What's in a name?

From Norbert Wiener's Teleology to Artificial Intelligence

Sean Manion, PhD

Adjunct Faculty, Psychology Department

Duquesne University of the Holy Spirit

Pittsburgh, Pennsylvania, USA

Systems & Complexity in Organisation

UK Virtual Open Meeting

16 November 2026

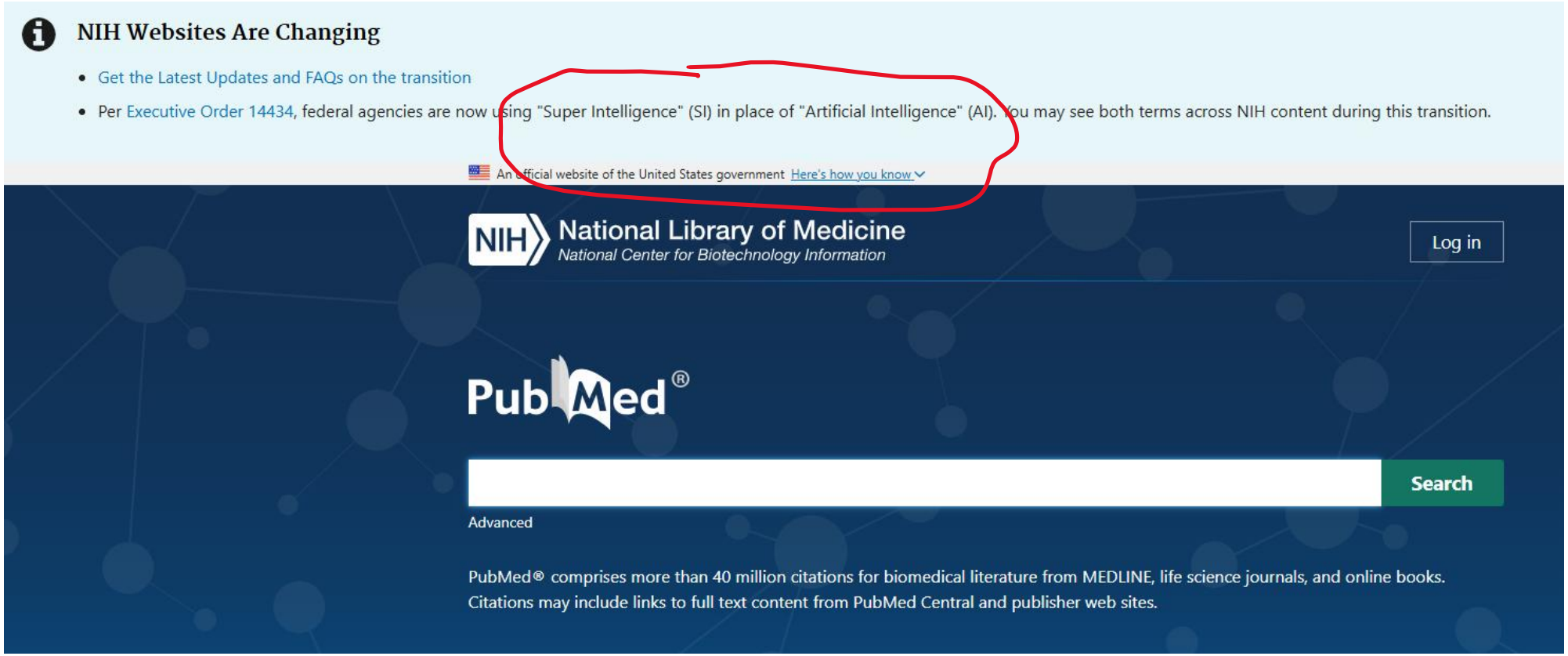
Key collaborators, support and resources

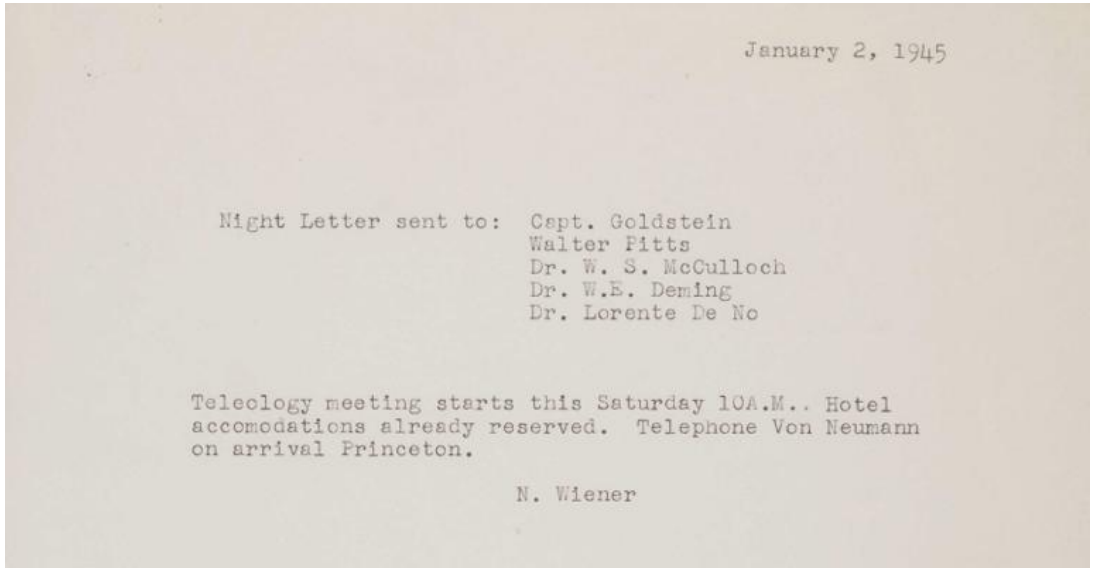
- **Kris Rockwell, Elizabeth Nickrenz, Ami Elliott, Adisyn Moorhead, Kass Botts, Paul Pangaro, Manuel & Lenore Blum, Ben Taylor and more**
- **Duquesne University, Psychology Department; Kris Rockwell Foundation; American Society for Cybernetics, Rebraiding Project (Carnegie Mellon University – Lab 4 Cybernetics); Pittsburgh Continental Philosophy Club; X - Cybernetics Chat aka Dangerous Secret Science Club**
- **Steven Heims**, John von Neumann & Norbert Wiener, The Cybernetics Group
- **Ronald Kline**, The Cybernetics Moment: Or Why We Call Our Age the Information Age
- **Flo Conway & Jim Siegelman**, Dark Hero of the Information Age: In Search of Norbert Wiener The Father of Cybernetics
- **Phil Husbands (Editor), Owen Holland (Editor), Michael Wheeler (Editor)**, The Mechanical Mind in History
- **Pamela McCorduck**, Machines Who Think: A Personal Inquiry into the History and Prospects of Artificial Intelligence
- **Andrew Pickering**, The Cybernetic Brain: Sketches of Another Future
- **Pesi Masani**, Norbert Wiener: 1894-1964
- **MIT Archives – Norbert Wiener Special Collection** (& **Ethan Vodovotz** for handwriting translation and searchability)
- **CMU Archives –** Pamela McCorduck, Herb Simon, Allen Newell & Joseph Traub Special Collections (**Emily Davis** & the rest of the staff)
- **American Society for Cybernetics –** Summary: The Macy Conferences
- **American Philosophical Society** – Warren McCulloch Collection
- **Duquesne Library & Simon Silverman Phenomenology Center**
- **Wellcome Library –** John Bates Collection (Ratio Club)
- **technovelgy.com (Bill Christiansen, h/t BergsonsGhost)**

Super(arti)ficial Intelligence?

Names are super(arti)ficial, yet they mean things.

Those names, and their meanings, can change.





January 2, 1945

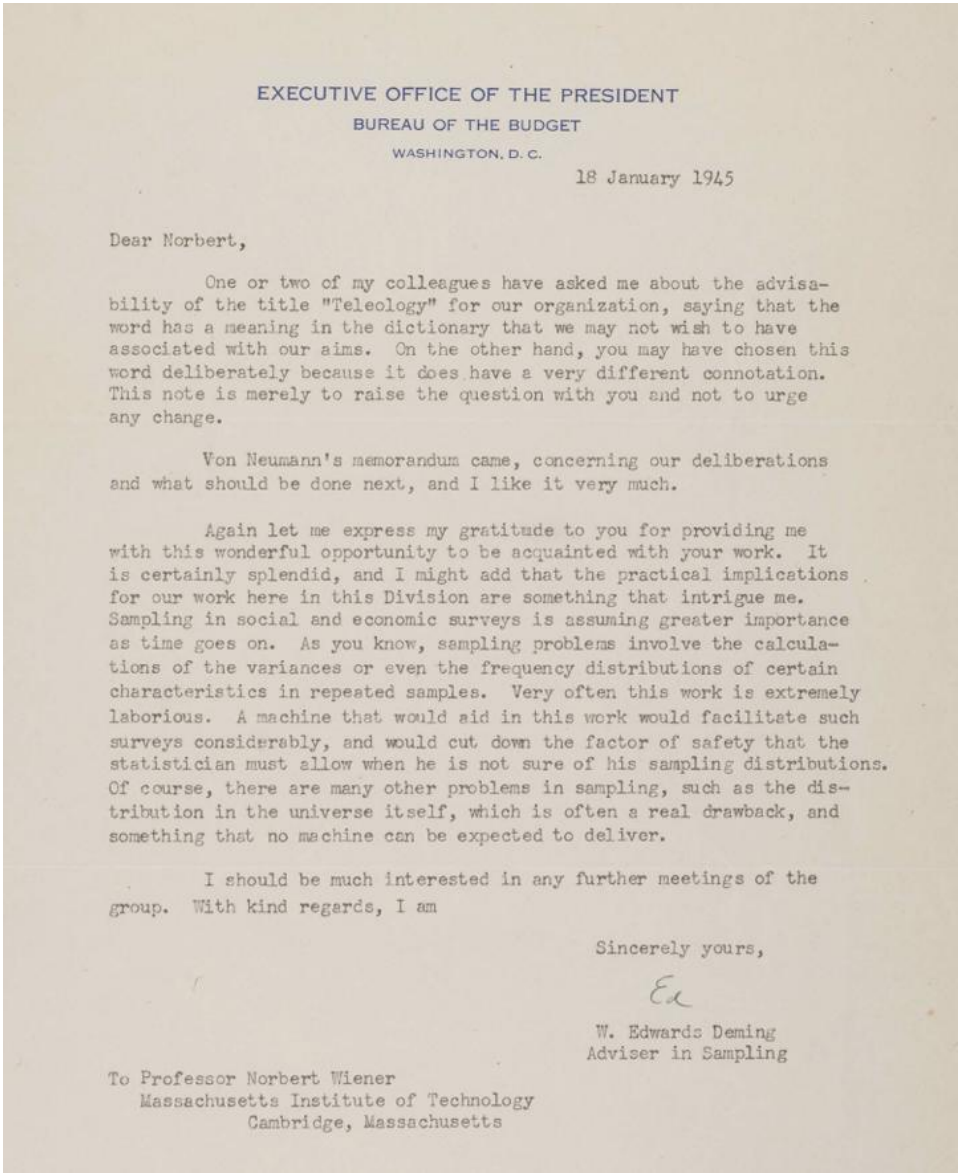
Night Letter sent to: Capt. Goldstein
Walter Pitts
Dr. W. S. McCulloch
Dr. W.E. Deming
Dr. Lorente De No

Teleology meeting starts this Saturday 10A.M.. Hotel accomodations already reserved. Telephone Von Neumann on arrival Princeton.

N. Wiener

"**Teleology** meeting starts this Saturday…"

"One or two of my colleagues have asked me about the advisability of the title **"Teleology"** for our organization, saying that the word has a meaning in the dictionary that we may not wish to have associated with our aims."



EXECUTIVE OFFICE OF THE PRESIDENT
BUREAU OF THE BUDGET
WASHINGTON, D. C.

18 January 1945

Dear Norbert,

One or two of my colleagues have asked me about the advisability of the title "Teleology" for our organization, saying that the word has a meaning in the dictionary that we may not wish to have associated with our aims. On the other hand, you may have chosen this word deliberately because it does have a very different connotation. This note is merely to raise the question with you and not to urge any change.

Von Neumann's memorandum came, concerning our deliberations and what should be done next, and I like it very much.

Again let me express my gratitude to you for providing me with this wonderful opportunity to be acquainted with your work. It is certainly splendid, and I might add that the practical implications for our work here in this Division are something that intrigue me. Sampling in social and economic surveys is assuming greater importance as time goes on. As you know, sampling problems involve the calculations of the variances or even the frequency distributions of certain characteristics in repeated samples. Very often this work is extremely laborious. A machine that would aid in this work would facilitate such surveys considerably, and would cut down the factor of safety that the statistician must allow when he is not sure of his sampling distributions. Of course, there are many other problems in sampling, such as the distribution in the universe itself, which is often a real drawback, and something that no machine can be expected to deliver.

I should be much interested in any further meetings of the group. With kind regards, I am

Sincerely yours,

Ed

W. Edwards Deming
Adviser in Sampling

To Professor Norbert Wiener
Massachusetts Institute of Technology
Cambridge, Massachusetts



What's in a Name?

Our nearly century-long effort to mechanize the mind, and decipher ourselves in doing so, has gone by many names. These include:

- **Teleology**
  - **Circular Causality**
- **Cybernetics**
  - **Machine/Automata Intelligence (-Amplifier)**
- **Artificial Intelligence**
  - **Super Intelligence**

Teleology

BEHAVIOR, PURPOSE AND TELEOLOGY

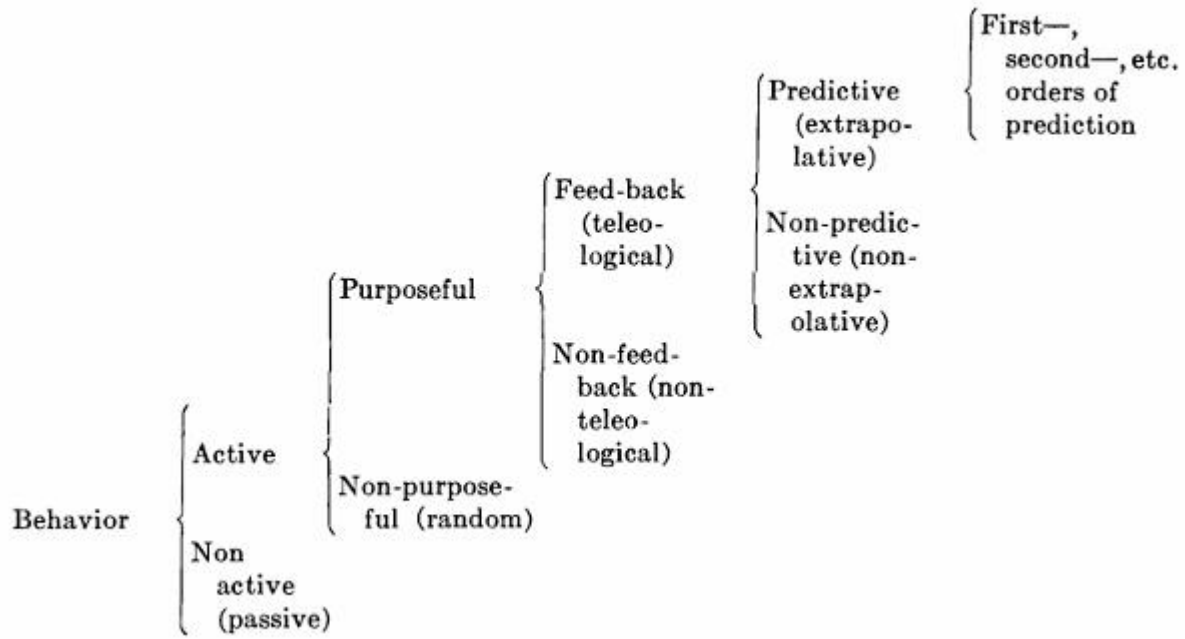
ARTURO ROSENBLUETH, NORBERT WIENER AND JULIAN BIGELOW

This essay has two goals. The first is to define the behavioristic study of natural events and to classify behavior. The second is to stress the importance of the concept of purpose.

