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CORRESPONDENCE

March 20-31, 1958

N. WIENER · MC 22

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WAYNE STATE UNIVERSITY

COLLEGE OF LIBERAL ARTS

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DEPARTMENT OF MATHEMATICS

March 20, 1958

Professor Norbert Wiener
Massachusetts Institute of Technology
Cambridge, Massachusetts

Dear Professor Wiener:

This extends to you an invitation to speak in a Colloquium jointly sponsored by the Departments of Mathematics, Physics, Chemistry, and Philosophy here at Wayne State. Your eminence in these areas makes us eager to hear anything you wish to say to a professional group of faculty and graduate students from these departments. I realize that the background of such a group would be sufficiently diverse to present difficulties for a lecturer on an advanced research topic in mathematics. Should you prefer to speak more technically on mathematics, I would personally very much welcome this as we are working hard to develop our Ph.D. program here and have had a number of other distinguished speakers in the Mathematics Colloquium this year.

I should be entirely explicit on the matter of payment. I am not certain of the amount of the honorarium from the President's office. We would, however, be obliged to ask that this lecture, if you wish to give it, would not carry any additional payment as our funds for such purposes are severely limited.

The time proposed is 4:00 p.m. on Thursday, April 17. This schedule has been cleared with the various departments and with Dr. James McCormick in President Hilberry's office.

Cordial personal regards,

Wallace Givens

Wallace Givens
Chairman



Mainstream

832 Broadway, New York 3, N. Y.
Telephone: GRamercy 3-5145

Editor: MILTON HOWARD

Managing Editor: CHARLES HUMBOLDT

Feb

March 20, 1958

Dr. Norbert Wiener
Massachusetts Institute of Technology
Cambridge, Massachusetts

Dear Dr. Wiener:

This is in reply to your inquiry as to the context in which we would be printing your address to the students and faculty of Wabash College. It would appear as an informatory document relating to the problems of American education, which so many people are tossing back and forth today, to less effect than more, it seems. The editorial introduction will make it clear that the article was not written specifically for us, as will a similar preface to an address of Linus Pauling's which we hope to run in the near future.

I trust that you have received the three issues of the magazine which were shipped to you a few days ago.

Cordially,

Charles Humboldt

Charles Humboldt
Editor

CH:MB

PABLO CASALS

Santurce,
Puerto Rico

March 21, 1958

Dear Mr. Wiener:

A few of my American and European friends and I have formed a committee called Spanish Refugee Aid. I write to you in the hope that you will join us in aiding the thousands of Spanish Refugees in France whose losing battle for freedom, followed by years of bitter exile, has been forgotten.

Many of them are today in hospitals, ill with diseases caused by the miserable conditions under which they live. Although many have been able to build new lives here, thousands are destitute, in need of food, medical care and, not the least, of moral encouragement.

The enclosed leaflet describes our effort and our first results. Whatever you contribute will be used for immediate help to these distressed human beings. Please help them.

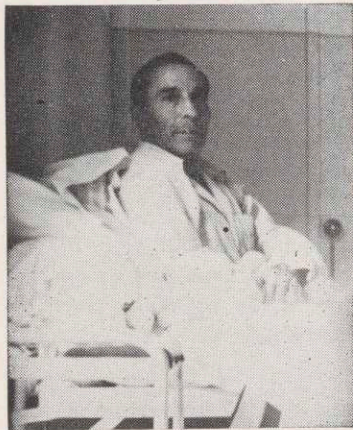
Thank you,

Pablo Casals.

"I have the two packages that you kindly sent. I thank you from the bottom of my heart," writes Mrs. C., who is ill herself and has a tubercular husband. "You can imagine how welcome everything was, since it is so cold and damp here. The wool clothes and blankets arrived in the nick of time. Thanks also for the beautiful navy blue sweater you bought for me; that is for Sundays."

If you can't send us your old money, send us your old clothes or bed-clothes. Many of our families need sheets and blankets.

