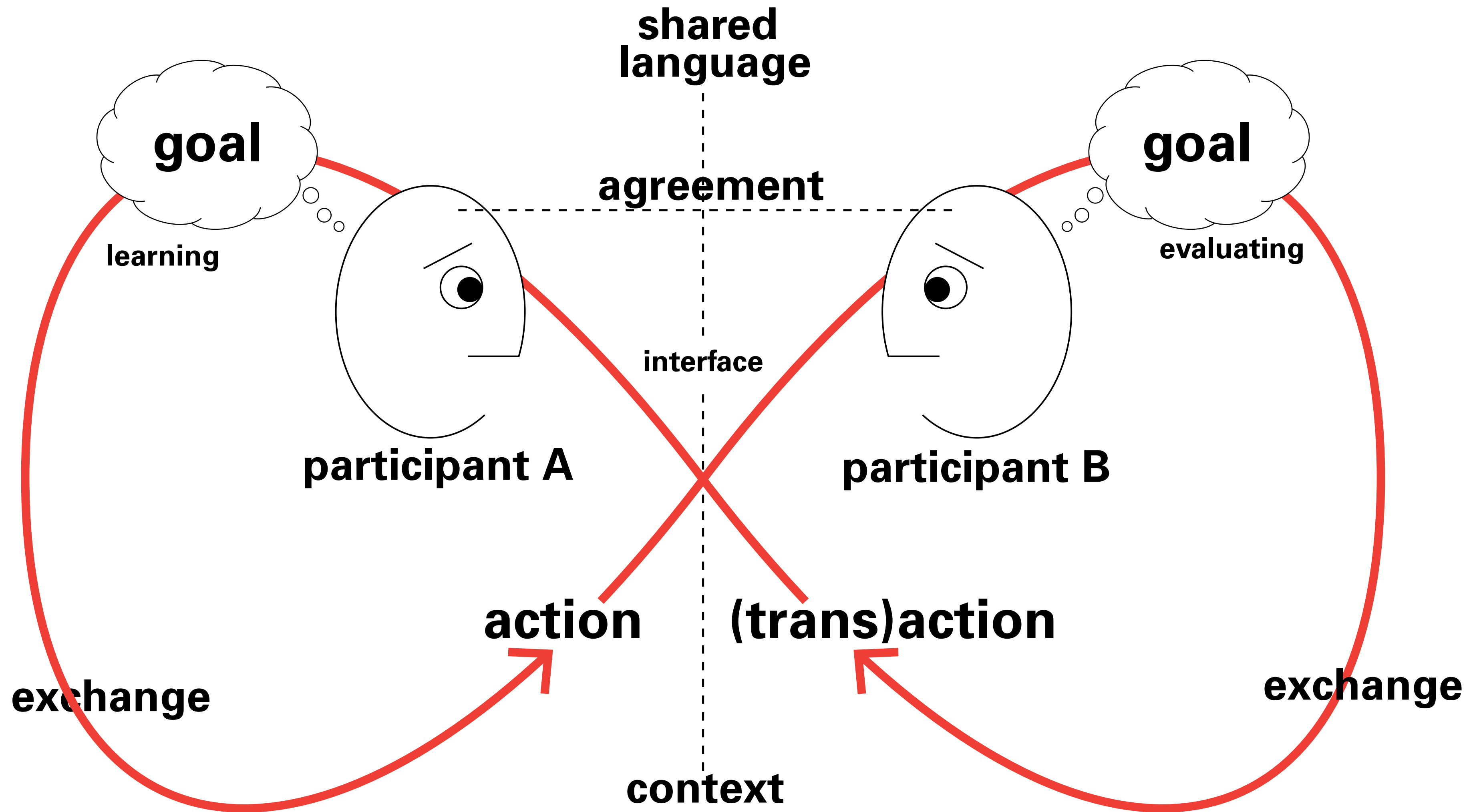
Example: A

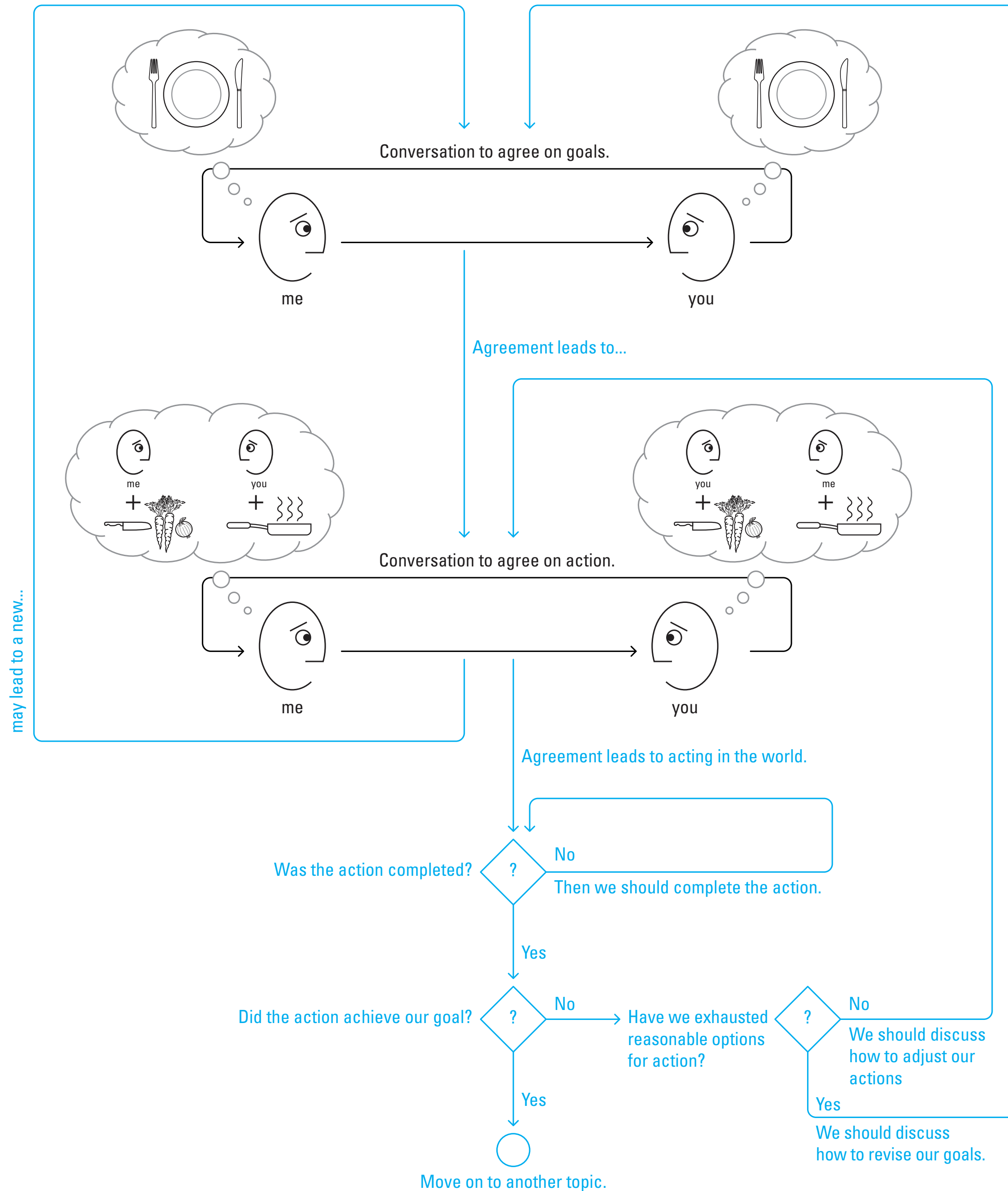


Example: B





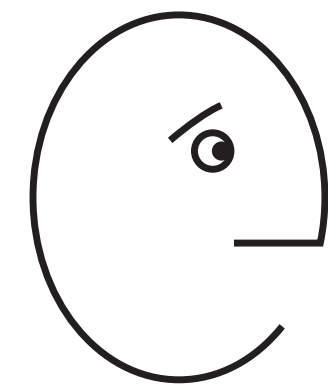




2nd-order cybernetics

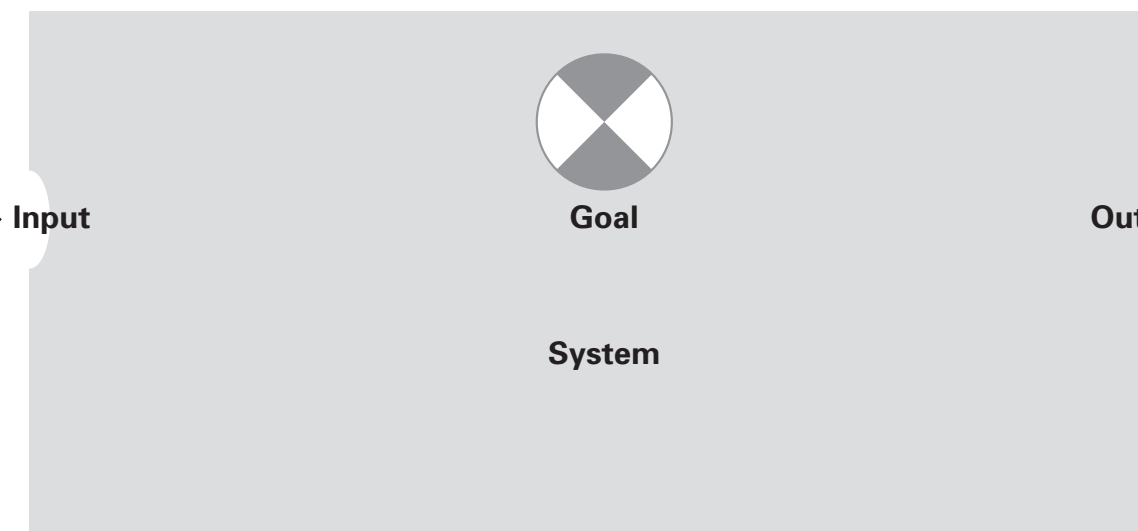
1st-order cybernetics

observing system



Observer

observed system



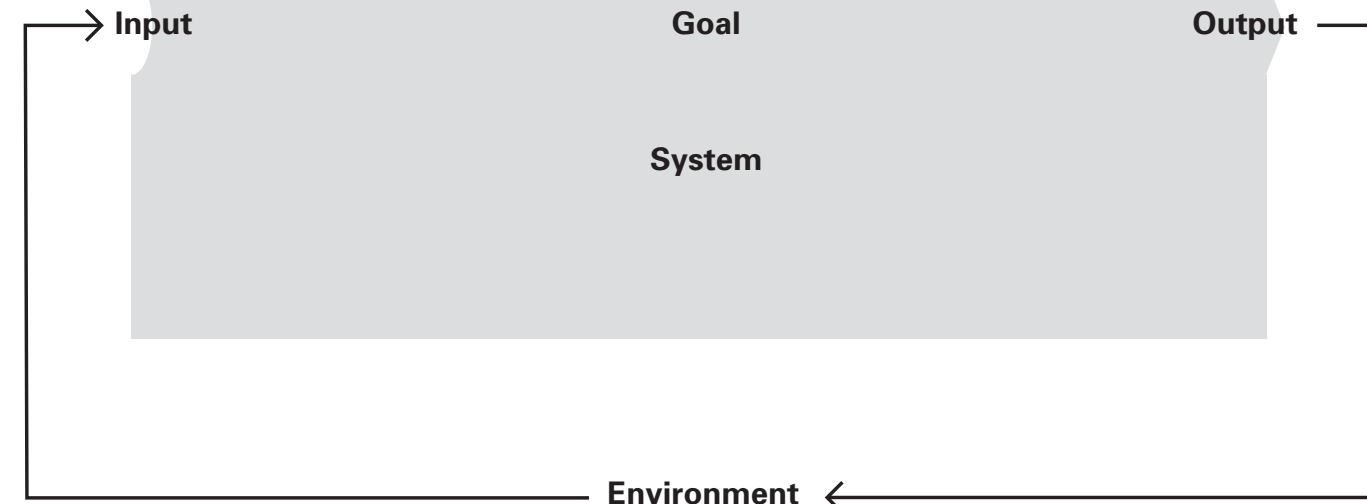
Input

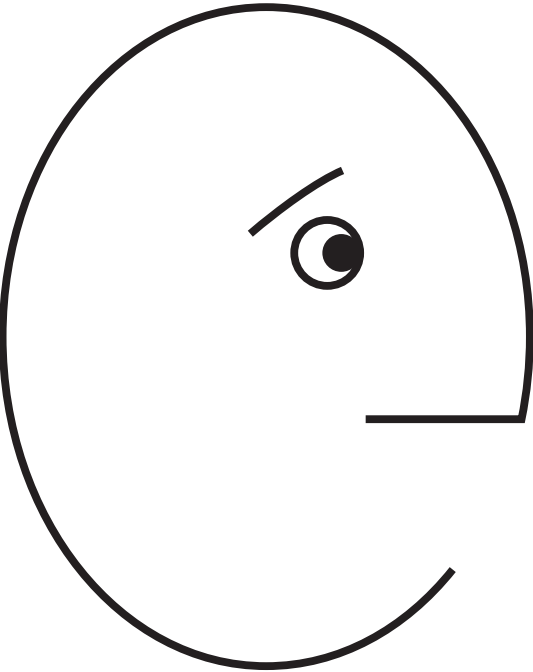
Goal

System

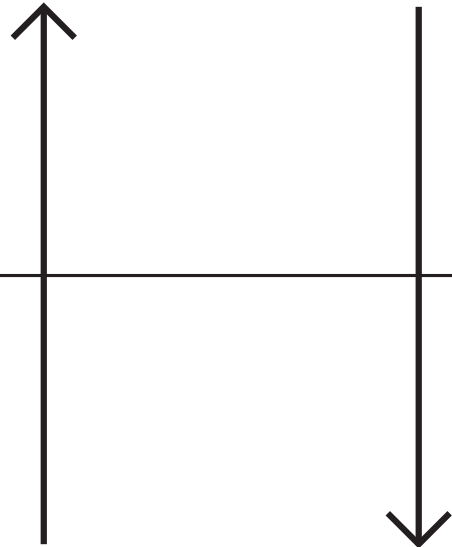
Output

Environment

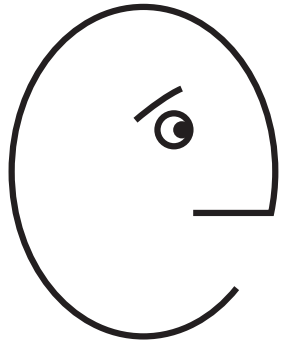




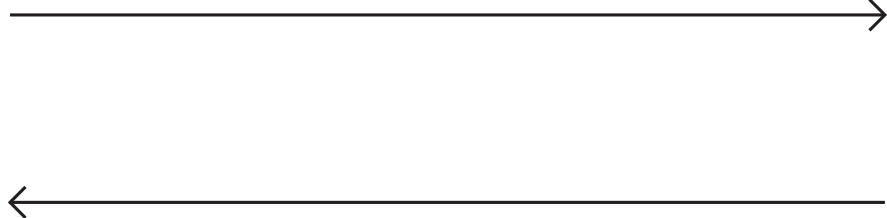
Observer



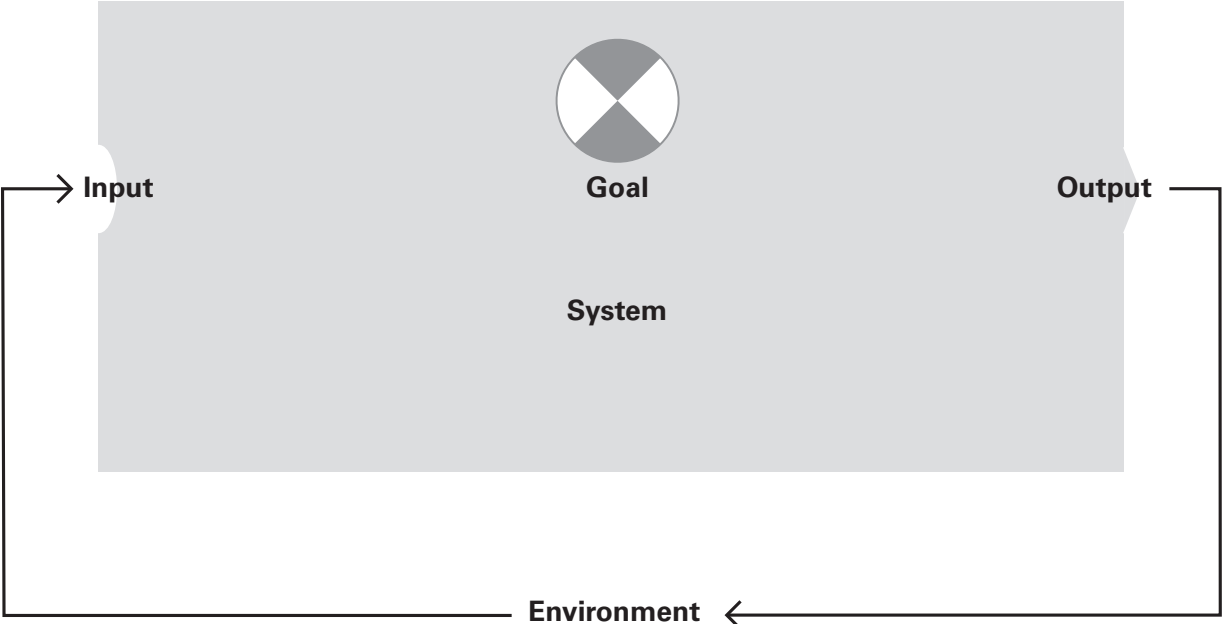
observing system



Observer

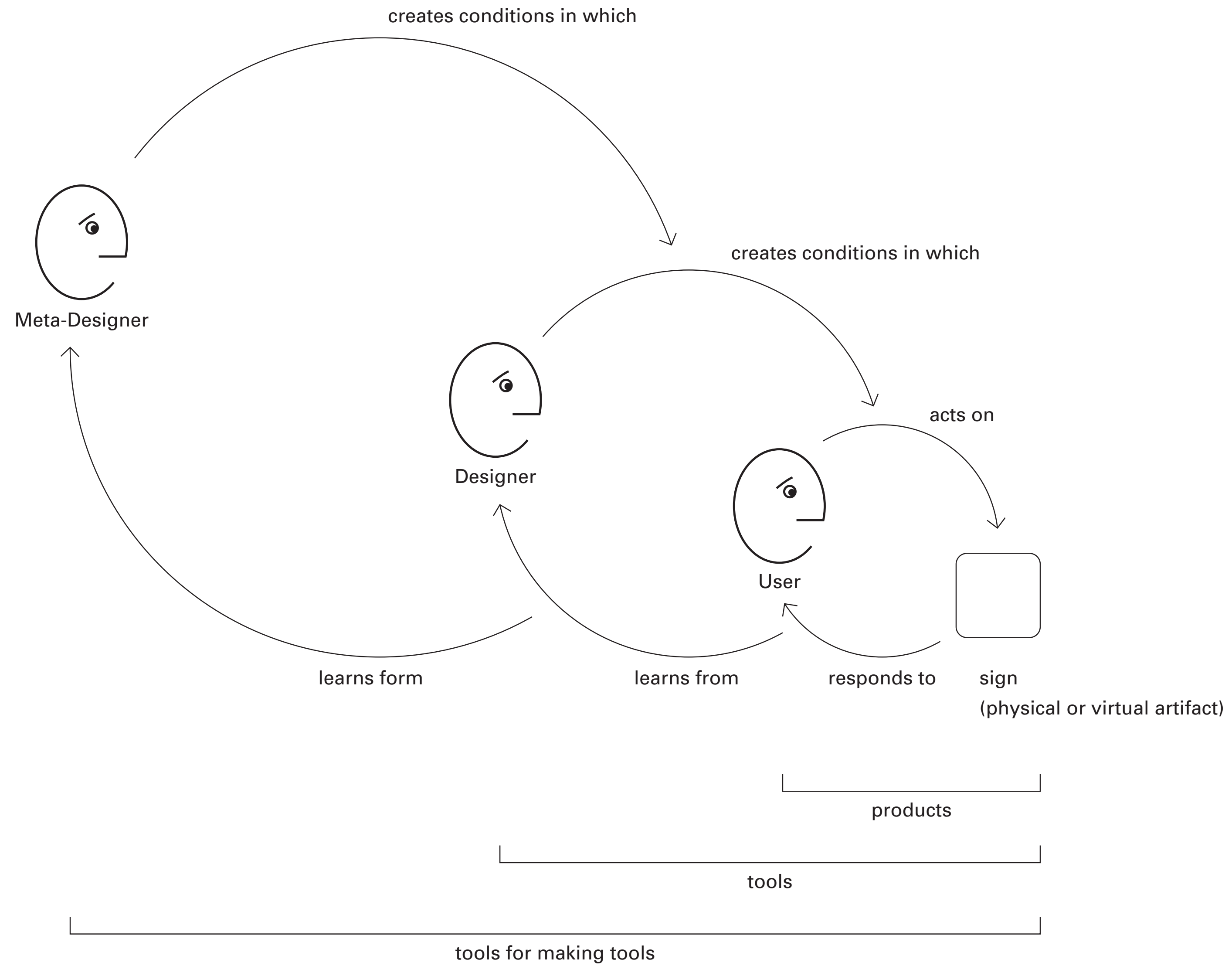


observed system



Second-order brings a new perspective: that the observer is part of a system of her observing.