Given any object, relatively abstracted from its surroundings for study, the

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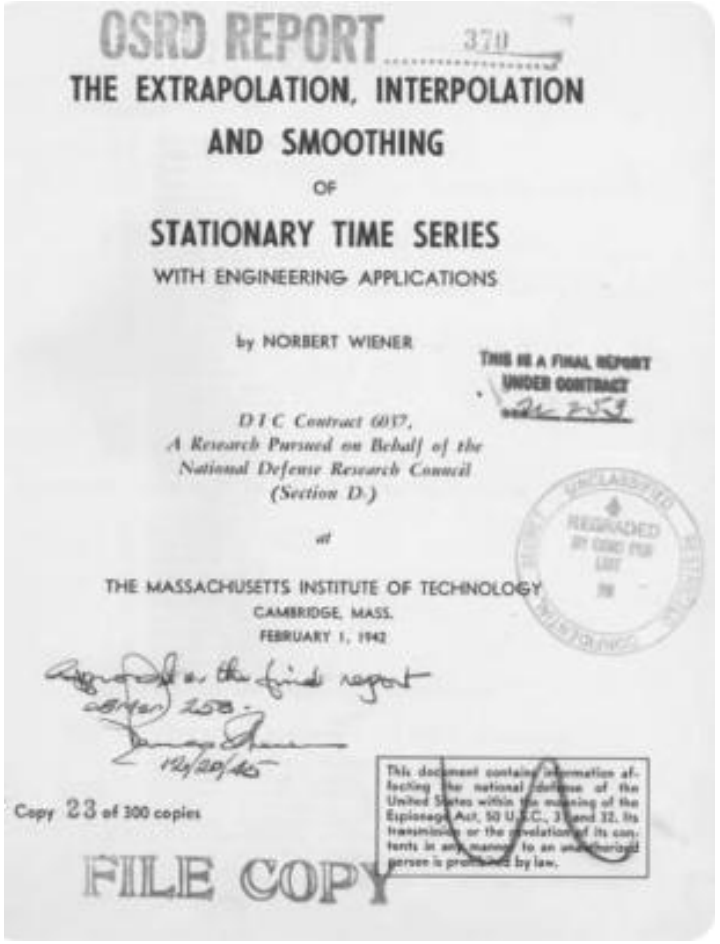
The classification of behavior suggested so far is tabulated here:



Norbert Wiener
Mathematician at MIT who coined the term cybernetics in modern form. Child prodigy and later, ex-prodigy

Along with Arturo Rosenbleuth and Julian Bigelow, published "Behavior, Purpose & Teleology" in 1943

This paper, along with McCulloch & Pitts' "Logical Calculus" and Craik's "Nature of Explanation" became the foundational manuscripts in 1943 that coalesced into cybernetics



OSRD REPORT 370

THE EXTRAPOLATION, INTERPOLATION AND SMOOTHING OF STATIONARY TIME SERIES

WITH ENGINEERING APPLICATIONS

by NORBERT WIENER

THIS IS A FINAL REPORT UNDER CONTRACT

D I C Contract 6037,
A Research Pursued on Behalf of the National Defense Research Council (Section D-)

at

THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY
CAMBRIDGE, MASS.
FEBRUARY 1, 1942

Copy 23 of 300 copies

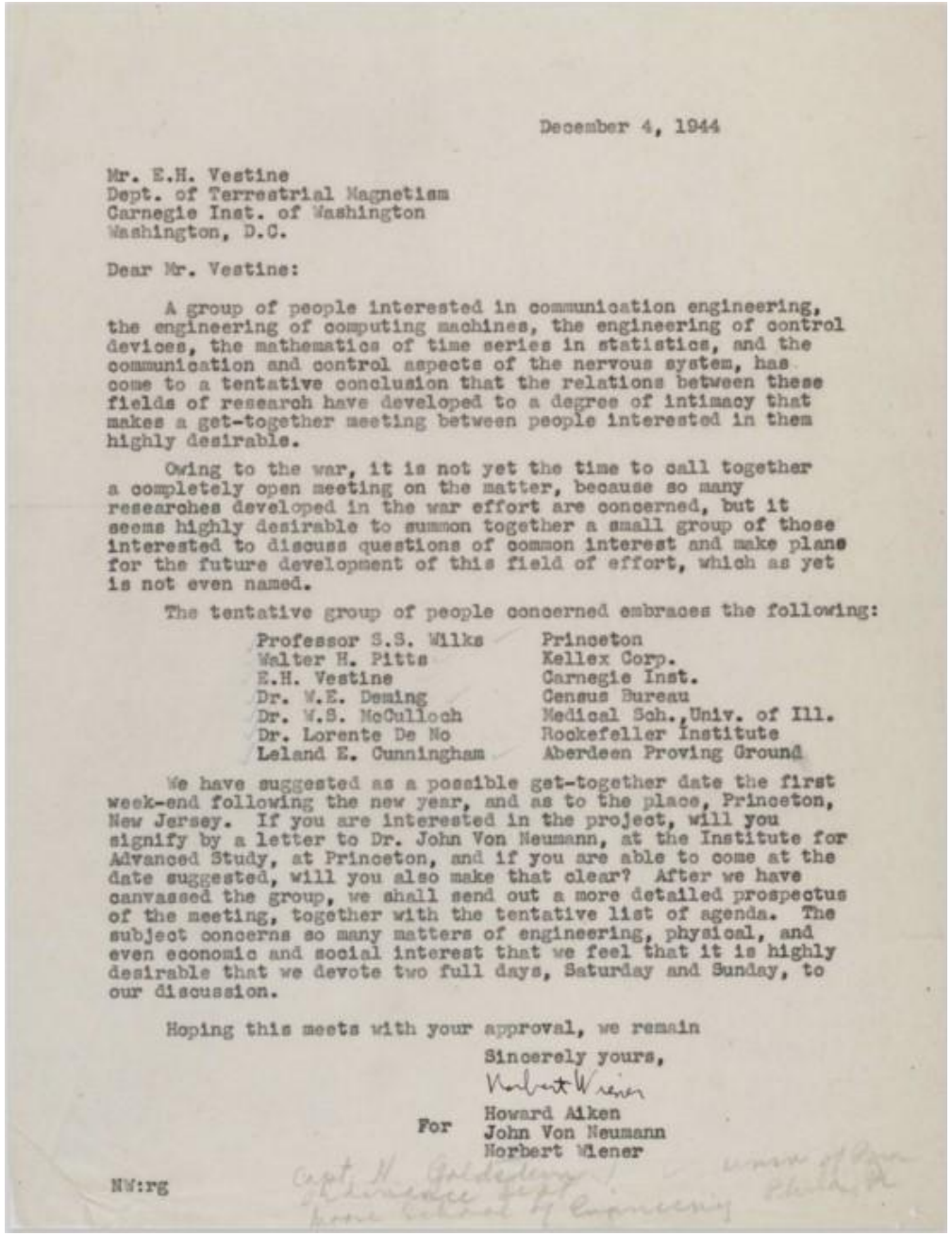
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Teleological Society, 1945:

"A group of people interested in communication engineering, the engineering of computing machines, the engineering of control devices, the mathematics of time series in statistics, and the communications and control aspect of the nervous system has come to a tentative conclusion that the relations between these fields of research have developed to a degree of intimacy that makes a get-together meeting between people interested in them highly desirable."

– Norbert Wiener w/ Howard Aiken & John von Neumann, Dec 4, 1944



December 4, 1944

Mr. E.H. Vestine
Dept. of Terrestrial Magnetism
Carnegie Inst. of Washington
Washington, D.C.

Dear Mr. Vestine:

A group of people interested in communication engineering, the engineering of computing machines, the engineering of control devices, the mathematics of time series in statistics, and the communication and control aspects of the nervous system, has come to a tentative conclusion that the relations between these fields of research have developed to a degree of intimacy that makes a get-together meeting between people interested in them highly desirable.

Owing to the war, it is not yet the time to call together a completely open meeting on the matter, because so many researches developed in the war effort are concerned, but it seems highly desirable to summon together a small group of those interested to discuss questions of common interest and make plans for the future development of this field of effort, which as yet is not even named.

The tentative group of people concerned embraces the following:

Professor S.S. Wilks	Princeton
Walter H. Pitts	Kellex Corp.
E.H. Vestine	Carnegie Inst.
Dr. W.E. Deming	Census Bureau
Dr. W.S. McCulloch	Medical Sch., Univ. of Ill.
Dr. Lorente De No	Rockefeller Institute
Leland E. Cunningham	Aberdeen Proving Ground

We have suggested as a possible get-together date the first week-end following the new year, and as to the place, Princeton, New Jersey. If you are interested in the project, will you signify by a letter to Dr. John Von Neumann, at the Institute for Advanced Study, at Princeton, and if you are able to come at the date suggested, will you also make that clear? After we have canvassed the group, we shall send out a more detailed prospectus of the meeting, together with the tentative list of agenda. The subject concerns so many matters of engineering, physical, and even economic and social interest that we feel that it is highly desirable that we devote two full days, Saturday and Sunday, to our discussion.

Hoping this meets with your approval, we remain

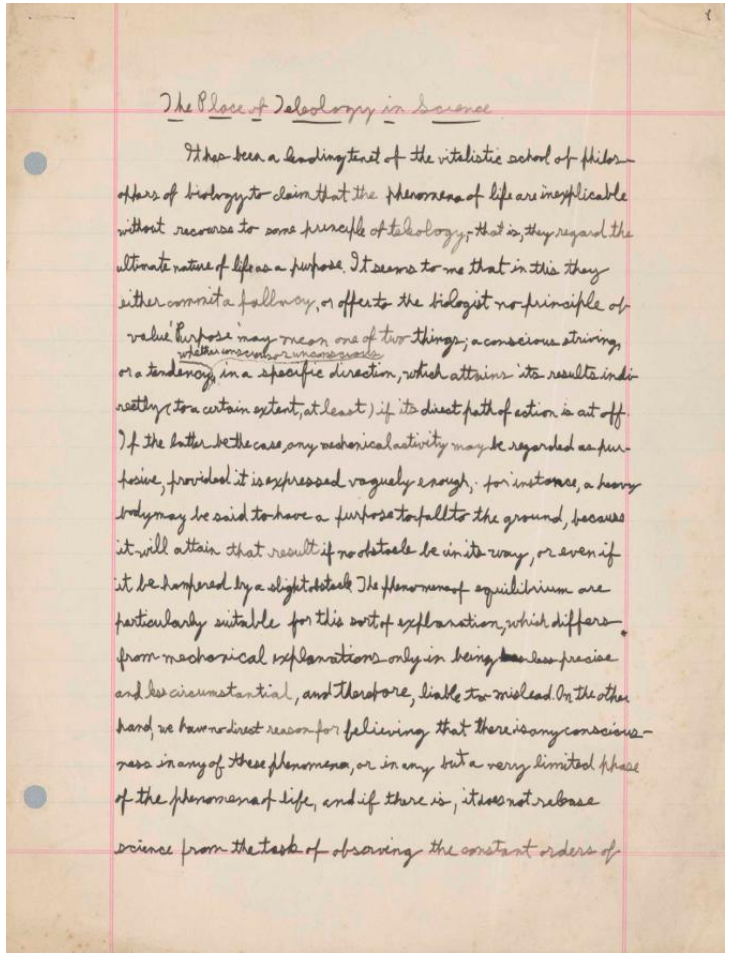
Sincerely yours,

Norbert Wiener

For Howard Aiken
John Von Neumann
Norbert Wiener

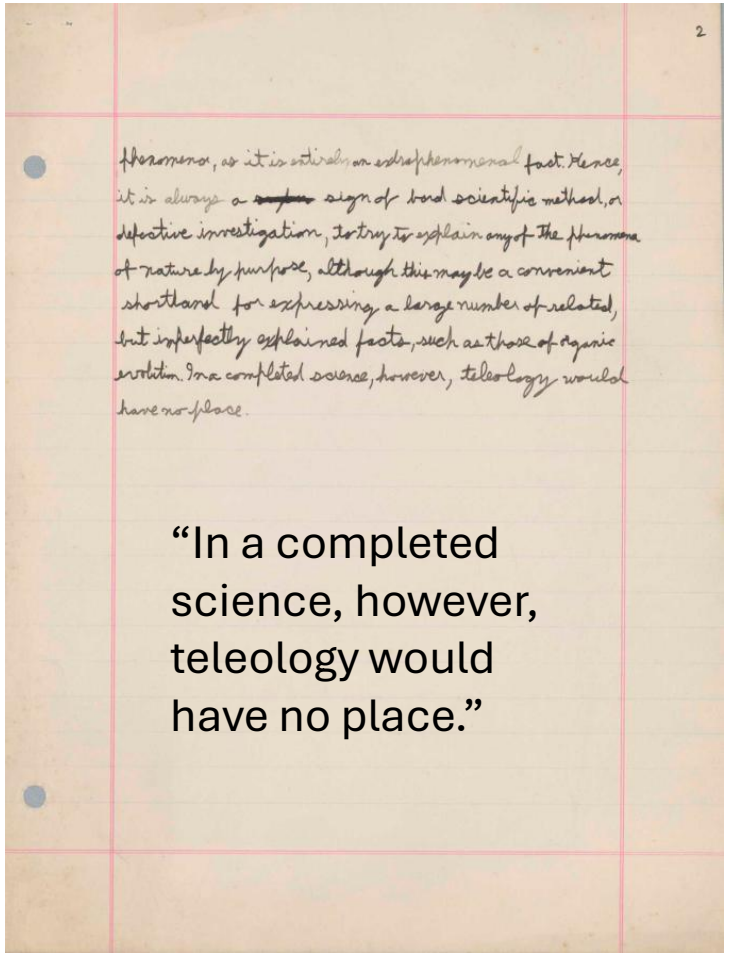
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The Place of Teleology in Science – Wiener (1910-13 ca) & Behavior, Purpose and Teleology – Rosenblueth, Wiener & Bigelow (1943)



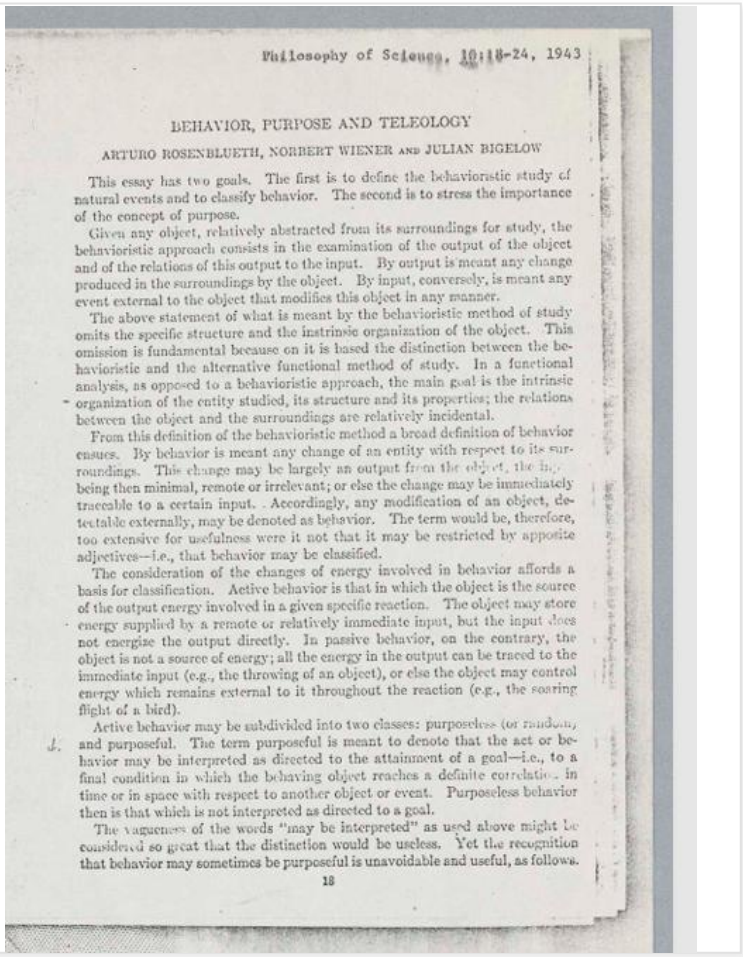
The Place of Teleology in Science

It has been a leading tenet of the vitalistic school of philosophers of biology to claim that the phenomena of life are inexplicable without recourse to some principle of teleology, that is, they regard the ultimate nature of life as a purpose. It seems to me that in this they either commit a fallacy, or affect to the biologist no principle of value. 'Purpose' may mean one of two things, a conscious striving, whether unconscious or unaware, or a tendency, in a specific direction, which attains its results indirectly, (to a certain extent, at least) if its direct path of action is cut off. If the latter be the case, any mechanical activity may be regarded as purposive, provided it is expressed vaguely enough. For instance, a heavy body may be said to have a purpose to fall to the ground, because it will attain that result if no obstacle be in its way, or even if it be hampered by a slight obstacle. The phenomena of equilibrium are particularly suitable for this sort of explanation, which differs from mechanical explanations only in being less precise and less circumstantial, and therefore, liable to mislead. On the other hand, we have no direct reason for believing that there is any consciousness in any of these phenomena, or in any but a very limited phase of the phenomena of life, and if there is, it does not release science from the task of observing the constant orders of



phenomena, as it is actual, or subphenomenal fact. Hence, it is always a sign of bad scientific method, or defective investigation, to try to explain any of the phenomena of nature by purpose, although this may be a convenient shorthand for expressing a large number of related, but imperfectly explained facts, such as those of organic evolution. In a completed science, however, teleology would have no place.

"In a completed science, however, teleology would have no place."



Philosophy of Science, 10:18-24, 1943

BEHAVIOR, PURPOSE AND TELEOLOGY

ARTURO ROSENBLUETH, NORBERT WIENER AND JULIAN BIGELOW

This essay has two goals. The first is to define the behavioristic study of natural events and to classify behavior. The second is to stress the importance of the concept of purpose.

Given any object, relatively abstracted from its surroundings for study, the behavioristic approach consists in the examination of the output of the object and of the relations of this output to the input. By output is meant any change produced in the surroundings by the object. By input, conversely, is meant any event external to the object that modifies this object in any manner.

The above statement of what is meant by the behavioristic method of study omits the specific structure and the instrinsic organization of the object. This omission is fundamental because on it is based the distinction between the behavioristic and the alternative functional method of study. In a functional analysis, as opposed to a behavioristic approach, the main goal is the intrinsic organization of the entity studied, its structure and its properties; the relations between the object and the surroundings are relatively incidental.

From this definition of the behavioristic method a broad definition of behavior ensues. By behavior is meant any change of an entity with respect to its surroundings. This change may be largely an output from the object, the input being then minimal, remote or irrelevant; or else the change may be immediately traceable to a certain input. Accordingly, any modification of an object, detectable externally, may be denoted as behavior. The term would be, therefore, too extensive for usefulness were it not that it may be restricted by appotite adjectives—i.e., that behavior may be classified.

The consideration of the changes of energy involved in behavior affords a basis for classification. Active behavior is that in which the object is the source of the output energy involved in a given specific reaction. The object may store energy supplied by a remote or relatively immediate input, but the input does not energize the output directly. In passive behavior, on the contrary, the object is not a source of energy; all the energy in the output can be traced to the immediate input (e.g., the throwing of an object), or else the object may control energy which remains external to it throughout the reaction (e.g., the soaring flight of a bird).

Active behavior may be subdivided into two classes: purposeless (or random) and purposeful. The term purposeful is meant to denote that the act or behavior may be interpreted as directed to the attainment of a goal—i.e., to a final condition in which the behaving object reaches a definite correlation in time or in space with respect to another object or event. Purposeless behavior then is that which is not interpreted as directed to a goal.

The vagueness of the words "may be interpreted" as used above might be considered so great that the distinction would be useless. Yet the recognition that behavior may sometimes be purposeful is unavoidable and useful, as follows.