You Help:



Angel B. has had 2 operations in eight months. He needs money for extra food. He is one among the 219 hospitalized cases on our lists (63 have tuberculosis). Jose B. who recently fled from Spain, writes: "The food in the hospital is deficient for tuberculars. There are seven of us but we are indigent and cannot buy any extras. I need an overcoat. We are not used to begging but we are far from our loved ones and I hope you can alleviate our poverty and help our morale." Can you "adopt" a Spaniard in a hospital and send a little cash, clothes and letters?

Sponsors of Spanish Refugee Aid

Honorary Chairmen: General Lazaro Cardenas . . . Pablo Casals . . . Chairman: James T. Farrell . . . Treasurer: Margaret De Silver . . . Office Staff: Nancy Macdonald . . . Ynez Lynch . . . Field Representative: Suzanne Chatelet

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SPANISH REFUGEE AID, INC., 80 East 11 Street, N. Y. 3, N. Y. (OR 4-7451)

- I am enclosing my check for \$.....
- I am enclosing \$..... and will send you \$..... a month, as long as I am able.
- I wish to "adopt" a Spanish Republican, to whom I will write and send money and clothing.

NAME

ADDRESS

CITY ZONE STATE

(Please make checks payable to Spanish Refugee Aid, Inc. Contributions are tax deductible.)

SPANISH REFUGEE AID

Pablo Casals and General Lazaro Cardenas, honorary chairmen



Forgotten People

FOUR years ago, a small working committee was formed in New York. Its name is Spanish Refugee Aid. Its aim is to help those forgotten heroes of the first war against fascism: the 160,000 Spanish Republican refugees who today, eighteen years after the end of the Civil War, are still living in Southern France. Pablo Casals, the cellist, and Lazaro Cardenas, former president of Mexico, have lent their names as honorary chairmen. In its first four years, Spanish Refugee Aid sent to the 2,000-odd Spanish families on its active list about \$115,000 in cash or goods.

This help, tragically inadequate to the need that cries out in letters that come to our office every week, cannot even be maintained, let alone increased, unless you help us. Or, if you have already contributed, continue to help us.

Who Are They?

Eighteen years ago, the remnants of a defeated army of freedom, with their wives and children, straggled over the Pyrenees, fleeing to France from their homeland and the military dictatorship which had, after a long and hard-fought civil war, overthrown the Spanish Republic. Today, although most of

these refugees have been absorbed into the French economy, thousands are old, sick, mutilated, desperately poor—and forgotten.

France offered the Spanish Republicans asylum in the first place, and is now the only country giving them substantial help. But their life in France has been terribly hard. After crossing the Pyrenees in January 1939 in the dead of winter, they were interned many months in ill-equipped camps at Vernet, Argeles, St. Cyprien, Gurs—names that are still bitter in their mouths. Then came the war. Many fought in the French armies, many in the Resistance "maquis." Ten thousand who refused to work for the Nazis were sent to the dreaded Mauthausen concentration camp. Two thousand came back.

At least 90% of the Spanish refugees are strong anti-Communists, with vivid memories of Communist treachery and terror during the Civil War. The tiny pro-Communist minority is cared for by the world Communist movement, but the great non-Communist majority has been shamefully neglected by the free world. Spanish Refugee Aid was set up to help this majority.

We Americans who oppose totalitarianism cannot honorably ignore our debt to these veterans of our common fight.

How Do They Live Now?

The great bulk of the Spanish refugees live in the south of France, in and around Perpignan, Toulouse and Montauban. Most of them make some sort of living, as farm laborers, factory workers, woodcutters, etc. But when, because of age or illness, they are unable to work, their condition is a miserable one. The French Government gives them sickness and old-age benefits but these are pitifully inadequate for refugees with long years of privation behind them.



Francisco and Guiteria L., aged 76 and 69, "live" on \$7 a month. They write: "We are alone in a furnished room and have very little that belongs to us. My wife has been ill for 8 years and I cannot walk very well as I was a prisoner of Franco for 7 years. I was condemned to death but being old they let me go. In Spain I was a farmer, and during the war I worked at whatever they asked me to do.