This means, in short, subjectivity; which leads to the role/responsibilities of the observer in framing (seeing/adopting and developing language); and therefore, responsibility for what is designed.



Where does cybernetics fit into an “era analysis” that includes the “industrial age” and the “information age”?

The Machine Revolution

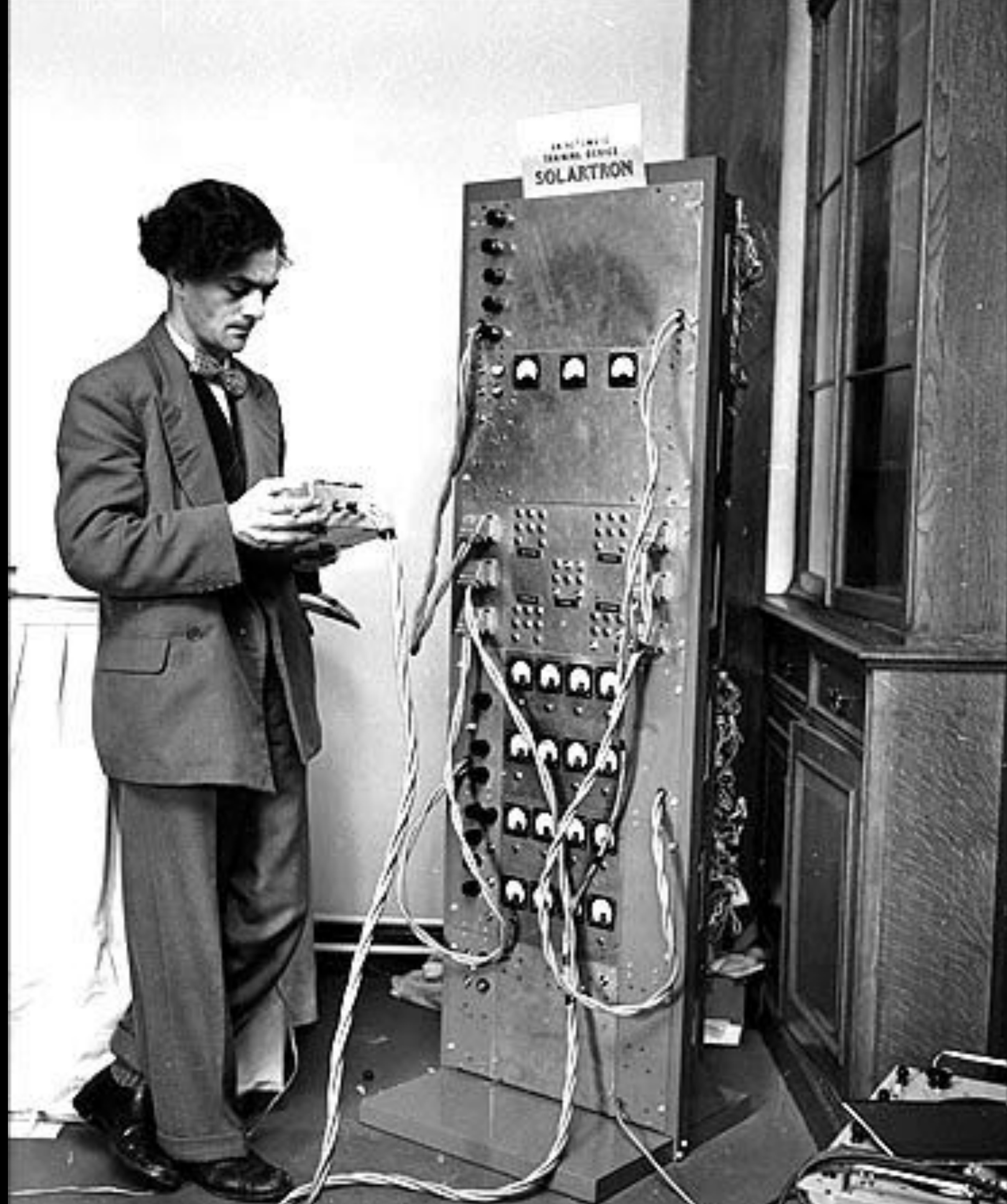
Role of machines...	Industrial Revolution (1750–1850)	Computer Revolution (1955–1995)	Conversation Revolution (2015–?)
Extend and enhance...	...muscles	...nervous system	...muscles and nervous system
Create value by lowering the cost of...	...performing physical labor	...performing cognitive tasks	...collaborating



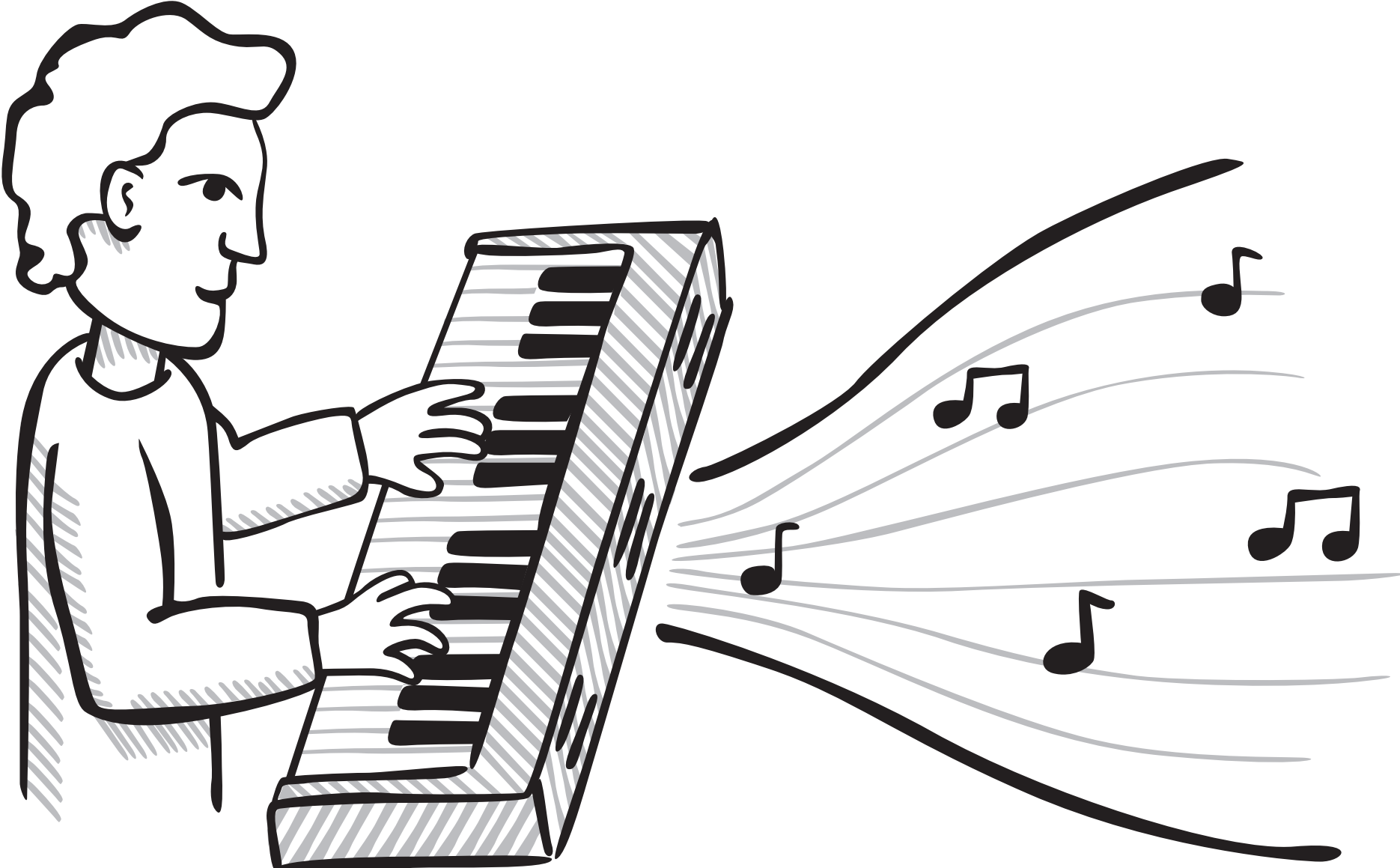
How does cybernetics help frame technology for humans?