18

Phenomenology & Cybernetics

XXIII

Psychoanalysis and cybernetics, or on the nature of language

LECTURE[1]

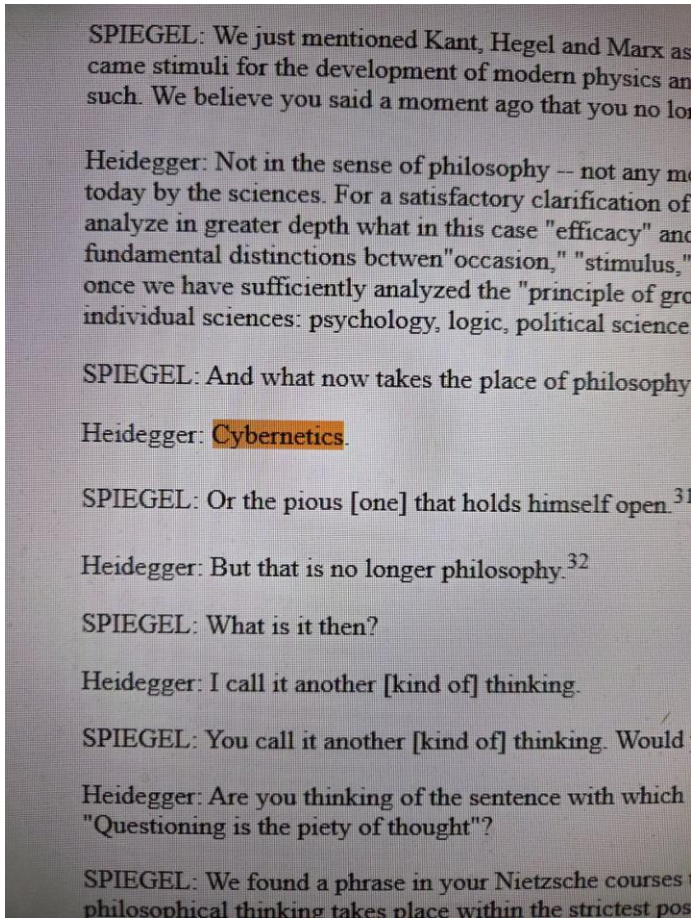
Professor, Ladies and Gentlemen,

In what I am going to say, I would like to single out from amongst you those who come regularly to hear me on Wednesdays, in order to associate them in the gratitude we feel for the person I named first, Jean Delay, who agreed to inaugurate this series of lectures, and who is honouring us by his presence at this session.

On a personal note, I would like to thank him for having given a home to the seminar which I have been running here for the last two years, giving us a roof which adds renown to this teaching through all the memories accumulated under it, and allowing it to share in the resonances of his own speech.

Today I would like to talk about psychoanalysis and cybernetics. As it involves bringing together psychoanalysis and the various human sciences, it seemed to me to be a subject worthy of attention.

Lacan, Seminar 2, 1955



SPIEGEL: We just mentioned Kant, Hegel and Marx as
came stimuli for the development of modern physics an
such. We believe you said a moment ago that you no lo

Heidegger: Not in the sense of philosophy -- not any m
today by the sciences. For a satisfactory clarification of
analyze in greater depth what in this case "efficacy" and
fundamental distinctions bctwen"occasion," "stimulus,"
once we have sufficiently analyzed the "principle of gro
individual sciences: psychology, logic, political science

SPIEGEL: And what now takes the place of philosophy

Heidegger: Cybernetics.

SPIEGEL: Or the pious [one] that holds himself open.[31]

Heidegger: But that is no longer philosophy.[32]

SPIEGEL: What is it then?

Heidegger: I call it another [kind of] thinking.

SPIEGEL: You call it another [kind of] thinking. Would

Heidegger: Are you thinking of the sentence with which
"Questioning is the piety of thought"?

SPIEGEL: We found a phrase in your Nietzsche courses
philosophical thinking takes place within the strictest pos

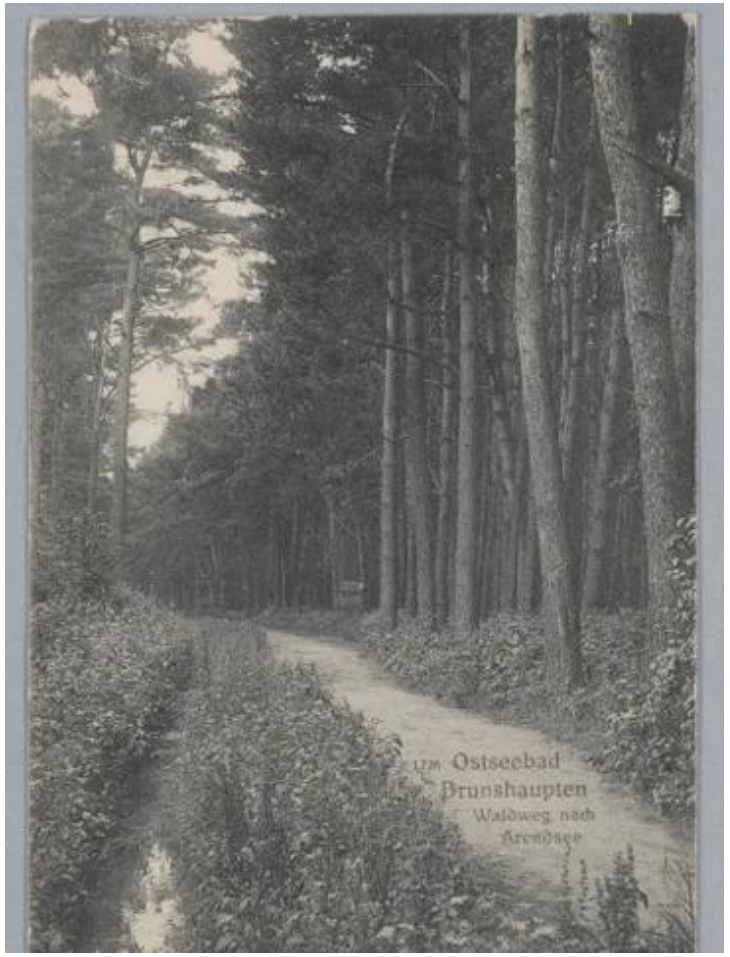
Heidegger interview with Der Speigel, "*Only God can save us now*", 1966

Norbert Wiener's Journey – Studying with Husserl in Göttingen, 1914

April 25, 1914,
Bühlstr. 28,
Göttingen.

Dear ma:

On the 200 marks you are sending me with what I have on hand, I can live at the very least until June 27, and, if needs be, until July 4. I answered the English postcard at once. Elliot went away Wednesday morning. Stuart did not stay here overnight. I went the other day to visit Husserl, under whom I am going to study. I could converse with him O.K. in German, though perhaps not grammatically. My Sheldon & my letter from Monsterberg were sufficient introductions.

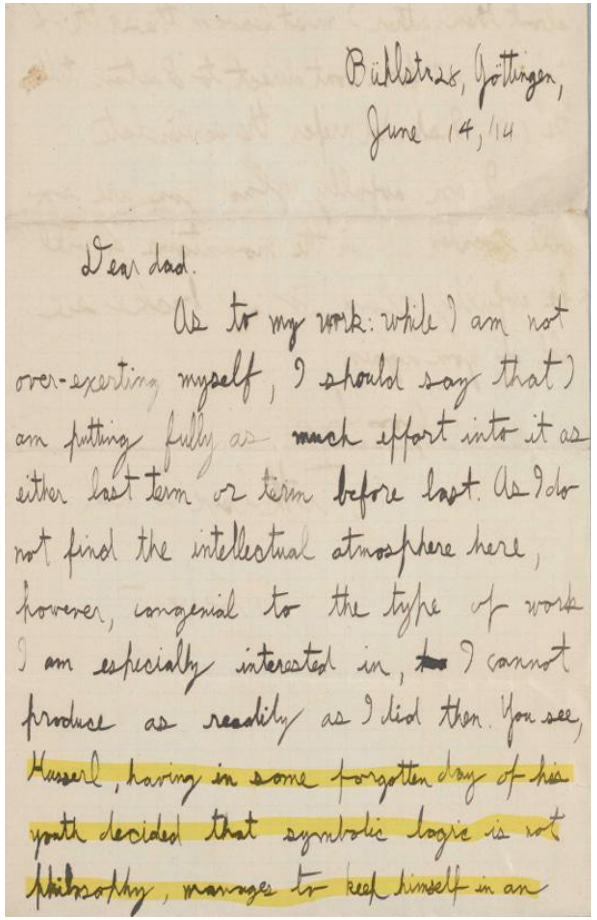


been solved before by determinants, but the idea of a row of Σ's where the upper limit of each sum is a function of the particular term selected from the previous sum, although I do not know if it is new, strikes me as interesting.

I haven't received the Nation nor the Gazette yet. Have you had any more scraps with Jagemann or Grandgent yet? Tell me all the news of that sort.

Last Sunday Husserl invited me over to see him. He was very pleasant personally to me, but he tried to warn me out of Mathematics. If, however, my choice were limited to Math. & H's sort of phil., I'd take math. every time. H's trichotomizing tendencies (can you make out what I mean) are too much for me. When a man lends his sanction, for instance, to a book on the

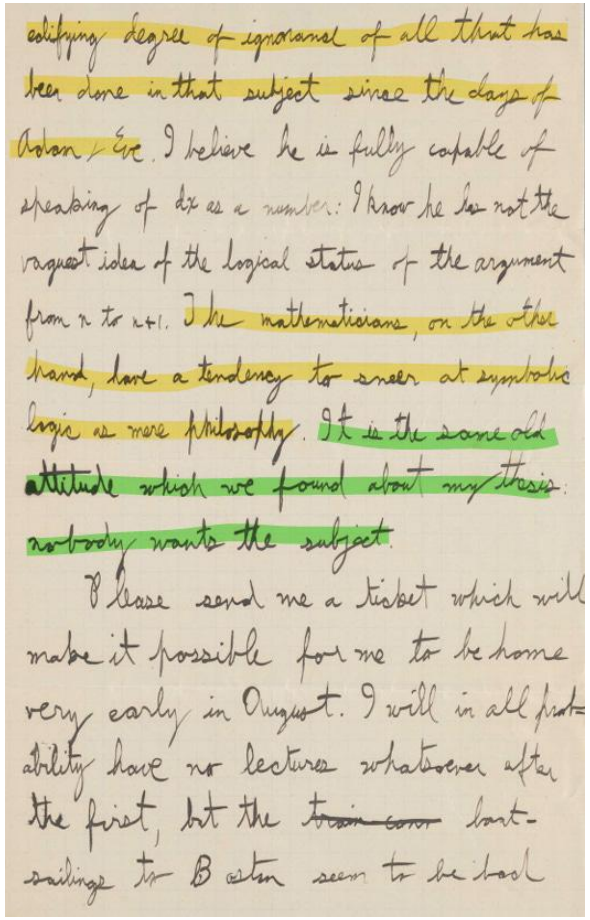
Math, Philosophy and Symbolic Logic



Bülstrasse, Göttingen,
June 14, 14

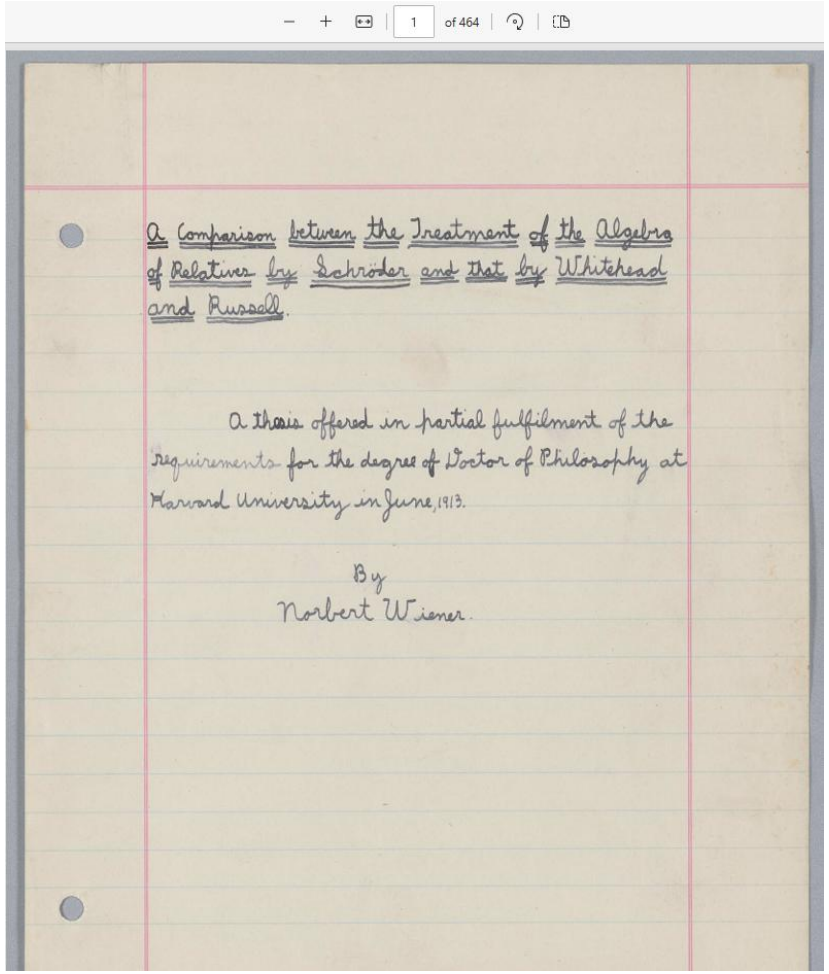
Dear dad.

As to my work: while I am not over-exerting myself, I should say that I am putting fully as much effort into it as either last term or term before last. As I do not find the intellectual atmosphere here, however, congenial to the type of work I am especially interested in, I cannot produce as readily as I did then. You see, Husserl, having in some forgotten day of his youth decided that symbolic logic is not philosophy, manages to keep himself in an



edifying degree of ignorance of all that has been done in that subject since the days of Adam & Eve. I believe he is fully capable of speaking of dx as a number: I know he has not the vaguest idea of the logical status of the argument from x to x+1. The mathematicians, on the other hand, have a tendency to sneer at symbolic logic as mere philosophy. It is the same old attitude which we found about my thesis: nobody wants the subject.

Please send me a ticket which will make it possible for me to be home very early in August. I will in all probability have no lectures whatever after the first, but the ~~train~~ boat-sailings to Boston seem to be bad

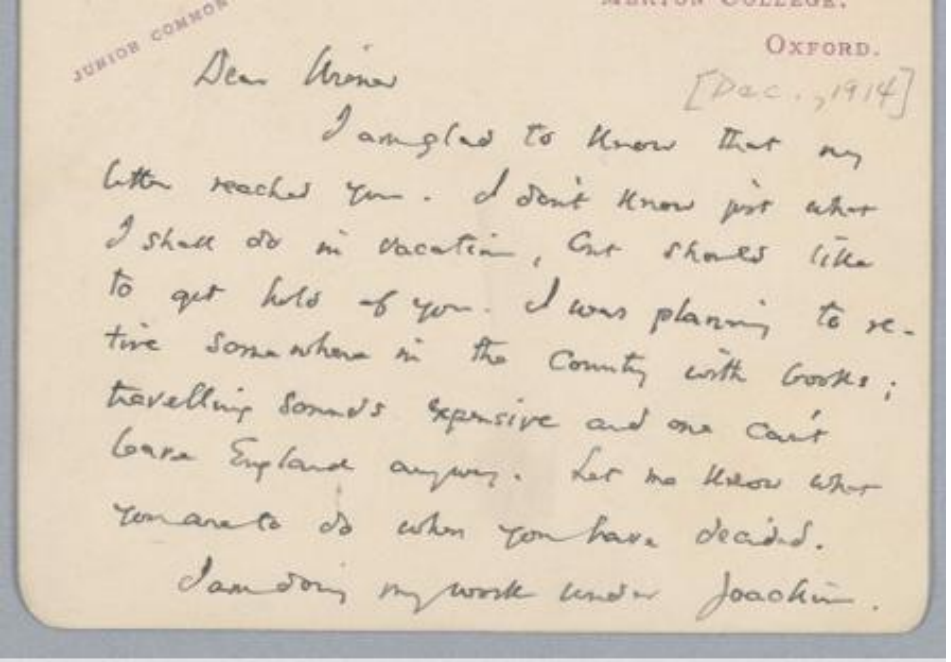


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A Comparison between the Treatment of the Algebra of Relatives by Schröder and that by Whitehead and Russell.

A thesis offered in partial fulfilment of the requirements for the degree of Doctor of Philosophy at Harvard University in June, 1913.

By
Norbert Wiener.



JUNIOR COMMON ROOM

MERTON COLLEGE,

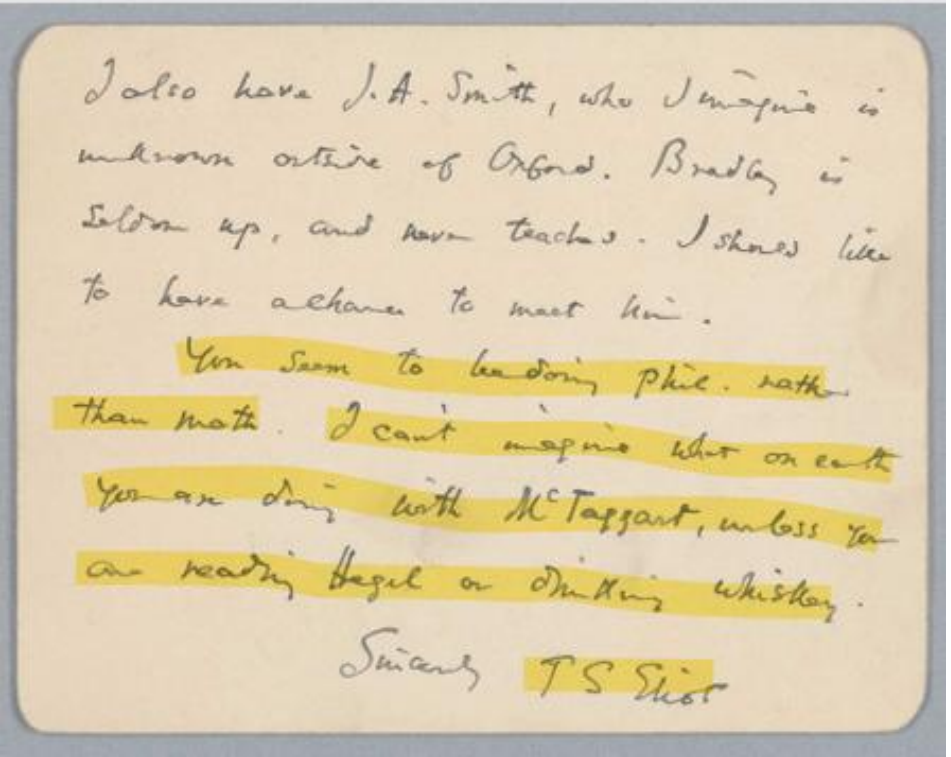
OXFORD.