Here in a few words is our little life, if a little help would come from you, we would be eternally grateful."

The Spanish refugees in France are no longer a matter of primary concern to voluntary agencies. The need, on the other hand, has increased as they are getting older. There are too many cases of old, blind, abandoned people, who must depend on the kindness of friends almost as needy as themselves. People whose lives might be made useful by a hearing aid or artificial limb, by re-training in a new field, wait in vain for the small help that would make all the difference.

What Is SRA Doing About It?

Here are some of the things SRA has done in the last four years.

- We have sent \$100 a month to the Spanish Republican Red Cross Dispensary in Montauban.
- We have shipped, at cheap bulk rates, almost 9 tons of used clothing to Spanish relief groups in France.
- We have sent \$50 a month to Pablo Casals, for distribution among the many Civil War veterans he is in contact with. ("Casals is my friend," writes a factory worker. "He knows my entire life. You could help in my denture, my stomach, and my sadness.")
- We have given direct aid to 1,300 families and individuals either by getting them "adopted" by Americans who send them regular food and clothing packages, or by sending them \$10 a month in cash ourselves, for 3 months or more (\$1.50 a month for single men in hospitals).
- Recently we have provided 10 sewing machines, dental care for 13, one artificial eye, 3 stoves, 4 beds, work tools for a draftsman, cabinet maker, barber and electrician, trips for 2 widows with children to enable them to rejoin their families, money to save a flooded garden.
- Your contribution will help us fill many other requests, such as 28 sewing machines, 4 typewriters, 2 hearing aids, a truck, tools for bicycle repair and mending radios, an incubator, 2 trumpets and an accordion.

Nancy Macdonald, our executive secretary, and the volunteers who work with her, try to give help on a human, friendly, individual basis, without red tape or bureaucratism. Also without much pay: the total wage bill in four years was \$10,829 as against about \$115,000 given in cash and goods.

Money and Clothes Help:

"My wife is a dressmaker," writes Isidro R. "Ten years ago, in order to help me earn money, she bought an old sewing-machine. Now we and the machine have become much older. My wife has been offered dressmaking work, but cannot accept it because her machine is too old. Could you help me to get another? Isidro R. is tubercular, 57 years old, with a wife and two boys. When we first began helping them, in May, '55, he wanted to commit suicide. . . . We sent them \$10 a month for 18 months and bought Mrs. R. her sewing machine.



Maria A. is a widow whose husband died fighting on the Asturian front. Years of hard work and privations have undermined her health. Last year she wrote us "I need many things but the most important is food, and a topcoat would be most welcome." We helped her with money and clothes but now she is seriously ill again. **Your money will help her or one of the many sick people on our lists.**

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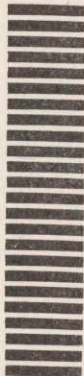
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PABLO CASALS

Spanish Refugee Aid, Inc.

80 East 11th Street

New York 3, N. Y.



I am enclosing my check for \$..... for the Spanish refugees in
France. I will undertake to send you \$..... a month as long as I can.

(Please make checks payable to Spanish Refugee Aid, Inc. Contributions are tax deductible.)

Name

Address

City Zone State

If you have received more than one appeal, please give our circular to a friend.

THE OHIO STATE UNIVERSITY

NOVICE G. FAWCETT, *President*

COLUMBUS 10

DEPARTMENT OF PHYSIOLOGY
HAMILTON HALL

March 21, 1958

Dr. Norbert Wiener
Research Laboratory of Electronics
Massachusetts Institute of Technology
Cambridge 39, Massachusetts

Dear Dr. Wiener:

Dr. Glasser has suggested that I contact you to prevent duplication of effort in preparing articles for MEDICAL PHYSICS: VOL. 3.


I am to prepare articles on (1) Computers: Analog: Applications in Biology and Medicine, and (2) Computers: Digital: Applications in Biology and Medicine. These are large orders. I believe they call for considerable exposition of the nature and procedure of application of the computers, so that I will have a minimum of space to devote to applications in the literature.