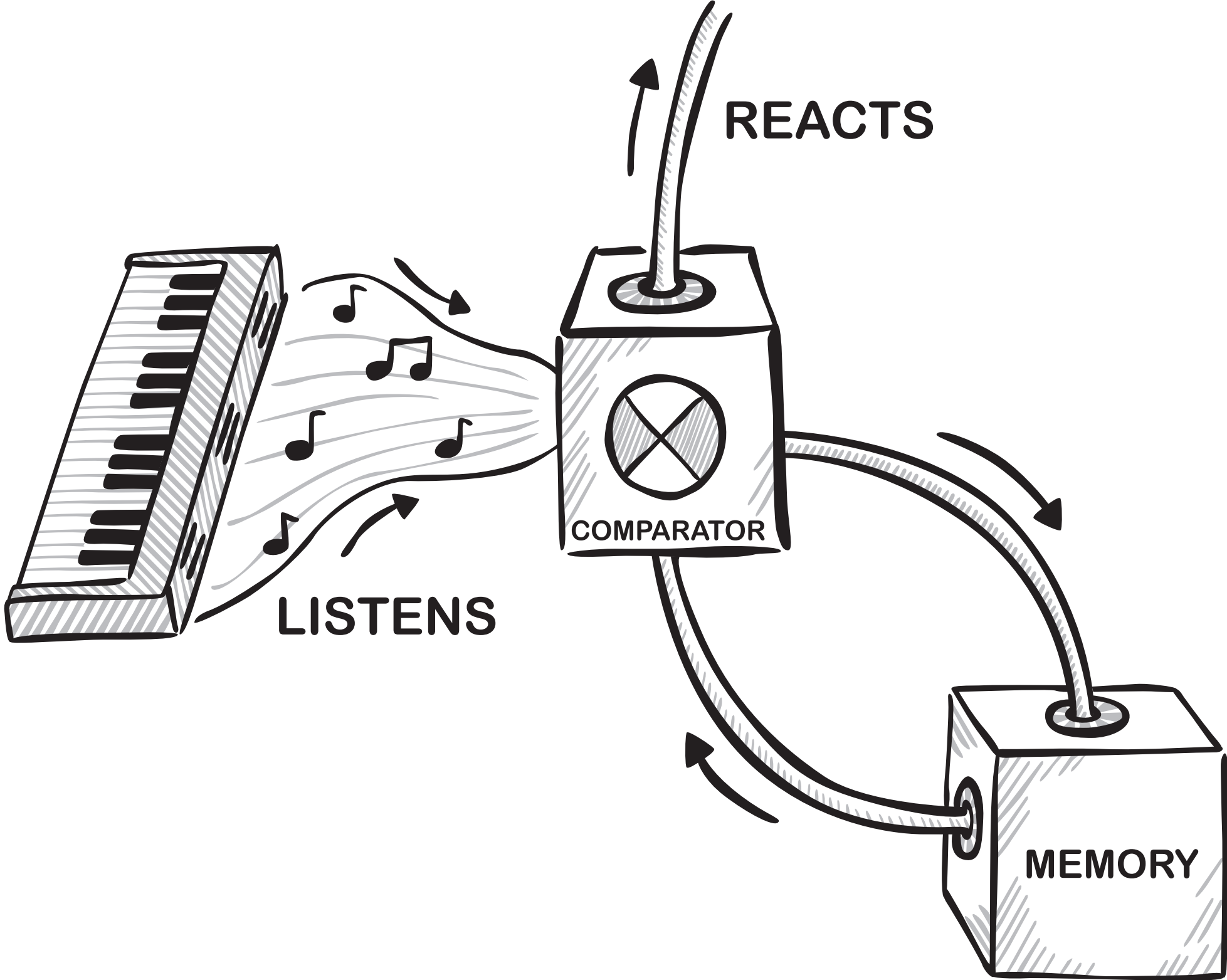
Doesn't it just force a mechanistic model of interaction and turn
humans into the equivalent of machines?

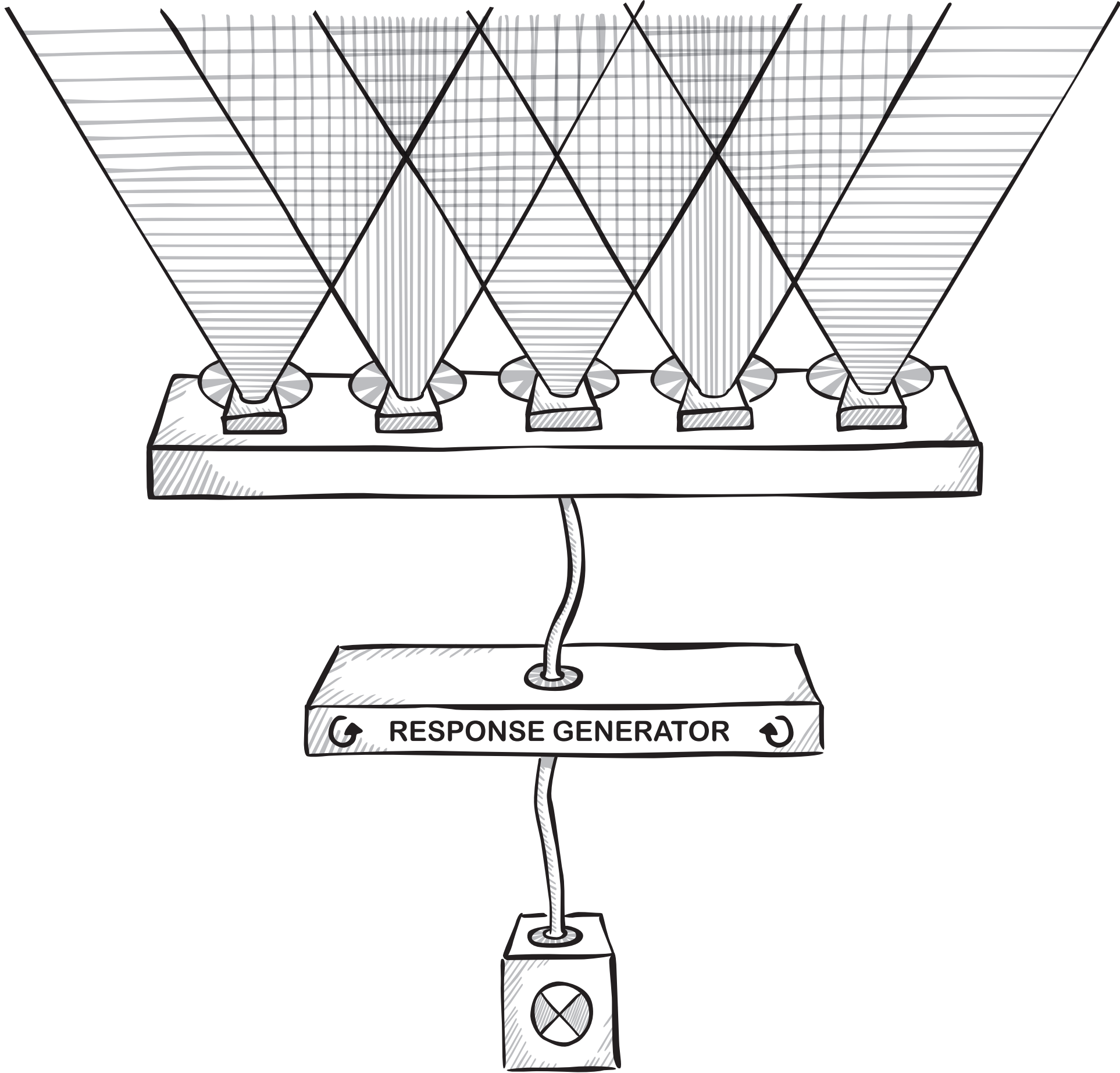
Who is Gordon Pask?

