229

CORRESPONDENCE June, 1957

Acta Mathematica

Uppsala, June

Professor Norbert Wiener
Massachusetts Institute of Technology
Cambridge 39, Mass.
U.S.A.

Dear Professor Wiener,

With reference to the paper 'The Prediction Theory of Multivariate Stochastic Processes' (Wiener and Masani), part I, we note that the manus contains the following symbol: $\underset{\sim}{\phi}$. This, we take it, is to be a bold-face Greek phi. However, while the ordinary ϕ used in your paper is available here, there is no other bold-face phi than the 'curly' one, i. e. φ . Will this do, alongside with the ordinary ϕ ? If not, the printers may be able to cut a special type, which will, however, imply a certain delay.

Sincerely yours,

Bengt Ulin

Bengt Ulin
addr: Verkmästargatan 15
Uppsala
Sweden

TO OPEN CUT HERE / OUVRIR ICI

AEROGRAM

FLYGPOST
PAR AVION

CAMBRIDGE, A MASS.
JY 2 6PM
1951

Lovett Tamworth
New Hampshire

Professor Norbert Wiener
~~Massachusetts Institute of Technology~~
~~Cambridge 39~~
~~Mass.~~ ~~U.S.A.~~

Tjänsteförs.
Uppsala Universitets
Matematiska Institution

SENDER / EXPÉDITEUR:

FLYGBEFORDRAS ÖVER HELA VÄRLDEN UTAN TILLÄGGSAVGIFT
BEFORDRAS ICKE SOM AEROGRAM, OM NÅGOT LÄGGES INUTI

GODKÄNT AV KUNGL. GENERALPOSTSTYRELSEN

LITHOGRAFEN NORRKÖPING

Rudolf Virchow Medical Society in the City of New York

June 1st,1957

PRESIDENT
HANS H. BIBERSTEIN, M.D.
667 MADISON AVENUE

COR. SECRETARY
WOLF ELKAN, M.D.
120 CENTRAL PARK SOUTH

TREASURER
ARNOLD T. BENFEY, M.D.
50 PARK TERRACE WEST

Dr.Norbert Wiener,
Department of Mathematics,
Massachusetts Institute Of Technology,
Cambridge 39,Mass.

Dear Dr.Wiener:

The Program Committee of the Rudolf Virchow Medical Sosiety is greatly honored by your acceptance of the invitation to deliver a lecture for our Society on November 4th,at the Academy of Medicine at 8:3o p.m.

We understand your topic will be:"Rhythm in Physiology with Particular Reference to Enceph - alography." This seems to be a most interesting and promising subject for our audience which consists of many specialists in diverse fields and also of general practitioners.We ask you not to place too much confidence in our mathematical background and our capacity to move around in highly theoretical fields.Of course the relations of theoretical science with practical medicine,as outlined by you in the title of your presentation, will be of the greatest interest to us and we are eagerly looking forward to your lecture.

The Virchow Society publishes the scientific lectures in the yearly "Proceedings".May we hope to receive either the manuscript or an outline of your presentation after the delivery of your lecture?

Please,let us know whether or not you desire to demonstrate lantern slides.

We should be glad to arrange your transportation and hotel accomodation as our guest and should be honored if Mrs.Wiener would join you and also participate in the annual Virchow Dinner which preceeds the lecture.

Hoping to hear from you,we remain very sincerely yours

(Hans J.Behrend)
Chairman of the Program Committee

Hans H. Biberstein
(Hans H.Biberstein)
President

[ans 6/17/57]

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KIngsbridge 3-2857------ Home:---------- 2831 University Avenue
Bronx, New York
June 2, 1957

Mr. Norbert Weiner
M.I.T.
Boston, Mass.

Dear Sir;

This date I read your article in the Sunday Times Magazine section. I think that you may be the same man who taught me math in New Utrecht High School in Brooklyn.

If I am correct, in the first place I would like to take this opportunity to apologize for giving you the nickname of "Cowboy Weiner" while I was a high school student. In the second place, I would like to visit you when and if you ever have spare time during a week-end.

I would write more, however, I cannot actually be certain that you are the same Mr. Weiner to whom I refer.

If you can spare a moment, please let me know whether or not I have located my high school math teacher.

Respectfully yours,

Roy Lishansky

Roy Lishansky

P.S.

During 1950, I was the principal of the Boy's Republic in Detroit. White supremecy reigned there until I changed it to equality because I remembered some of my high school teacher's views on fair play. I became known in the State of Michigan as the outstanding math teacher. Actually I only applied the same methods that were used by my high school teacher of math.

RL

[ans 6/5/57]

THE BAKER STREET IRREGULARS, INC.
Two Twenty-One B Baker Street
Morristown, New Jersey

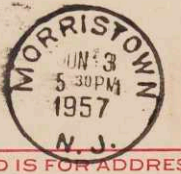
June 2/57

Dear Norbert:

I greatly enjoyed your article on prodigies in this morning's Times Magazine.

It reminds me that you promised once to do a piece for the Baker Street Journal. I'd welcome such a contribution, no matter how short - it would raise our intellectual level inestimably!

Sincerely - Edgar W. Smith



THIS SIDE OF CARD IS FOR ADDRESS

Professor Norbert Wiener
Massachusetts Institute of Technology
Cambridge 38
Mass.

WESTERN

PRINTING AND LITHOGRAPHING CO. • 415 MADISON AVENUE, NEW YORK 17, NEW YORK

GOLDEN ANNIVERSARY
NINETEEN FIFTY-SEVEN

June 3, 1957

Dr. Norbert Wiener
Massachusetts Institute of Technology
Cambridge, Massachusetts

Dear Dr. Wiener:

Western Printing and Lithographing Company is initiating a new series of better literary anthologies and original non-fiction paperbound books under the name Laurel Editions. The books are distributed and sold by the Dell Publishing Company at 35¢ and 50¢. Under separate cover, I am sending you copies of the first two volumes in the series, FOUR PLAYS BY GEORGE BERNARD SHAW and GREAT ENGLISH SHORT STORIES, along with A POPULAR HISTORY OF MUSIC, MODERN FRENCH PAINTING and FROM MEDICINE MAN TO FREUD -- three earlier volumes produced by Western for Dell. The latter three will become Laurel Editions when they are reprinted.

Each of these volumes is issued in minimal editions of 100,000 copies, and sold through newsstands as well as bookstores. Consequently, they are designed for a general reading public in addition to students in high schools and colleges. To assure this breadth of interest, the books must be clearly and dramatically written, without special language on the one hand, and without condescension on the other. We feel that they should contain a viewpoint rather than simply survey a field. Although in general we prefer to avoid footnotes, such other useful trappings of academe as bibliographies, illustrations, and indexes should be included.

Laurel Editions will eventually cover all areas of thought, we hope, but at the outset we have naturally given priority to those fields which offer the best hope of reaching both the general reader and the student. This means that these fields are the most complex, rather than the simplest, either because they have enjoyed more rapid development in recent years, or because they have been expounded by men with the greatest originality of viewpoint and breadth of scientific understanding. Thus from our standpoint as publishers for a market which includes both student and layman, it is the implications of your work in cybernetics -- the analogies in human physiology on the one hand and the social psychological overtones on the other -- which are of greatest concern. We would like very much to have your ideas on a book for Laurel Editions which would encompass these implied aspects of your work, with cybernetics

itself as the fulcrum on which they hinge, so to speak.

One possible approach to the field (for which I hold no particular brief excepting the idea is the springboard for this letter) would be an anthology called HOW WE THINK: THE MACHINERY OF THE BRAIN. By anthology I mean the kind of work done in FROM MEDICINE MAN TO FREUD in which the author has sought out materials in support of his approach to the field and presented them with his own running commentary rather than absorbing the selections into the text. HOW WE THINK might begin with philosophical assumptions regarding the brain, explore current research into the physiology of the brain and nervous system along with your own analogies between the brain and machines, and conclude with consideration of functions and behavioral psychology with some attention to correlations (where they exist at all) between current knowledge of the brain and Freudian psychology. Attention might also be given to the conditioning of political and economic behavior by advertising and "brainwashing." This loose proposal will serve its purpose if it indicates the range in which we feel you are well-fitted to write.

Normally Western Printing and Lithographing Company offers an advance against royalties of $3000.00 of which half is paid upon signing of a contract, and the balance upon completion of the manuscript. Royalties are customary throughout the industry: roughly 4% with a small increase after the first 150,000 copies have been sold. Although we arrange permissions for the use of copyrighted materials, fees for these permissions are usually paid by the author out of his advance royalties.

I would very much like the opportunity to meet you and to discuss these ideas. Please let me know if you are going to be in New York; or, if you prefer, it would be possible for me to come to Cambridge.

Sincerely,

Richard B. Fisher

Richard B. Fisher

DELL BOOK DIVISION

RBF/bsm

NEW ENGLAND INSTITUTE FOR MEDICAL RESEARCH

RIDGEFIELD, CONNECTICUT

June 3, 1957

Professor Norbert Wiener
Massachusetts Institute of Technology
Cambridge 39, Massachusetts

Dear Professor Wiener:

Mrs. Charles Miller of our staff will call for you at your home, 53 Cedar Road, Belmont, at approximately 2:00 p.m., Sunday, June 9, to escort you to Ridgefield.

Your talk is scheduled for 10:05 a.m. Monday morning.

We are looking forward to great anticipation to seeing you and hearing you.

Sincerely yours,

John H. Heller, M.D.
Executive Director

JHH:eg

June 3, 1957.

My dear Professor N. Wiener

Excuse me to write you without introduction.

I am a graduate student studying electrical communication at the University of Tokyo. My theme is related with the theory of information and prediction, so I heard with keen interest your several lectures which you had during your stay in Japan last year.

Among the themes of your scheduled lectures was there one titled "The Factoriztion of Matrices", which you have perhaps forgotten. Because I had been interested in the same problem for a long time, I went to listen to you expecting a instructive lecture. But to my regret, the theme was altered to the one related with quantum mechanics and I failed to get the necessary information.

Would you please send me, if published, the copies of papers on the above theme, "The Factorization of Matrices" ? If unpublished yet, I shall be glad to be informed the summary of it or its literatures.

I wish that I become able to send you my paper completing my study as soon as possible.

Yours very truely

Hiroshi Miyakawa

Hiroshi Miyakawa

Department of Electrical Engineering,
Faculty of Engineering,
University of Tokyo,
Bunkyo-ku, Tokyo, Japan

[ans. 7-17-57]

C O P Y

Professor V. F. Weisskopf
Room 6-305

June 3, 1957

Professor W. N. Locke
Room 14S-216

Dear Professor Locke:

I have received your note concerning the export of technical data to foreign countries. Do you really mean that we should have to get an official license for any scientific exchange with our colleagues abroad? What impression would it make on our colleagues if they see some kind of official stamp or designation on any envelope containing scientific letters or reprints? They would conclude that we are really that kind of police state which Communist propaganda wants us to be.

You might be interested to know that this silly regulation has been rescinded anyway recently. I am quoting here from the Newsletter of the Federation of American Scientists of March 15, 1957.

"Little known regulations affecting scientists' correspondence with their colleagues abroad were eased recently by the Dept. of Commerce, largely as a result of an investigation by the House (Moss) Subcommittee on Government Information and of protests by FAS. The Bureau of Foreign Commerce (BFC) of the Commerce Dept. announced revision of these regulations on Jan. 31; details appear in BFC's Current Export Bulletin 779 of that date."

. . .

"Their revision of Jan. 31 removes the labeling requirement 'in cases (a) where non-commercial shipments of technical data are exported via first-class mail under the provisions of General License "GTDP" (published technical data) or General License "GTDS" (scientific and educational technical data), by other than a business concern, e.g., private person not engaged in business, philanthropic organizations, non-profit scientific society, etc., or (b) where technical data are exported via all classes of mail by a US government agency under the provisions of General License "GTDS"' (Current Export Bulletin No. 779)."

I wonder whether you should not circulate a second memorandum pointing out these changes in order to prevent that some people be induced by your communication to follow the old rules which would be detrimental to the reputation of United States science abroad.

Sincerely yours,

/s/ Victor F. Weisskopf

Victor F. Weisskopf

VFW:nb

June 4, 1957

Dear Mr. Weiss,

I so enjoyed reading your article in the N.Y. Times especially your definition of intellectual ability. As a parent I have often wondered how one does (if there is a basic pattern) help develop a childs growth towards becoming a whole, complete, man.

If you should have a free evening and care to join us in an evening of conversation and coffee, please do so.

Many Compliments once again.

Sincerely

Blanca Batteau

Mrs. D. W. Batteau
51 Lexington Ave.
Cambridge Mass
TR-6-5738

The City College
NEW YORK 31, N. Y.

DEPARTMENT OF PHILOSOPHY

June 4, 1957.

Professor Norbert Wiener
Department of Mathematics
Massachusetts Institute of Technology
Cambridge 39, Mass.

Dear Professor Wiener,

Thank you for your letter of May 16. I am sorry that there was some misconception about the plans for the symposium on "Determinism in the Light of Recent Physics" involving an advance manuscript. We should certainly like to meet your wishes on the matter, and have accordingly revised our plans so as to require no paper for publication from you in advance. Instead, then, we hope that you will feel free to take as much as half an hour for your talk at the meeting itself, on Sunday morning December 29.

Very sincerely yours,

Abraham Edel

Abraham Edel
for the Program Committee,
Eastern Division, American
Philosophical Association.

JOHN M. LESSELLS
984 MEMORIAL DRIVE
CAMBRIDGE 38, MASSACHUSETTS

June 4, 1957

Professor Norbert Wiener
Department of Mathematics
Massachusetts Institute of Technology
Cambridge 39, Massachusetts

Dear Professor Wiener:

I have read with a great deal of interest your article "Analysis of the Child Prodigy" which appears in the Magazine Section of the New York Times for June 2, and congratulate you on a scholarly presentation of this important subject.