[Dec., 1914]

Dear Norman

I am glad to know that my letter reached you. I don't know yet what I shall do in vacation, but should like to get hold of you. I was planning to retire somewhere in the country with books; travelling sounds expensive and one can't leave England anyway. Let me know what you are to do when you have decided.

I am doing my work under Joachim.



I also have J.A. Smith, who I imagine is unknown outside of Oxford. Bradley is seldom up, and never teaches. I should like to have a chance to meet him.

You seem to be doing phil. rather than math. I can't imagine what on earth you are doing with McTaggart, unless you are reading Hegel or drinking whiskey.

Sincerely T S Eliot

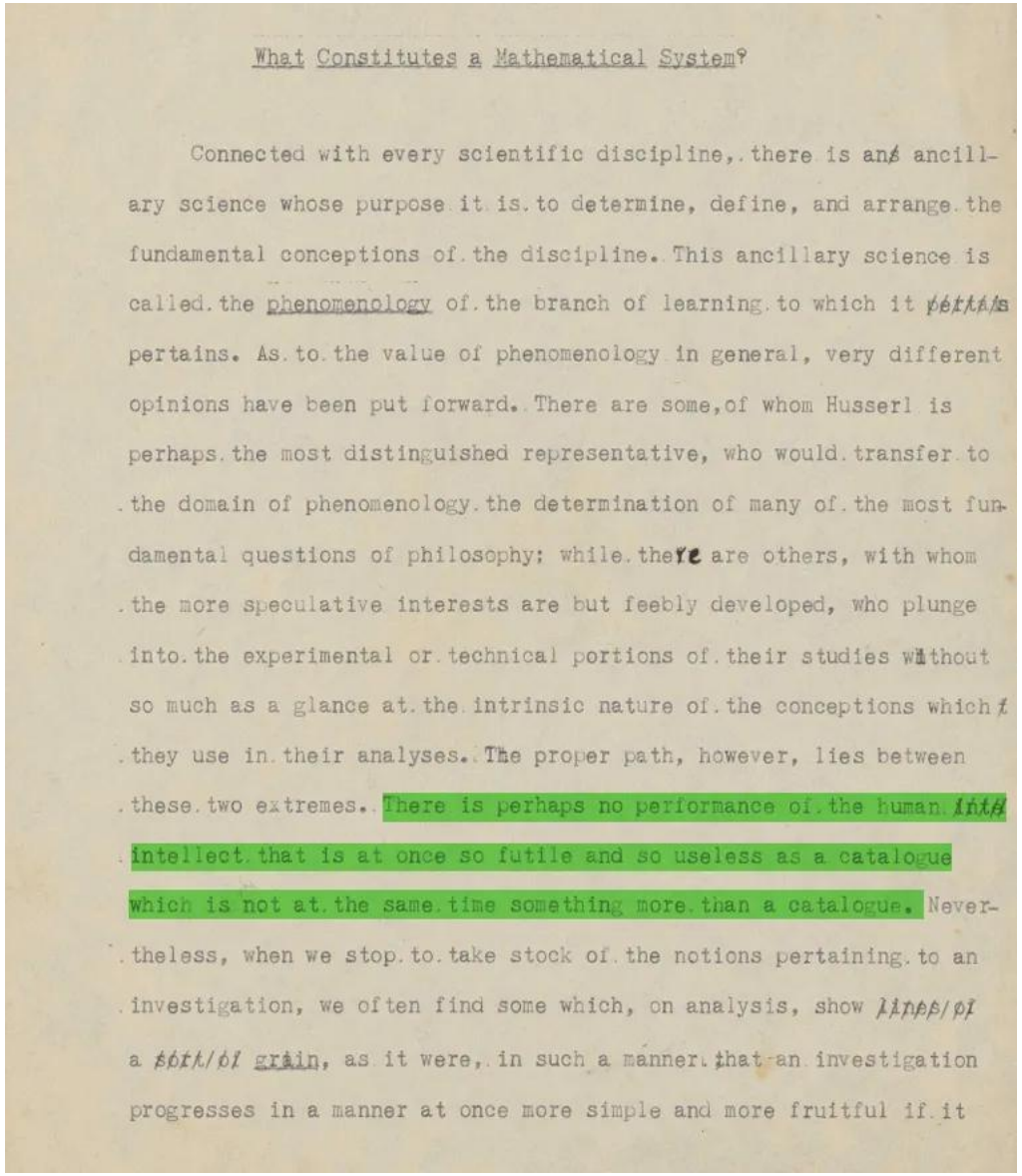
T.S. Eliot taunts Wiener about his interest in phenomenology

- "You seem to be doing phil. rather than math. I can't imagine what on earth you are doing with McTaggart, unless you are reading Hegel or drinking whiskey."
- J.M.E. McTaggart was a phenomenologist at Cambridge best known for "Unreality of Time"
- Wiener was frequently attending the Moral Sciences Club, which McTaggart led

What Constitutes a Mathematical System (ca 1916) by Norbert Wiener

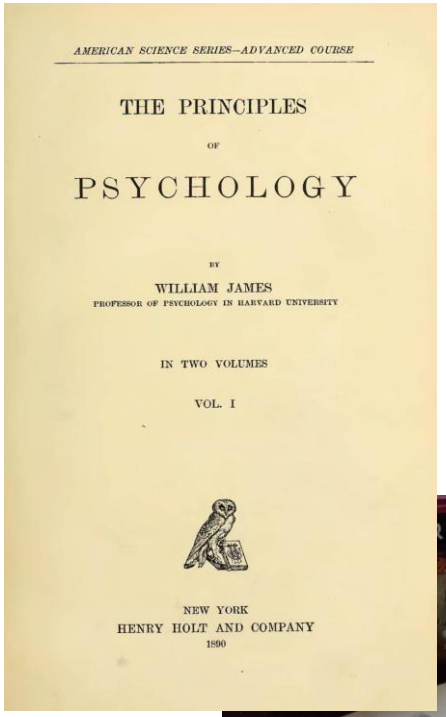
- “Connected with every scientific discipline, there is an ancillary science…phenomenology”

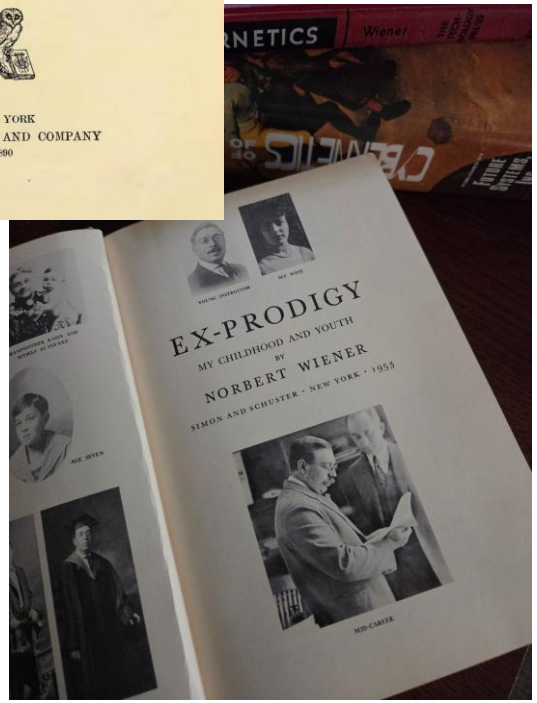
- “The proper path, however, lies between these two extremes”
  - Phenomenology
  - Experimental & technical



What Constitutes a Mathematical System?

Connected with every scientific discipline, there is an ancillary science whose purpose it is to determine, define, and arrange the fundamental conceptions of the discipline. This ancillary science is called the phenomenology of the branch of learning to which it pertains. As to the value of phenomenology in general, very different opinions have been put forward. There are some, of whom Husserl is perhaps the most distinguished representative, who would transfer to the domain of phenomenology the determination of many of the most fundamental questions of philosophy; while there are others, with whom the more speculative interests are but feebly developed, who plunge into the experimental or technical portions of their studies without so much as a glance at the intrinsic nature of the conceptions which they use in their analyses. The proper path, however, lies between these two extremes. There is perhaps no performance of the human intellect that is at once so futile and so useless as a catalogue which is not at the same time something more than a catalogue. Nevertheless, when we stop to take stock of the notions pertaining to an investigation, we often find some which, on analysis, show themselves of a coarse grain, as it were, in such a manner that an investigation progresses in a manner at once more simple and more fruitful if it



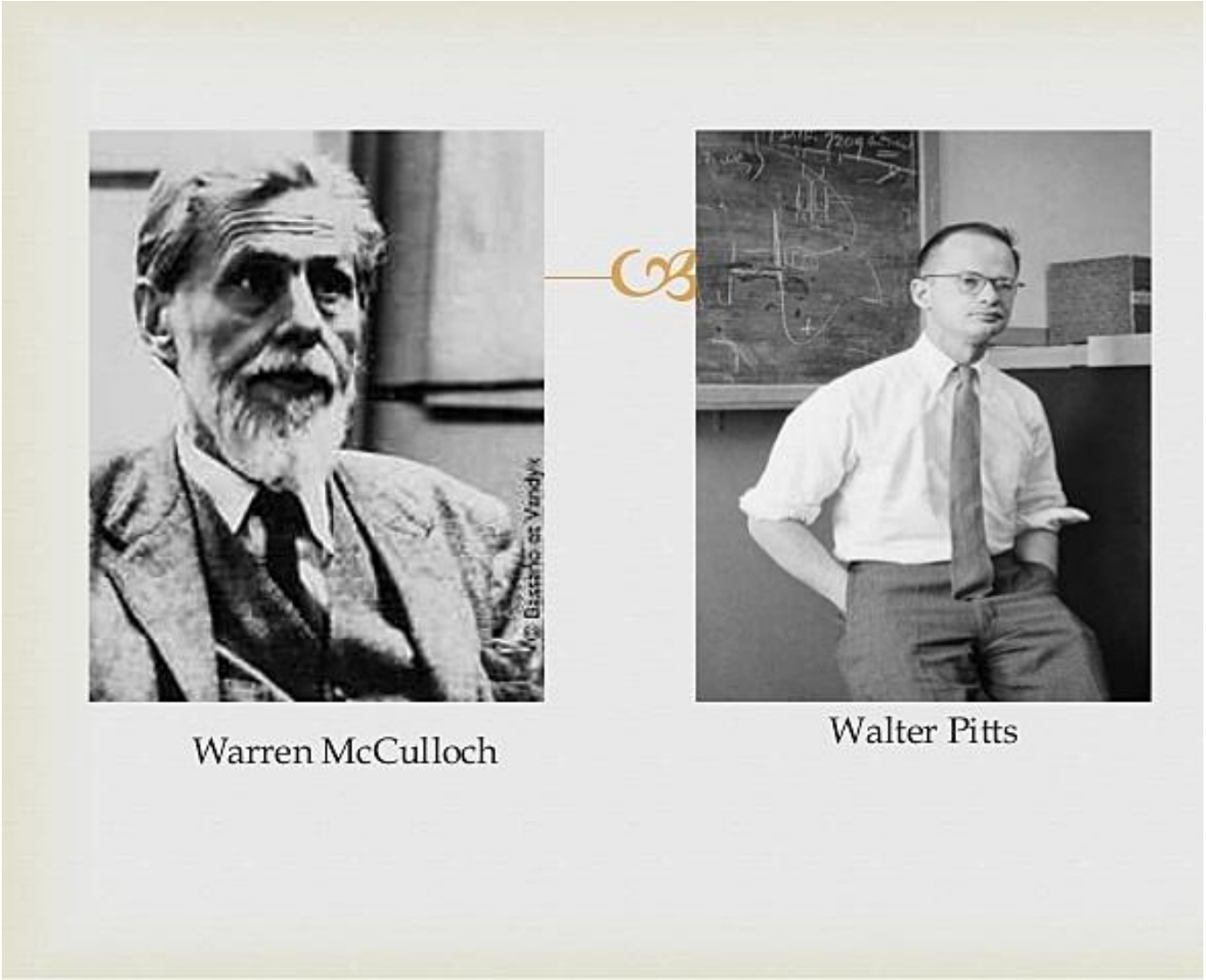


Norbert Wiener & William James

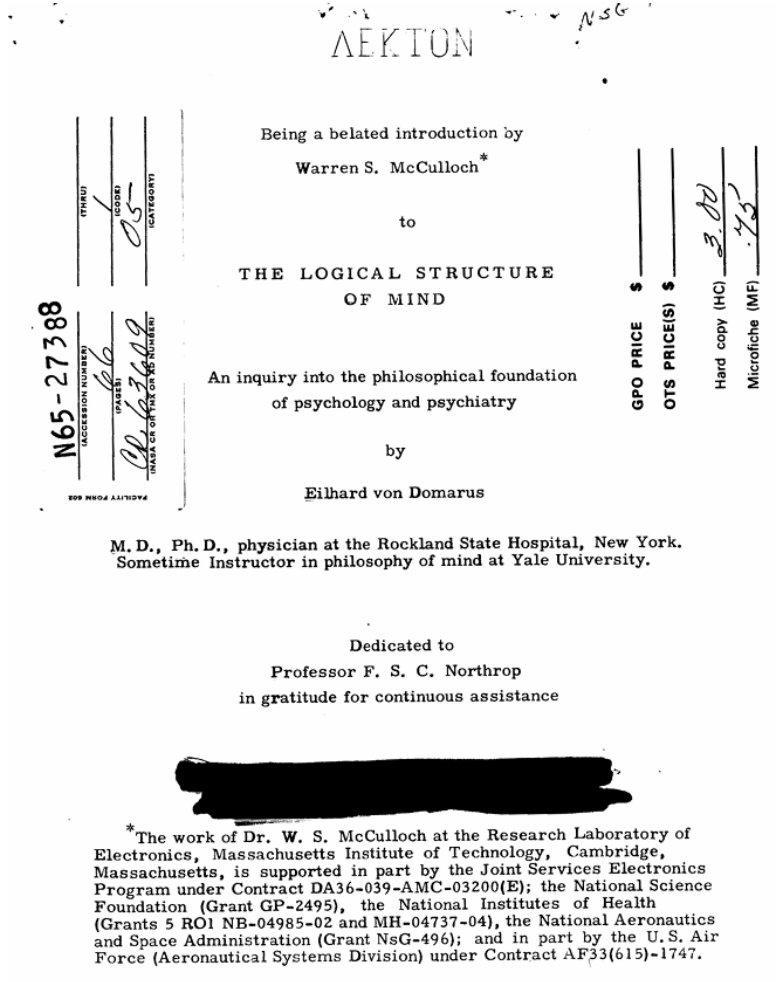
- "The rather dilute material of my courses in philosophy and psychology showed up poorly in comparison with the outside reading and in particular with the great books of William James, which I devoured almost as much as literary tidbits as for their serious content"
- "...it was not long before I had the chance to visit him in his own house..."
- "...kind to me in my own confusion, and later invited me to sit in on his Lowell lectures...I attended them and was delighted when Professor James presented my father with a copy of the book in which he embodied this series of lectures."
- "In the more concrete material of psychology, his insight showed itself in every paragraph..."
- "...one of the places I was most often to be found was the Harvard Philosophical Library...For example, we found that a number of books which had been left to the library by William James were full of autographic margin notations by James himself...The James copies of the books of Royce and Bertrand Russell were particularly amusing."

Warren McCulloch
Neuropsychiatrist who co-founded cybernetics and chaired the Macy Conferences on Cybernetics

Published “A Logical Calculus of the Ideas Immanent in Nervous Activity” with Walter Pitts in 1943; first description of an artificial neural network



Warren McCulloch's Phenomenological Roots



ΛΕΚΤΟΝ

Being a belated introduction by

Warren S. McCulloch*

to

THE LOGICAL STRUCTURE OF MIND

An inquiry into the philosophical foundation of psychology and psychiatry

by

Eilhard von Domarus

M. D., Ph. D., physician at the Rockland State Hospital, New York. Sometime Instructor in philosophy of mind at Yale University.

Dedicated to
Professor F. S. C. Northrop
in gratitude for continuous assistance

[redacted]

*The work of Dr. W. S. McCulloch at the Research Laboratory of Electronics, Massachusetts Institute of Technology, Cambridge, Massachusetts, is supported in part by the Joint Services Electronics Program under Contract DA36-039-AMC-03200(E); the National Science Foundation (Grant GP-2495), the National Institutes of Health (Grants 5 RO1 NB-04985-02 and MH-04737-04), the National Aeronautics and Space Administration (Grant NsG-496); and in part by the U. S. Air Force (Aeronautical Systems Division) under Contract AF33(615)-1747.