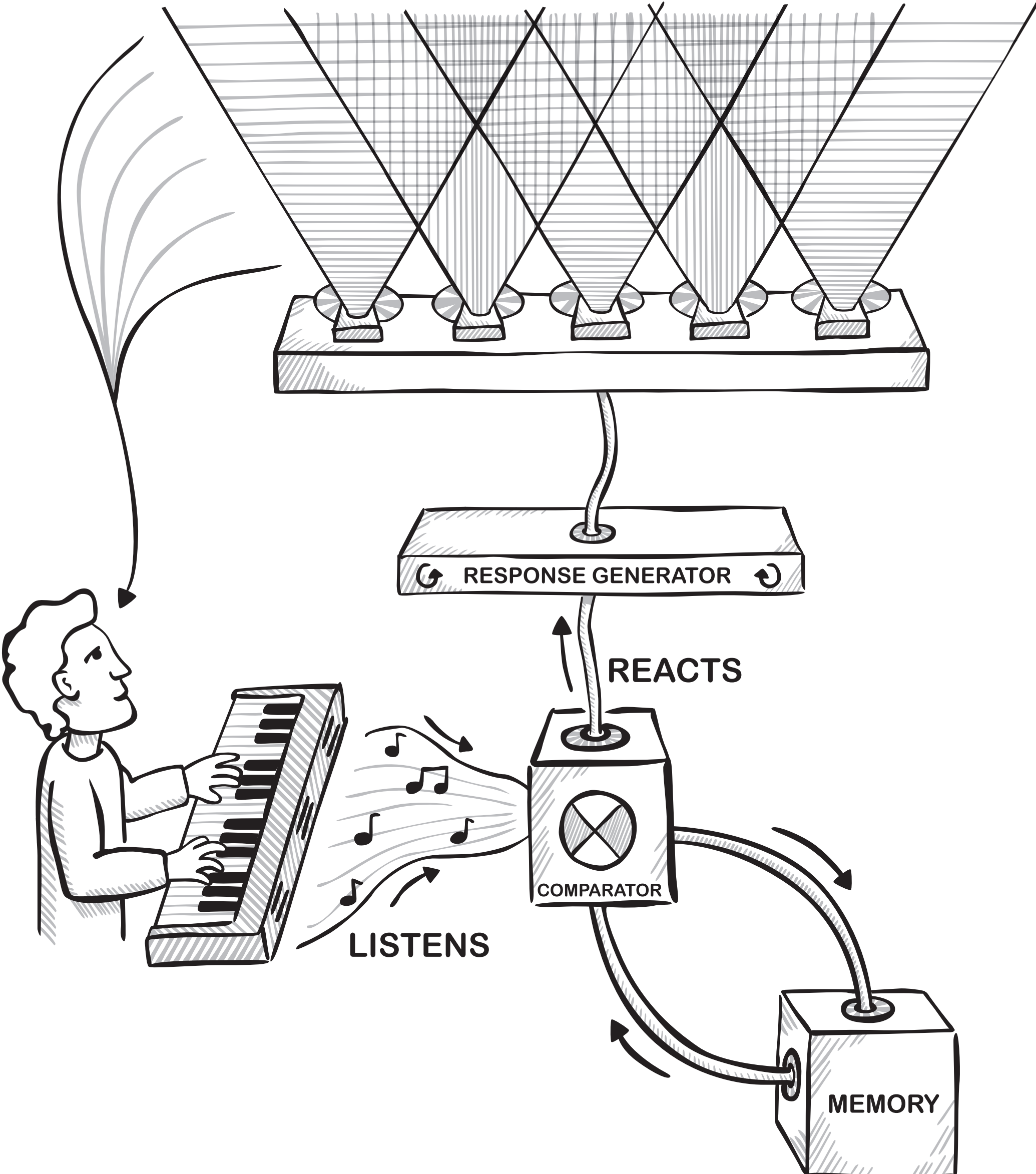


GORDON PASK



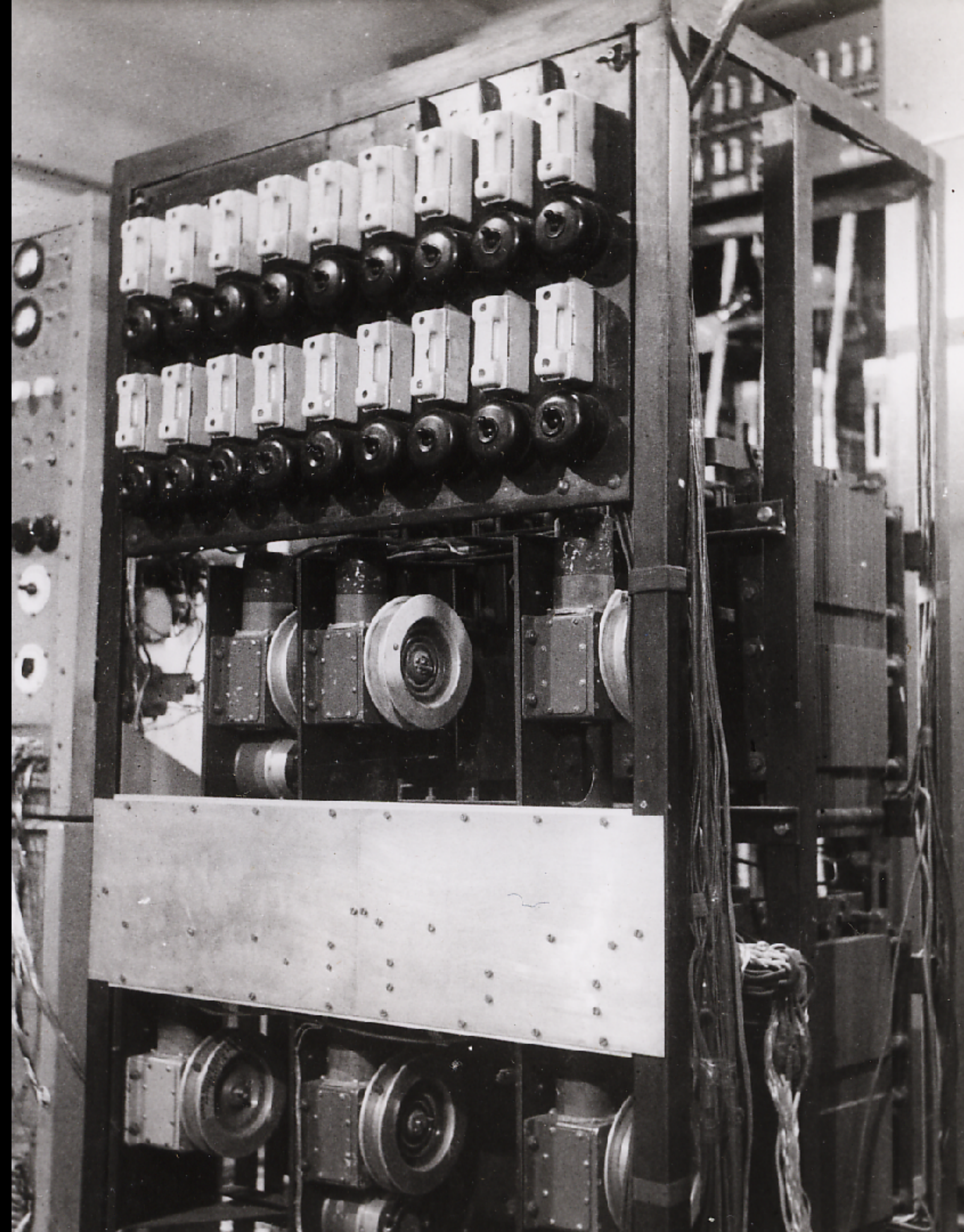




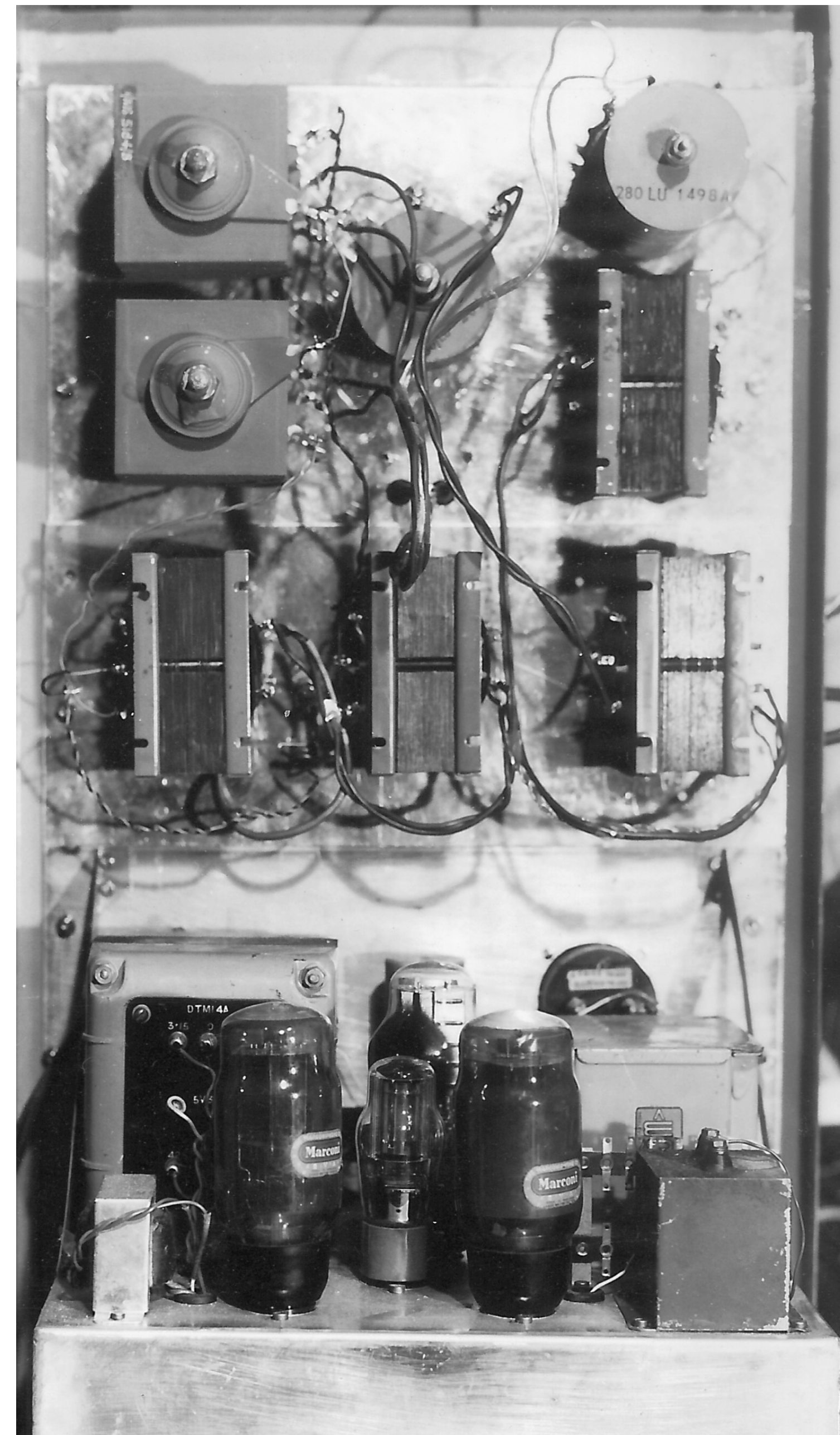
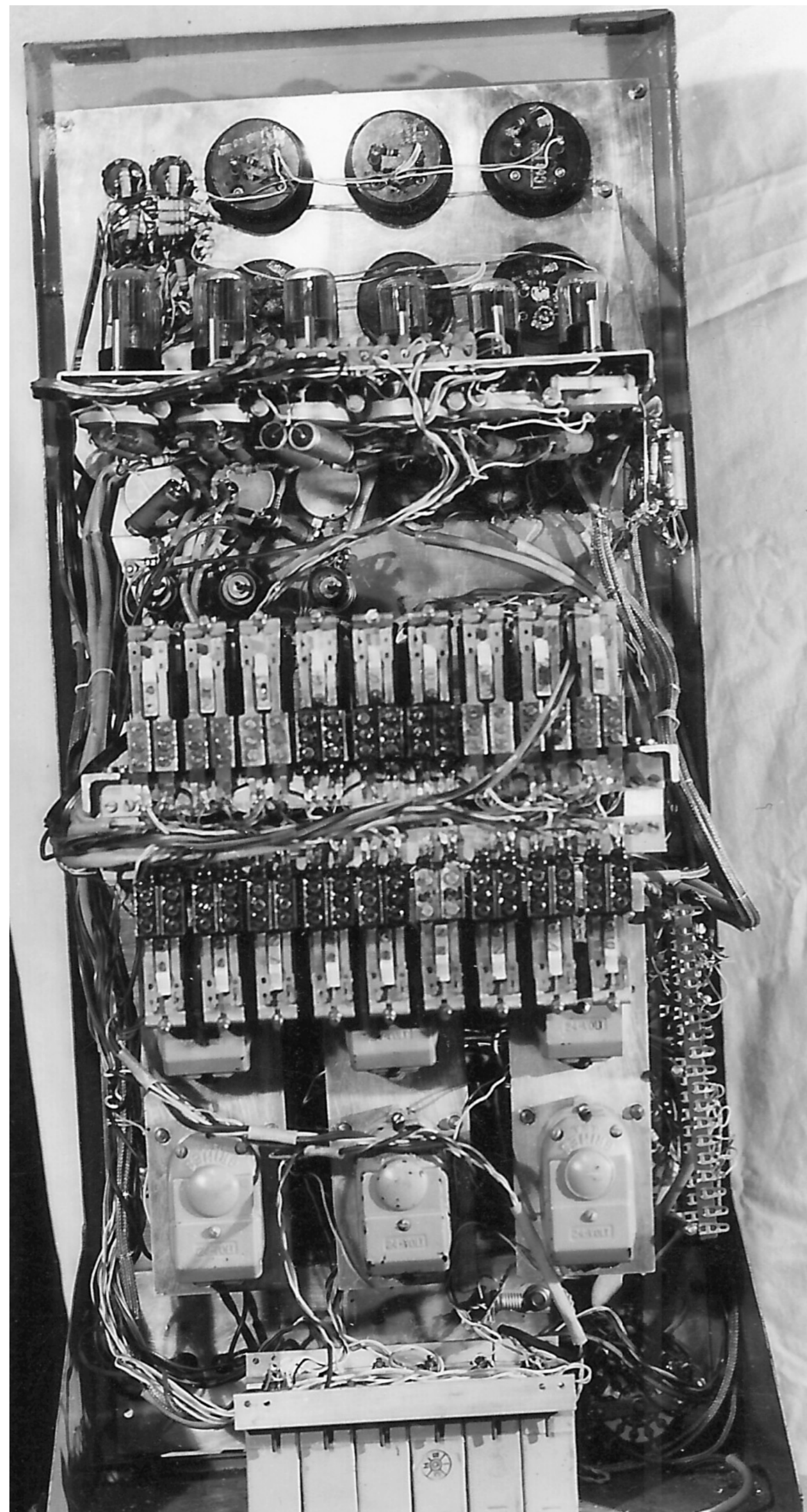