Although the better types of television programs are appreciated by most of us, the note that you strike in your article that the media of public entertainment tends to emphasize the retentive rather than the creative powers of a child's abilities is, in my opinion, sound reasoning.

The comparison you make of secondary education in Europe and the U.S.A. is also of interest.

Thanks for an instructive and interesting article.

Sincerely yours,

John M. Lessells

STUART CHASE June 5, '57 Tuesday

Telegrams: Redding, Connecticut GEORGETOWN, CONNECTICUT

Dear Dr Wernher – Marian and I read your piece on the Quiz Kids in NY Times Magazine with the greatest delight and attention. You said something which badly needed saying! Yours S.C.

Professor Norbert Wiener
Mass. Institute of Technology
Cambridge, Mass.

June 5, 1957

George Allen and Unwin Ltd.
40 Museum Street
London, W.C.1
ENGLAND

Gentlemen:

I shall be delighted to give permission for the inclusion of the joint paper by Born and myself in your collection of fundamental papers on Quantum Mechanics.

Sincerely yours,

Norbert Wiener

maf

June 5, 1957

Mr. Roy Lishansky
Perma-Vi Company
2831 University Avenue
Bronx, New York

Dear Mr. Lishansky:

I am afraid that I am not the Wiener whom you knew in Brooklyn. I have never taught secondary school and I have never lived for any length of time in New York. As you know, the name Wiener is not sufficiently rare to be a good mode of identification.

Sincerely yours,

Norbert Wiener

maf

~~Mo~~
Peyre

June 5, 1957

Mr. S. Andre Peyre
a/s M.M. Hermann and Cie, Editeurs
6, rue de la Sorbonne
Paris 5, FRANCE

Dear Mr. Peyre:

Many thanks for your letter and your enclosures. I was delighted to see the periodical Marsyas.

Sincerely yours,

Norbert Wiener

maf

Pittsburgh

June 6, 1957

Mr. Max A. Lauffer
University of Pittsburgh
Pittsburgh, Pennsylvania

Dear Mr. Lauffer:

Professor Wiener accepts as full payment for his traveling expenses to Pittsburgh the check of $85.23.

I am sorry for the slight difference of $3.80 between the two vouchers. When your letter of May 24 was received requesting the expense voucher, I assumed that the one we had sent you earlier had been lost in transit and, accordingly, it became necessary for me to try and remember as best I could the correct amounts for the various items.

Please accept my apologies for any confusion resulting from the two vouchers sent to you.

Sincerely yours,

Margaret Fitz-Gibbon
Secretary to
Professor Wiener

maf

SCIENCE
THE SCIENTIFIC MONTHLY

PUBLICATIONS OF
THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE
1515 MASSACHUSETTS AVENUE, NW, WASHINGTON 5, D.C. • DUPONT 7-7171

7 June 1957

Professor Norbert Wiener
Department of Mathematics
Massachusetts Institute of Technology
Cambridge 39, Massachusetts

Dear Professor Wiener:

I have been informed of the death of Dr. Frank L. Hitchcock, Emeritus Professor of Mathematics at M. I. T., and I am wondering whether or not Science should attempt to obtain an article about his life.

As you know, we confine obituary articles to people of considerable distinction in Science. I would appreciate your frank opinion about this, and, if you think an obituary article is justified, please suggest the name of the person best qualified to prepare one.

Sincerely,

Graham DuShane
Editor

GDuS-plc

[ms 6/17/57]

MIECZYSŁAW CHOYNOWSKI
Kraków, Słowackiego 66

9 June, 1957

Professor Norbert Wiener,
Massachusetts Institute of Technology,
Cambridge, Mass.

Dear Professor Wiener,

I take the liberty to kindly ask you for a permission to publish your paper "Behavior, purpose and Teleology" and the second part of "Time, communication, and the nervous system" (beginning with words "We wish to apply notions..." p. 207) in Polish translation in a volume of papers on cybernetics which I am preparing. This first collection will comprise some most important papers published in 1943-1950. The volume will be published by Ossolineum, The Polish Academy of Sciences Press. I shall also ask for a permission of the Editor of the Philosophy of Science and my publisher will arrange the matter of publication rights with The Williams and Wilkins Co. and The New York Academy of Sciences.

I'd suggest to publish the selected part of the "Time, communication, and the nervous system" simply as "Communication and the nervous system". Do you agree? Of course, I know both chosen papers, but it would help us in translating them if you care to send me the reprints. I shall be also much obliged for a reprint of your paper "Some maxims for biologists and psychologists".

As we intend to publish in the planned volume photographs of all authors and short data on their scientific career and work, I shall greatly appreciate if you care to enclose them in your ansver.

Will you excuse me if I thank you in advance?

Sincerely yours,

Mieczysław Choynowski

Mieczysław Choynowski, Ph. D.

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84 MASSACHUSETTS AVENUE · CAMBRIDGE 39, MASSACHUSETTS · UNIVERSITY 4-6400

Monday, June 10, 1957

Norbert Wiener
Professor of Mathematics
M.I.T.

Dear Professor Wiener,

Here at WGBH-TV we do a weekly program called I'VE BEEN READING. This program, telecast on Tuesday evenings 9:00-9:30 is basically a discussion of an important book of fecent publication.

For Tuesday evening, July 23rd we would like to have a discussion on Pierre de Latil's THINKING BY MACHINE. We would be greatly honored if you could join us that evening to take part in the discussion of the merits and implications of this book. On the program there would be our regular moderator plus yourself and possibly one or two other guests.

The program is spontaneous and unrehearsed, therefore you needn't be here until 8:45 P.M. that evening and you would be finished at 9:30. I do hope you will be able to accept. I know that one of your objections to television progfams is the glare of strong lights, by I'm sure you will find our studio quite cool and comfortable...even in mid-summer.

Sincerely,
Lewis Barlow

Lewis Barlow
Producer-Director
I'VE BEEN READING

[ans 6/17/57]

THOMAS E. BREWSTER
(NOT AN ATTORNEY)
1786 E. 89TH STREET
CLEVELAND 6, OHIO

June 10th,1957

Professor Norbert Wiener,
Mass.Institute of Technology,
Boston, Mass.

Dear Dr.Wiener:

In my letter of May 20th, I did not make clear my understanding of your statement regarding the uncertainty in Physicists' minds as to the theory of relativity, and gravitational effects. My reference was to page 109 of your "I am a Mathematician".

I enclose copy of my article and sketch sent to a few popular science magazines, and to Scientific Monthly, which latter gave it considerable study before sending it back unpublished.

What a benefit it is to science that there is available such an authoritative acknowledgment of inconsistencies in scientific concepts.

Perhaps I am presumptuous in expecting you to spare any time for consideration of my difficulty in securing freedom to present my opinion for public consideration.

Respectfully yours,

Thomas E Brewster

Thomas E Brewster (Age 73 years)

[ms 6/17/57]

February 3, 1957

Are light-rays of a star bent by gravitational influence of the Sun?

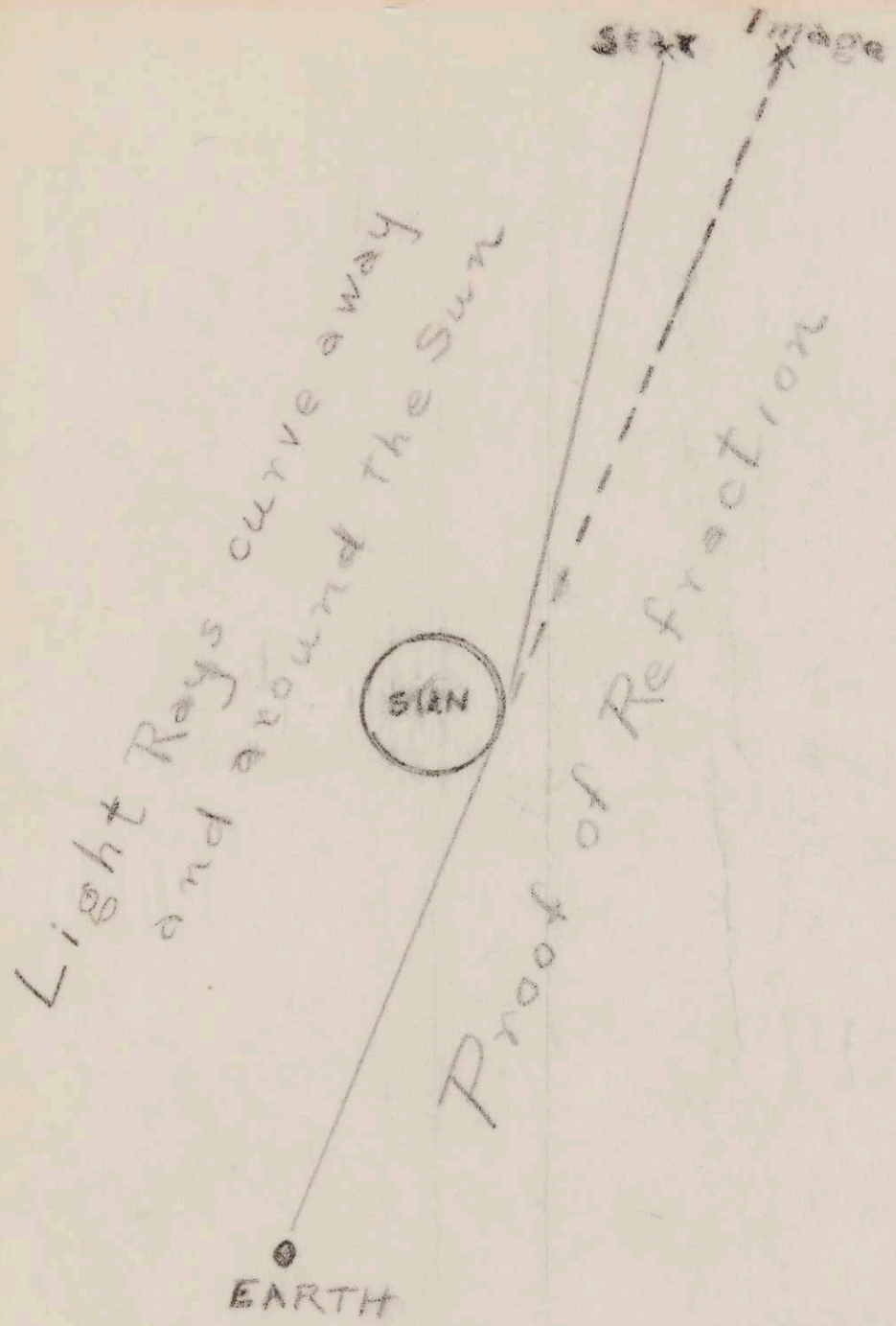
A diagram on page 97 of "The Universe and Dr Einstein" by Lincoln Barnett, a Mentor Book published by The New American Library, Inc., 501 Madison Avenue, New York 22, N Y. Copyright 1950, is entitled - "The deflection of star light in the gravitational field of the Sun. Since the light from a star in the neighborhood of the Sun's disk is bent inward (sic) toward the sun, as it passes through the sun's gravitational field, the image of the star appears to observers on earth to be shifted outward and away from the Sun"

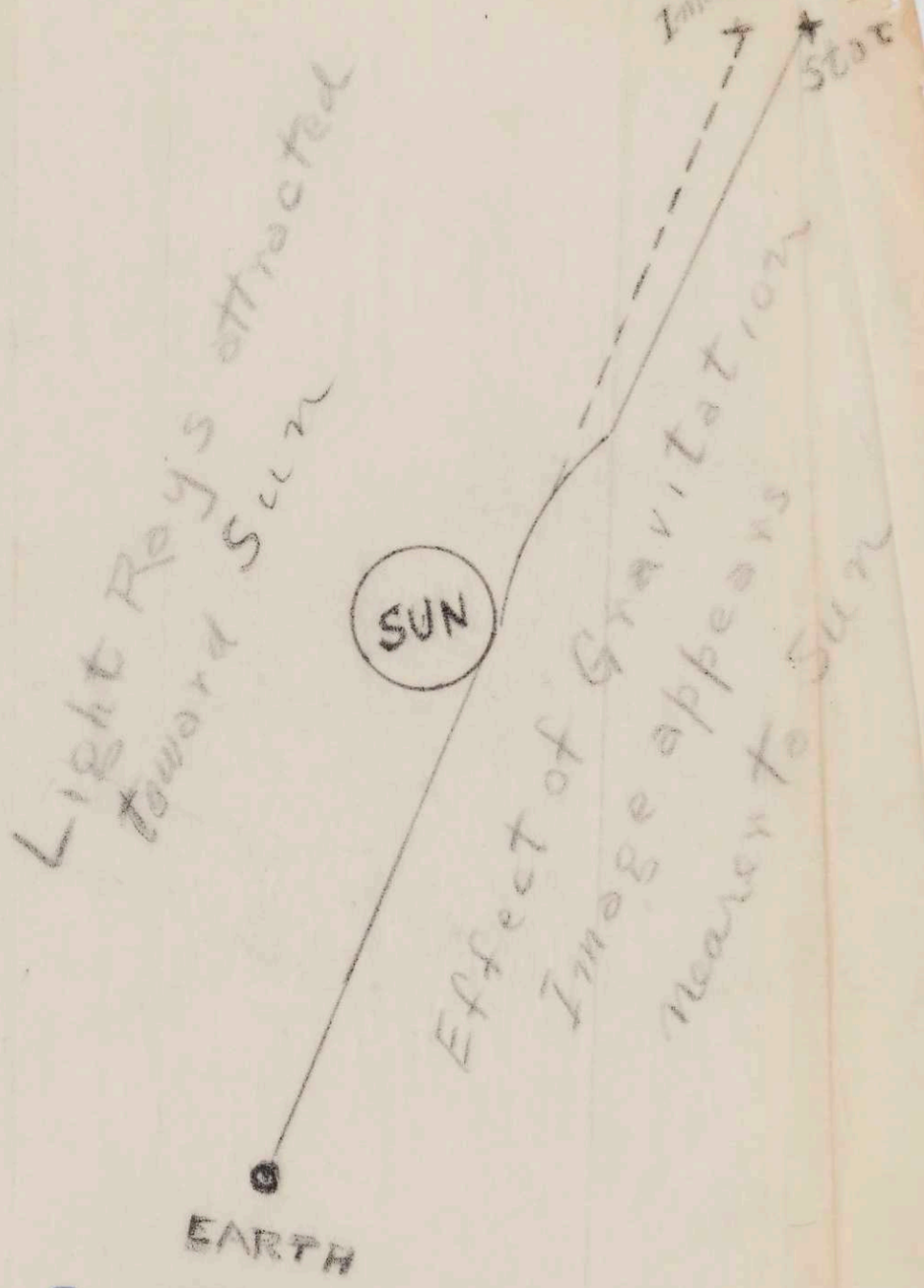
Before seeing this "proof" I had thought that such curvature of light rays might be caused by refraction as discovered by Isaac Newton using a prism to show the colors of the spectrum, so useful in chemistry and astronomy. Now that I have seen this diagram, I am more ~~sure~~ than ever convinced that refraction is the cause of this bending effect. When the sun sets on a clear day, we see part of the suns image after it has gone below our horizon. The color of its light is shifted toward the red end of the spectrum, and the sun has appeared to increase in size, not because it is more closely in contrast to objects on the earth, as so often explained.