Therefore, I will welcome the opportunity to simply refer to your article for reference to a specific application. In turn, you ^{could} refer to mine for details of the computer per se.

Please let me know if this is satisfactory. If it is, I will send you outlines of my articles so we will know what the other is doing.

I shall look forward to hearing from you.

Sincerely yours,



Ralph W. Stacy, Ph.D.
Division of Biophysics

RWS:bjm

[ans 5/26/58]

INSTITUT FÜR PRAKTISCHE MATHEMATIK (IPM) · PROFESSOR DR. A. WALTHER
TECHNISCHE HOCHSCHULE DARMSTADT

(16) DARMSTADT, 21. März 1958
Telefon 4936

Professor Dr. N. Wiener
53 Cedar Road

Belmont/Mass.
USA

Betrifft: Wissenschaftliche Tätigkeit meines Sohnes Jost in USA

Lieber Herr Wiener,

bei Ihrem Besuch in Darmstadt im Sommer 1956 haben Sie und Ihre Frau vielleicht meinen Sohn Jost kennengelernt, der damals eben als wissenschaftlicher Mitarbeiter in das William-Kerckhoff-Institut in Bad Nauheim eingetreten war. Er hat dann im Februar 1957 seine mündliche Doktorprüfung in Würzburg gemacht mit einer Dissertation "Untersuchungen am Belichtungspotential des Komplexauges von Periplaneta mit farbigen Reizen und selektiver Adaptation". Auch heute befindet er sich noch in Bad Nauheim und ist weiterhin mit wissenschaftlichen Untersuchungen der elektrischen Vorgänge auf der Netzhaut des Auges beschäftigt. Er hatte eine Einladung, als Gastforscher an das große Institut für Sinnesphysiologie in Caracas/Venezuela zu gehen. Aber diese Möglichkeit hat sich durch die dortige politische Umwälzung aufgeschoben. Man kann nicht einmal beurteilen, ob überhaupt etwas daraus werden wird. Deshalb wende ich mich hiermit an Sie mit der Frage und Bitte, ob Sie vielleicht einen Rat geben oder Jost sogar irgendwohin empfehlen können. Ich denke z. B. an Ihren Freund Dr. Arturo Rosenblueth, Instituto Nacional de Cardiologia of Mexico, auch deshalb, weil Jost für Caracas, wo er auch Praktikum abhalten sollte, Spanisch gelernt hat. Aber auch jeder andere Vorschlag für einen anregenden Forscher ist uns natürlich willkommen. Welche Möglichkeiten sehen Sie für die Beschaffung eines Stipendiums?

Ich schreibe an Sie nicht nur, weil es sich um meinen Sohn handelt, sondern auch deshalb, weil Ihnen die Verbindung zwischen Biologie und Elektronik am Herzen liegt. Jost hat bei der mehrjährigen Arbeit an seiner Dissertation zu seiner Ausbildung in der Biologie noch sehr viel Elektronik hinzugelernt und sich insbesondere für die Verstärkung der sehr kleinen Belichtungspotentiale im Insektenauge als experimentell äußerst geschickt erwiesen.

Haben Sie schon im voraus vielen Dank für alles, was Sie tun werden und nehmen Sie und Ihre Frau herzliche Grüße von Haus zu Haus entgegen.

Ihr

A. Walther

[ans 4-4-58]



SIMON AND SCHUSTER, INC.

publishers

ROCKEFELLER CENTER, 630 Fifth Avenue, New York 20 • CABLE ADDRESS *Essandess* • TELEPHONE Circle 5-6400

24 March 1958

Dear Dr. Wiener:

Here's something we hope you'll enjoy, a book for scientists, mathematicians, and other grownups: THE SPACE CHILD'S MOTHER GOOSE by Frederick Winsor and Marian Parry. I (who scarcely know a Quantum from a Kumquat, and haven't memorized any verse since The Quality of Mercy speech in highschool) have, to my delight, unintentionally learned batches of the lines by heart. So if you like it, and just flip through it once, you'll probably have it all letter perfect.