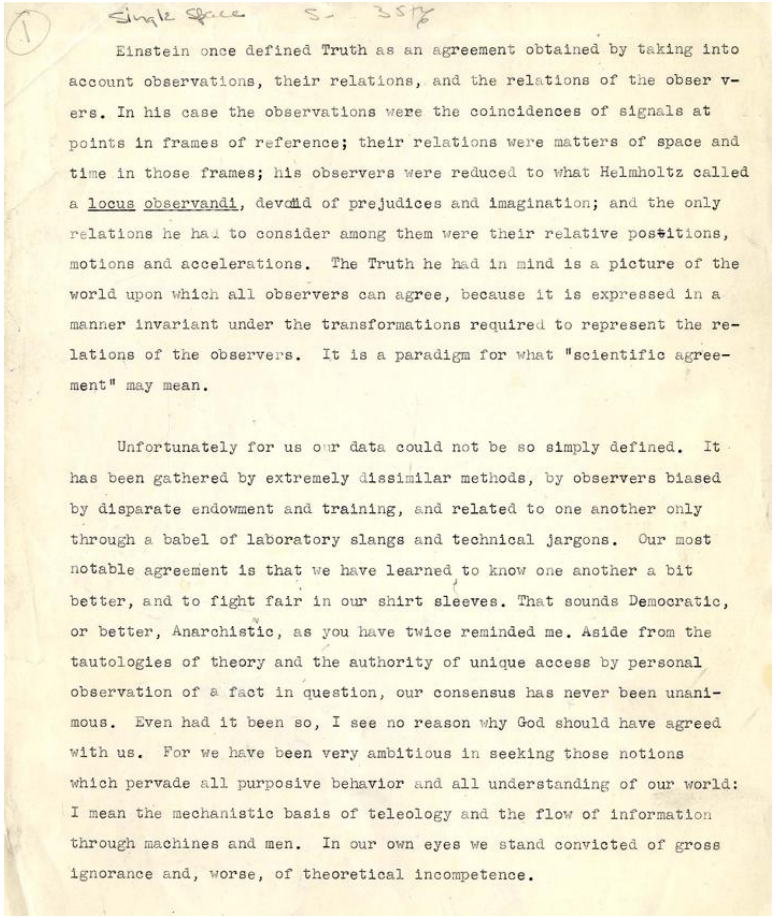
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OTS PRICE(S) $
Hard copy (HC) 3.00
Microfiche (MF) .75

- "What is a number, that a man may know it, and a man, that he may know a number?" (1917)

- "It took over a year of nightly sessions to do it, but I came away with a real understanding of what was important for me in German philosophy and German neuropsychiatry, without which I would never have come to a definition of thinking that fits cybernetics." (About work with von Doramus in 1931)

McCulloch's address to the last Macy Cybernetic Conference, 1953



Einstein once defined Truth as an agreement obtained by taking into account observations, their relations, and the relations of the obser v- ers. In his case the observations were the coincidences of signals at points in frames of reference; their relations were matters of space and time in those frames; his observers were reduced to what Helmholtz called a locus observandi, devoid of prejudices and imagination; and the only relations he had to consider among them were their relative positions, motions and accelerations. The Truth he had in mind is a picture of the world upon which all observers can agree, because it is expressed in a manner invariant under the transformations required to represent the re- lations of the observers. It is a paradigm for what "scientific agree- ment" may mean.

Unfortunately for us our data could not be so simply defined. It has been gathered by extremely dissimilar methods, by observers biased by disparate endowment and training, and related to one another only through a babel of laboratory slangs and technical jargons. Our most notable agreement is that we have learned to know one another a bit better, and to fight fair in our shirt sleeves. That sounds Democratic, or better, Anarchistic, as you have twice reminded me. Aside from the tautologies of theory and the authority of unique access by personal observation of a fact in question, our consensus has never been unani- mous. Even had it been so, I see no reason why God should have agreed with us. For we have been very ambitious in seeking those notions which pervade all purposive behavior and all understanding of our world: I mean the mechanistic basis of teleology and the flow of information through machines and men. In our own eyes we stand convicted of gross ignorance and, worse, of theoretical incompetence.

"...I see no reason God should have agreed with us. For we have been very ambitious in seeking those notions which pervade all purposive behavior and all understanding of our world. I mean the mechanistic basis of **teleology** and the flow of information through machines and men."

Warren McCulloch, Chairman of the Macy Conferences on Cybernetics, in a letter to the group in advance of the 10th and final conference, 1953

Cybernetics & Teleology

“Bateson hinted at the expansive approach as early as 1951, when he grandly claimed that the information theory part of **cybernetics** ‘marks the greatest single shift in human thinking since the days of Plato and Aristotle, because it unites the natural and social sciences and finally resolves the problems of **teleology** and the body-mind dichotomy which Occidental thought has inherited from classical Athens’ (Ruesch and Bateson, 1951, *Communication: The Social Matrix of Psychiatry*)”

Ronald Kline, “How disunity matters to the history of cybernetics in the human sciences in the United States, 1940–80”, *History of the Human Sciences*, 2020, Vol. 33(1) 12–35

Cybernetics

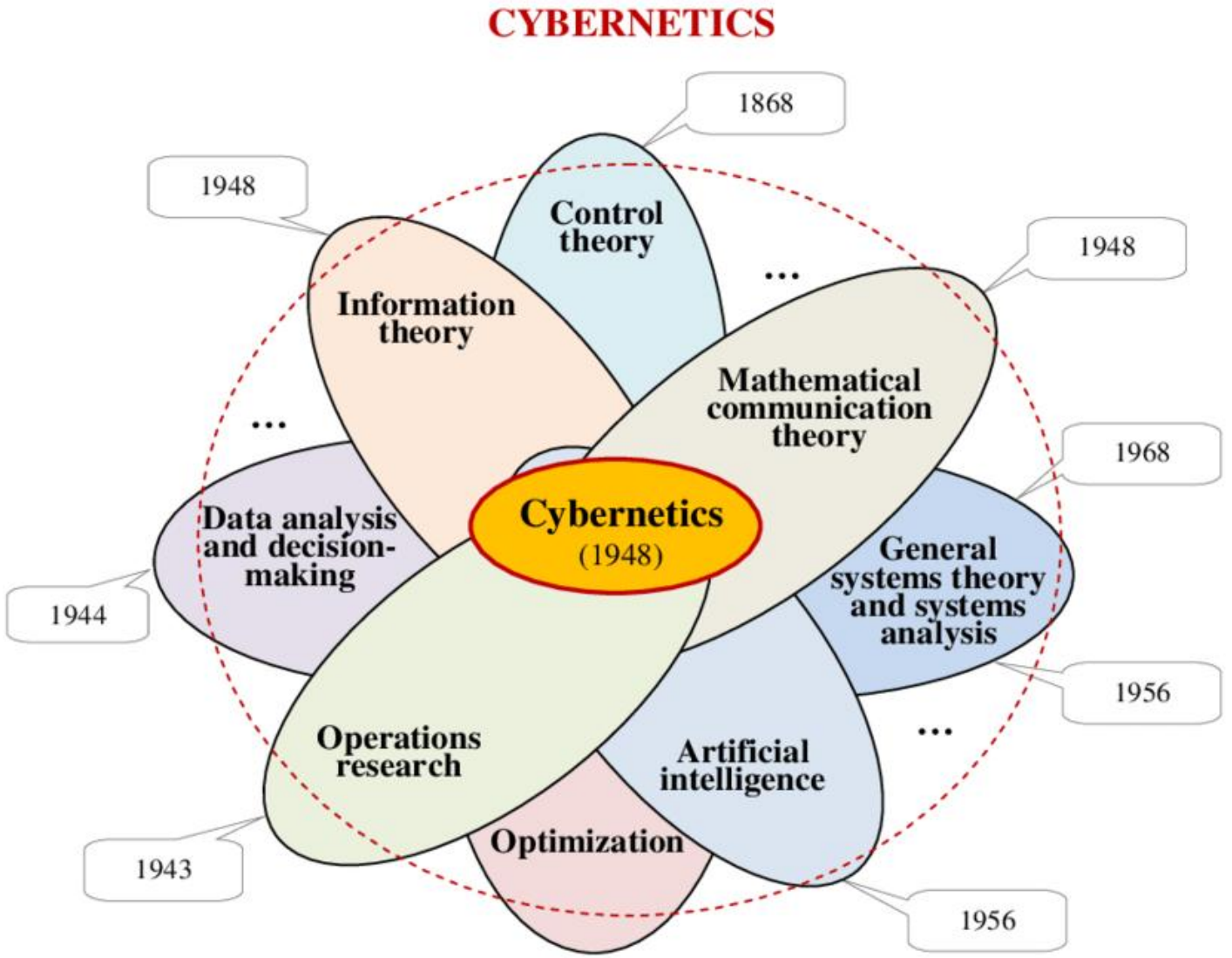


Figure from Novikov, D.A. Cybernetics: From Past to Future. 2016

Pope Leo, William Gibson & The New Testament



← Post

Pope Leo XIV
@Pontifex

Today, the promises of transhumanism and posthumanism are multiplying. These are ideological currents according to which, sooner or later, technology will eliminate all disease and pain, as well as aging and even death itself. Precisely because scientific progress is a supreme achievement of human intelligence, it must not be confused with a privilege reserved for millionaires seeking immortality, while entire peoples suffer from poverty and oppression. In the face of this mirage, which promotes the illusion of human beings perfected by cybernetics and biotechnology, Christian anthropology reminds us that a limitation is not a manufacturing defect, but rather the very condition of human grandeur. #ApostolicJourney #Peru #MagnificaHumanitas
vatican.va/content/leo-xi...

9:10 PM · Nov 13, 2026 · **4.6M** Views

1.6K 10K 68K 9.8K

"And God has placed in the church first of all apostles, second prophets, third teachers, then miracles, then gifts of healing, of helping, of guidance, and of different kinds of tongues."
1Cor 12:28 (NIV)

2941 *kybérnēsis* – properly, someone who steers (guides) a ship; (figuratively) the divine calling which empowers someone to *lead* in affairs relating to the Church. (2941 */kybérnēsis* only occurs in 1 Cor 12:28.)

2941 */kybérnēsis* ("a helmsman who steers") refers to a pilot (a captain, as in Plato) – a *director* who guides, administrates, etc. (*Abbott-Smith*).

Thayer's Greek Lexicon

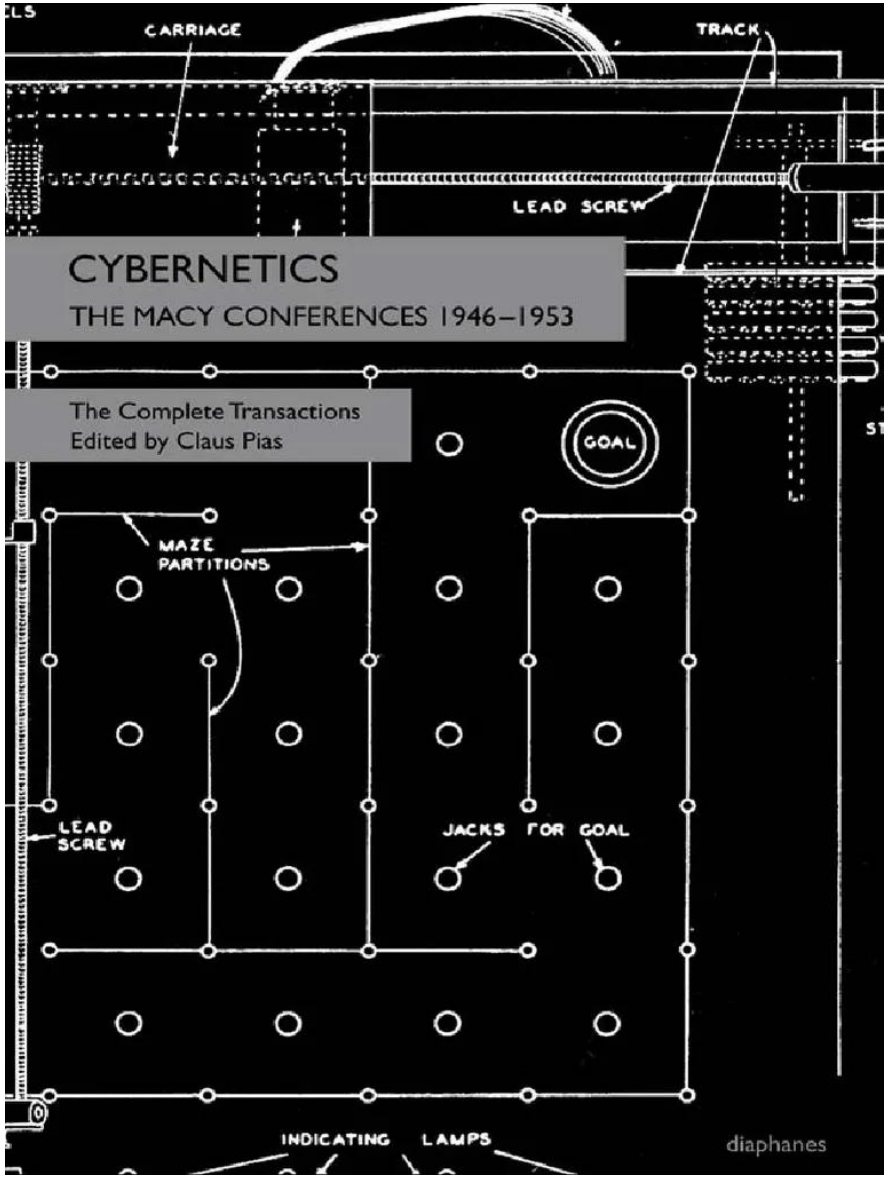
STRONGS NT 2942: κυβερνήτης

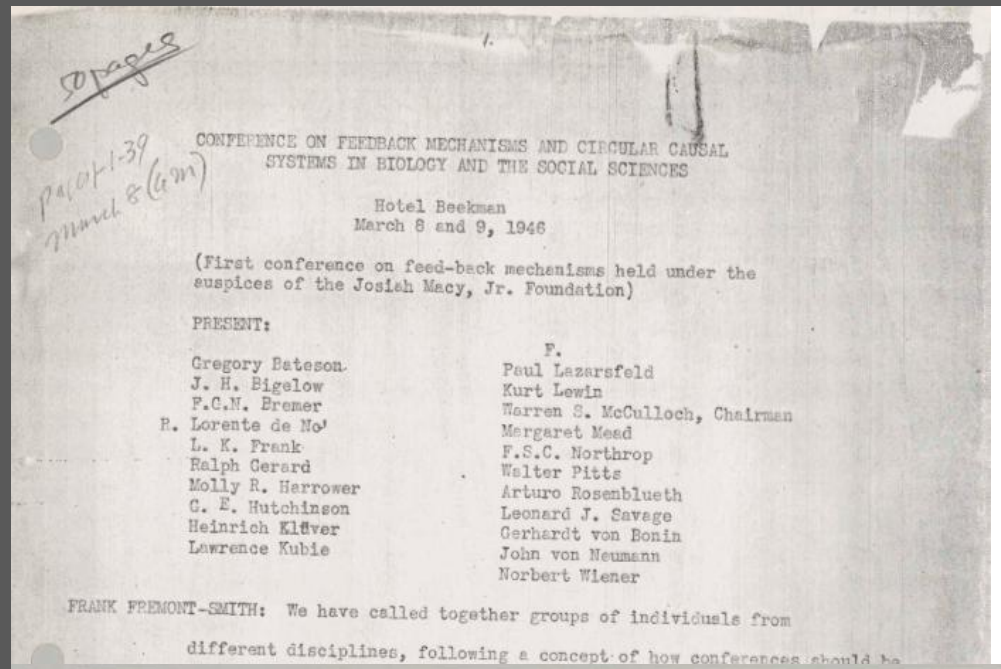
κυβερνήτης, κυβερνητου, ὁ (κυβερνάω (`to steer'; see the preceding word)); from Homer down; **steersman, helmsman, sailing-master**; (A. V. **master, ship-master**): Acts 27:11; Revelation 18:17. (Ezekiel 27:8, 27f.)