Here is the proof that refraction is the cause of bending of the star's light rays - If gravitation were the cause, the rays of the star would be drawn inward toward the sun, causing the image of the star to appear nearer to the sun's disk than it actual position.

Signed,

Thomas E Brewster
1786 E 89th Street,
Cleveland 6, Ohio.





Was this a Hoax?

Thomas Edison Brewster
Cleveland Ohio

"I AM THE LADY OF THE ROSARY
MARY, GOD'S MOTHER, AT FATIMA, PORTUGAL, 1917

June 11, 1957

Dr. Norbert Weiner
Professor of Mathematics
Massachusetts Institute of
Technology

Dear Dr. Weiner: "I Am The Lady Of The Rosary"

I have been studying Rev. Father Agostino Gemelli O.F.M., M.D., in his work in psychiatry, psychoanalysis, and experiental psychology. Dr. Gemelli is Chairman of the Pontifical Academy of Science, has many honory degrees from universities in many nations. Born in 1878 in Milan, once a positivist and Marx-line social worker, he became a Franciscan priest, obtained a medical degree, wrote some 14 books in Italian, pertaining to psychology and psychiatry. In his biography, which you will find in "Catholic Authors" published by St. Mary Abbey, N.J., you will see that at The Catholic University of the Sacred Heart in Milan, which he founded and where he is both head and professor, in his experiental psychology laboratory, he is conducting with delicate apparatus considerable experiments in language in the electroacoustical field and cortical (brain's cortex) brain rhythms. You ought to be of interest to him and he to you in the work you are both doing. I have sent a copy of the article in today's N.Y. Times, headed, BRAIN WAVES GET A NEW YARDSTICK, to him.

Faithfully yours in Christ,
Mary and the Rosary,

J.W. Quinn

681 Clarkson Ave.
Brooklyn 3, N.Y.

[and 6/17/57]

"I AM THE LADY OF THE ROSARY"
MARY, GOD'S MOTHER, AT FATIMA, PORTUGAL, 1917

COPY

June 11, 1957

Rev. Father Agostino Gemelli,O.F.M., M.D.
The Catholic University of the Sacred Heart
Milan
Italy

Dear Reverend Father: "I Am The Lady Of The Rosary"

In today's N.Y.Times appears a news item which deals with a subject with which you are experimenting. It is headed, BRAIN WAVES GET A NEW YARDSTICK, and sub-titled, AID TO MEDICINE SEEN.

The item is dated June 10, Ridgefield, Connecticut, (USA) and begins, "Electrical equipment to analyze so-called brain waves was described here today. It was said that a stable physiological index to mental activity could be drawn from the analysis.

"Only a $10,000 laboratory model of the equipment has been tested so far in the Massachusetts General Hospital (USA), according to an informal report presented by Norbert Weiner, Professor of Mathematics at Massachusetts Institute of Technology. But Dr. Weiner predicted that improved models suitable for a doctor's office might be produced for a few thousand dollars.

"He said that improved simplified versions of the device tested might have other important applications in medical diagnosis and treatment. For one thing, variations in the pattern of the human heartbeat that are too slight to be picked out by eye in the conventional electrocardiograph could be measured.

"Dr. Weiner also said that changes in the electrical activity of women's skin were believed to vary according to the sexual cycle. Thus, he said, the analyzer of physiological rhythms might pinpoint the precise time of ovulation to aid in the treatment of fertility or sterility problems.

"Dr. Weiner addressed a gathering of specialists in physical sciences and medical men. The New England Institute for Medical Research here sponsored the conclave...Dr. Heller, a physician, pointed out that doctors now attached leads to the heads of patients and observed by eye the fleeting pattern of fluctuations in voltage that the brain produced.

"Dr. Weiner described how analysis of the complex pattern of brain waves might be accomplished by mathematical manipulations through electronic equipment.

"A mathematical method known as Fourier

analysis is used. This harmonic analysis is used, for instance, to find the frequencies that make a beam of light. Mathematical deductions about the source and cause of ocean waves are analogous. In this field the arrival of waves at the shoreline are measured and timed.

"Conventional Fourier analysis is used with very high frequencies. Dr. Weiner said a similar analysis could be done on the typical low-frequency alpha rhythm in the brain by electronically matching the observed alpha rhythm with a source of constant high frequency fluctuations. The recorded alpha rhythm is put on magnetic tape and speeded up some 100 times over its ordinary speed.

"Dr. Weiner said this was in contrast with the use of the electroencephalograph, by which a physician gauges by eye the voltage-time patterns made on an oscilloscope.

"The session will continue tomorrow with a study of the application of physical means to other medical problems."

In view of your own study, with delicate apparatus, of such things as cortical rhythms and language in electroacoustical field, I thought this would be of help to you.

I am sending a copy of this letter to Dr. Weiner, since your work and his ought to be complementary, one to the other.

Faithfully yours in
Christ, Mary and the
Rosary,

J.W.Quinn

681 Clarkson Ave.
Brooklyn 3, N.Y.

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826 TSUNOHAZU 1 CHOME, SHINJUKU-KU, TOKYO.

Telephone: (37) 0 1 3 1～5
Cable address: *KINOKUNI*

June 11, 1957

Mr. Prof. Wiener
Massachusetts Institute of Technology
Cambridge 39, Mass. U.S.A.

Dear Sir:

We trust you will make allowance for the delay caused by our editor's fault in suggesting our plan and now have the honour of writing you enclosing herewith letters of introduction of Prof. Ikehara and Mr. Abe.

We are earnestly desiring to publish the English edition of your "CYBERNETICS NINE YEARS AFTER", lectures delivered last year in Japan and should be much obliged if you would kindly consider for reprint rights in this "CYBERNETICS NINE YEARS AFTER".

We are one of the most powerful bookseller, book-importers and publishers in Japan and Messrs. John Wiley & Sons Inc., in your country would be willing to give you our credit reference.

If the above suggestion is agreable to you, we will contact Messrs. John Wiley & Sons, Inc., and do our best for the sales of the book throughout the world.

American publishing world possibly differs from ours and we wish to hear your experienced opinion about obscure points and to conclude a contract to the satisfaction of either side.

1) Contents of the book.
   1. The main ideas of cybernetics.
   2. Servomechanisms and the automatic factory.
   3. Time and organization.
   4. The origins of cybernetics.
   5. Brain waves and the interferometer.
   6. Measure and probability.

2) We ask you for instruction about the following points which seem us essential:

A. Will copyrights be held by publishers or author? If publishers, you, an American, will be protected in Japan like a Japanese.
B. The terms will be on a royalty of 10% of the published price and we will send you annually account of sales at the 31st March and 30th September and settle the account on the 31st May and the 30th November.
C. The size of the book will be 18.2 cm by 12.8 cm, the page, about 200 pages, the price, $2.50 or $3.00.
D. The first proof-reading by author and the following by Prof. Ikehara.
E. Ten free copies will be sent to the authors.
F. Author will not agree to any other publishers in any country to publish any other edition for five years after the publication of our book.

Asking your kind consideration to the matter and hoping to hear favorably from you, we are,

Yours faithfully,

H. Takeuchi
Managing Director
KINOKUNIYA BOOK-STORE CO., LTD.

NEW ENGLAND INSTITUTE FOR MEDICAL RESEARCH
RIDGEFIELD, CONNECTICUT

June 12, 1957

Dr. Norbert Wiener
Massachusetts Institute of Technology
Cambridge, Massachusetts

Dear Doctor Wiener:

Many thanks for the magnificent contribution which you made to our symposium.

We are all grateful to you and are greatly intrigued by the various hypotheses and data which you presented.

Again, with many thanks, I am

Sincerely,

John H. Heller, M.D.
Executive Director

JHH:jmh

Please Note-Just a friendly
letter with good intentions.
Thank You

155 Lawson Avenue
Rockville Centre, N.Y.
June 13, 1957

Massachusetts Institute of Technology
Department of Mathematics
Cambridge, Massachusetts

Attention of a
Norbert Weiner
Professor

Dear Professor:

The enclosed article stimulates this comment.

I am always interested in such applications when it concerns medicine and yours is no exception and your mention of a fertility and sterlity problems is one which has interested me in view of my years on the electro-magnetic studies of cellular genes and the changes in their normal functions when specific magnetic metals are lacking. It was read recently that they intend to detect diseases and changes in the system by electrical and magnetic means and this is helpful as more doctors are beginning to "see the handwriting on the wall" so to speak about the value of such physical states. In getting back to fertility one must remember that all cell life from the egg stage onward evolves the electro-magnetic state and lack of copper, zinc, manganese, magnesium, iron, nickel and cobalt can create differences and change cells by absorbing toxic substitutes which create malfunctions in the living system.

I have no facilities for evaluating such results so must keep an open mind on the subject and noted sometime ago how a doctor injected a minute amount of selenium salt into a normal fertilized hen's egg and the chick was hatched without eyes indicating that selenium which is paramagnetic caused some change in normal cell pattern. There may be other tests but as yet it has not been found but in this case it would have been interesting to have measured the electrical changes before and after the selenium injections as there is a change to account for this occurrence in the chick system. So in sterlity cases it may be a change of metal which acts defensively as it may be that her system cannot adequately carry the embryo and defensively reacts by promoting sterility. Any more than when babies are born prematurely which can be traced to a decline in copper and zinc and to save both baby and mother her defense system brings about the premature birth and so such tests would be helpful here to indicate the possiblity of lack of copper and zinc which could be added orally or injected to carry her child through to normal birth. Thus can serve anyone keenly interested from ten years of cellular data and you may circulate it for any interest it creates here.

The writer appreciates hearing from you, I am.

Very sincerely yours,

John Thomas Cleary

JTC
Enc

BRAIN WAVES GET A NEW YARDSTICK

Weiner Says Use of Harmonic Analysis Equipment Could Provide Accurate Index

AID TO MEDICINE SEEN

Finer Measurements of Skin Changes and Heartbeats Forecast for Physicians

By ROBERT K. PLUMB

Special to The New York Times.

RIDGEFIELD, Conn., June 10 —Electrical equipment to analyze so-called brain waves was described here today. It was said that a stable physiological index to mental activity could be drawn from the analysis.

Only a $10,000 laboratory model of the equipment has been tested so far in the Massachusetts General Hospital, according to an informal report presented by Norbert Weiner, Professor of Mathematics at Massachusetts Institute of Technology.

But Dr. Weiner predicted that improved models suitable for a doctor's office might be produced for a few thousand dollars.

He said that improved simplified versions of the device tested might have other important applications in medical diagnosis and treatment. For one thing, variations in the pattern of the human heartbeat that are too slight to be picked out by eye in the coventional electrocardiograph could be measured.

Dr. Weiner also said that changes in the electrical activity of women's skin were believed to vary according to the sexual cycle. Thus, he said, the analyzer of physiological rhythms might pinpoint the precise time of ovulation to aid in the treatment of fertility or sterility problems.

Addresses Science Meeting

Dr. Weiner addressed a gathering of specialists in physical sciences and medical men. The New England Institute for Medical Research here sponsored the conclave.

About 100 physicians, scientists and engineer representatives of commercial scientific instrument manufacturing concerns attended the session. It was called by Dr. John H. Heller, executive director of the research institute and a former Yale University professor, to acquaint instrument designers and manufacturers with some areas in which medical men need instruments for diagnosis and treatment.

Dr. Heller, a physician, pointed out that doctors now attached leads to the heads of patients and observed by eye the fleeting pattern of fluctuations in voltage that the brain produced.

Dr. Weiner described how analysis of the complex pattern of brain waves might be accomplished by mathematical manipulations through electronic equipment.

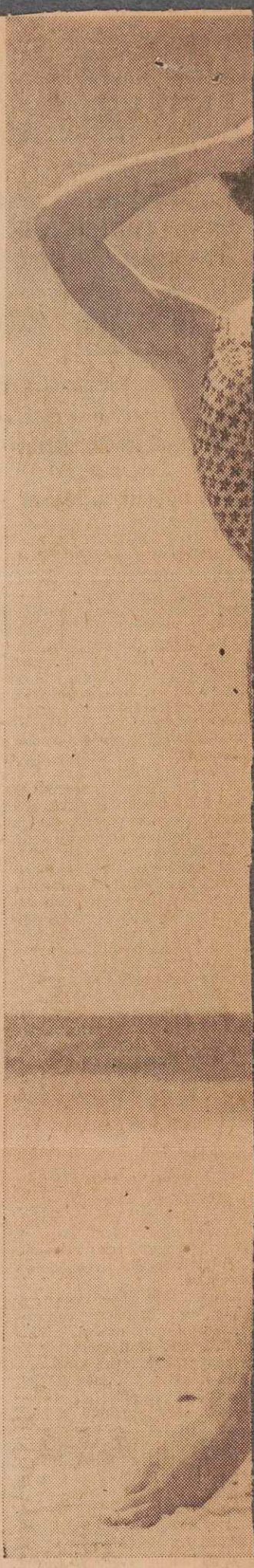
Waves Are Speeded

A mathematical method known as Fourier analysis is used. This harmonic analysis is used, for instance, to find the frequencies that make a beam of light. Mathematical deductions about the source and cause of ocean waves are analogous. In this field the arrival of waves at the shoreline are measured and timed.