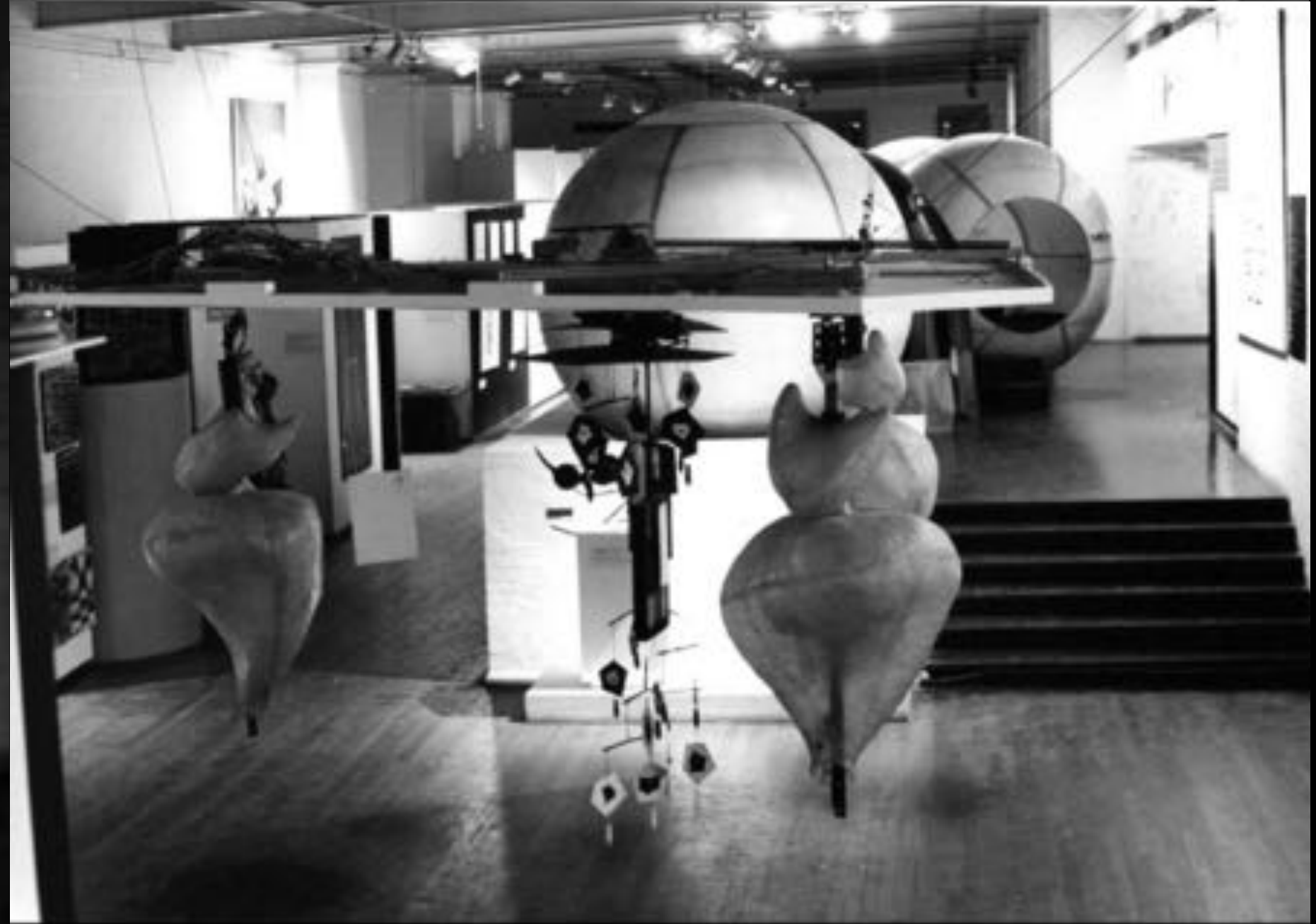


MUSICOLOUR HALL



MUSICOLOUR SWITCHBANK

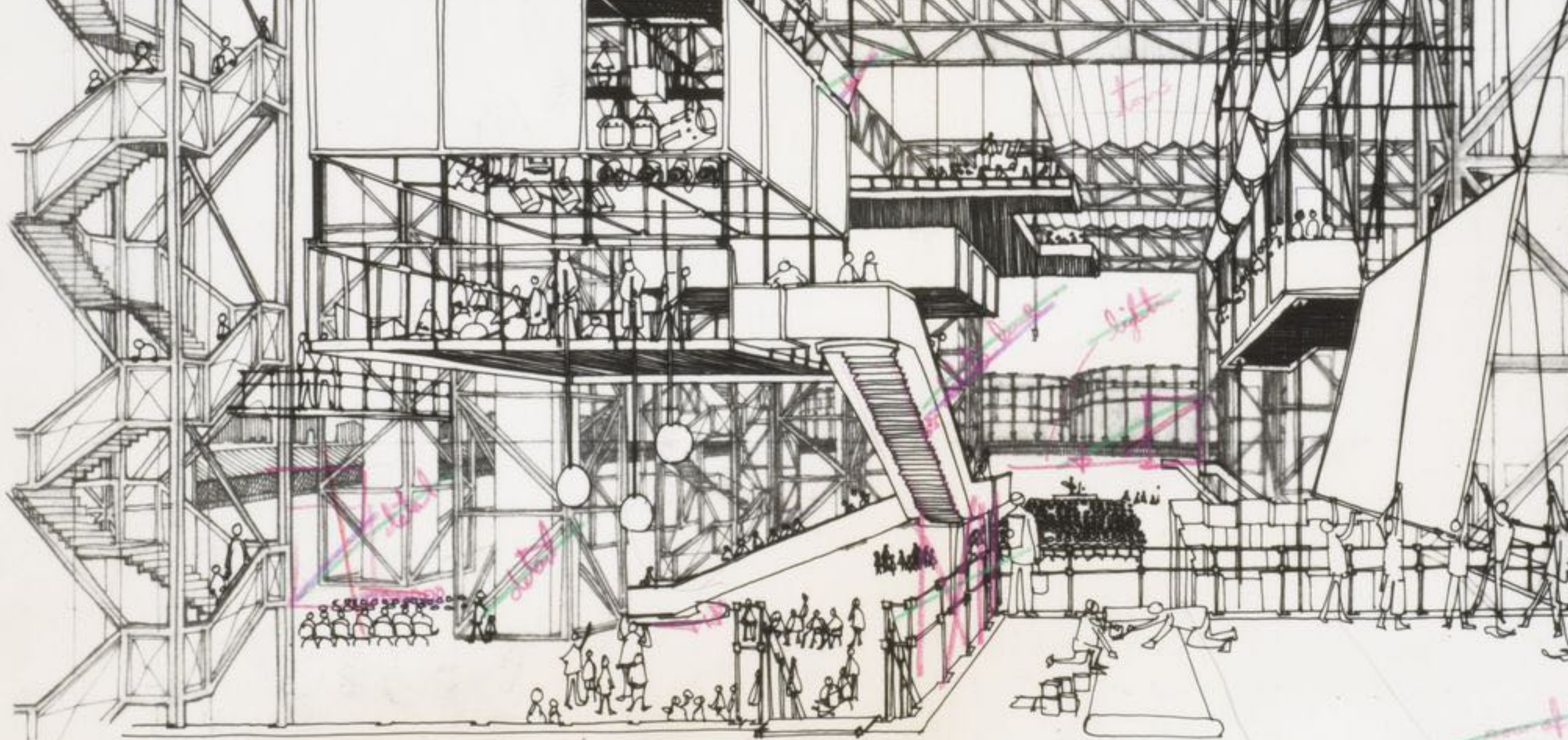




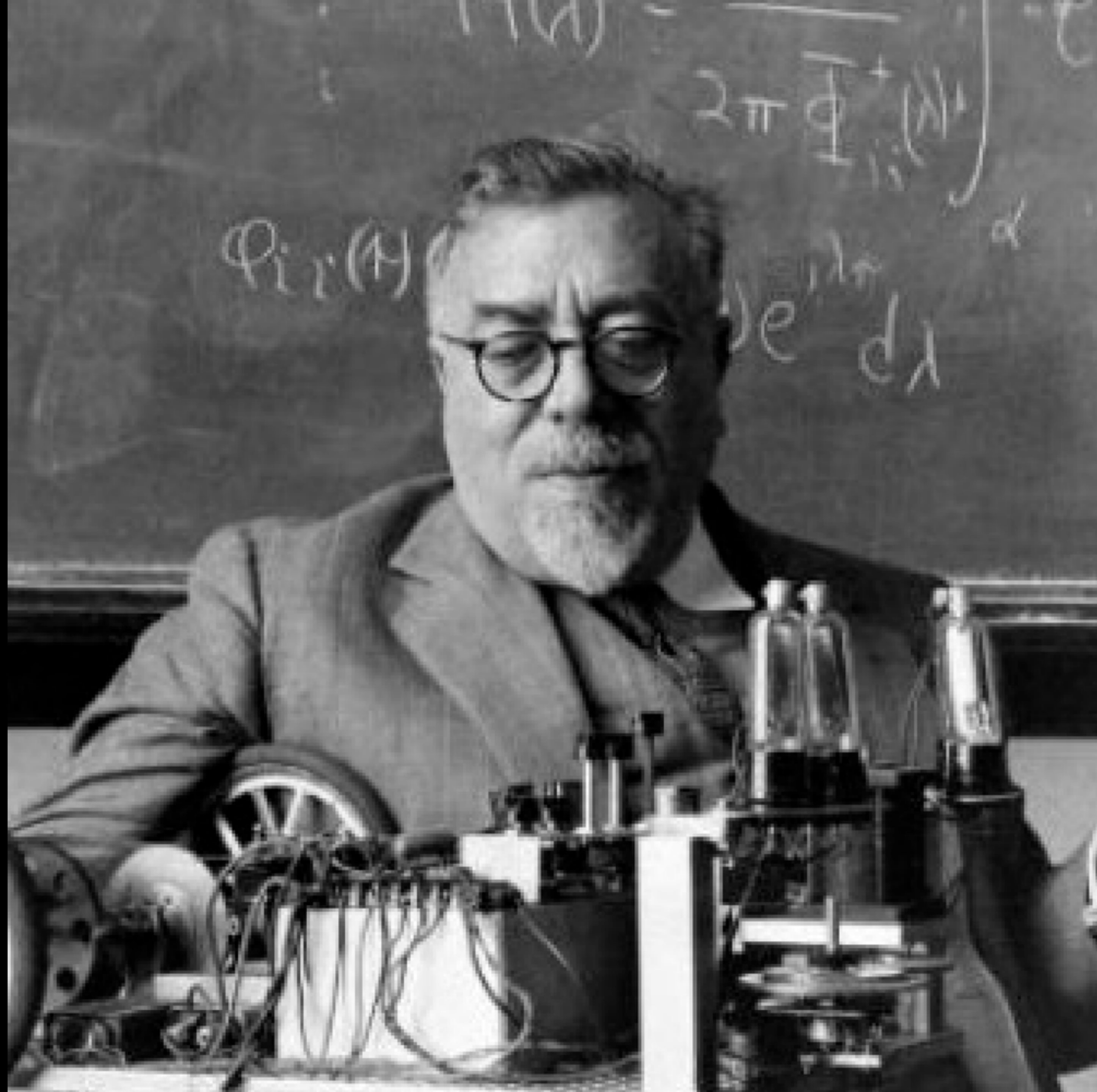
GORDON PASK'S COLLOQUY OF MOBILES

What is Pask's Theory of Conversation?

Whom did it influence?







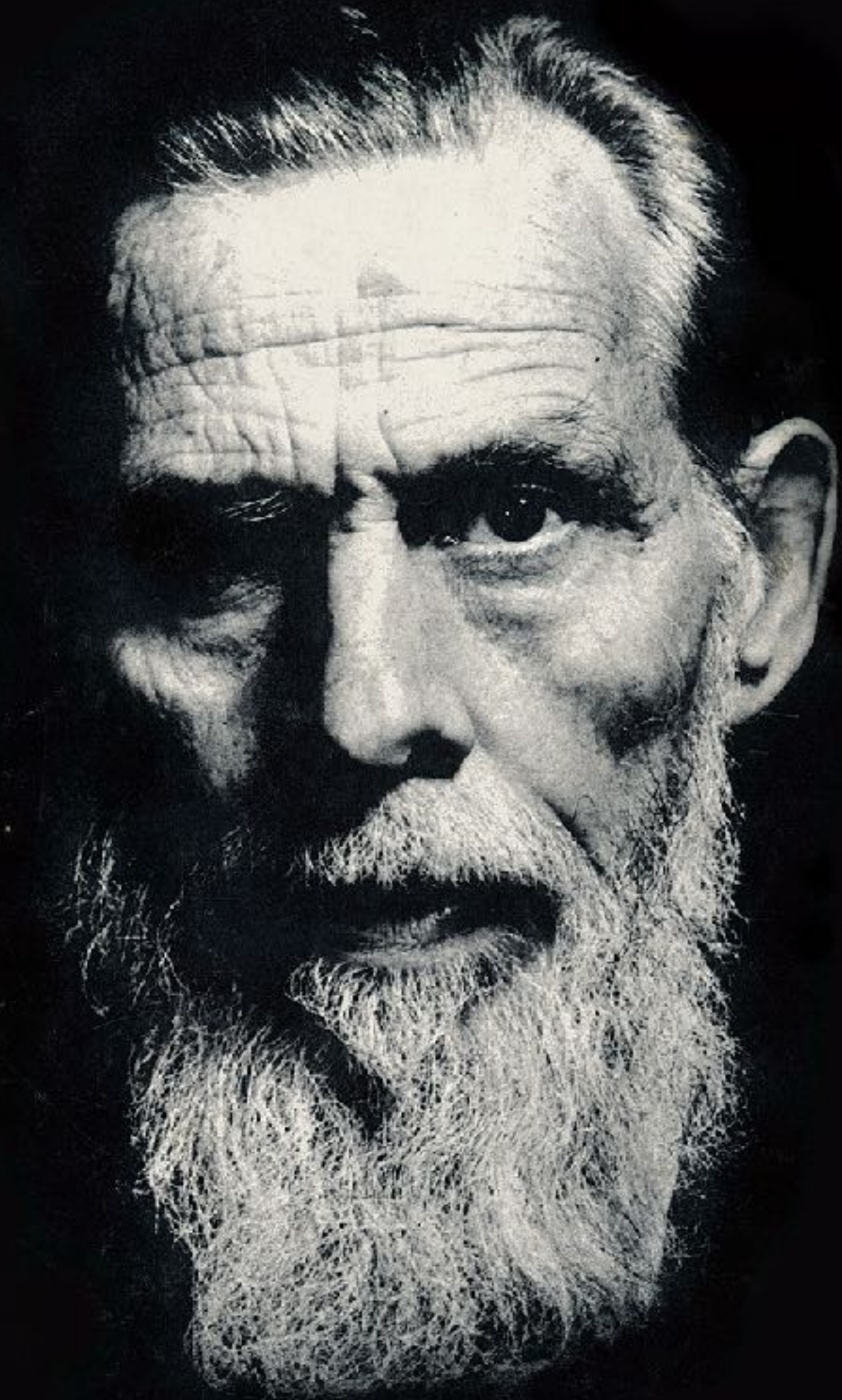
NORBERT WIENER



MARGARET MEAD



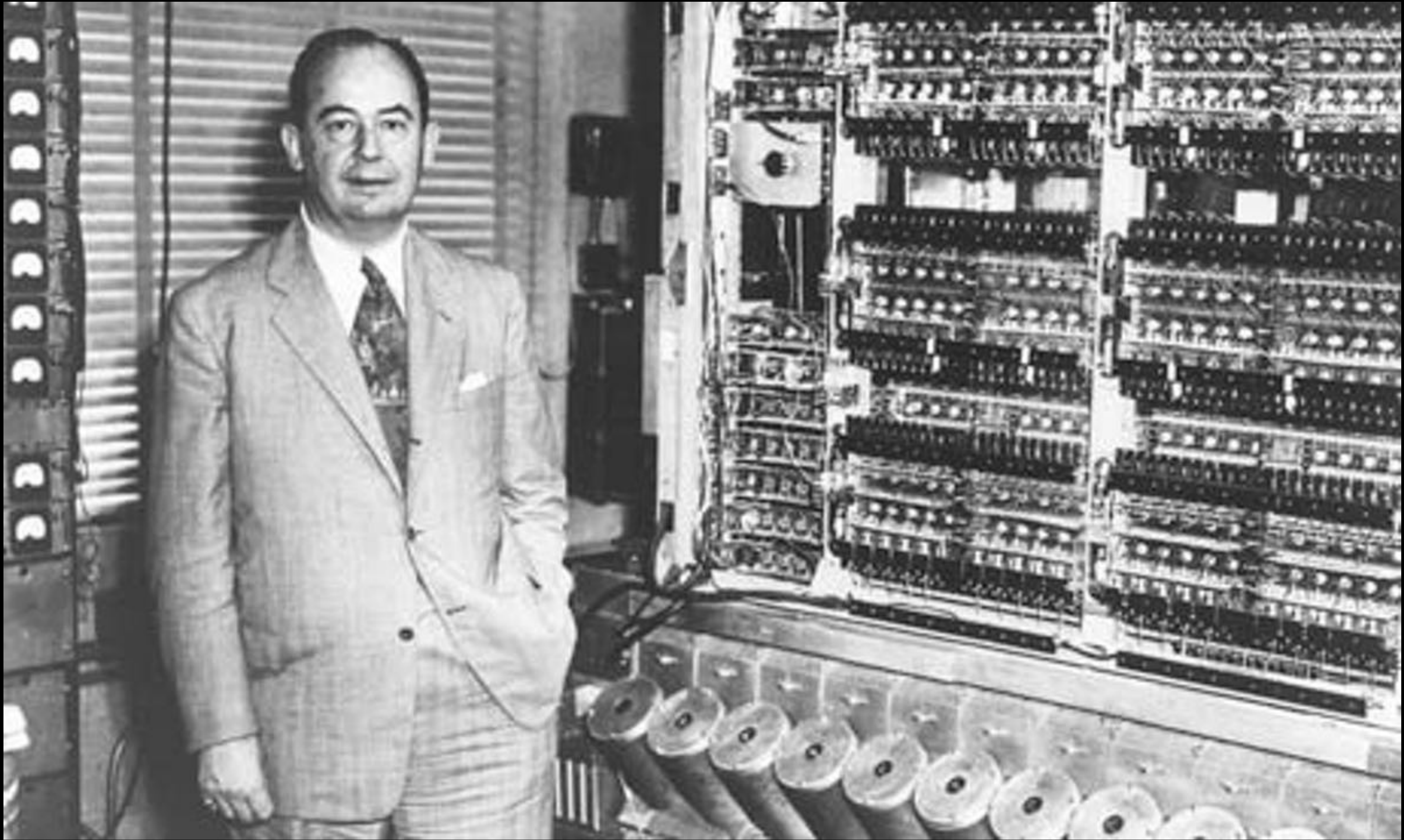
GREGORY BATESON



Warren S. McCulloch
EMBODIMENTS OF MIND

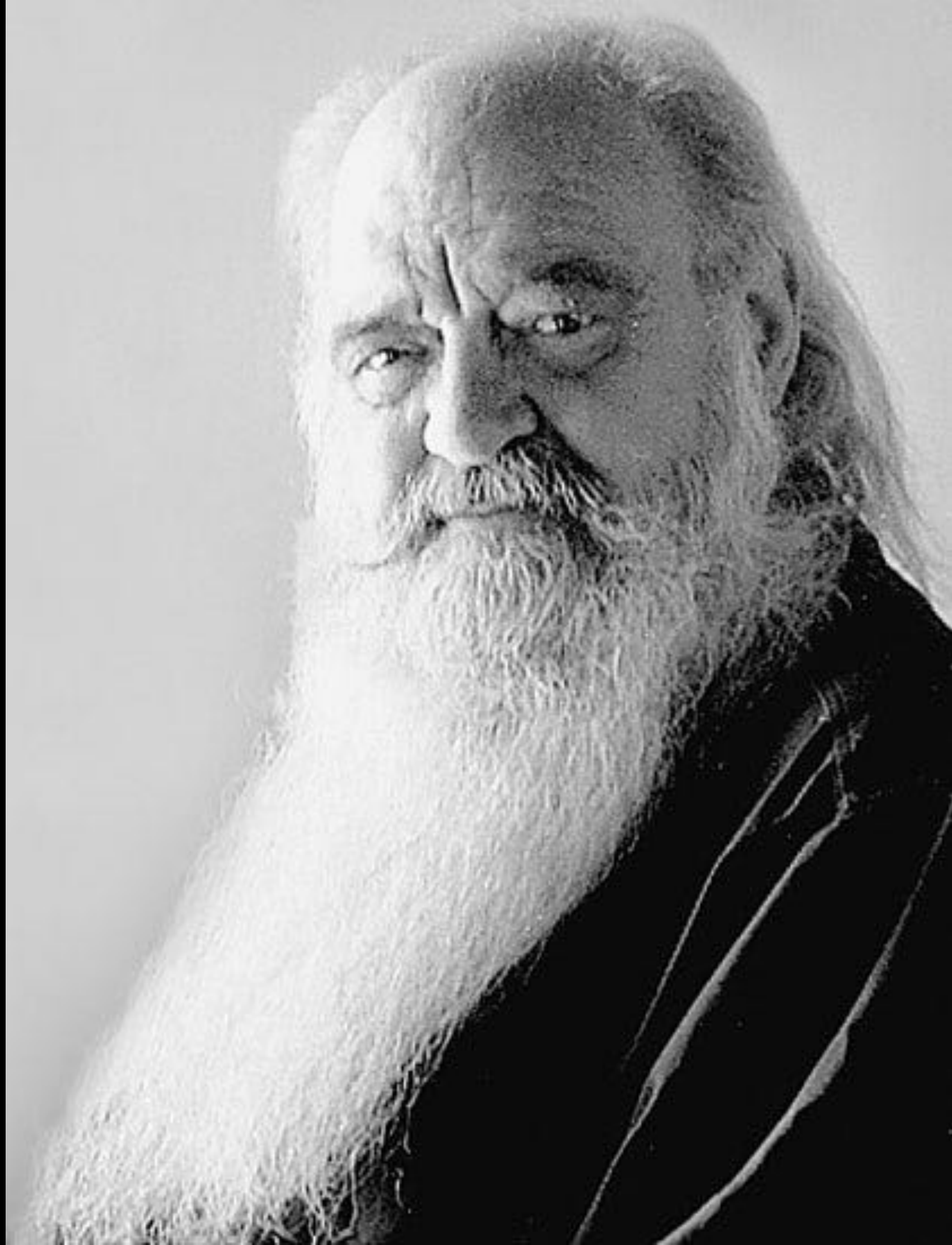
Introduction by Seymour Papert
Forewords by Jerome Y. Lettvin and Michael A. Arbib