Macy Conferences

A series of conferences sponsored by the Josiah Macy Foundation that included an interdisciplinary groups of people from the natural and human sciences. Including:

- **Cerebral Inhibition and Hypnosis (1942)**
- **1st - Feedback Mechanisms and Circular Causal Systems in Biological and Social Systems (1946)**
- **2nd & 3rd - Teleological Mechanisms and Circular Causal Systems (1946-47) ???**
- **4th – 6th - Circular Causal and Feedback Mechanisms in Biological and Social Systems (1947-49)**
- **7th – 10th - Cybernetics: Circular Causal and Feedback Mechanisms in Biological and Social Systems (1949-53)**
- **Problems of Consciousness (1950-54)**
- **Neuropharmacology (1954-59)**
- **Group Processes (1954-60)**





50 pages

Pacific-39
March 8 (am)

CONFERENCE ON FEEDBACK MECHANISMS AND CIRCULAR CAUSAL SYSTEMS IN BIOLOGY AND THE SOCIAL SCIENCES

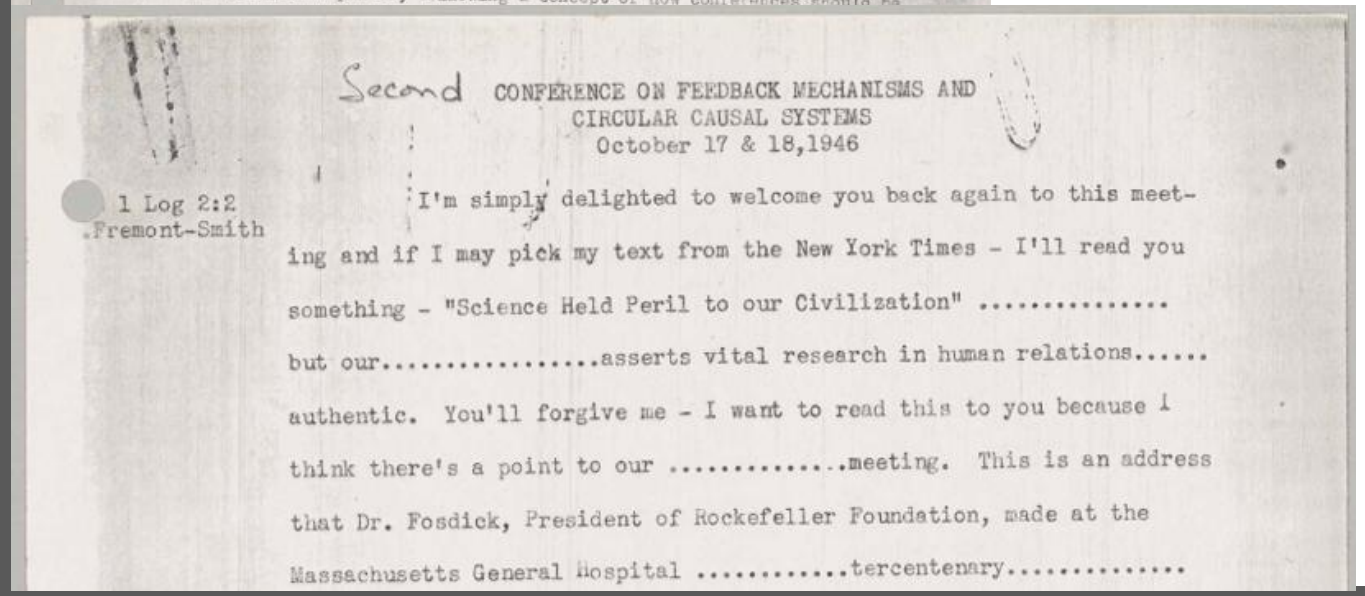
Hotel Beekman
March 8 and 9, 1946

(First conference on feed-back mechanisms held under the auspices of the Josiah Macy, Jr. Foundation)

PRESENT:

Gregory Bateson	Paul Lazarsfeld
J. H. Bigelow	Kurt Lewin
F.C.N. Bremer	Warren S. McCulloch, Chairman
R. Lorente de No	Margaret Mead
L. K. Frank	F.S.C. Northrop
Ralph Gerard	Walter Pitts
Molly R. Harrower	Arturo Rosenblueth
C. E. Hutchinson	Leonard J. Savage
Heinrich Klüver	Gerhardt von Bonin
Lawrence Kubie	John von Neumann
	Norbert Wiener

FRANK FREMONT-SMITH: We have called together groups of individuals from different disciplines, following a concept of how conferences should be



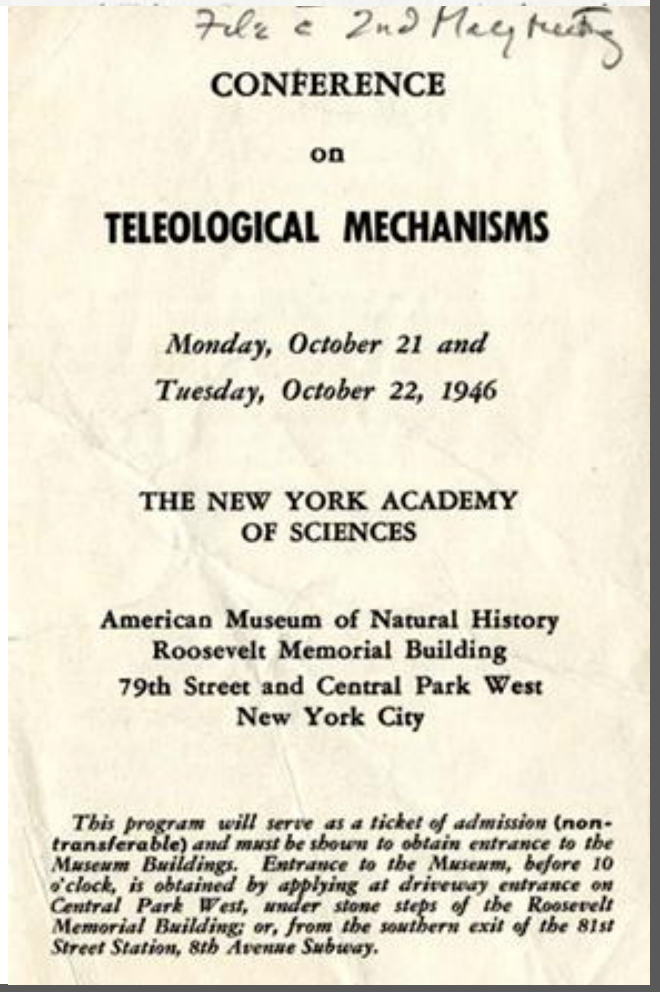
Second CONFERENCE ON FEEDBACK MECHANISMS AND CIRCULAR CAUSAL SYSTEMS
October 17 & 18,1946

1 Log 2:2
Fremont-Smith

I'm simply delighted to welcome you back again to this meeting and if I may pick my text from the New York Times - I'll read you something - "Science Held Peril to our Civilization" ..... but our.....asserts vital research in human relations..... authentic. You'll forgive me - I want to read this to you because I think there's a point to our .....meeting. This is an address that Dr. Fosdick, President of Rockefeller Foundation, made at the Massachusetts General Hospital .....tercentenary.....

Was Teleology/Teleological used in the names of the 2nd and 3rd Macy Conferences on Circular Causality?

The special session on social science had been suggested by Lazarsfeld at the first meeting. It contributed to the propagation of the cyberneticians' ideas into the social sciences. His hand in planning the Teleological Mechanisms in Society conference, held on 20 September 1946, shows itself in the focus on quantitative methods in social science and in the selection of sociologists Robert Merton—Lazarsfeld's close friend and Co-



Folder 2nd Macy meeting

CONFERENCE

on

TELEOLOGICAL MECHANISMS

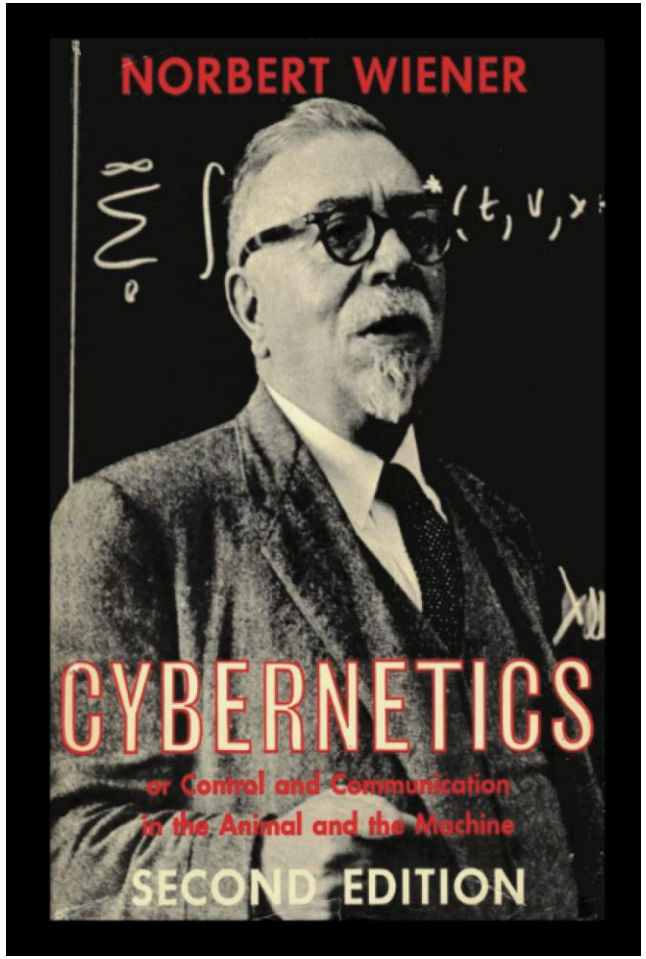
Monday, October 21 and
Tuesday, October 22, 1946

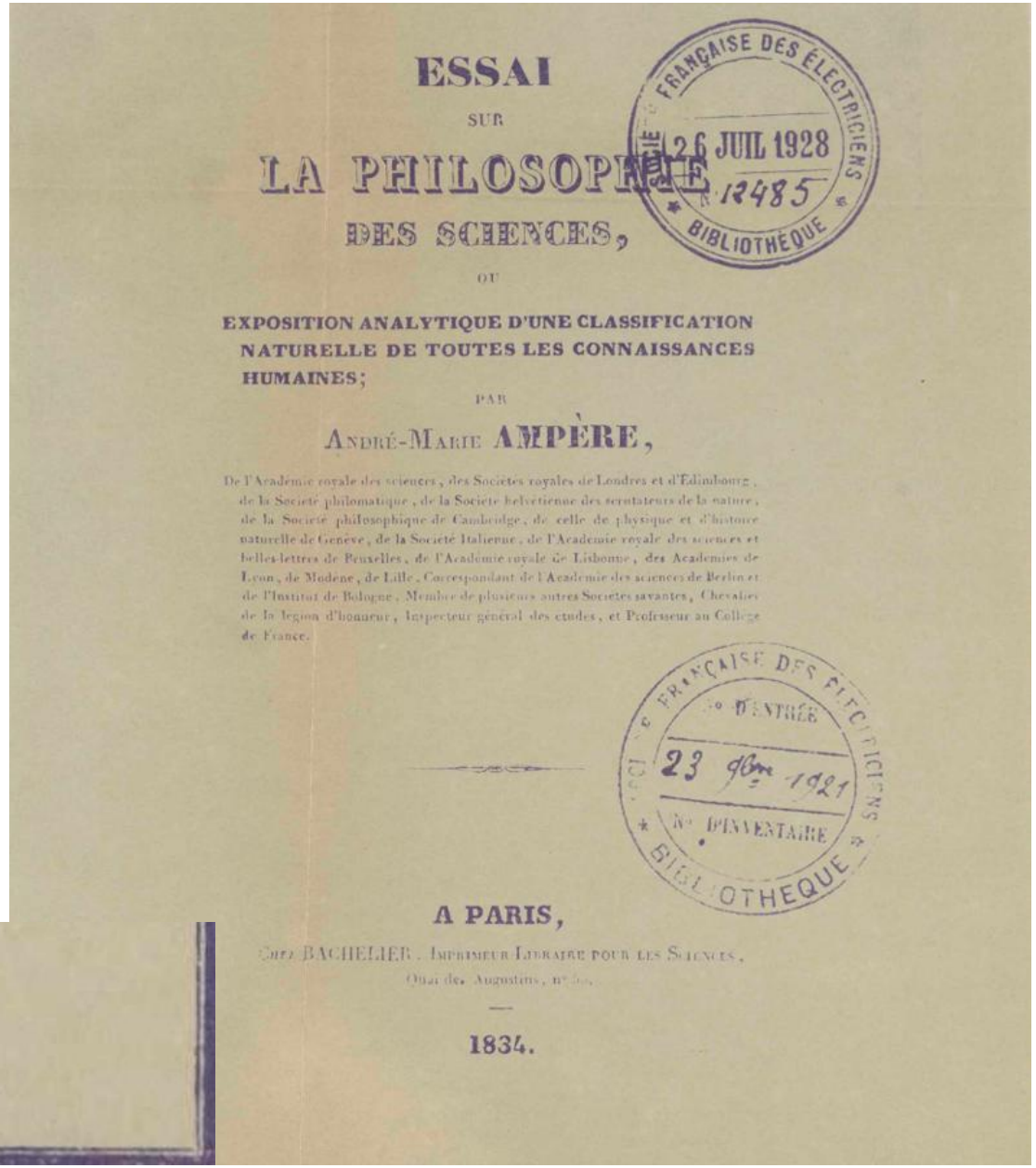
THE NEW YORK ACADEMY
OF SCIENCES

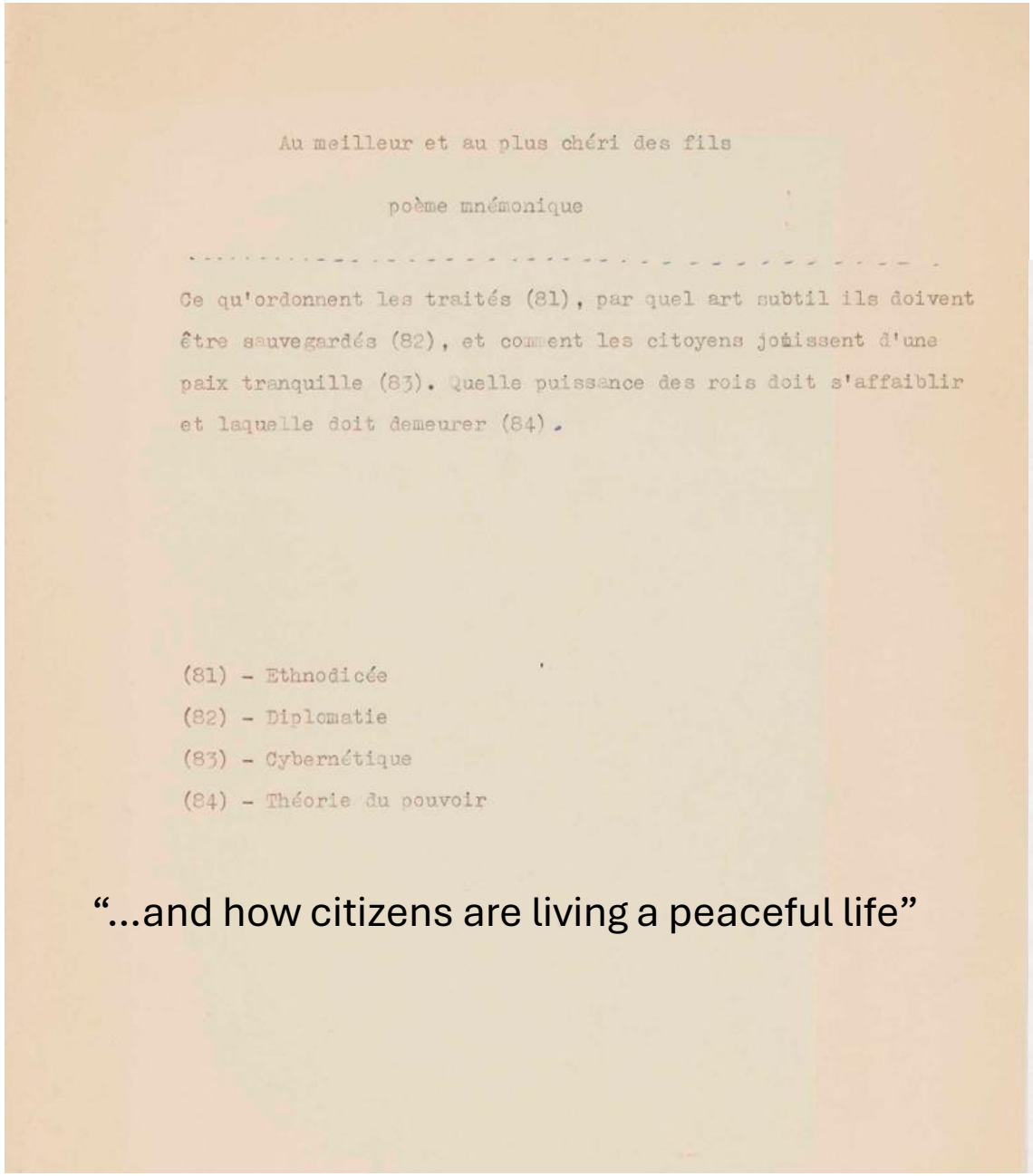
American Museum of Natural History
Roosevelt Memorial Building
79th Street and Central Park West
New York City

This program will serve as a ticket of admission (non-transferable) and must be shown to obtain entrance to the Museum Buildings. Entrance to the Museum, before 10 o'clock, is obtained by applying at driveway entrance on Central Park West, under stone steps of the Roosevelt Memorial Building; or, from the southern exit of the 81st Street Station, 8th Avenue Subway.

Wiener's Cybernetics & Ampère's cybernétique







Au meilleur et au plus chéri des fils

poème mnémonique

. . . . . .

Ce qu'ordonnent les traités (81), par quel art subtil ils doivent être sauvegardés (82), et comment les citoyens jouissent d'une paix tranquille (83). Quelle puissance des rois doit s'affaiblir et laquelle doit demeurer (84).

(81) - Ethnodicée
(82) - Diplomatie
(83) - Cybernétique
(84) - Théorie du pouvoir

"...and how citizens are living a peaceful life"

Did Wiener knowingly borrow the term "cybernetics"?

marginal to the mainstream of the life sciences. Incidentally, are you aware of the original title of these meetings?

Dr. Heims: Yes. Circular Causal and Feedback Mechanisms.

Dr. Teuber: "In mechanical biological and social systems", period. And then one day, Norbert Wiener came in with the typescript of "Cybernetics" and said, "I have a new name for us", and this, of course, is not in the record, and we all jumped and we all said "what a totally, utterly absurd name and he made the usual arguments about cybernetics being in the dictionary; that it was used in the 19th century in France and as a term, and that it made perfectly good sense and was most applicable and we all assured him that it would actually stand in the way of success of his manuscript and fortunately he didn't take anybody's advice, but I think people were just about unanimous in condemning his usage at that time, at that particular meeting.

Dr. Heims: But eventually, it became adopted as the title ...

Dr. Teuber: Immediately; at the next meeting already. It was renamed Cybernetics.