Conventional Fourier analysis is used with very high frequencies. Dr. Weiner said a similar analysis could be done on the typical low-frequency alpha rhythm in the brain by electronically matching the observed alpha rhythm with a source of constant high frequency fluctuations. The recorded alpha rhythm is put on magnetic tape and speeded up some 100 times over its ordinary speed.

Dr. Weiner said this was in contrast with the use of the electroencephalograph, by which a physician gauges by eye the voltage-time patterns made on an oscilloscope.

The session will continue tomorrow with a study of the application of physical means to other medical problems.



Two generations of Cole c
Miss 1957, at left, wears a s
Right, a less covered-up v

Food News:

Seasonal Catches N
—Interesting Reci

By JUNE

SAY tuna to the landlubber and he thinks of the fish that comes in a can. But sportsmen know tuna as a fighting fish. Those who have savored the fresh meat, sold here most often in the form of steaks, liken it to fresh swordfish.

The fresh tuna season, just under way with the arrival of catches from the waters off Cape Cod, will continue through most of the summer. The West Coast, which also enjoys fresh tuna during the summer, ships frozen fish here during the winter and spring.

Fresh tuna takes well to baking, broiling and steaming. There are those who say that they prefer canned to fresh tuna but others rate fresh tuna, properly prepared, as one of the most delectable of fish. Tuna can be

UNIVERSITÉ LAVAL
FACULTÉ DES SCIENCES
QUÉBEC, CANADA.

June 13, 1957.

Dr. N. Wiener,
Department of Mathematics,
Massachusetts Institute of Technology,
Cambridge, Mass.

Dear Dr. Wiener:

Last April you were kind enough to read two of my papers on realizability and stability of circuits, one of which was at that time already published in the Comptes Rendus de l'Académie des Sciences. In the conversation which followed you made me the honour of expressing a favourable opinion on these papers.

It would render me a great service if one of my superiors could know about your favourable opinion, because this would help me considerably at the beginning of my academic career. At my request you had offered to inform my superiors.

I realize that you are very busy, but if you find the time, please write to either Dr. C. Ouellet, Dean, or to Mr. L. Boulet, Director of the Department of Electrical Engineering, at Laval University.

I am writing this letter at your suggestion expressed in today's telephone conversation.

Thanking you for your consideration in advance, I remain,

Very truly yours,

Igor Gumowski
(Igor Gumowski)

Enclosed: two papers.

[illegible 6/17/57]

ÉLECTRICITÉ. — *Quelques considérations sur la réalisabilité des circuits électriques*. Note de M. **Igor Gumowski**, présentée par M. Eugène Darmois.

Dans l'étude de la réalisabilité d'une fonction représentant une caractéristique de circuit, cette réalisabilité est généralement définie d'une des façons suivantes :

(I). D'après H. W. Bode (1), un circuit est dit réalisable si : 1° il est décrit avec une précision suffisante par un système d'équations intégrodifférentielles à coefficients constants, et si 2° ce système d'équations n'admet aucune solution particulière qui croît exponentiellement avec le temps.

Par conséquent, dans le sens de Bode on peut dire qu'une caractéristique $A(\omega)$ est réalisable si elle est déductible d'une fonction de transfert rationnelle en $p = 0 + j\omega$, n'ayant pas de pôles dans le demi-plan droit.

(II). D'après Wiener (-Redheffer) (2), (3), si la fonction $A(\omega)$ représente une résistance, cette résistance est dite réalisable, à condition que $A(\omega)$ admette une transformée de Hilbert non nulle $B(\omega)$. $A(\omega)$ doit être une fonction paire non négative et $\log A(\omega)$ doit admettre une transformée de Hilbert non nulle $\varphi(\omega)$. Dans ce cas $H(\omega) = A(\omega)\, e^{j\varphi(\omega)}$ décrira la fonction de transfert d'un circuit physiquement réalisable.

(III). Une troisième définition de réalisabilité est donnée par Wallman (4). D'après cette définition une caractéristique $A(\omega)$ est dite réalisable si la fonction de transfert $H(\omega)$ du circuit correspondant est telle que sa réponse transitoire s'annule identiquement pour $t < 0$, s'il en est de même pour le signal d'entrée.

Lorsque $A(\omega)$ désigne une caractéristique d'amplitude, Wallman formule le critère de réalisabilité particulier suivant : lorsque $A(\omega)$ est sommable $L^2(-\infty, +\infty)$, la condition nécessaire et suffisante pour qu'il existe une fonction de phase $\varphi(\omega)$ telle que $H(\omega) = A(\omega)\, e^{j\varphi(\omega)}$ soit réalisable est que l'intégrale

$$\int_{-\infty}^{+\infty} \frac{\log A(\omega)}{1 + \omega^2}\, d\omega \tag{1}$$

converge. L'énoncé précédent représente le théorème bien connu de R. E. A. C. Paley-N. Wiener sur les fonctions non quasi analytiques (5).

La condition de Bode s'applique uniquement aux fonctions de transfert rationnelles en $p = 0 + j\omega$, tandis que celles de Wiener (-Redheffer) et de Wallman (-Wiener) s'appliquent aussi aux fonctions de transfert non rationnelles. Illustrons ceci au moyen de deux exemples.

a. Considérons d'abord la caractéristique d'amplitude

$$A(\omega) = \sqrt{\frac{\omega^2}{1+\omega^2}}. \tag{2}$$

Puisque la transformée de Hilbert de $\log A(\omega)$ existe, et est donnée par

$$\varphi(\omega) = \frac{\pi}{2} - \operatorname{arc\,tg}\,\omega,$$

$A(\omega)$ est réalisable au sens de Wiener (-Redheffer). La caractéristique (2) est aussi réalisable au sens de Bode parce que

$$H(\omega) = A(\omega)\, e^{j\varphi(\omega)} = \frac{j\omega}{1+j\omega}$$

n'a pas des pôles pour $\mathrm{Re}\, p > 0$. (2) est réalisable d'après la définition générale de Wallman; ceci ne peut pas s'établir en appliquant le critère (1), parce que $A(\omega)$ n'est pas sommable $L^2(-\infty, +\infty)$.

b. Considérons maintenant la caractéristique d'amplitude

$$A(\omega) = |\omega|^{-\frac{1}{2}}. \tag{3}$$

Cette caractéristique est réalisable au sens de Wiener (-Redheffer) parce que $\log A(\omega)$ admet une transformée de Hilbert non-nulle. En effet, $\log A(\omega)$ est la partie réelle de

$$-\frac{1}{2}\log z = -\frac{1}{2}\log\sqrt{x^2+y^2} - j\operatorname{arc\,tg}\frac{y}{x}$$

lorsque $x = \omega$ et $y \to 0$. Donc, la transformée de Hilbert de $\log A(\omega)$ est donnée par

$$\varphi(\omega) = \begin{cases} -(2k+1)\dfrac{\pi}{2} & \text{pour} \quad \omega > 0 \\ +(2k+1)\dfrac{\pi}{2} & \text{pour} \quad \omega < 0 \end{cases}, \qquad k = 0, 1, 2, \ldots.$$

Comme $A(\omega)\, e^{j\varphi(\omega)}$ n'est pas une fonction rationnelle de $j\omega$, la réalisabilité de (3) ne peut pas se déterminer d'après Bode. Et comme (3) n'est pas sommable $L^2(-\infty, +\infty)$, elle ne peut pas se déterminer non plus d'après Wallman.

Puisque $A(\omega)\, e^{j\varphi(\omega)}$ admet une transformée de Fourier, il est facile de voir que (3) n'est pas réalisable au sens de Wallman. En effet, la réponse à une

impulsion de $A(\omega)\,e^{j\varphi(\omega)}$ est donnée par

$$u(t)=\frac{1}{2\pi}\int_{-\infty}^{0}\frac{e^{j\left(\omega t+\frac{\pi}{2}\right)}}{\sqrt{-\omega}}\,d\omega+\frac{1}{2\pi}\int_{0}^{\infty}\frac{e^{j\left(\omega t-\frac{\pi}{2}\right)}}{\sqrt{\omega}}\,d\omega$$

$$=\frac{2}{\pi}\int_{0}^{\infty}\sin t\omega^{2}\,d\omega=\begin{cases}+(2\pi t)^{-\frac{1}{2}}, & t>0\\ -(2\pi t)^{-\frac{1}{2}}, & t<0\end{cases},$$

qui ne s'annule pas pour $t<0$.

Si l'on admet que la réalisabilité au sens de Wallman est essentielle pour la réalisabilité physique, la définition de Wiener (-Redheffer) est non-suffisante ; elle est aussi non-nécessaire, parce que le calcul d'une réponse transitoire à partir d'une caractéristique sinusoïdale constitue un problème de variable réelle.

Il semble que la réalisabilité d'une caractéristique d'amplitude puisse se décider sur la base d'une équation intégrale. En effet, la caractéristique d'amplitude $A(\omega)$ sera dite réalisable au sens de Wallman si, pour au moins une fonction $g(t)$ il existe une fonction $\varphi(\omega)$ solution de l'équation singulière de Fredholm

$$(4)\qquad \frac{1}{2u}\int_{-\infty}^{+\infty}e^{j\omega t}\,A(\omega)\,e^{j\varphi(\omega)}\,d\omega=\begin{cases}0 & \text{pour } t<0\\ g(t) & \text{pour } t>0\end{cases}=u(t),$$

l'intégrale étant considérée au sens des distributions de L. Schwartz ([6]), ([9]), ou si nécessaire, dans un sens encore plus général.

Dans l'exemple (a), (4) admet une infinité des solutions. En particulier, si l'on choisit $g(t)=-e^{-t}$, $\varphi(\omega)=\operatorname{arc\,tg}\omega+(\pi/2)$ est une solution de (4). Comme dans ce cas l'intégrale dans (4) ne converge pas au sens usuel, $u(t)$ ne sera pas une fonction usuelle, mais une distribution. Il est facile de vérifier que

$$u(t)=\delta(t)-Y(t)\,e^{-t},$$

où $\delta(t)$ est la mesure de Dirac et $Y(t)$ l'échelon unité.

([1]) *Network analysis and feedback amplifier design*, D. Van Nostrand Co., New-York, 1945.

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([4]) G. E. Valley et H. Wallman, *Vacuum Tube Amplifiers*, Mc Graw-Hill, New-York, 1948.

([5]) *Am. Math. Soc. Colloq. Pub.*, 1934.

([6]) *Théorie des distributions*, Hermann et Cie, Paris, 1950-1951.

(7) I. Halperin, *Introduction to the theory of distributions*, University of Toronto Press, Toronto, 1952.

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(Extrait des *Comptes rendus des séances de l'Académie des Sciences*, t. 244, p. 317-319, séance du 14 janvier 1957.)

GAUTHIER-VILLARS,
ÉDITEUR-IMPRIMEUR-LIBRAIRE DES COMPTES RENDUS DES SÉANCES DE L'ACADÉMIE DES SCIENCES
151285-57 Paris. — Quai des Grands-Augustins, 55.

Un critère de stabilité sous forme d'une équation intégrale

Igor Gumowski

(publiée dans: Comptes Rendus de l'Académie des Sciences,
No. 15, 8 avril 1957, pp. 2004-7).

Mars 1957

Faculté des Sciences
Université Laval
Québec, P. Q.

Considérons une équation différentielle linéaire à coefficients constants avec second membre

$$(1) \qquad L(D)\, y(t) = f(t) = \left\{ \begin{array}{ll} f_1(t) & \text{pour } t < 0 \\ f_2(t) & \text{pour } t > 0 \end{array} \right\},$$

où $L(D)$ est un opérateur de degré n, fini ou infini, en $D = \frac{d}{dt}$. Notons d'abord que si $f(t)$ est une fonction usuelle, et si une solution particulière de (1) existe, la forme de cette solution particulière est indépendente de $f_2(t)$ pour $t < 0$. En d'autres mots, si (1) décrit un circuit électrique, la réponse transitoire pour $t < 0$ ne possède aucune relation, causale ou autre, avec le signal appliqué à $t \geq 0$.

Si $f_1(t) \neq 0$, il est évident que quelles que soient les conditions aux limites associées à (1), la solution de (1) ne peut pas s'annuler identiquement pour $t < 0$. Cependant si $f_1(t) = 0$, il ne s'en suit pas nécessairement que toutes les solutions particulières de (1) s'annulent identiquement pour $t < 0$, mais certains $L(D)$ peuvent admettre cette propriété. Lorsque ceci est le cas on dit que l'opérateur $L(D)$ décrit un circuit réalisable au sens de Wallman. L'opérateur $L(D)$ satisfait alors formellement l'équation de Fredholm

$$(2) \qquad \frac{1}{2\pi} \int_{-\infty}^{+\infty} e^{j\omega t}\, L^{-1}(j\omega)\, d\omega = \left\{ \begin{array}{ll} 0 & \text{pour } t < 0 \\ g(t) & \text{pour } t > 0 \end{array} \right\}.$$

Mais la réalisabilité au sens de Wallman constitue une généralisation de la réalisabilité au sens de Bode, [1]. Rappelons ici que la définition de réalisabilité donnée par Bode n'est pas une définition de réalisabilité au sens philosophique du mot mais une définition de stabilité [2]. En effet, Bode a formulé sa notion de réalisabilité surtout comme un artifice permettant d'économiser l'effort de la pensée dans les problèmes de synthèse, raisonnant comme suit:

Si le circuit que l'on veut réaliser est instable, son régime permanent, i.e. l'intégrale particulière de (1), ne peut pas être établie expérimentallement par les méthodes habituelles. En général il y a donc économie de pensée (economy of thought) d'exclure ces circuits d'avance en les appelant irréalisables.