We're sending the Space Child ~~to~~ you just for fun. But if you should happen to like it well enough to want to give it a hand, we would be most grateful for a few lines from you that we might quote.

Sincerely

Nina Bourne

Nina Bourne

Dr. Norbert Wiener
53 Cedar Road
Belmont, Mass.

March 24, 1958

Professor Ralph B. Ginsberg
Box 1153
Brown University
Providence 12, Rhode Island

Dear Professor Ginsberg:

Professor Wiener has received your letter of March 19th concerning final arrangements for his visit to Providence. Since you have suggested it, he would very much like to arrive in time for dinner, and plans to take a train leaving Boston at 5:00 P.M. which arrives in Providence at 6:00 o'clock. It would be greatly appreciated if he could be met at the railroad station. Incidentally, you may wish to know that he is a strict vegetarian.

Very truly yours,

Secretary to
Professor Norbert Wiener

March 17²⁴, 1958

Dr. William Zielonka
The Robert Lindner Foundation
2 West 25th Street
Baltimore 18, Maryland

*1170 S. Mount St.
Balt 2*

Dear Dr. Zielonka:

Thank you for your letter of March 13th
inviting me to be the Foundation's Invitational Lecturer
for 1958.

I would appreciate knowing the date on which
you wish to have me talk as I have an engagement to
give a lecture in Maryland on May 3, and it is possible
that the dates may dovetail in such a way that I may be
able to visit your Foundation while I am in the vicinity.

I shall await your reply before making a
definite commitment.

Sincerely yours,

Norbert Wiener

*Subj suggested by
Prof Wiener,
"What is the Function
of Electroencephalographic
Oscillations?"
NW:AD*

[Faint handwritten notes and scribbles at the bottom of the page]

JEP

JOURNAL *of the* OPTICAL SOCIETY *of* AMERICA

Published by the
AMERICAN INSTITUTE OF PHYSICS
for the
OPTICAL SOCIETY OF AMERICA

March 25, 1958

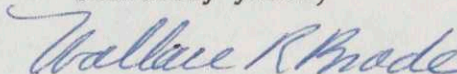
WALLACE R. BRODE, *Editor*
MARY E. CORNING, *Assistant Editor*
NATIONAL BUREAU OF STANDARDS
WASHINGTON 25, D. C.

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

Dear Dr. Wiener:

This is with reference to your letter of March 19th concerning the manuscript "Radiative Transfer Axions" by Rudolph W. Preisendorfer. We thank you very much for your comments. We noted in your comments to the author that you had indicated that you might send him copies of your notes on random processes. We like to maintain our referee system as an anonymous one. For this reason we would prefer that you do not contact the author directly, but transmit these notes to us, which we will forward on.

Sincerely yours,



Wallace R. Brode
Editor

Feb

INTERDEPARTMENTAL

MASSACHUSETTS INSTITUTE OF TECHNOLOGY CAMBRIDGE 39, MASS.

from the office of Walter A. Rosenblith

March 25, 1958

Professor Norbert Wiener
Room 2-276

Dear Professor Wiener:

Morris Chafetz and I have finally discussed the matter over the telephone and I think it should be possible to proceed with the necessary analyses, once Morris can get the EEG's taped which from what I understand won't happen before a month from now.

3750 Tudor Arms Ave
Baltimore 11, Md.

am 25. März 1958

Liebe Frau Wiener und lieber Herr Wiener,

Haben Sie herzlichen Danke für
Ihre beiden Briefe, die mir mit Ihren
freundschaftlich teilnehmenden Worten gut-
getan haben.

Da Aurel sich sehr wohl gefühlt hatte,
auch bei sehr guter Stimmung gewesen war,
waren Claude und ich trotz allem auf das
plötzliche Ende wenig vorbereitet. Wohl müssen
wir uns damit trösten, daß Aurel noch vier
gute Jahre nach seiner Krankheit hatte.

Pat habe dieselbe Arbeit wie zuvor,
arbeite aber ganztägig, was ich als eine
rechte Hilfe empfinde. Claude geht es gut
und wird in ein paar Tagen für eine
Woche nach Hause kommen.