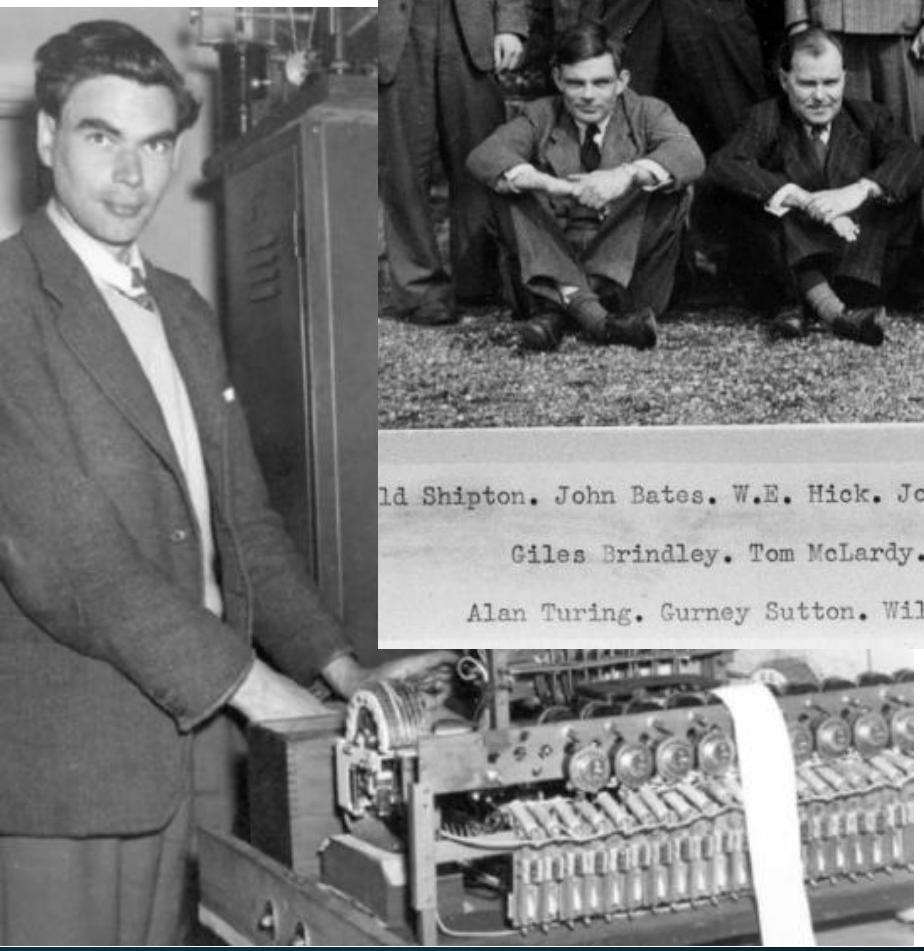
Yes, I remember these very enjoyable editorial sessions,



ld Shipton. John Bates. W.E. Hick. John Pringle. Donald Sholl. John Westcott. Donald Macka

Giles Brindley. Tom McLardy. Ross Ashby. Thomas Gold. Albert Uttley.

Alan Turing. Gurney Sutton. William Rushton. George Dawson. Horace Barlow.



Kenneth Craik
Scottish philosopher and psychologist who wrote "The Nature of Explanation" in 1943, contributing to the founding of cybernetics. Known for theory of mental models. Named first director of Cambridge-associated Applied Psychology Unit in 1944. Died May 1945 at 31.

Inspired the British cybernetics group, the **Ratio Club**, which met dozens of times from 1949-1955 as an informal Supper Club, to discuss an array of ideas directly and indirectly associated with cybernetics.

The **Ratio Club** was one place where **Alan Turing** developed and presented, **"Intelligence & Computing Machinery"** and related thoughts in 1949-50.

C. Selfridge

AUTOMATA STUDIES

W. R. ASHBY — J. MC CARTHY
J. T. CULBERTSON — M. L. MINSKY
M. D. DAVIS — E. F. MOORE
S. C. KLEENE — C. E. SHANNON
K. DE LEEUW — N. SHAPIRO
D. M. MAC KAY — A. M. UTTLEY
J. VON NEUMANN

Edited by

C. E. Shannon and J. McCarthy

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Artificial Intelligence



Medea solves the AI alignment issue with Talos

A PROPOSAL FOR THE DARTMOUTH SUMMER RESEARCH PROJECT ON ARTIFICIAL INTELLIGENCE

J. McCarthy, Dartmouth College
M. L. Minsky, Harvard University
N. Rochester, I.B.M. Corporation
C.E. Shannon, Bell Telephone Laboratories

"...one of the reasons for inventing the term 'artificial intelligence', was to escape association with 'cybernetics.' Its association with analog feedback seemed misguided, and I wished to avoid having either to accept...Wiener as a guru or having to argue with him."

- From McCarthy's 1988 review of **The Question of Artificial Intelligence**

We propose that a 2 month, 10 man study of artificial intelligence be carried out during the summer of 1956 at Dartmouth College in Hanover, New Hampshire. The study is to proceed on the basis of the conjecture that every aspect of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to simulate it. An attempt will be made to find how to make machines use language, form abstractions and concepts, solve kinds of problems now reserved for humans, and improve themselves. We think that a significant advance can be made in one or more of these problems if a carefully selected group of scientists work on it together for a summer.

The following are some aspects of the artificial intelligence problem:

1 **Automatic Computers**

If a machine can do a job, then an automatic calculator can be programmed to simulate the machine. The speeds and memory capacities of present computers may be insufficient to simulate many of the higher functions of the human brain, but the major obstacle is not lack of machine capacity, but our inability to write programs taking full advantage of what we have.

2. **How Can a Computer be Programmed to Use a Language**

It may be speculated that a large part of human thought consists of manipulating words according to rules of reasoning and rules of conjecture. From this point of view, forming a generalization consists of admitting a new word and some rules whereby sentences containing it imply and are implied by others. This idea has never been very precisely formulated nor have examples been worked out.

3. **Neuron Nets**

How can a set of (hypothetical) neurons be arranged so as to form concepts. Considerable theoretical and experimental work has been done on this problem by Uttley, Rashevsky and his group, Farley and Clark, Pitts and McCulloch, Minsky, Rochester and Holland, and others. Partial results have been obtained but the problem needs more theoretical work.

4. **Theory of the Size of a Calculation**

If we are given a well-defined problem (one for which it is possible to test mechanically whether or not a proposed answer is a valid answer) one way of solving it is to try all possible answers in order. This method is inefficient, and to exclude it one must have some criterion for efficiency of calculation. Some consideration will show that to get a measure of the efficiency of a calculation it is necessary to have on hand a method of measuring the complexity of calculating devices which in turn can be done if one has a theory of the complexity of functions. Some partial results on this problem have been obtained by Shannon, and also by McCarthy.

5. **Self-Improvement**

Probably a truly intelligent machine will carry out activities which may best be described as self-improvement. Some schemes for doing this have been proposed and are worth further study. It seems likely that this question can be studied abstractly as well.

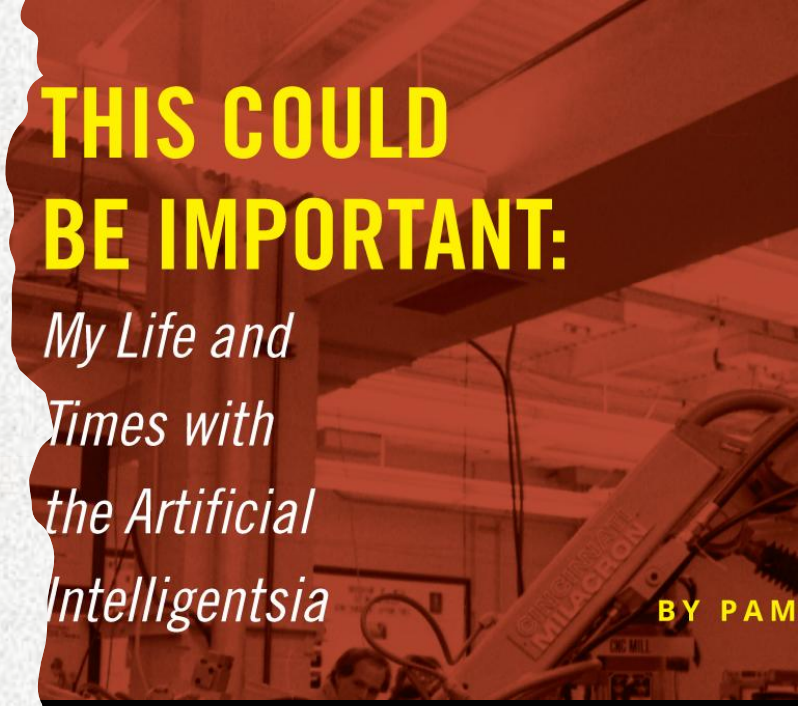
6. **Abstractions**

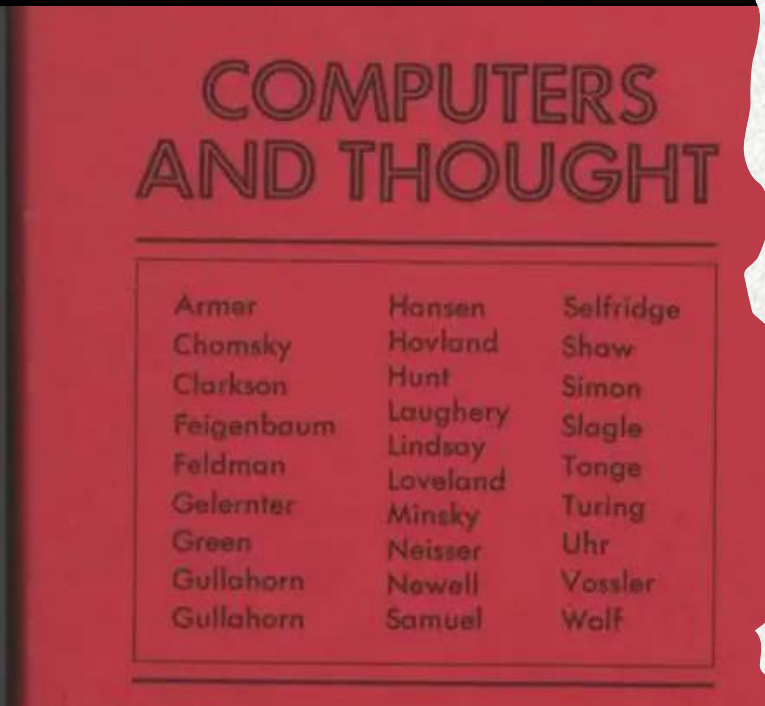
A number of types of "abstraction" can be distinctly defined and several others less distinctly. A direct attempt to classify these and to describe machine methods of forming abstractions from sensory and other data would seem worthwhile.



Pamela McCorduck, Machines Who Think

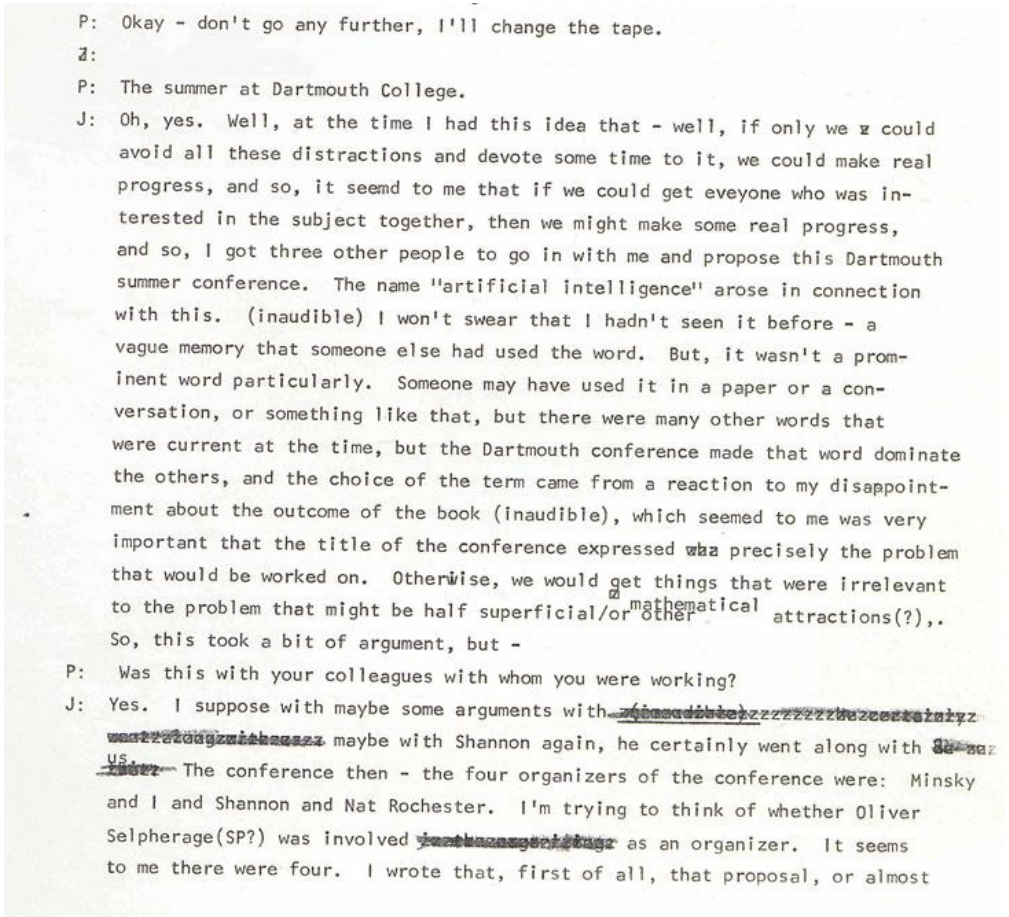
A Personal Inquiry into the History and Prospects of Artificial Intelligence (1979, 2004)







McCorduck's Interview with John McCarthy



P: Okay - don't go any further, I'll change the tape.

J:

P: The summer at Dartmouth College.

J: Oh, yes. Well, at the time I had this idea that - well, if only we could avoid all these distractions and devote some time to it, we could make real progress, and so, it seemd to me that if we could get eveyone who was interested in the subject together, then we might make some real progress, and so, I got three other people to go in with me and propose this Dartmouth summer conference. The name "artificial intelligence" arose in connection with this. (inaudible) I won't swear that I hadn't seen it before - a vague memory that someone else had used the word. But, it wasn't a prominent word particularly. Someone may have used it in a paper or a conversation, or something like that, but there were many other words that were current at the time, but the Dartmouth conference made that word dominate the others, and the choice of the term came from a reaction to my disappointment about the outcome of the book (inaudible), which seemed to me was very important that the title of the conference expressed what precisely the problem that would be worked on. Otherwise, we would get things that were irrelevant to the problem that might be half superficial/or other mathematical attractions(?),. So, this took a bit of argument, but -

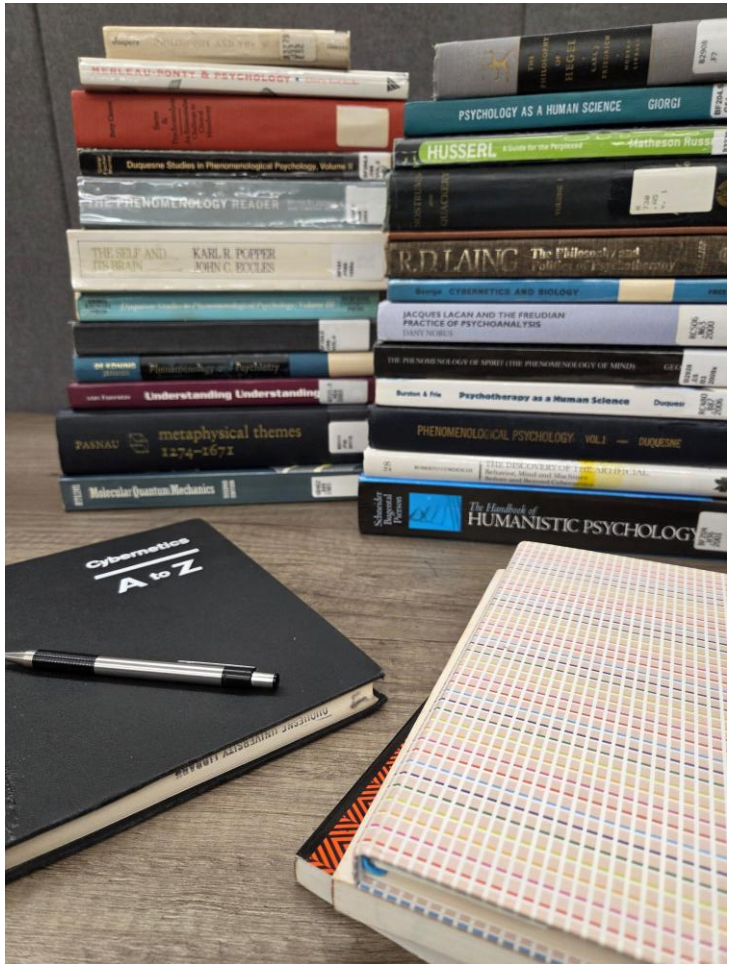
P: Was this with your colleagues with whom you were working?

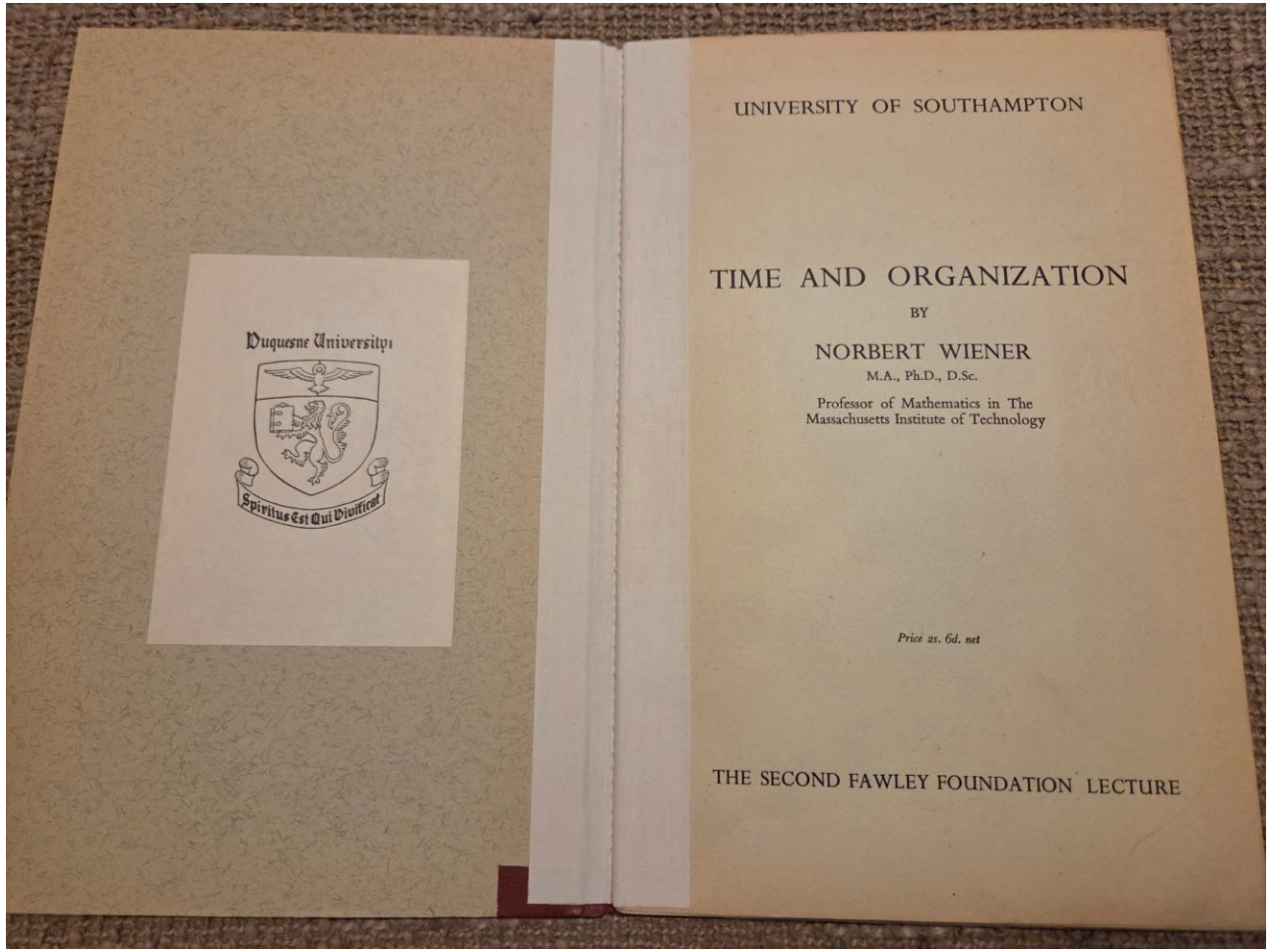
J: Yes. I suppose with maybe some arguments with [redacted] maybe with Shannon again, he certainly went along with [redacted] us. The conference then - the four organizers of the conference were: Minsky and I and Shannon and Nat Rochester. I'm trying to think of whether Oliver Selpherage(SP?) was involved [redacted] as an organizer. It seems to me there were four. I wrote that, first of all, that proposal, or almost

"I won't swear that I hadn't seen it before – a vague memory that someone else had used the word."