Examinons maintenant si le critère de réalisabilité au sens de Wallman, exprimé sous la forme (2), ne peut pas être interpreté de la même façon. Si oui, l'équation (2) constituerait un critère de stabilité plus général que les critères habituels (Bode, Nyquist, etc.). En effet, lorsqu'on considère l'intégrale dans un sens généralisé, la classe des $L(D)$ auquels (2) s'applique est très grande et elle contient comme cas particuliers les opérateurs $L(D)$ traitables par les méthodes usuelles [1].

Or, il semble que le critère de réalisabilité au sens de Wallman peut être interpreté comme un critère de stabilité. En effet, si l'équation (1) décrit un circuit instable, au moins une solution particulière de (1) aura tendance d'augmenter indéfiniment. Mais en appliquant la transformation de Fourier à l'équation (1) on choisit de toutes les solutions possibles une solution particulière $y(t)$, telle que les intégrales

$$\int_{-\infty}^{+\infty} \left| D^k y(t) \right| dt \quad , \quad k = 0, 1, 2, \ldots$$

existent. Par conséquent on cherche précisement une solution particulière, définie pour $-\infty < t < +\infty$, qui n'augmente pas indéfiniment pour $t \geq 0$, ce qui est impossible à moins que la tendance de $y(t)$ de s'éloigner du régime forcé par $f_2(t)$ soit opposé par un signal convenable. Evidemment ce signal doit être présent avant que $f_2(t)$ soit appliqué. Or nous avons vu que pour $t < 0$ $y(t)$ est indépendent de $f_2(t)$. Donc, si $f_1(t) = 0$, le signal nécéssaire pour empecher $y(t)$ de s'éloigner du

régime forcé doit être auto-généré par le circuit, ce qui est une autre manière de dire que le circuit est instable. Par conséquent on peut établir la stabilité d'un circuit soit en s'assurant que sa réponse transitoire n'augmente pas indéfiniment pour $t \succ 0$, soit en s'assurant que le circuit n'admet pas de signal auto-généré pour $t \prec 0$.

Il semble que le point de vue de l'auto-génération est plus avantageux que le point de vue usuel, parce que dans ce cas $L(D)$ n'a pas besoin d'être connu sauf sur l'axe $D = j\omega$. En d'autres mots, la connaissance de la réponse en fréquences du circuit $H(\omega) = L^{-1}(j\omega)$ est suffisante pour déterminer sa stabilité. Cette réponse en fréquences $H(\omega)$ n'a pas besoin d'être une fonction analytique; elle peut même être connue sous forme graphique ou numérique seulement.

Exemples.

(I) $$H(\omega) = \pi (-j)^n e^{-j\omega} J_n(\omega) \quad ,$$

où $J_n(\omega)$ est la fonction de Bessel de première espèce et d'ordre n. La stabilité du circuit décrit par cette fonction de transfert ne peut pas s'établir par la méthode usuelle parce que la seule singularité de $H(\omega)$ se trouve à l'infini. Cependant en substituant dans (2) on obtient

$$\frac{1}{2\pi}\int_{-\infty}^{+\infty} e^{j\omega t} H(\omega)\, d\omega = \left\{ \begin{array}{ll} 0 & \text{pour } t \prec 0 \\ \sqrt{1-(t-1)^2}\, \cos[n \arccos(t-1)] & \text{pour } 0 \prec t \prec 2 \\ 0 & \text{pour } t \succ 2 \end{array} \right\} ,$$

ce qui montre que le circuit est stable.

(II) $$L(D) = \sqrt{1 + D^2} \quad .$$

L'opérateur étant d'ordre infini, la méthode usuelle n'est pas directement appliquable. Substituant dans (2) on obtient

$$\frac{1}{2\pi}\int_{-\infty}^{+\infty} \frac{e^{j\omega t}}{\sqrt{1-\omega^2}}\, d\omega \;=\; 2\,J_0(t) \quad .$$

Comme l'intégrale précédente définit une fonction de t paire, le circuit est instable. Mais $L(j\omega)$ a la même forme que l'impédance image d'un filtre passe-bas classique. Or, il est bien connu que l'impédance image de ce filtre peut être approchée par une fonction rationelle en $j\omega$ d'un ordre aussi élevé que l'on veut, et que le circuit associé à cette fonction rationelle est stable. Cet exemple montre que si $H(\omega)$ décrit un circuit instable, et on a $H(\omega) = \lim_{n\to\infty} H_n(\omega)$, $H_n(\omega)$ peut décrire un circuit stable.

(III) $\qquad H(\omega) = 1$ pour $|\omega| < 1$ et 0 pour $|\omega| > 1$.

La stabilité du filtre idéal, défini par la fonction de transfert précédente, ne peut pas s'établir par la méthode usuelle parce que $H(\omega)$ est une fonction non-analytique. Mais d'après (2) on voit immédiatement que ce filtre idéal est instable. Cependant un filtre ayant une fonction de transfert très voisine n'est pas nécéssairement instable. Sans discuter la réalisabilité ou la stabilité, Golay a décrit une méthode de construire ce filtre approché [3].

(IV) $\qquad L(D) = \left(D + \sqrt{1 + D^2}\right)^{2n}$, n - un entier positif.

La méthode usuelle n'est pas appliquable à ce cas parce que l'ordre de l'équation différentielle est infini. Appliquant (2) on obtient

$$\frac{1}{2\pi}\int_{-\infty}^{+\infty} e^{j\omega t}\left[j\omega - \sqrt{1+(j\omega)^2}\right]^{2n} d\omega \;=\; 4n\,\frac{J_{2n}(t)}{t} \quad .$$

Comme $J_{2n}(t)$ est une fonction paire de t, le circuit est instable. $|H(\omega)|^2$ étant sommable dans $-\infty < \omega < +\infty$, cette conclusion peut se vérifier au moyen du théorème de Paley-Wiener sur les fonctions non-quasi-analytiques [4], [1] . En effet,

$$\int_{-\infty}^{+\infty} \frac{\log|H(\omega)|}{1+\omega^2}\, d\omega \;=\; 4n \int_{1}^{\infty} \frac{\log\left(\omega - \sqrt{\omega^2-1}\right)}{1+\omega^2}\, d\omega$$

diverge, et la réponse transitoire du circuit ne s'annulle pas identiquement pour $t < 0$.

References.

[1] I. Gumowski, Comptes rendus, 244, 1957, pp 317 - 319

[2] "Network analysis and feedback amplifier design", D.Van Nostrand Co.,

[3] New York, 1945.

[4] Proc. I.R.E., 34, 1946, pp 138P - 144P.

Am. Math. Soc. Colloq. Pub., vol. 19, 1934.

VANDENBERG

1318 North 16th Street
Lafayette, Indiana
June 13, 1957

Dr. Norbert Wiener
Department of Mathematics
Massachusetts Institute of Technology
Cambridge 39, Massachusetts

Dear Dr. Wiener:

Thank you very much for your letter of March 20 which suggested that I contact Professor Wiesner for information concerning M.I.T. work on vibratory communications. He put me in touch with Lamar Washington, in the Industrial Liaison Office, who has done some work in this area with Professor Witcher and who was able to give me some excellent references to research which would otherwise have escaped my attention.

Thank you again for your assistance.

Sincerely yours,

John D. Vandenberg

John D. Vandenberg

SCHERING

SCHERING CORPORATION BLOOMFIELD, NEW JERSEY

June 14, 1957

Dr. Norbert Wiener
Dept. of Mathematics
Mass. Inst. of Technology
Cambridge 39, Massachusetts

Dear Dr. Wiener:

I have been waiting for the enclosed check before answering your letter. We have been working on our surgical technique, attempting to lay in a supply of good cats, so that we will be ready to go ahead if we get the O.K. from Rosenblith. I hope we will be able to do something this summer, when things slow down a little here.

Please give my best regards to Mrs. Wiener.

Cordially,

Charles Hendley

Charles D. Hendley
Pharmacologist

CDH:ch

Enclosure

. . .

BOX 231

MERRILL K. RIDDICK

Consultant In Applied Ecology

"Prospecting In Its Broader Aspects"

PHILIPSBURG, MONTANA

June 15-57

M.I.T.

1. permission requested to quote views in the enclosed mss underlined ________

2. It looks like I have the new science started. It would be a privilege to work with you in this. I have received no answer to the April 30 series I sent to you, and I am ~~enclosing~~ resubmitting - enclosed

3. Out of the replies & impacts of the April 30 series, much material is coming in. Example the mss. I am enclosing indicates how this material can be used, in developing a Text.

4. It would be a pleasure to send you the material as it develops, or have you help me process it.

5. You are welcome to use for publication any of this. The material also offered elsewhere but little acceptance so far.

6. I have a series of placer claims, rare earth & other mineral, I would give free to a unio - fine summer camp - wilderness, water forest - mineral - wild life - atomic

Merrill K. Riddick

[ans 1/9/58]

am resubmitting this
From the replies, the
science grows form
& I find new ways
to illustrate

Merrill K. Riddick
Consultant In Applied Ecology
"Prospecting In It's Broader Aspects"
Philipsburg, Mont.
Box 231

- - - - - - - - - - - - - - - - - - -

April 30, 1957

Dear Sir:

How does one start a new science? That is what I am trying to do, using among other sciences the framework of the neglected science of Ecology. I call the name "Applied Ecology". It's aim is to arrange such data, faucets, aspects, factors and variables and undertake research and application in regard to the effect of such externals called environment, on man. This is more specific than a definition of just Ecology, which includes such externals as climate, natural resources on Biology in general.

The study of natural resources will be stressed, as their effect on man is profound. Not only do they effect our living standards, our industry and trade, our responsibilities and future, and as these things change, new perspective must be obtained.

The question arises as to how we are to use these resources and the new things in this new age of peril and change. The conditions and principal values might be in merely broadening a mobilization base, or this phase may be broken down and evaluated as to relationship to the many factors such as: agriculture, manpower, industry, credit, and their effect on usable available reserves. As one attempts to assign such values, he finds himself using such terms as service and co-operation. The President has talked in messages to Congress about the need for broader concepts of co-operation. Even with the word co-operation there are possibilities of double talk. Brigands might co-operate for their purposes. Specify a concept of co-operation for service as an ideal and the idea has new potentials.

A whole new pattern of the possibilities of selection of ~~focal~~ clusty points, around which to arrange these matters, is indicated. The problems can also be resolved to new breakdowns into their smallest divisions for better study. These problems will have but little interest to those folks engaged in a harvest or gleaning type of enterprise. However, such folks who are concerned with a "planting" type of enterprise - "the girding of our loins for the fuller use and utility of these natural resources" are invited to respond and aid in this development of a new science.

For illustration purposes, I have selected some projects with aspects that are non-controversial, to many people. Such problems might serve to illustrate applications of this new science.

If you object to my emphasis and selection of material, suggest better material. This letter (circulation 500) is being sent to you as a leader. It is being sent to Government officials, universities and some representative businesses. It is desired that better men than I help with these problems, and develop them beyond my capabilities. Your thoughts, ideas and help is asked ~~for~~.

For Applied Ecology departments ~~in~~ of Government are setting up new science courses in the Universities and I offer whatever help indicated.

For those who believe that the economic factor is paramount and who know how to utilize values, I offer a co-operative attempt ~~on receipt of a tentative retainer of $1000.~~

For those who may just care to receive monthly bulletins on the development of this science, a compiliation will be available at ~~the rate of $10.00 per month.~~ to you

Your response will be applied, with appreciation.

Merrill K. Riddick

Merrill K. Riddick

Merrill K. Riddick
Consultant In Applied Ecology
Philipsburg, Mont.
Box 231

"Prospecting In It's Broader Aspects"

Some Aspects of Applied Ecology

"For in him all things were created in Heaven and on Earth, visible and invisible, whether thrones or dominions or principalities, or authorities - all things were created thru him and for him", Colossians, 1st Chapter, Verses 15 through 16.

Further we have in the advent of Christianity instructions that are applicable to a use of these things, including natural resources.

We must try to figure why these natural resources were given us, we must try and learn our responsibilities to our nation and neighbor and divine creative laws, the answer might be different than if only economic or political or expedient or wasteful use is indicated. These resources effect man, the physical man, the mental man and the spiritual man. In turn these resources are effected by many externals.

A dictionary definition of Ecology is the effect of environment and externals on biology.

There are many externals, climate, soil, the atmosphere that effects the simple forms of life. But a very broad and complicated series of externals effect man. A study of these might be named the science of Applied Ecology.

In Applied Ecology, there are a group of externals, one might generalize as natural resources, their use in turn is effected by many and complicated external factors less tangible with the need and possibility of resolving. Any of these natural resources, for example "water", has as many faucets as a childs block. A power company will believe the waters best use is to create cheap power. A man whose experience level and study leads him to believe in the values of the man on the land, will see in "water" special values in developing deserts. The mineral man, realizing values in the mineral and industrial needs or broadening either place, time or mobilization weeks, would stress other values. The forester, soil conservationist or wild life man could name values in water that another dedicated expert would not value highly. Nor would there be ways or words to allow the one to readily explain his view point or to influence the other expert.

It is only by breaking down the problem into its smallest possible phase, like the crystal can be broken down into molecules, into atoms, thence forces, can the full qualities be experienced. With natural resources and other externals of environment the attempt to work out the factors, assign values, recognize variables, this attempt could be similar to the development of a new science. This I have named, "Applied Ecology". It applies to all the externals that effect man and his organizations and entities.