WARREN MCCULLOCH



JOHN VON NEUMANN





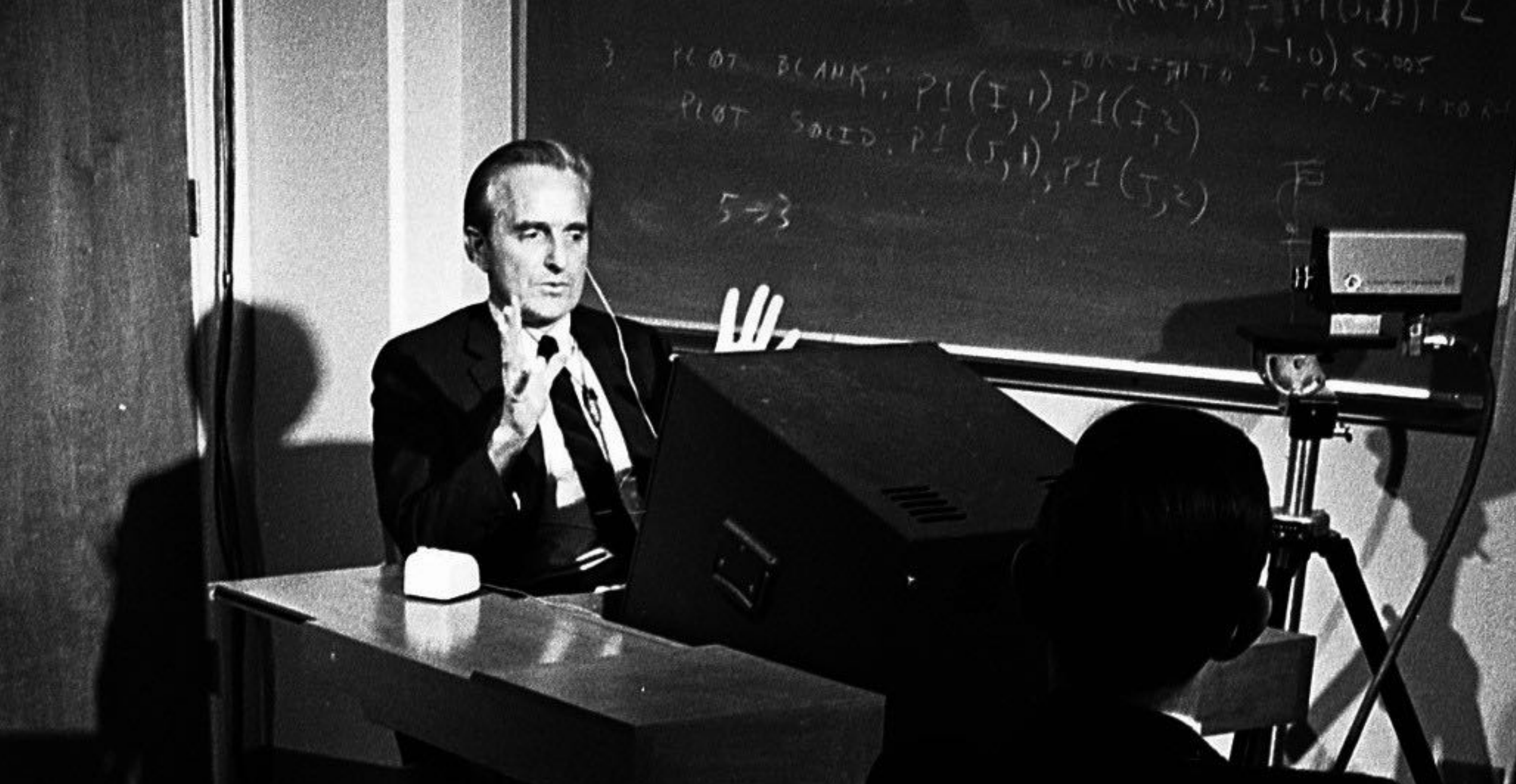
STAFFORD BEER



TED NELSON



IVAN SUTHERLAND — SKETCHPAD



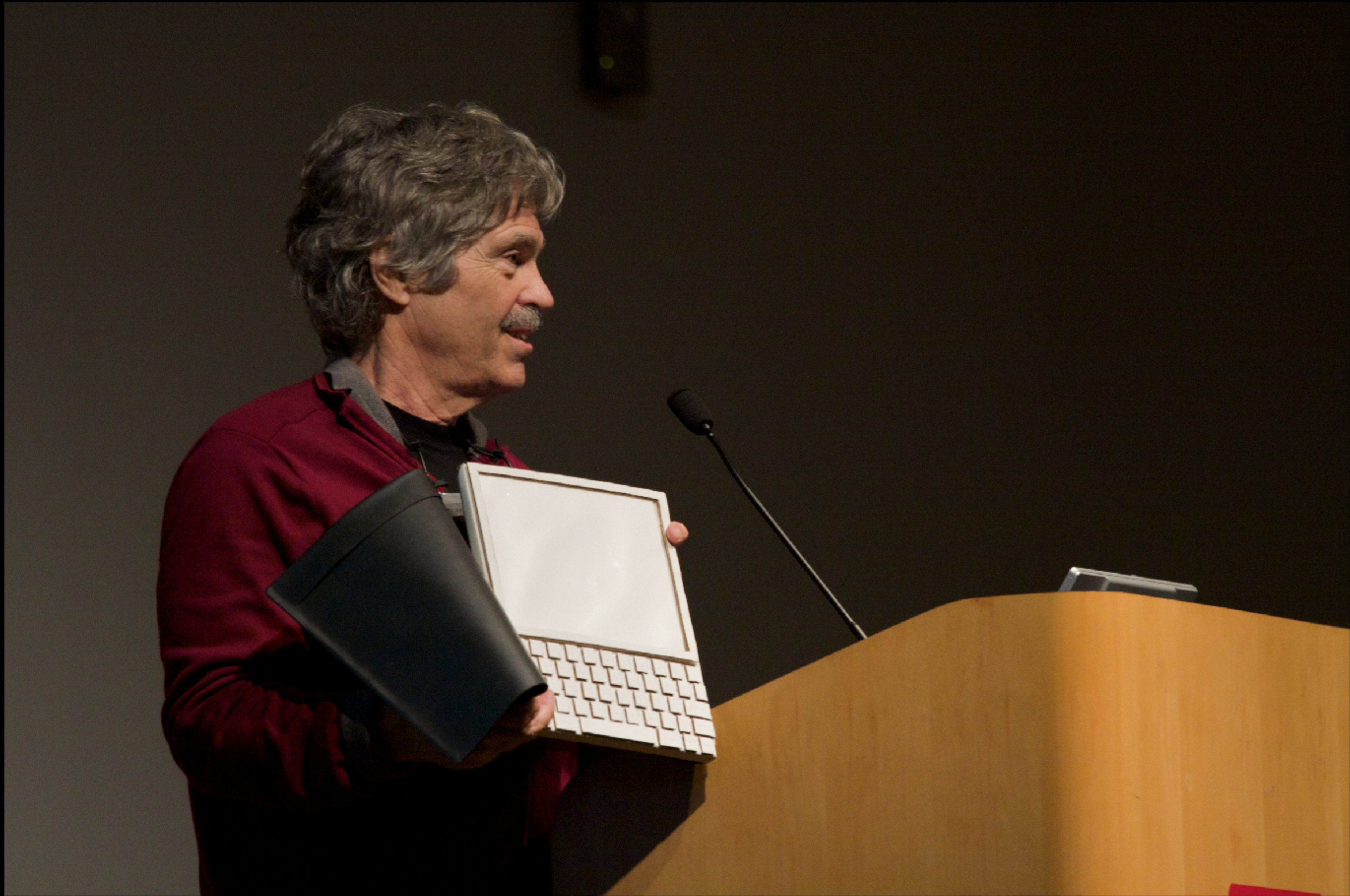
3) PLOT BLANK; P1(I,1), P1(I,2)
PLOT SOLID; P1(5,1), P1(5,2)
5-3

$(X(I,1), Y(I,1))$
 $(X(I,2), Y(I,2))$
 $(X(5,1), Y(5,1))$
 $(X(5,2), Y(5,2))$

$-1.0) < .005$
 Z FOR $J=1$ TO N

F

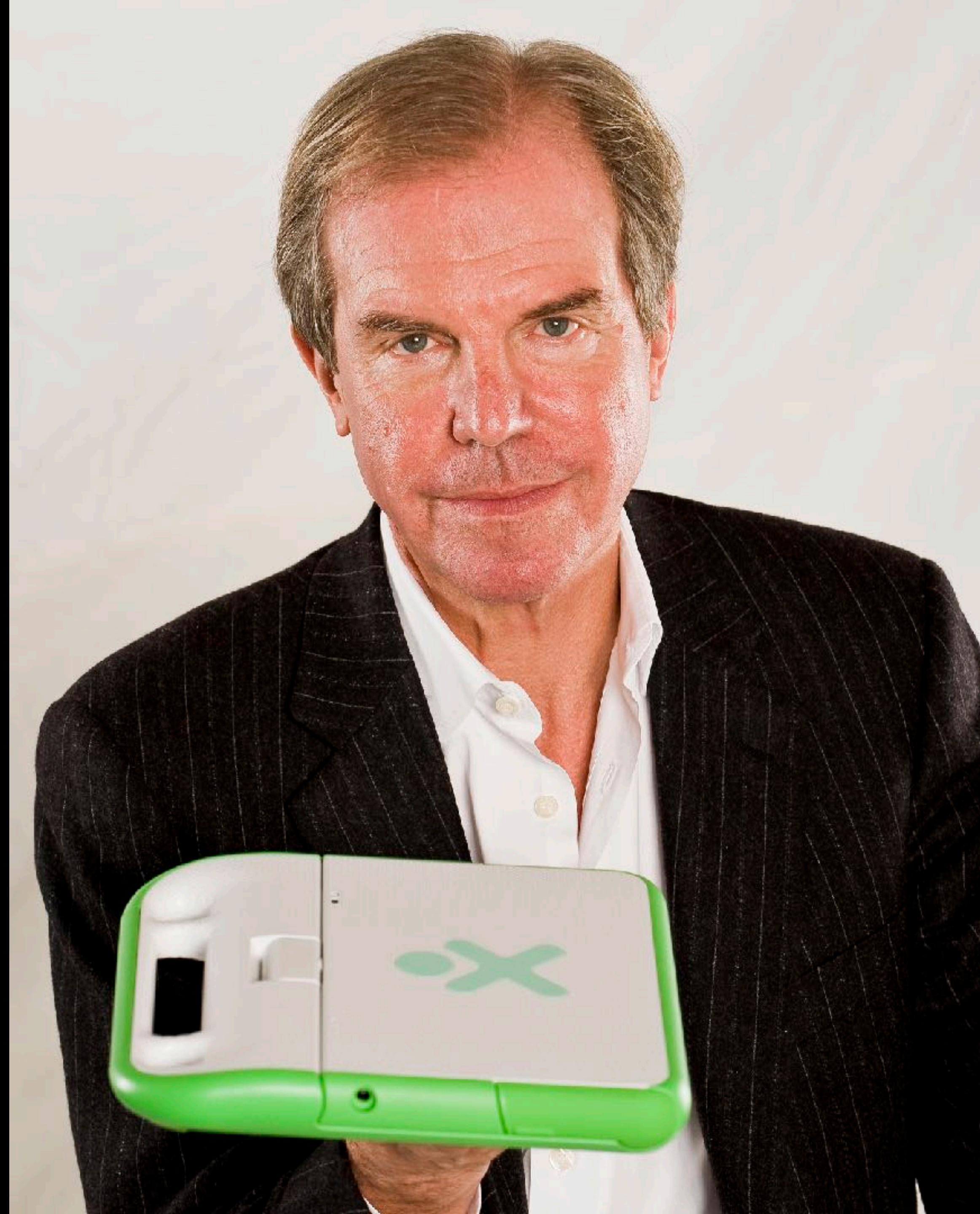
DOUGLAS ENGELBART — "MOTHER OF ALL DEMOS"