Wie es im Sommer sein wird, wissen
wir noch nicht, doch hoffen wir, für
einige Zeit nach Tamworth zu kommen.
Natürlich würde ich mich sehr

freuen, wenn es Ihnen möglich wäre,
mich Anfang Mai zu besuchen.

Mit freundlichen Grüßen bin ich

Yhre Ingeborg Winter

P.S. I would like to add a few
lines concerning the joint papers.

The paper "On Random Time" must
appear soon. Mrs. Roberson and I read the
proofs and returned them.

Mrs. Roberson says that there ~~are~~ no
proofs yet of "On a local L^2 -variant of
Ikehara's theorem", which is with the *Revista
Matematica Cuyana*.

We did not find a record of acceptance
on "Notes on Polya's and Turan's hypotheses
....." from the *Rendiconti* (mailed 7/22/57).

I am enclosing the copy of the be-
ginning of a letter which Aurel dictated
shortly before his death. The letter was sent
as planned - to Professor Sansone together
with the ms. Aurel wrote during the
Christmas vacation. Dr. Wiener, you have
a copy of the 20 typewritten pages. What
to do with them, is here with your decision.

Professor G. Sansone
Editor, Annali di Matematica
via F. Crispi 6
Firenze
Italy

Dear Professor Sansone:

Wiener and I did not forget the manuscript on harmonic analysis of random functions which we promised you last summer. In fact, we have a major portion (20 typewritten pages) in a final form. But we do not have the end of the paper, which actually is nothing but routine work but is very fussy and time-consuming since it requires a specific discussion of Fourier transforms for which in the main part we have the general theory.

There is no doubt at all that we can straighten out things next summer when we are together again in New Hampshire, and then we shall send the paper to you.

COPY

March 26, 1958

Dr. S. H. Gould, Executive Editor
Mathematical Reviews
190 Hope Street
Providence 6, Rhode Island

Dear Dr. Gould:

Professor Wiener and I would like the reviewer of our paper "The Definition and Ergodic Properties of the Stochastic Adjoint of a Unitary Transformation" to take account of the enclosed addendum in his review should he find it necessary.

Sincerely yours,

Edwin J. Akutowicz

EJA:AD
Enc.

Addendum to "The Definition and Ergodic Properties of the
Stochastic Adjoint of a Unitary Transformation"

by N. Wiener and E. J. Akutowicz

The Brownian motion processes occurring throughout
the above-named paper should be understood to be separable
Brownian motion processes.

The separability condition is tacitly used in § 4
where it is asserted that the paths $\overline{X}(t, \alpha)$ are continuous
except for a null α -set. Because conditions (2.2)-(2.5) on
p. 207 are used to identify a process as a Brownian motion
process, this continuity would not follow without the additional
hypothesis that $\overline{X}(t, \alpha)$ is separable. The process $\overline{Y}(t, \alpha)$
occurring in the LEMMA in § 4 will then necessarily be separable.

March 26, 1958

Professor F. de Franchis
Circolo Matematico di Palermo
Via Archirael 34
Palermo
Italy

Dear Professor de Franchis:

Professor Wiener and I find that we have inadvertently omitted a condition in our recent paper "The Definition and Ergodic Properties of the Stochastic Adjoint of a Unitary Transformation" and would therefore like to insert the enclosed addendum as soon as possible in a future issue of the Rendiconti.

Sincerely yours,

Edwin J. Akutowicz

EJA:AD
Enc.

Addendum to " The Definition and Ergodic Properties of the
Stochastic Adjoint of a Unitary Transformation"

by N. Wiener and E. J. Akutowicz

The Brownian motion processes occurring throughout the above-named paper should be understood to be separable Brownian motion processes.

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March 27, 1958

Dear Colleague:

Due to a misunderstanding it might be necessary to have the conference on May 29, 30 and 31. I hope this will be all right with you; otherwise please let me know immediately since I will have to fix the date shortly after Easter.