Some of these externals, while having many faucets, have various horizons of identity, one of these identities being physical identity, like ice water and vapor have in relation to measurable causes and effects. There are also possible conditions or horizons where the cause is not measurable but the effect can be noted. Philosophy calls this the "occluded middle" and compares it to that immeasurable cause that might cause a flight of birds to veer.

There is still a higher horizon, an immeasurable ~~course~~ Cause and immeasureable effect compared perhaps to a good deed going out into the world. It might be compared to any of those human qualities that cause a job to be well done, a sacrifice to be made, service to be rendered, discipline, cooperation, love, or the way any of these are developed and expressed.

Choice and the reaction to experience and training are among these changeables and have their impact on the development of natural resources. There are several horizons of identity and these are as important as they are intangible.

These problems include problems covered to some extent in many of the sciences. They

Page 2
aspects

also cover areas of no mans land between the sciences. They project into areas where a lack of names handicap one expert from recording or conveying his findings to an expert in another field.

This attempt to develop a new science of "Applied Ecology", will be of use to you in your work and service. The field is so broad and complicated, that any development of this science to your uses, will require special "feed back" and response and cooperation. I am enclosing as illustration, outlines of some of our undeveloped natural resource potentials. Your interest may not be apparent in the subjects chosen, you may not agree with the scope or materials of the outline or such limitations that loom to pose difficulties in this start. The point is that the fundamental and applied aspects developed in such a study, have values.

You are invited to attempt with me a scientific approach to such phases of the development of this new science of Applied Ecology.

Merrill K. Riddick

Merrill K. Riddick

Tentative Outline of Factors and Variables
Applicable to the Following Projects

I. Project - Another Place.

The undeveloped tract west of Salt Lake, size of Massachusetts, good soil, good climate, favorable location aspects, which only lacks the water that could so easily be brought in from North.

A. Factor and concept of using available water for "broader uses" than only for power. Includes a "distinction between words utilize and use.

1. "Producing bread", a generalization with application to projects Heartland, agriculture, population trends, blighted areas.

B. New Empire - Generalization with application to relocation of industry for a broader mobilization base, greater surplus potential where needed, effect on raised standards, civil defense, strategic mineral.

C. Associate use of water and power. Water to be pumped or conveyed.

1. Water to develop the Colorado-Wyoming Oil Shales, whose reserves are several times greater than other oil reserves.

2. Variable Lignite Coal - the 440 billion tons of lignite in Montana, Dakota, and Wyoming and Missouri basin area, which in addition to better grades of coal, have oil and gas potential, along with their chemical, known uranium content, power from the oil, uranium, thorium, rare earth associates and fusion, solar energy and other factors, such as desalting other water resources and desalting special types of land from such as chemicals left through irrigation.

II. Water to develop such mineral as the 1.7 trillion tons of phosphate in Montana, Utah and Idaho areas, $5.40 by products. The fluorspar phase, a subject in its own right because of its new product potentials and potential for use with utilization of wood wastes; application of smaller sub-divisions of enterprise, such as the "Bigger Than Butte" concept of Montana.

The billions feet waste timber, burn, insect control, mill waste, scrap timber, including material now left in forests. The effect of wood waste use on new lands being developed by new water potentials combined with trace and other fertilizer treatment allowing timber to be grown in places where no timber now grows. Soil and water conservation; land reserves not needed at present because of surpluses; wild life applications; recreation esthetic; tourists. Water to allow use of other minerals along the lines Geneva plant of U. S. Steel is developing an iron industry at S. Pass, Wyoming.

III. Relation of the development of this "another place" near Salt Lake:

A. Canal, pipe and tunnel and other water movement south along the west side of Continental Divide; Columbia; other potential from Columbia river; Hells Canyon-Montana; Wyoming and other.

B. Application to Colorado River problem .

C. Application to project Missouri River water along the east side of Continental Divide to Denver Dust Bowl and Texas.

D. Application to sub-surface water problems, including conate water (or water in place as the sediments laid down) or sub-surface water, water with natural or artificial replacement possibilities. Control of use of sub-surface waters.

E. Application to Great Western water project - Klamath and Lower Columbia to S. California and Mexico via Central Basin, California.

F. Impact on Colorado treaty rights problems with Arizona; Nevada river; Sonora and Baja Mexico and the Empires there possible of development.

G. Effect of mineral development, such as the artillery peak manganese, potash, titanium and rare earth and the pegmatite type of associates and other.

IV. Interlocking relationship of the development of above projects and upgrading blighted areas, with new concepts of cooperation between the larger political units.

A. Canada with head waters of Columbia River; potential of raising the Great Lakes level, her oil and gas and coal surpluses.

V. The application of experience in above and such things as damming the San Francisco Bay to raising standards and increasing economic potential through Mediterranean dam; the projects of Near East and elsewhere. Water level aspects of the Great Lakes; and pollution problems as exampled by Missouri, Ohio, Delaware Rivers and others. Erosion-climate control and others.

VI. Experience in what the Honorable Wayne Aspanall of Colorado calles the art of Government. A loosing of the individuality of many of the political sub-divisions so that the, cooperation for service, there can be enlarged stature.

VII. Financial aspects - The separation of responsibility of subsidized operation and private initiative and enterprise.

A. Creation of Hedge against change of dollar value.

B. Relief of Government expense to allow private initiative to finance new large projects in an escape from the concept that wherever possible these things must be subsidized.

C. Relief from concept that in some of these things broader than any state sub-division, industry or corporation that past precedent laws or treaty rights, special economic or political advantage, cannot be adjusted.

Merrill K. Riddick

Merrill K. Riddick

KAY ELECTRIC COMPANY

MEGALINE SONALINE

MAPLE AVE., PINE BROOK, N. J.

CALDWELL 6-4000

June 17, 1957

Dr. Norbert Weiner
Professor of Mathematics
Massachusetts Institute of Tech.
Cambridge, Mass.

Dear Dr. Weiner:

We read with interest comments made by the New York Times of June 11,1957 on your recent address concerning harmonic analysis equipment. This address was given at the New England Institute for Medical Research gathering. You mentioned a Fourier analysis on heart bands, brain waves, etc. The article also pointed out that you had a $10,000 model of equipment being tested at M.I.T. for this type of work.

We would like to point out that we manufacture a sound spectrograph which gives this three-dimensional analysis of these particular waves. We are enclosing a specification sheet describing this equipment. Many articles have been written in the past concerning this particular subject, and in each case our instrument has been used. It may be that you would like to comment concerning our equipment.

Sincerely yours,

KAY ELECTRIC COMPANY

John Gilmore

John Gilmore
Sales Manager

JG:gs
Encl.

Ltr 7/20/57

THE CARDIALYZER

The **CARDIALYZER** is an audio and sub-audio spectrograph especially designed for making analyses and permanent audible and visible records of all heart sounds. These records, or *Cardiagrams*, may be filed with the patients' medical record. Time correlation is assured between the electrical events of the heart cycle (as recorded on an EGC) and the sounds that are heard during recording and which appear graphically on the *Cardiagram*.

The recording medium in this completely self-contained unit is a flexible, magnetic disc, 12" in diameter and approximately 3 mils thick, which is removable for filing purposes. It can be held indefinitely or used again to record another patients' heart sounds.

SPECIFICATIONS

FREQUENCY RANGE: 10 - 1500 cps

FILTER BANDWIDTH: 23 cps

DURATION OF RECORDED SAMPLE: 6.6 sec. or 20 sec.

RECORDING TRACKS: Two tracks presently available. May be modified to contain four tracks, so that sounds emanating from the APICAL, AORTIC, MITRAL & PULMONIC areas may be recorded on one disc.

RECORDING MEDIUM: Magnetic disc (plastic base), 12" diameter, 3 mils thick.

DISPLAYS AVAILABLE:

#1 (CARDIAGRAM): FREQUENCY vs. ENERGY vs. TIME characteristics.
Linear with respect to frequency and time.

#2 (SECTION): INTENSITY vs. FREQUENCY at five consecutive times in recorded interval.
Sixty separate sections may be selected.
Range of #2 record: Linear scale, 10:1
Logarithmic scale, 35 db

#3 (When Amplitude Display Unit is available): Average AMPLITUDE vs. TIME. Amplitude scale logarithmic over 24 db and 34 db range.

(#1 and #2 displays may be made either on separate sheets or on same sheet.)

ANALYZING TIME: #1 display, 5 minutes; #2 display, additional 5 minutes.

RECORD SIZE: 4" x 12" (on 5 5/8" x 12 3/4" facsimile paper). In NORMAL operation, entire range of selected frequency band is shown in this area. In EXPANDED operation, only lower half of range (enlarged 2 times) is shown.

FREQUENCY CALIBRATION: Calibration markers at 30 cps or 240 cps intervals may be recorded on analysis paper.

AMPLIFIER CHARACTERISTICS: Flat, with CONTOUR (tone) control on monitor; STETHOSCOPIC, with rising frequency characteristic.

PICKUP MEDIUM: Condenser microphone (at extra cost).

POWER SUPPLY: Input approximately 250 watts, 117V (±10%), 60 cps (50 cps models available on special request). Plate supply voltage electronically regulated.

TENTATIVE PRICES: Cardialyzer - $2850.00, f.o.b. Pine Brook, N. J.
Microphone and Pre-Amplifier - $250.00

KAY ELECTRIC COMPANY

Pine Brook, N. J. CA 6-4000

YALE UNIVERSITY SCHOOL OF MEDICINE
333 CEDAR STREET · NEW HAVEN 11 · CONNECTICUT

DEPARTMENT OF PHYSIOLOGY

June 17, 1957

Professor Norbert Wiener
Massachusetts Institute of Technology
Cambridge, Massachusetts

Dear Professor Wiener:

I read with interest in The New York Times an account of your talk at the New England Medical Research Institute, in Ridgefield, Connecticut, in which you discussed frequency analysis of the electroencephalogram. If a more extended version of your thoughts on this subject is available, I should very much appreciate receiving a copy. Otherwise, would you kindly refer me to whatever publication has set forth your views.

Thank you for your helpfulness.

Sincerely,

Harold Lamport

Harold Lamport, M.D.
Research Associate

[ans 7/2/57]

cable address "SMADAYALC", N. Y.

CLAY-ADAMS, INC., 141 EAST 25th STREET, NEW YORK 10, N.Y.

telephone: MUrray Hill 6-4920

June 17, 1957

Dr. N. Wiener, Ph.D.
Professor of Mathematics
Massachusetts Institute
of Technology
77 Massachusetts Avenue
Boston, Massachusetts

Dear Dr. Wiener:

Unfortunately I missed your presentation at the recent Conceptual Clinic called by the New England Institute for Medical Research on "Mathematical Theory and Analysis Applied to Biomedical Phenomena".

I would greatly appreciate it if you would send me a copy of your paper or any references made covering the subject material you presented.

The discussion which you led after dinner that same evening was very interesting and I would like to be more enlightened on the background research work in this field.

Very truly yours,

CLAY-ADAMS, INC.

D.H. Palmer

Dewey H. Palmer
Director of Product Development

DHP:

[ans 6/20/57]

Barlow

June 17, 1957

Mr. Lewis Barlow
WGBH
Lowell Institute Cooperative Broadcasting Council
84 Massachusetts Avenue
Cambridge 39, Massachusetts

Dear Mr. Barlow:

I think you know that I do not do broadcasting as a rule, but I should be willing to make an exception for WGBH as it is largely an MIT institution. I think very highly of Pierre de Latil's book and consider that it represents the thoughtful journalism that the French are particularly good at.

Sincerely yours,

Norbert Wiener

maf

June 17, 1957

Mr. Thomas E. Brewster
1786 E. 89th Street
Cleveland 5, Ohio

Dear Mr. Brewster:

I am writing this letter merely to acknowledge receipt of your letter which I shall consider at my leisure when I am up in the country on my summer vacation.

Sincerely yours,

Norbert Wiener

maf

June 17, 1957

Mr. Wallace R. Brode
Journal of the Optical Society of America
National Bureau of Standards
Washington 25, D.C.

Dear Mr. Brode:

Professor Wiener wishes to express his regrets at not being able to review the manuscript "Intensity Matrix and Degree of Coherence" which you sent to him, and I am returning it herewith.

Due to Professor Wiener's already heavy schedule, he finds he will have no opportunity to devote the necessary amount of time to Mr. Gamo's manuscript.

Sincerely yours,

Margaret Fitzgibbon
Secretary

maf
Enc.

June 17, 1957

Mr. Graham DuShane, Editor
Science
1515 Massachusetts Avenue
N.W. Washington 5, D.C.

Dear Mr. DuShane:

Like yourself, obviously, I find the case of Professor Hitchcock a little difficult to answer. He did interesting scientific work in a rather specialized field and in a field which has not received much general attention. I would put him just on the borderline of deserving an obituary in SCIENCE. He was a very sincere worker and a dear friend of mine, but I have always considered his work as somewhat in a minor key. I would prefer that you get other opinions concerning his work from people who are not personally as close to him as I was. I cannot recommend his name as a must for an obituary and I hate being in the invidious position of not recommending him. In other words, honestly and truly I prefer to pass the buck.

Sincerely yours,

Norbert Wiener

maf

[ans 6/27/57]

June 17, 1957

Dr. Igor Gumowski
Universite Laval
Faculte des Sciences
Quebec, CANADA

Dear Dr. Gumowski:

I am sending a letter concerning your work to Dr. Ouellet and I think very highly of the things you are doing concerning the realizability of electric circuits. Meanwhile, I am occupying myself with investigations concerning nonlinear circuits and their spectra both in a state of free oscillation and in a state where they are stimulated by random impulses. I am using this material for the study of electric encephalograms, but it is also directly applicable to the study of electric generator systems, and to that of resonant absorption in physics.