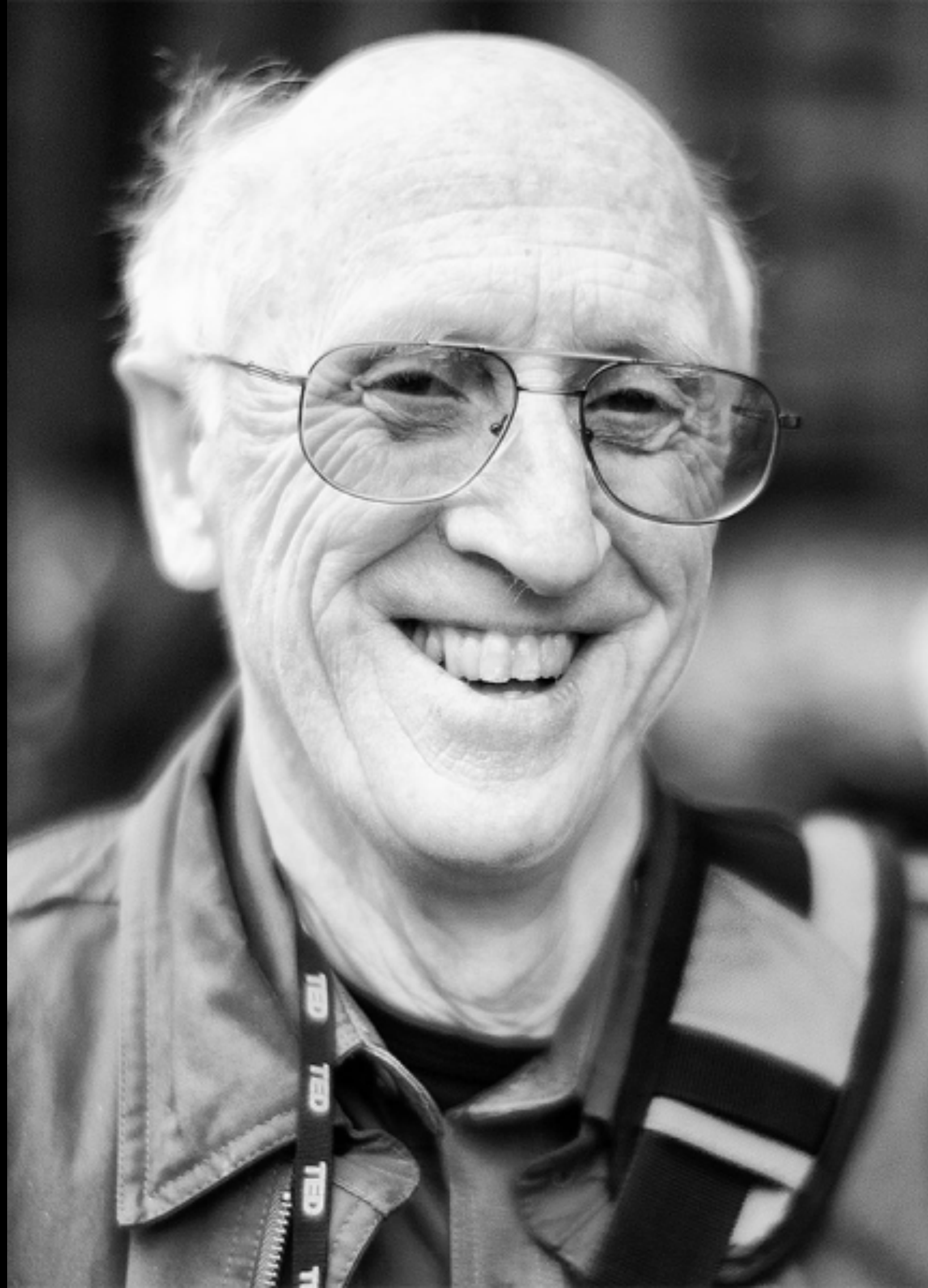
ALAN KAY



TERRY WINOGRAD



NICHOLAS NEGROPONTE



The Last Whole Earth Catalog

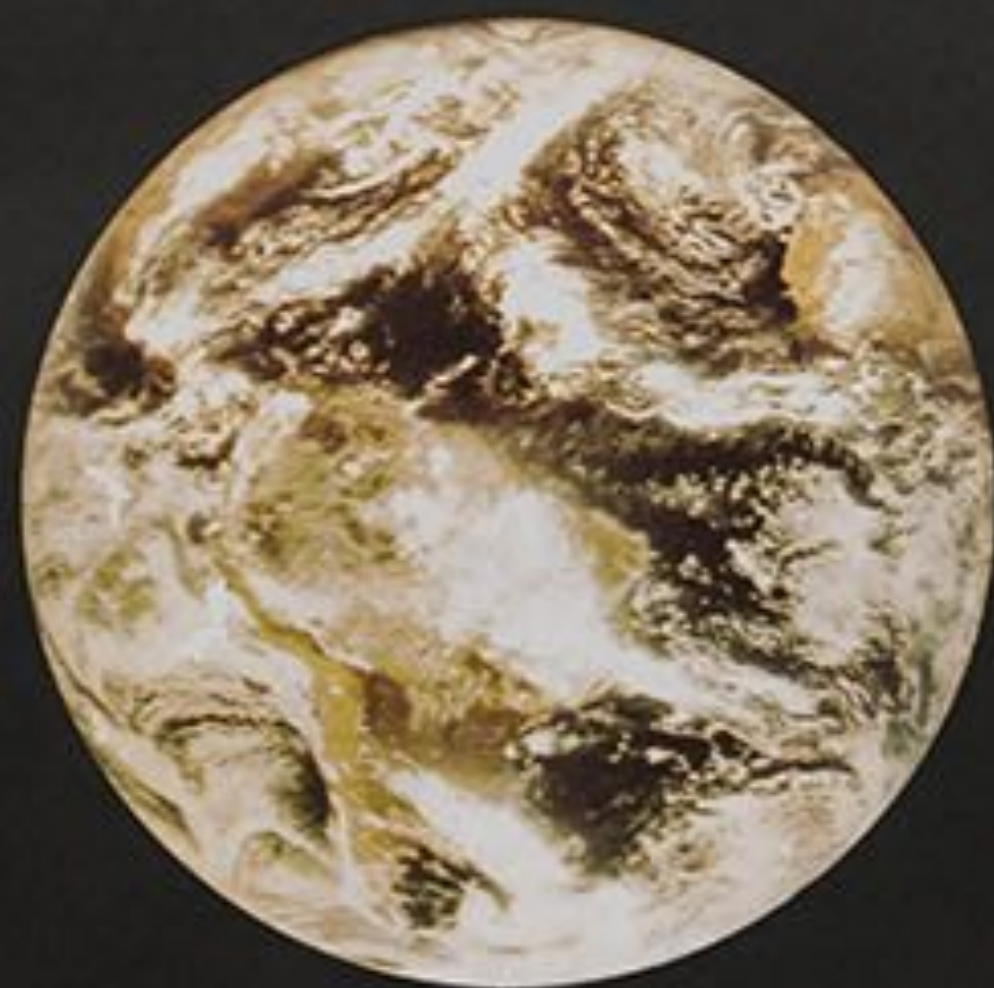
access to tools



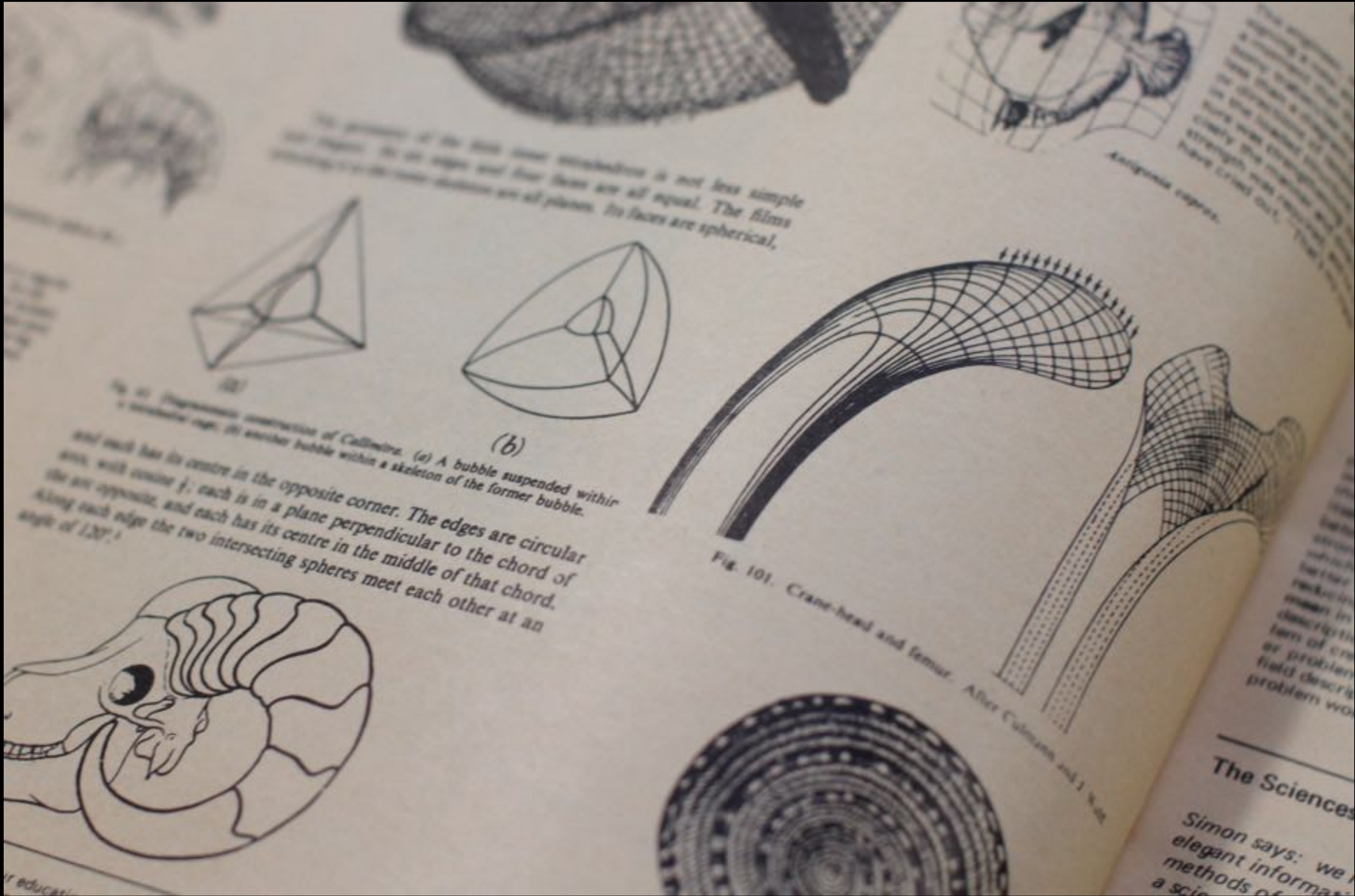
\$5

*Evening
Thank you*

We can't put it together.
It is together.



70419



#861 SCHABLONENSCHEREN (double blades shears) Available after July 1st, 1970. Schablonenscherenmeister: This set of 12 pairs of paper stencils and eliminates the need for a ruler between the blades to allow for a wide variety of uses. Used by stained glass studios and pattern work, it is almost indispensable for any postpaid.



LEAD For silhouettes and exercises. A pure lead which can be formed into cases, lampshades, etc. Usually sold per running foot. Add for postage per running foot.

9" diameter pure lead with effects on stained glass. Postpaid.



Truss turning corner
8 A cells - 4 B cells

Order in Space

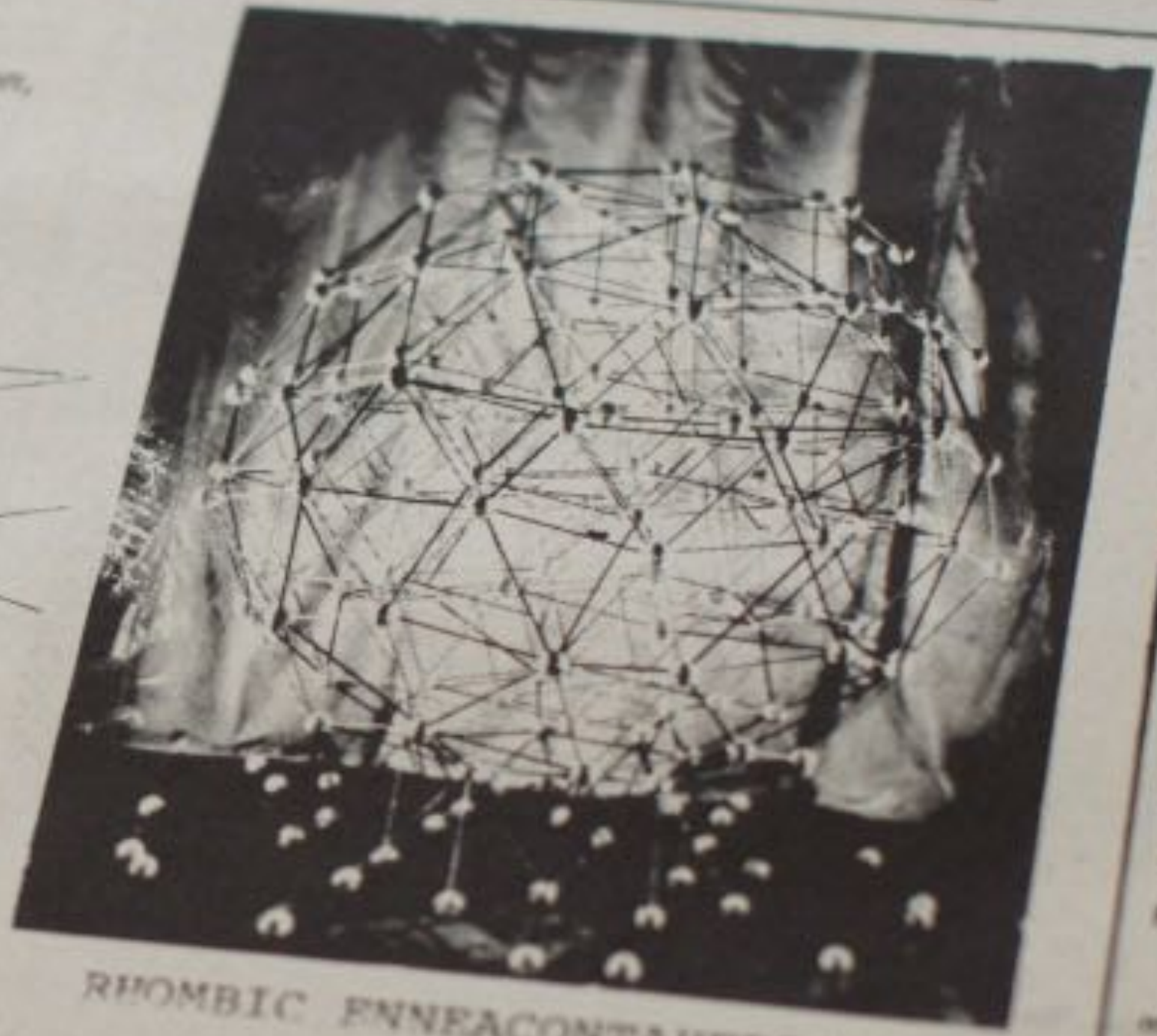
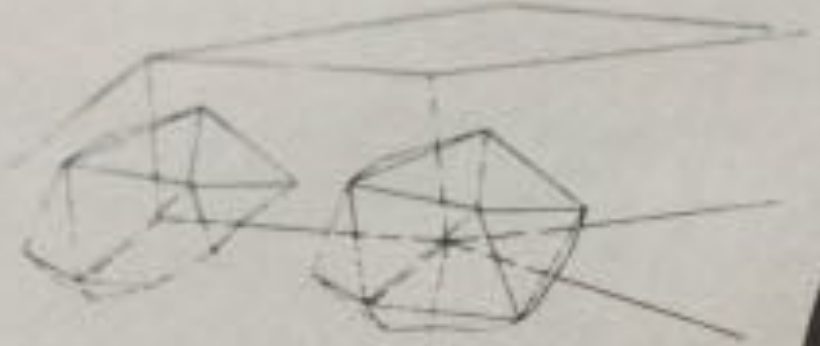
A new book by an experimental mathematician on order in space. "... space defining, distribution patterns, space filling properties, packing & stacking, economy grids and communication linkages."

There are exciting insights into structure in nature, and exploratory diagrams of the functions possible in space.

-Lloyd Kahn

The second issue of *Book*, *Book's* investigation of the use of the full symmetry back toward a kind of... *Book* is... *Book* is... *Book* is...

-SB



RHOMBIC ENNEACONTAHEDRON

The geodesic dome, if it is large and composed of many different edges and joints, has many different edge lengths. It is complicated in structure and simple in shape. Zomes are simple in structure and complicated in shape.