- John McCarthy on "artificial intelligence" to Pamela McCorduck in a 1974/75 interview for her MIT, CMU & NEA funded oral history of AI, and subsequent book, Machines Who Think (1979, Freeman)

Did John McCarthy get the term AI from Norbert Wiener?





https://seanmanion.substack.com/p/artificial-imitation-did-john-mccarthy

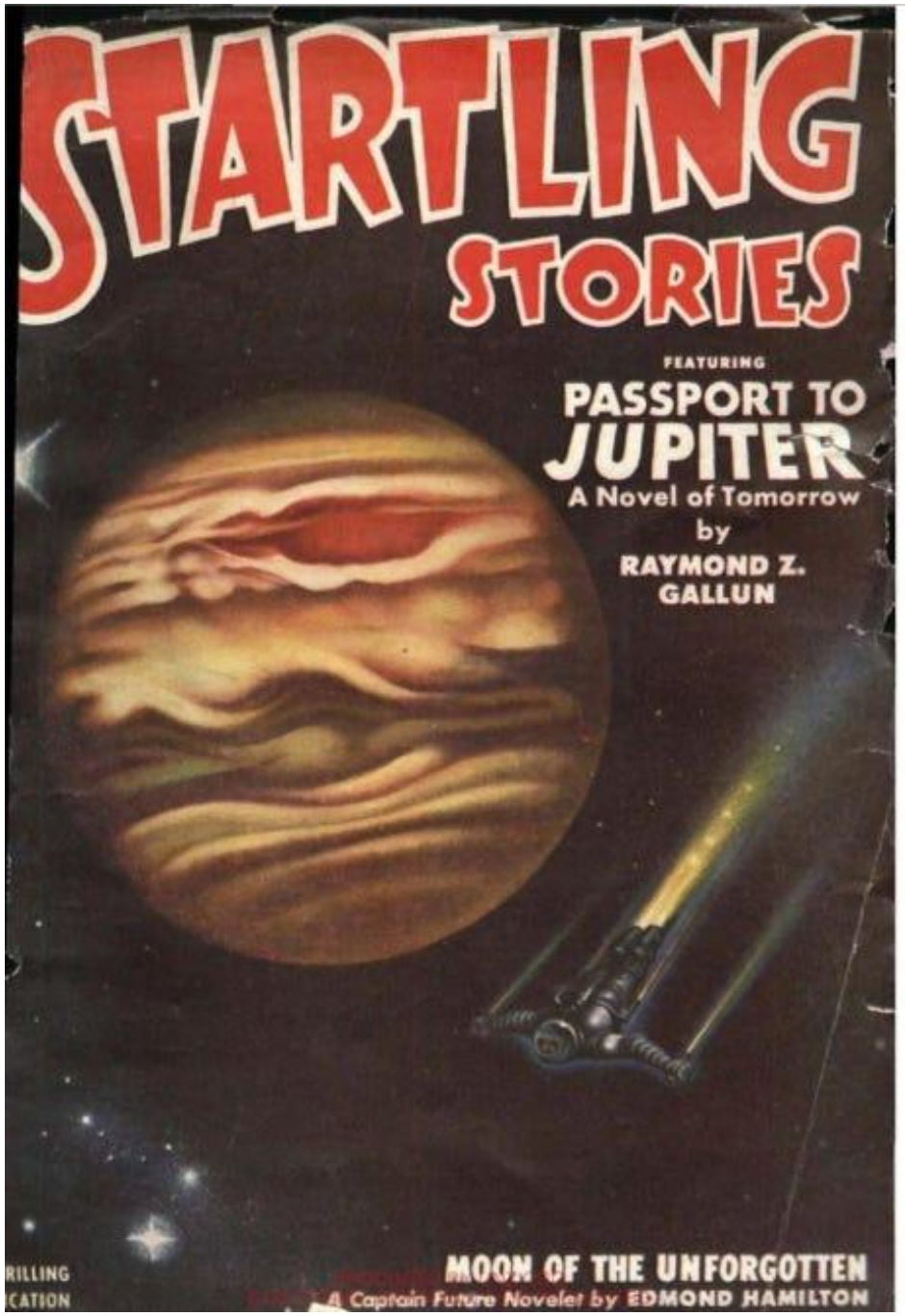
First use of the term “artificial intelligence” in the modern sense - Edmond Hamilton, “Moon of the Unforgotten”, January 1951

compassionate beneath their habitual irony.

Grag, the towering manlike giant who bore in his metal frame the strength of an army and an artificial intelligence equal to the human, rumbled a question in his deep booming voice. But Curt Newton only vaguely heard him. His gaze had followed Joan's out into the alien night.

This was not his first visit to Europa. And he was surpised to find that Joan

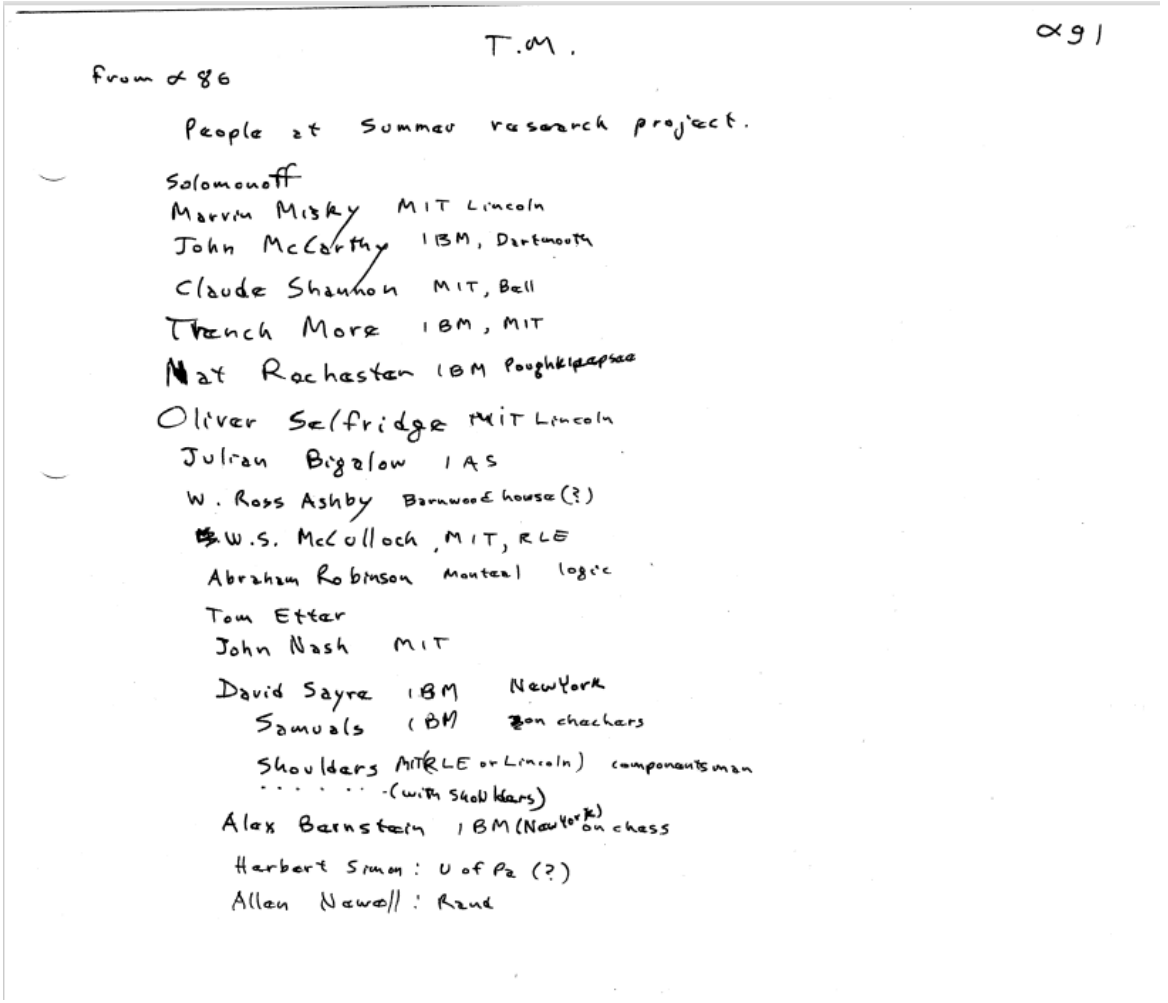
technovelgy.com (Bill Christiansen, h/t BergsonsGhost)



Beyond Dartmouth - Allen Newell's 1957 dissertation, "Information Processing: A New Technique for the Behavioral Sciences"

5 categories of "information processing"

1. **Engineering**
2. **Artificial Intelligence** (Alan Turing and Claude Shannon)
3. **Cybernetics** (Ross Ashby, Grey Walter, Warren McCulloch, and Walter Pitts)
4. **Cybernetics + digital computing** (Nathaniel Rochester, Oliver Selfridge, and Gerald Dinneen)
5. **Complex Information processing** (Allen Newell, Herb Simon, and Cliff Shaw)



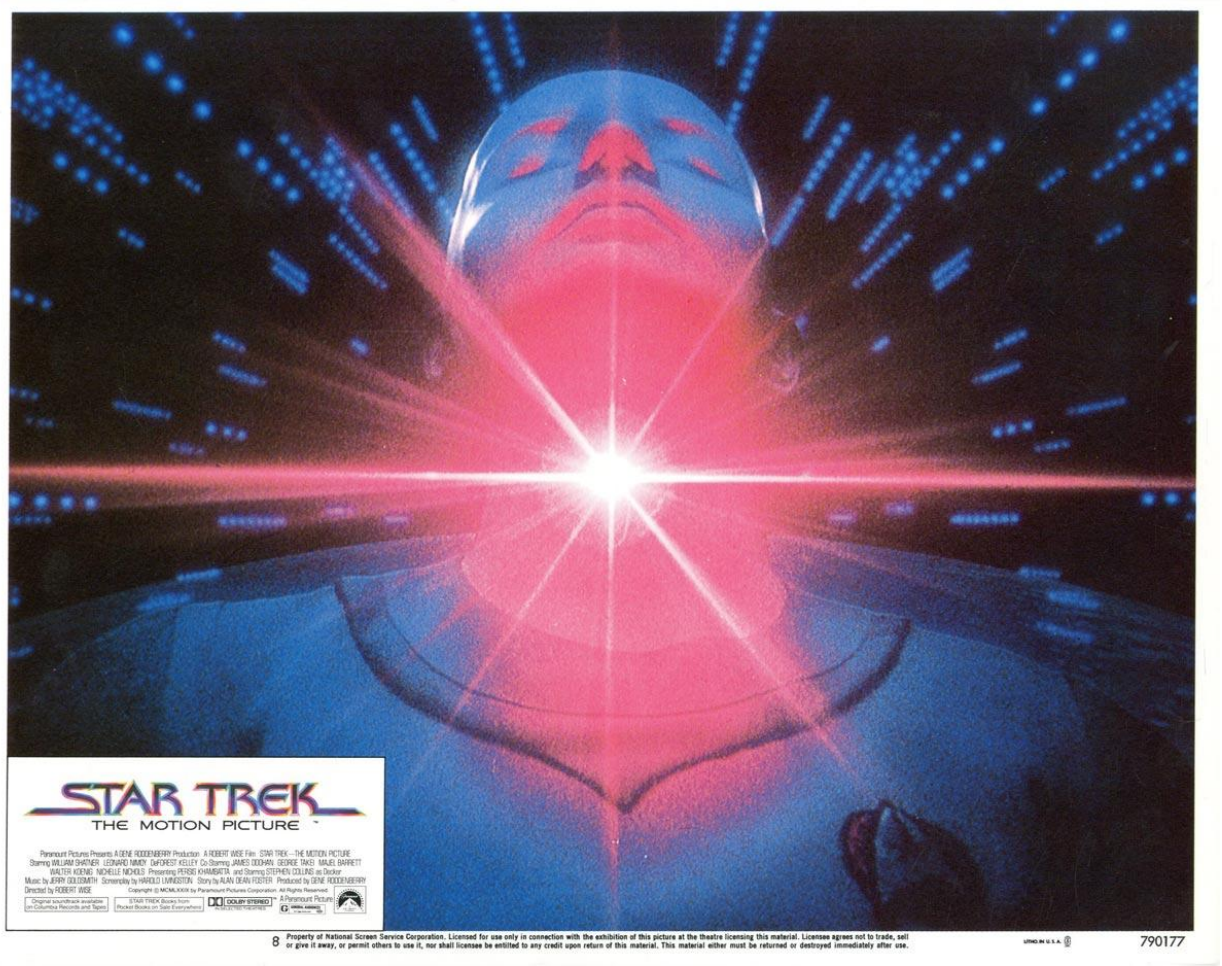
T.M. ∝91

from ∝86

People at Summer research project.

Solomonoff
Marvin Misky MIT Lincoln
John McCarthy IBM, Dartmouth
Claude Shannon MIT, Bell
Trench More IBM, MIT
Nat Rochester IBM Poughkeepsie
Oliver Selfridge MIT Lincoln
Julian Bigelow IAS
W. Ross Ashby Barnwood house (?)
W.S. McCulloch, MIT, RLE
Abraham Robinson Montreal logic
Tom Etter
John Nash MIT
David Sayre IBM NewYork
Samuals IBM on checkers
Shoulders MITRLE or Lincoln) componentsman
- - - - - -(with Shoulders)
Alex Bernstein IBM (Newyork) on chess
Herbert Simon: U of Pa (?)
Allen Newell: Rand

Superintelligence – Sci-Fi, Ed Fredkin (McCorduck interview) and Star Trek



they can't carry as much as a truck. It doesn't make me feel bad. There were people whose thing in life was completely physical— John Henry and the steam hammer. Now we're up against the intellectual steam hammer. The intellectual doesn't like the idea of this machine doing it better than he does, but it's no different from the guy who was surpassed physically. So the intellectuals are threatened, but they needn't be—we should only worry about what we can do ourselves. The mere idea that we have to be the best in the universe is kind of far-fetched. We certainly aren't physically.

The fact is, I think we'll be enormously happier once our niche has limits to it. We won't have to worry about carrying the burden of the universe on our shoulders as we do today. We can enjoy life as human beings without worrying about it. And I think that will be a great thing.

There are three events of equal importance, if you like. Event one is the creation of the universe. It's a fairly important event. Event two is the appearance of life. Life is a kind of organizing principle which one might argue against if one didn't understand enough—shouldn't or couldn't happen on thermodynamic grounds, or some such. And, third, there's the appearance of artificial intelligence. It's the question which deals with all questions. In the abstract, nothing can be compared to it. One wonders why God didn't do it. Or, it's a very godlike thing to create a superintelligence, much smarter than we are. It's the abstraction of the physical universe, and this is the ultimate in that direction. If there are any questions to be answered, this is how they'll be answered. There can't be anything of more consequence to happen on this planet.

And we get back, slowly, to evolution.

Most people think that evolution means a better human will evolve. If what appeared was only a slightly better human, then we'd disappear, because it would want the same niche we have. If that were the way evolution always proceeded, there'd be exactly one kind of creature on the planet. But there's always lots of kinds. The turtle has been around for a long time because the turtle is better than anything else is at being a turtle. Now with AI coming along, if it were a slightly better human, then we'd disappear. But it's not going to be a slightly better human. It's going to be a completely, a totally different thing, which leaves us our niche. We'll be the best creatures at being humans

What is next?

- Talk at Duquesne, Grefenstette Center Colloquium Dec 4 – **“The Pope's AI: The phenomenological roots of AI and a roadmap to purpose-driven tech for the Vatican, NIH, and you.”**
- Manuscript (Dec-Jan) – **“The Phenomenological Roots of Cybernetics and Artificial Intelligence”**
- Monograph (Early 2027) – **“Prolegomena to Any Future Cybernetics”**
- Special Issue (Late 2027) - **Frontiers in Systems Biology: Systems Concepts, Theory and Policy in Biology & Medicine (Section Editor)**

Questions? and Discussion!

(NOW)

OR

(LATER)

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