Sincerely yours,

Norbert Wiener

maf

June 17, 1957

Mr. Hiroshi Miyakawa
Department of Electrical Engineering
Faculty of Engineering
University of Tokyo
Bunkyo-ku, Tokyo, JAPAN

Dear Mr. Miyakawa:

My paper on the factorization of matrices that I wrote already was very defective, but there is a new one coming out in a matter of months together with Massani of Bombay in ACTAMATEMATICA in Stockholm. I am also busy with colleagues at MIT on a book on time series in which a chapter concerning this subject will play an important role.

Sincerely yours,

Norbert Wiener

maf

June 17, 1957

Dr. C. Ouellet, Dean
Universite Laval
Faculte des Sciences
Quebec
CANADA

Dear Dr. Ouellet:

Your colleague, Igor Gumowski, has acquainted me with his work on the realizability and stability of circuits and I think that it is an important field and that he is doing valuable work in it. I myself am engaged in the study of related problems and I can envisage the future importance of Dr. Gumowski's work.

Sincerely yours,

Norbert Wiener

maf

[ans 6/19/57]

June 17, 1957

Mr. J.W. Quinn
681 Clarkson Avenue
Brooklyn 3, New York

Dear Mr. Quinn:

Professor Wiener has asked me to thank you for bringing the work of Fr. Gemelli to his attention.

Sincerely yours,

Margaret FitzGibbon
Secretary

June 17, 1957

Rudolf Virchow Medical Society
667 Madison Avenue
New York, N.Y.

Dear Dr. Behrend and Dr. Biberstein:

I have made a good deal of progress on my work in rhythm in physiology with particular reference to encephalography. I have gone over the work recently with Dr. Tukey of Princeton, who is probably the best statistician in this field, and he confirms me in my opinion that our results are very significant. In particular, like myself he believes that we should go into further long time work and that we shall find that the central rhythm of the alpha rhythm is well defined, not merely to 1 part in 100 but at least 1 part in 300 or 400, and possibly better still. I have also some definite ideas as to the resonance mechanism causing that rhythm and I hope that by the time I give my talk I shall have elaborated these ideas.

I would like to avoid the obligation to have to write up my talks in advance of publication, but I should be glad if they are taken down as I give them (perhaps by tape recorder) with this end in view. As to lantern slides, I think this matter should wait as I shall probably have slides by that time but do not have them now. I cannot say definitely if my wife is to accompany me but I think it highly likely and let us count on that tentatively.

Sincerely yours,

Norbert Wiener

maf

ASHLEY T. COLE
COUNSELOR AT LAW
30 EAST 42ND STREET
NEW YORK 17, N.Y.

Will Dr. Wiener kindly favor me with a few lines of his handwriting and his signature on a sheet of his official or personal letter paper, to add to a very notable collection of autograph letters.

I would greatly appreciate his sympathetic consideration of this request.

Respectfully,

Ashley T. Cole

June eighteenth,
Nineteen hundred and fifty-seven

[ans 7/2/57]

NEW YORK UNIVERSITY — BELLEVUE MEDICAL CENTER
NEW YORK UNIVERSITY COLLEGE OF MEDICINE
477 FIRST AVENUE, NEW YORK 16, N. Y.

DEPARTMENT OF PSYCHIATRY
AND NEUROLOGY

ORegon 9-3200

June 18, 1957

Norbert Wiener, Ph.D.
Massachusetts Institute of Technology
Cambridge 39, Mass.

Dear Dr. Wiener:

The first New York State Divisional Meeting of the A.P.A., is being held in New York City, at the Hotel Roosevelt November 15-17, 1957.

The emphasis for the meeting will be on "Research Trends" and "Problems of Communication and Consciousness". We have been searching for a person who can keynote the meeting and be the academic lecturer.

The selection committee unanimously feels that you would be the ideal person, and it sincerely hopes that you will be free at that time, so that you may be with us.

The program committee has scheduled the academic lecture at 10:30 A.M. Friday, November 15, and it is our guess that a large, interested and enthusiastic audience will be there.

If you can join us at that time, please let us know and we shall fill in the details of all the arrangements.

Sincerely,

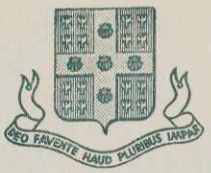
Marvin Stern

Marvin Stern, M.D.
Assoc. Prof. of Psychiatry
Chairman, Program Committee
Divisional Meeting A.P.A.

MS/fe

[ans 7/22/57]

UNIVERSITÉ LAVAL
QUÉBEC



FACULTÉ DES SCIENCES
CABINET DU DOYEN

Quebec June 19, 1957.

Dr. Norbert Wiener,
Department of Mathematics,
Massachusetts Institute of Technology,
Cambridge 39,
Mass.

Dear doctor Wiener:

Thank you very much for your appreciation of the work done by our professor, Igor Gumowski.

Yours very truly,

Ls. P. Bonneau,
Vice Dean.

LPB/gp

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

DEPARTMENT OF HUMANITIES
CAMBRIDGE 39, MASSACHUSETTS

14N 432
June 19, 1957

Professor Norbert Wiener
Room 2-278
Massachusetts Institute of Technology

Dear Professor Wiener,

Early next September I am to read a paper on William Faulkner's prose style before the English Institute, meeting at Columbia University. I wonder whether there is any possibility that your method of analyzing the rhythmical pattern of prose in far more subtle ways than it has ever been done before could possibly be put to work on some sections of Mr. Faulkner's fiction so that I could present the results--naturally, as your results--to that professional group.

I can, of course, think of scores of reasons why you would not want to do this. But if it were possible, I know that there would be great profit to the members of the English Institute and to literary critics in general.

Sincerely yours,

Carvel Collins

Carvel Collins
Professor of English

CC/bh

[ans 8/5/57]

Mathematics Department
The Institute of Science
Bombay 1, India

June 20, 1957

Miss Lucie H. Schaub
Secretary to Professor Wiener
Mathematics Department
Mass. Institute of Technology
Cambridge 39, Mass.
U. S. A.

Dear Miss Schaub :

Enclosed herewith is a copy of what I have sent to Mr. Carleson of the Acta Mathematica. Please inform Professor Wiener of this.

Let me thank you for all the trouble you are taking over correspondence pertaining to myself, and to my paper with Professor Wiener.

Sincerely yours

P. Masani

P. Masani

[ans 7/1/57]

Mathematics Department
The Institute of Science
Bombay 1, India

June 19, 1957

Mr. Lennart Carleson
Acta Mathematica
Tradgardsgatan 18
Upsola
Sweden.

Dear Mr. Carleson :

On Professor Wiener's suggestion I am sending herewith a list of corrections to our joint paper to appear in your journal. These fall under three heads.

First there are a few mathematical mistakes. The constant terms in F in the formulae (4.12) on p.21 and (7.4) on p.40 are wrong. This, however, has no adverse effect, since what is involved in the stochastic theory is either dF or $F'(\theta)d\theta$. Also the relation (7.1) is incorrect with the given definitions of E_θ and F (pp.39-40). But this is easily rectified by the insertion and omission of $1/2\pi$ in certain equations.

Next come passages which can be deleted without any loss. This includes the proofs of 2.6(p.5), 4.9(p.19), 4.13(p.21), 6.9(p.33). Perhaps the somewhat longer proofs of 5.8 (pp. 25-27) and 6.10(p.34) could also be deleted. These are indicated by a ? in the margin.

Finally there are many minor typographical changes.

I am also enclosing a sheet marked - "For the Printer", in case this has not already reached you with the paper. Our use of bold face letters is germane to the discussion and I would plead for its retention.

I shall be much obliged if you can send proof sheets for correction to this address as well as to Professor Wiener.

Sincerely yours

P. Masani

C O R R E C T I O N S

to

Prediction Theory of Multivariate Stochastic Processes

Part I

by N. Wiener & P. Masani

1. p. 1, last line. Replace "found" by "established"
2. p. 2, line 21. Replace "a" by "the"
3. p. 2, line 6*. After "studying" insert "multiple"
4. p. 3, line 10. Replace "parameters" by "parameter"
5. p. 5, line 7. Add: "The proofs of parts (a), (b) due to F. Riesz are given in [19, p.162]. The proofs of parts (c), (d) are essentially the same as those given by Szego [10, §2] for $\delta = 2$.
6. p. 5, Omit the whole para marked Remarks on Proof.
7. p. 6. Omit the first para.
8. p. 6, line 13. Replace "a.e." by "$0 < \theta < 2\pi$".
9. p. 6, line 15. Replace "Corollary" by "corollary".
10. p. 6. Omit the para marked Proof.
11. p. 7, line 1. Insert the following new para:
    Proof. Our proof is a variation of that given by Szego [10, §1] and Wiener [15] for $\delta = 2$.
12. p.11. Omit the para just before 3.6.
13. p.12, last line. Omit the words "from a".
14. p.13. Omit the first line.
15. p.14, Thm. 3.12. At the end of the displayed inequality, insert "$\geq -\infty$."
16. p.15. Omit the first para of Sec. 4.
17. p.18. Replace para (b) of 4.8 by :
    (b) Analogous results hold for the integrals
    $$\int_a^b d\underset{\sim}{G}(x)\cdot\underset{\sim}{F}(x) \ , \quad \int_a^b \underset{\sim}{F}(x)\cdot d\underset{\sim}{G}(x)\cdot\underset{\sim}{F}^*(x).$$
18. p.19. Omit the Proof (of Thm. 4.9).
19. p.21, line 5. Change this to :
    $$\tfrac{1}{2}\{\underset{\sim}{F}(0+) + \underset{\sim}{F}(2\pi -)\} + \underset{\sim}{A}_0\pi = \underset{\sim}{B}_0 + \sum_{n\neq 0}\frac{\underset{\sim}{A}_n}{ni}$$

---

*indicates that the line should be counted from the bottom.

20. p.21, (4.12). Change this to

$$(4.12)\quad \frac{\underset{\sim}{F}(\theta+) + \underset{\sim}{F}(\theta-)}{2} - \frac{\underset{\sim}{F}(0+) + \underset{\sim}{F}(2\pi-)}{2} = \underset{\sim}{A}_0(\theta-\pi) + \sum_{n\neq 0} \frac{\underset{\sim}{A}_n}{ni}(e^{ni\theta}-1),\ 0<\theta<2\pi .$$

21. p.21. Omit Proof of 4.13.

22. p.23. Replace the second para by the sentence :

"The inner product (5.2) does not play any significant role in the stochastic theory, although the corresponding norm (5.3) and the topology it induces do, and has to be replaced by Gramian matrices:"

? 23. pp.25-27. The proof of 5.8 could be omitted. In this case replace the full stop just before 5.8 by a comma and add: "but the proof being of a routine nature is omitted."

24. p.28, line 12. Replace "$n \longrightarrow \infty$" by "$n \longrightarrow -\infty$".

25. p.33. Replace the colon just before 6.9 by a comma and add: "as shown by the following obvious lemma:"

26. pp.33-34. Omit the proof of Lemma 6.9.

? 27. p.34. The proof of 6.10 could be omitted. In this case replace the full stop just before 6.10 by a comma and add: "the proof of which we leave to the reader."

28. p.36, line 4. Insert the symbol "$\perp$" just before the last occurrence of $\underset{\sim}{v}_n$. ~~(small v.)~~

29. p.37, line 4*. Replace "orthogonal" by "normalised".

30. p.38, line 6. Just before "S.P." insert "stationary".

31. p.39, line 1. Replace $\underset{\sim}{\mathcal{M}}_{-n}$ by $\underset{\sim}{\mathcal{N}}_{-n}$.

32. p.39, line 4*. Omit $1/2\pi$.

33. p.39, last line. Omit $1/2\pi$.

34. p.39, last line. Replace last $f^{(i)}$ by $f_o^{(i)}$.

35. p.40, line 2. Just after the first = sign, insert "2π".

36. p.40. In (7.2) insert "2π" just after each of the = signs.

37. p.40, line just after (7.3). Change this to :

"In fact, putting $\underset{\sim}{F}_1(\theta) = \frac{1}{2}\{\underset{\sim}{F}(\theta+) + \underset{\sim}{F}(\theta-)\}$ we get, cf. (4.12),"

38. p.40, (7.4). Change this to

$$(7.4)\quad \begin{cases} \underset{\sim}{F}(\theta) = \underset{\sim}{F}_1(\theta+), \\ \underset{\sim}{F}_1(\theta) - \underset{\sim}{F}_1(0) = \underset{\sim}{\Gamma}_0(\theta-\pi) + \sum_{n\neq 0} \frac{\underset{\sim}{\Gamma}_n}{ni}(e^{ni\theta}-1). \end{cases}$$

---

*indicates that the line should be counted from the bottom.

39. p.42, line 10*. Begin the para with the sentence : "We shall call the function $\underset{\sim}{\Phi}$ defined in 7.7(a) the generating function of the moving average process $(\underset{\sim}{f}_n)_{-\infty}^{\infty}$. On combining ..."

40. p.42, line 3*. Replace the semi-colon by a comma and add: "$\underset{\sim}{A}_k\underset{\sim}{G} = (\underset{\sim}{f}_o, \underset{\sim}{g}_{-k})$; "

41. p.43, 7.9(b). Replace the fullstop by a comma and on a new line add: "where the integral on the right may equal $-\infty$ ".

42. p.46, line 10. Replace "indentity" by "identity".

43. p.47, last line. Replace "6.10(A)" by "7.10(A)".

44. p.49, line 11*. Replace "It seems, however, that" by "But it is clear that".

---

*indicates that the line should be counted from the bottom.

For the Printer

1. Letters with a tilde underneath should be in bold face italics. The distinction between letters with a tilde underneath and those without is important.

2. The letters $\mathcal{F}$, $\mathcal{M}$, $\mathcal{N}$, $\mathcal{S}$ should be printed as Gothic or script F, M, N, S; those with a tilde underneath in bold face.