Social Graph of Cybernetics

and how it connects computing, counterculture, and design

MIT

Vannevar Bush
Julian Bigelow

Arturo Rosenblueth

Bertrand Russell

J. Willard Gibbs

James Clerk Maxwell

Key

- Scientists
- Designers and Architects
- Design Theorists and Critics
- Computer Pioneers
- Counterculture Leaders

Personal Connections
(usually collaborations)

Influences
(usually publications)

Interactive version at
<http://cybergraph.dubberly.com/>

Macy Conferences

Gregory Bateson
J.C.R. Licklider
Warren McCulloch, Chair
Margaret Mead
Walter Pitts
Claude Shannon

Heinz von Foerster

John von Neumann

Norbert Wiener

Grey Walter

Stafford Beer

Serge Chermayeff

William Burroughs

Brian Eno

Brian Eno

SRI, NLS

Douglas Engelbart

Ivan Sutherland

BCL

Ross Ashby
Humberto Maturana
Gordon Pask

Charles Eames

Buckminster Fuller

Marshall McLuhan

HfG Ulm

Bruce Archer
Gui Bonsiepe

Horst Rittel

Brian Eno

Ted Nelson

Univ. of Utah

Alan Kay
John Warnock (founded Adobe)
Jim Blinn
Ed Catmull (founded Pixar)
James Clark (founded Netscape)

Whole Earth Catalog

Stewart Brand

Merry Pranksters

Ken Kesey

Timothy Leary

Gene Youngblood

Fernando Flores
Terry Winograd

Francisco Varela

ARPA

PARC

Bob Taylor

Media Lab

Nicholas Negroponte

Brunei University

Ranulph Glanville

Paul Pangaro

Design Methods

London Conference

UC Berkeley

Christopher Alexander

IIT Institute of Design

Chuck Owen

Soft Systems

Jim Bagnall
Don Koberg

Lou Danziger

John Rheinfrank

Apple

Bill Atkinson
Larry Tesler

WiReD

Kevin Kelly
Barbara Kuhr
John Plunkett

Design Thinking

Usman Haque
Hugh Dubberly

Design Rationale

Design Patterns

Google

Sergey Brin
Larry Page

Internet

Tim Berners-Lee

Social Graph of Cybernetics

and how it connects computing, counterculture, and design

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Macy Conferences

Gregory Bateson
J.C.R. Licklider
Warren McCulloch, Chair
Margaret Mead
Walter Pitts
Claude Shannon

Heinz von Foerster

John von Neumann

Norbert Wiener

Cedric Price

R.D. Laing

SRI, NLS

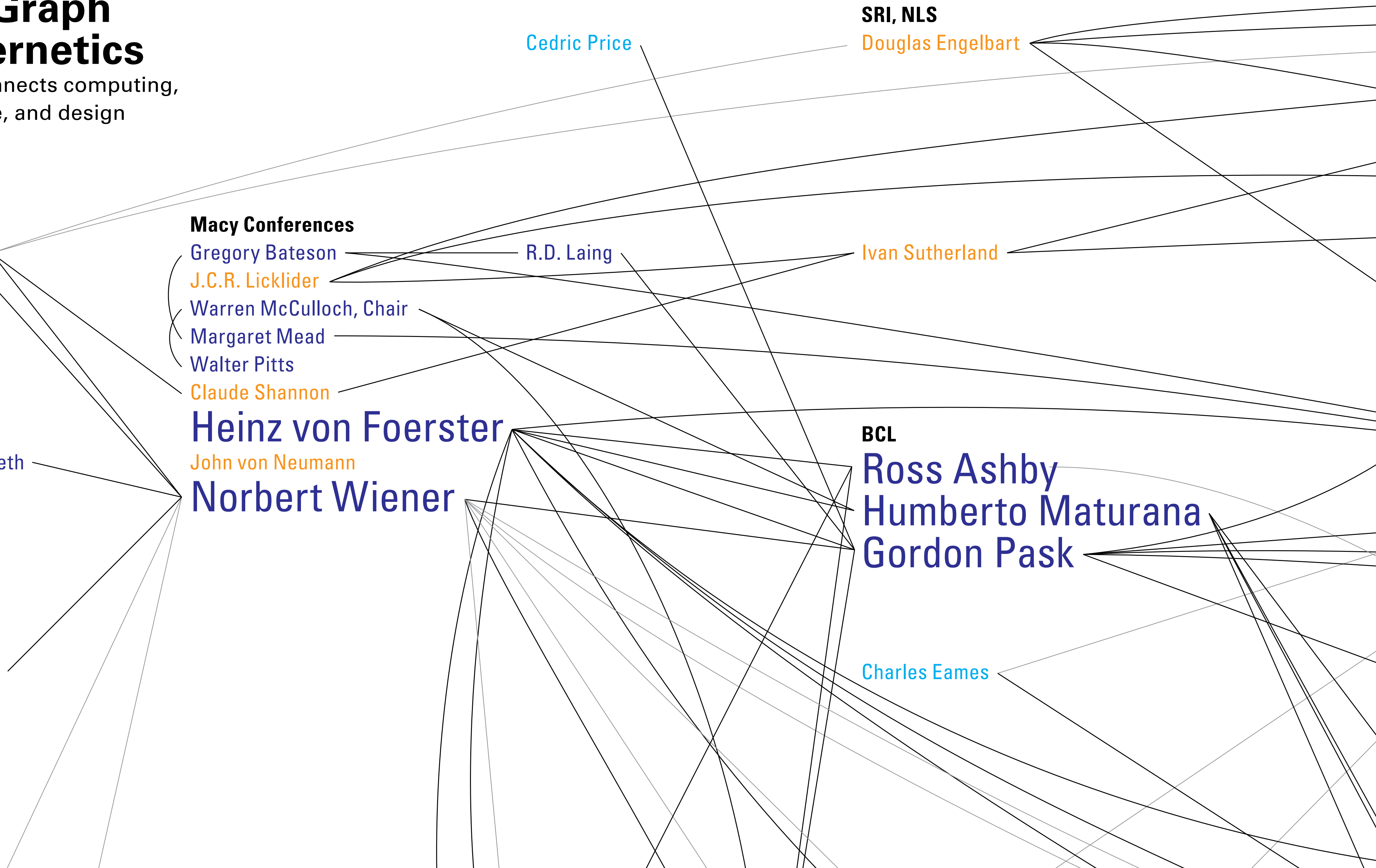
Douglas Engelbart

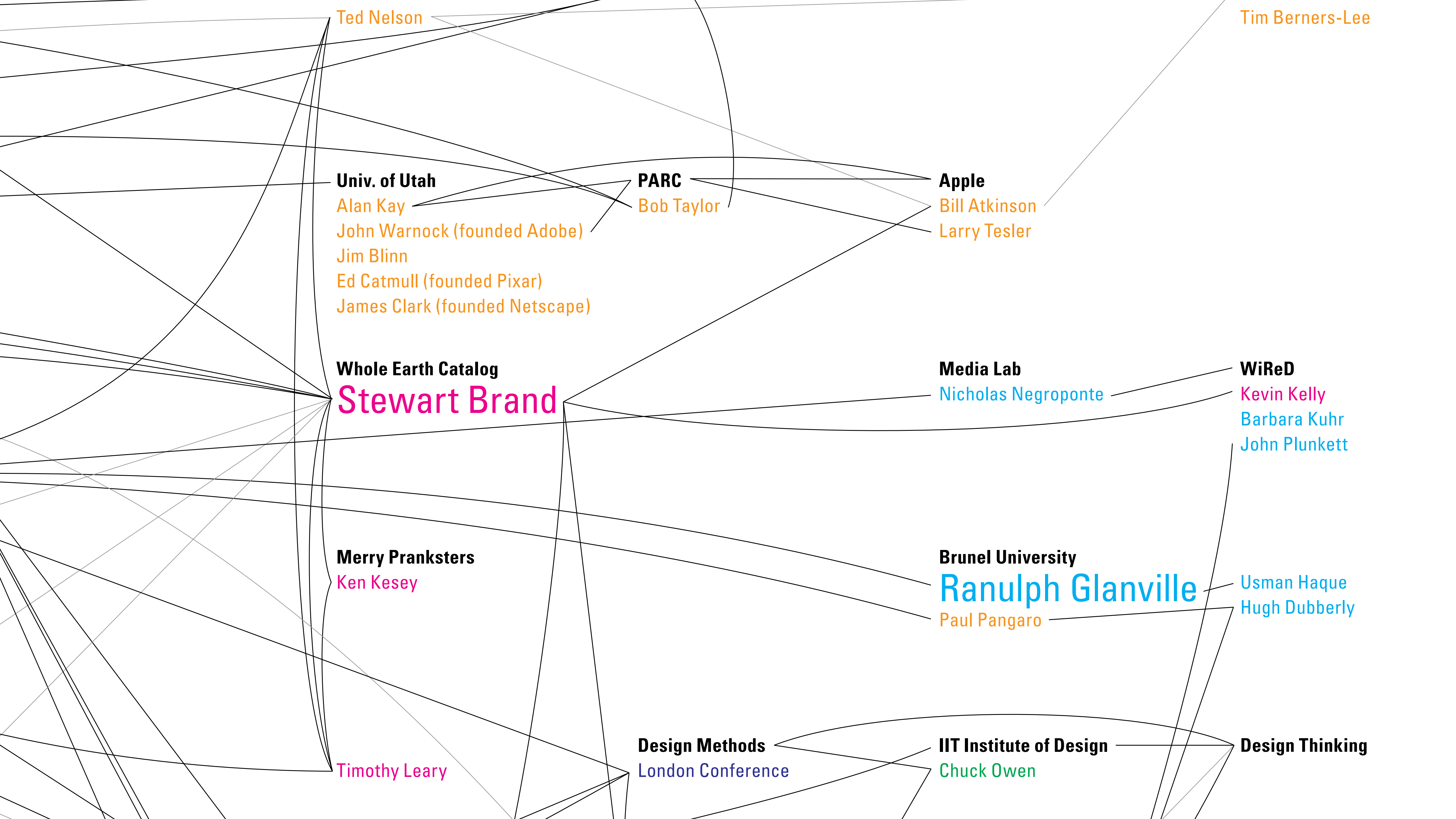
Ivan Sutherland

BCL

Ross Ashby
Humberto Maturana
Gordon Pask

Charles Eames





How can we operate as designers
in a world where we don't
understand the consequences of
the things we've made?



Value

How does design address
“wicked problems” and what
are cybernetic ways of
approaching them?

What is the responsibility of the designer?

What are the ethics of design?

What is “truth” in the era of
“fake news”, especially if
cybernetics affirms that
knowledge is subjective?

What is our responsibility
as designers when working
for these companies?

How are we responsible for what we design?

How can we be optimistic about the future?

What is there to make us optimistic about the future?

NOW WHAT?

Cybernetics, Design, and Society

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Appendix

How is science different from cybernetics?

e.g. Wanting to know versus wanting to act
effectively/to achieve goals?

How is “action” from a computer
or an AI different than action by
a person or team?

What is the value of models?

Where is cybernetics
appearing, perhaps
unexpectedly?

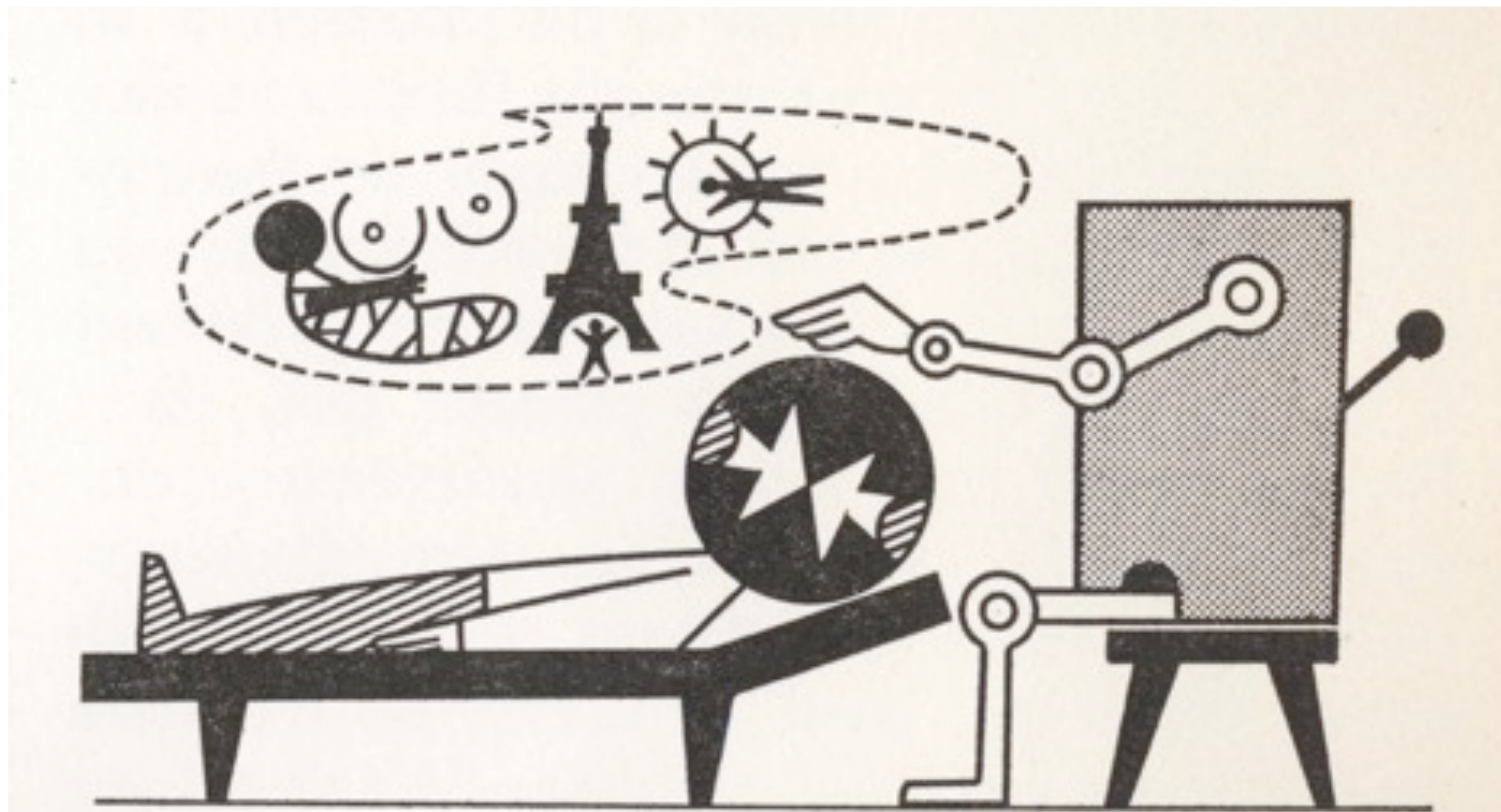


Fig. 2. Verrons-nous un jour la machine à psychanalyser ?