3. Passages marked by a vertical line in the margin should be italicised.

4. Certain abbreviations used in the Ms. may or may not be retained. Obvious ones are Thm., Cor., Def.. Also L.H.S. (left-hand side), R.H.S. (right-hand side), S.P. (stochastic process).

5. The Q.E.D.'s may be kept, as they signalise completion of proofs.

6. On p. 14, first two lines, please print

$$a_1 \cdots a_{k-1} \cdot a_{k+1} \cdots a_q$$

instead of $a_1 \cdots \acute{a}_k \cdots a_q$.

South Tamworth
New Hampshire
July 20, 1957

Mr. Dewey H. Palmer
Director of Product Development
Clay-Adams, Inc.
141 East 25th Street
New York 10, New York

Dear Mr. Palmer:

I am at present working on a paper on the brain wave phenomenon and its mathematics which will probably appear as a publication of the Johns Hopkins Press. I ought to have it to the printer some time this autumn and shall be glad to communicate it to you when it appears. Please remind me again in September about your interest in the publication.

Sincerely yours,

Norbert Wiener

NW:jc

Murray Hill 3-6775

NEJELSKI & COMPANY, INC.
Market Development Counsels
12 EAST 41ST STREET · NEW YORK 17, N. Y.

June 21, 1957

Dr. Norbert Wiener
Massachusetts Institute of Technology
Cambridge, Massachusetts

Dear Dr. Wiener:

Dr. John Heller asked me to send you a copy of the paper I read before the Conference at the New England Institute For Medical Research. This I am very happy to do. I am also attaching a reprint of an article that gives some background on our company.

Cordially,

Leo Nejelski
President

LN/mc

Encl.

[ans 7/2/57]

NEW YORK UNIVERSITY--BELLEVUE MEDICAL CENTER
OF NEW YORK UNIVERSITY
INSTITUTE OF PHYSICAL MEDICINE AND REHABILITATION

400 EAST 34TH STREET
NEW YORK 16, N.Y.

MURRAY HILL 6-1842

June 22, 1957

Dr. Norbert L. Weiner
Massachusetts Institute of Technology
Cambridge, Massachusetts

Dear Dr. Weiner:

It was a pleasure to hear your discussion on alpha waves at the Ridgefield symposium a few weeks ago. It was even a greater pleasure to me when you expressed such great interest in physical medicine and rehabilitation. I spoke to our Director, Dr. Howard A. Rusk, about your refreshing ideas on rehabilitation and he was most enthusiastic about them.

Dr. Rusk and many key personnel of the staff are disbursing for the summer but after Labor Day they will return with renewed vigor. You mentioned at our little talk at Ridgefield that you would be interested in discussing further your ideas with our group in order to see whether a practical application may be made. We are in the midst of adding three floors to the Institute and by September the noise and mess should be at a minimum. This fact, in addition to the returning staff, would make the fall an excellent time for our group to have the opportunity of playing host to you here and discussing in a leisurely fashion the over-all aspects of rehabilitation.

I shall write you myself in the fall and perhaps we can find a time which is mutually convenient for you to visit with us in New York. If it will be inconvenient for you to come to New York, several of us will be delighted to visit you in Cambridge if this is more satisfactory.

Sincerely yours,

Menard M. Gertler

Menard M. Gertler, M.D.

MMG:jbp

[ans 8/5/57]

June 23, 1957

Dear Professor Wiener,

I have read your spacious little book, The Human Use of Human Beings, and understood most of it despite a woeful inadequacy in science and mechanics. I am a very occasional poet, and one of the happiest effects of this reading (there were many) was the fact that it stimulated me, at three o'clock in the morning, to write a poem.

Since my own "ostentatious narcissism" coincides happily with a desire to convey to you my appreciation of the instructiveness and humanity of your book, I am enclosing a copy of this poem. Whether or not it possesses any merit--a problem which I am unable to resolve--I hope that you will accept it charitably as a token of gratitude.

Sincerely yours,

Jules Wein

Jules Wein
Pratt Institute
Brooklyn 5, N.Y.

[ans 7/2/57]

Love Song

At the point of maximum entropy,
At some deserted intersection
Of what used to be the universe,
With all the lights gone out
And the electrician too,
And a few scraps of newsprint
Floating away on interstellar gas,
In the dark, in the cold,
And no footfall anywhere,
Anywhere at all,
What will it add up to?

When the last hearse is in,
And the coachman
And his horse
And his hearse
Have descended with the corpse,
And the parson after the coachman,
And the gravediggers after the parson,
And there are no more mourners,
And no one left to close the grave,
And no footfall anywhere,
In the dark, in the cold,
What will the point have been?

When the galaxies are all for rent
And no takers,
And no one around to bear witness
To the triumph of the second law of thermodynamics,
And the last astronomer
Stares aghast forever out of empty sockets,
And a shutter hangs from one hinge at the whorehouse,
And the signs all point to nowhere,
Nowhere at all,
In the dark, in the cold,
What then?

What of the theaters
The banks
The July heat
The green light at the precinct?
What of the navies?
What of the string quartets?
The final examinations at the university,
What of them?
The prescription to be taken twice a day
With water?
The flaunting ass in the tight skirt?
The heresies?
What of the insurance company?
The portrait of the artist as a young man?

WHAT, FOR GOD'S SAKE, OF THE HEAVYWEIGHT CHAMPION OF THE WORLD?

The poet says we must love each other or die.
The table of logarithms says we shall die anyway.
There is no beating maximum entropy.
There is nowhere to hide, nowhere to go.
Time runs dry,
The lease expires,
The hinge fails,
The stars faint.
It is worse to die of love than of hatred.

Therefore let us not be sentimental.
Let us all kill each other,
As horribly as possible.
Let us stab and gouge and garrot.
Let us incinerate our neighbors
And eat their children raw.
Let us rot the bones of generations
To the greater glory of God and Pure White Womanhood
And go out in a blaze of isotopes.

For in the night of awful cancellation,
When the universes are without form
And void,
And even death has no dominion,
And the molecules are thin and seldom,
In the dark, in the cold,
In the silent cold,
And all the ink frozen,
Who will present a statement of charges?
And what will it avail that once,
Beside a brooding sea,
Old Priam and Achilles clasped each other's hands
And wept?

by Jules Wein

Columbia University
in the City of New York
NEW YORK 27, N. Y.
SCHOOL OF ENGINEERING
OFFICE OF THE DEAN

June 25, 1957

Dr. Norbert Wiener
Massachusetts Institute of
Technology
Cambridge 39, Mass.

Dear Dr. Wiener:

Every three years the Columbia School of Engineering is host to the presidents, academic deans, and liaison officers of some forty-five liberal arts colleges affiliated with us in what is called a three-two program or "Combined Plan for a Liberal Education in Engineering."

The second of these conferences has been scheduled for October 6th, dinner, through luncheon on October 9th at Arden House, Harriman, N. Y.

We are desirous of having you as one of our morning speakers, and knowing that you have a heavy calendar we would be happy to have you on the morning during the conference most convenient for you.- October 7, 8 or 9.

We have in the past followed the plan of having two speakers each morning, followed by workshops or discussion groups in the afternoon.

The program for this conference will be built around these two questions: What is the overarching purpose of a liberal arts college? How can such a college keep faith with its purpose and convictions, and at the same time prosper - intellectually and otherwise - in a society that more and more demands "useful" education, and demands it because it needs it? We are tentatively considering this phrase as a theme: "Spiritual Needs and Human Duties in Higher Education."

While the program is not complete, we have firm commitments for addresses from Dean Jacques Barzun of the Columbia University Graduate School; Dr. Joseph Sittler, Professor of Theology at the University of Chicago, and Dr. George Rickey, head of the Art Department at Tulane University. We are also inviting as speakers Mr. Walter P. Reuther and Mr. Benjamin Fairless. We would be glad to have you as our guest during the entire conference, if your commitments permit, and we would expect, of course, to reimburse you for your traveling expenses. We are also happy to offer you a token honorarium of $150.00.

[ms 7/9/57]

Dr. Norbert Wiener June 25, 1957

Briefly, under our plan of education a student may start at one of these affiliated colleges scattered throughout the country, remain there for three years, taking such liberal arts courses as that college may require, plus the basic mathematics, physics, and chemistry necessary for engineering; then, upon recommendation of the school of origin, transfer to us on a guaranteed basis and after two additional years of technological courses receive appropriate degrees from both the Columbia School of Engineering and the college at which he began his work. We think this emphasis on a broad cultural grounding for the scientific and technological leaders of our society has implications which, as we judge by your own pioneering books and public statements, should interest you.

I am enclosing herewith a copy of the proceedings of the last conference, which might be useful in giving you a slightly more detailed overview of the purpose of the meeting.

May we hear from you at your early convenience?

Sincerely yours,

J. R. Dunning

JRD:gd

1 Encl.

cc: Dr. Henry David
Dean Sherwood Mercer

UNIVERSITY OF MIAMI

SCHOOL OF MEDICINE

Department of Obstetrics-Gynecology
James Henry Ferguson
Professor and Chairman

June 25, 1957

Mailing Address:
Jackson Memorial Hospital
Miami 36, Florida

Professor Norbert Weiner
Department of Mathematics
Massachusetts Institute of Technology
Cambridge, Massachusetts

Dear Professor Weiner:

I read with a great deal of interest in the New York Times on June 11 of your report presented at the meeting of the New England Institute for Medical Research. If your report should ever be available in reprint form, I hope you will be so kind as to send me a copy. I am particularly interested in the intriguing possibility that changes in the electrical activity of the skin can be used in the determination of the time of ovulation. In sterility work this is one of our really great needs.

With my sincere congratulations on your most interesting work, I am,

Very truly yours,

James Henry Ferguson, M.D.

JHF:tg

[ans 7/4/57]

Association Internationale de Cybernétique
A. S. B. L.

International Association for Cybernetics
A. S. B. L.

13, RUE BASSE-MARCELLE, NAMUR (BELGIQUE)

ANNÉE / YEAR **1957**

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13. RUE BASSE MARCELLE
NAMUR (BELGIQUE)
TEL. 279.81 - 279.82

N°.....

NAMUR. LE 25 juin 1957.

Monsieur,

J'ai l'honneur d'accuser bonne réception de votre bulletin d'inscription à l'Association Internationale de Cybernétique ainsi que du montant de votre cotisation pour l'année 1957.

Je vous en remercie vivement et vous prie de trouver, en annexe, votre carte de membre.

Veuillez agréer, Monsieur, l'assurance de ma considération distinguée.

L'Administrateur-délégué,

J. LEMAIRE.

Monsieur Norbert WIENER
B E L M O N T.

Physics Department
University of Pittsburgh
Pittsburgh 13, Pa.
June 25, 1957

Prof. Norbert Wiener:
Massachusetts Institute of Technology
Cambridge, Massachusetts

Dear Prof. Wiener:

I am sending to you a color slide duplicated from one which was taken by me in memory of the inaugural seminar at the Univ. of Pittsburgh on last May 10. I hope it will please you, too.

With best wishes,

Sincerely yours,
Kozo Momoki
Research Associate

[rec'd 7/9/57]

No answer needed: July 3, 1957

J. M. C.

SCIENCE
THE SCIENTIFIC MONTHLY

PUBLICATIONS OF
THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE
1515 MASSACHUSETTS AVENUE, NW, WASHINGTON 5, D.C. • DUPONT 7-7171

27 June 1957

Dr. Norbert Wiener
Department of Mathematics
Massachusetts Institute of Technology
Cambridge 39, Massachusetts

Dear Dr. Wiener:

Thank you for your letter of June 17. In view of what you say, I think that I shall make no further effort to obtain an obituary article about Professor Hitchcock.

We have an embarrassment of abundance in this field, anyway, and, if there is no clear-cut opinion that we should publish such an article, we should prefer not to do so.

Sincerely,

Graham DuShane
Editor

GDuS-plc

501 West 111th Street (Apt. 1)
New York 25, New York
June 29, 1957

Professor Norbert Weiner
Massachusetts Institute of Technology
Cambridge, Massachusetts

Dear Sir:

Your work, "The Human Use of Human Beings (Cybernetics and Society)" introduced me to von Neumann and Morgenstern's "Theory of Games". "The Theory of Games", however, is very difficult to read. Are less technical treatments of the Theory available? If so, I would appreciate your sending me the names of them.

Thank you for your attention.

Very truly yours,

Livingston O. Lynch

[and 8/8/57]

South Tamworth
New Hampshire
June 29, 1957

Dr. Akutowicz
c/o Mathematics Department
Massachusetts Institute of Technology
Cambridge, Massachusetts

Dear Akutowicz:

I have finally got the material on matrix factorization into shape and I inclose it herein. You will see that I have managed to state it in self-contained form without any particular reference to time series. I think it is good, and you will note that your theorem on the representation of bounded functions as the ratio of two functions of positive type is proved and plays an important part in the work. You were also right about the mathematical induction proof of the factorization theorem. Don't worry about the lack of references in the paper, including a lack of reference to your own work, because I merely consider it in its present form as working notes.

I am now well settled into the life up country here and I am doing a good deal of dictation. A large part of it has concerned the brain wave work which I am going to put into definitive mathematical form. I shall send other paper when I am satisfied with it, but I hope that even before then you and your wife will come up here for a little visit and to talk things over. All I ask is that you call us up by telephone so that we can fit your visit in when we are free of other house guests.

Aurel Wintner is up here as a neighbor in the way we count neighbors in New Hampshire, that is, he is only ten or eleven miles from here. He looked me up and we are doing a good deal of mathematical work together which in particular concerns the ideas of the book. I am benefiting a great deal by his criticism.

Let me know what you want of me next in the way of chapters of the book. I regard that as my primary obligation and shall put all other things aside to take care of it.

Remember me to Ted and all the others.

Best wishes.

Norbert

NW:jc

Enclosure