June 7, 8 and 9 might also be possible, although this date is not so desirable since it would exclude at least one of the participants.

Sincerely yours,

K. O. Friedrichs
K. O. Friedrichs

[ans 4/2/58]



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THE ANNALS

of The American Academy of Political
and Social Science

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THORSTEN SELLIN, *Editor*

RICHARD D. LAMBERT, *Assistant Editor*

March 27, 1958

Dr. Norbert Wiener,
53 Cedar Road,
Belmont, Mass.

Referred

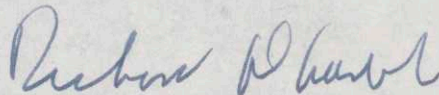
Dear Dr. Wiener:

Would you be willing to write for THE ANNALS a popular review of the book listed below? Our publishing schedule will allow you two months from the time you receive the book.

Although this is an important volume, budgetary considerations and a desire to bring our readers the widest possible coverage compel us to limit each review to 400 words. We would appreciate your cooperation in this limitation.

May I ask the favor of a prompt reply? We shall mail you the book at once if you consent.

Very sincerely yours,



Richard D. Lambert
Assistant Editor

Kaplan, Morton A. SYSTEM AND PROCESS IN INTERNATIONAL POLITICS. Pp. xxiv, 283. New York: John Wiley & Sons; London: Chapman & Hall, 1957. \$6.50.

Teachers Union
OF THE CITY OF NEW YORK
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TEL. WATKINS 4-5524

President Abraham Lederman • Vice-President Harry Starfield • Legislative Representative Rose V. Russell • Secretary Lucile Spence • Treasurer Mildred K. Garvin

March 27, 1958

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

Dear Professor Wiener:

The Twenty-Second Annual Educational Conference of the Teachers Union will be held on April 19th at the Hotel Biltmore, New York City.

The program will consist of three panel discussions on current educational problems followed by a luncheon session in the Grand Ballroom. Approximately 2,000 teachers, parents and others interested in school problems will be present.

Each year the climax of the afternoon session is the presentation of the Teachers Union Annual Award for Distinguished Service in the Cause of Education. This year the recipient will be the distinguished scientist and educator, Dr. Linus Pauling, winner of the Nobel Prize for Chemistry in 1954. Time and again throughout the years, he has given evidence of his uncompromising devotion to the ideal of intellectual freedom as well as of his broad humanitarian outlook.

During the afternoon ceremonies, we plan to read greetings to the Conference from eminent individuals, of national and international reputation. Messages written for Dr. Pauling in connection with the Teachers Union's tribute to him will be included in an album which will be presented to him with our Award.

It will give us great pleasure to receive a message from you.

May we hear from you soon?

Sincerely yours,

Abraham Lederman

Abraham Lederman
President

AL:hkb
ftul/1283

[ans 4/2/58]

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NEW YORK 10, N. Y.

OFFICE OF THE MANAGING EDITOR

27 March 1958

Professor Norbert Wiener
Massachusetts Institute of Technology
Cambridge 39, Massachusetts

Dear Professor Wiener,

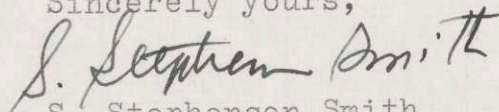
In doing the editing work for our forthcoming Funk & Wagnalls Standard Dictionary, International Edition, we have kept a special eye out for significant word coinages of the last fifteen years. Among the coined words of special interest are cybernetics, genocide, automation, exurbanite, humiture, logotechnics, show-how, etc. not to forget Philip Wylie's excellent momism. You most likely have your special favorites and I would enjoy knowing about them. Would it be possible for you to have lunch with me some time on your next trip to New York? It would be a pleasure to discuss them with you. Recently I lunched with Rafael Lemkin and also with Osborn Fort Hevener.*

Meanwhile we would very much like to have a glossy photograph of you for our files, with permission to use it later on when enquiries come in, as we expect they will, on coiners of words.

You are perhaps familiar with Roland Wilbur Brown's Composition of Scientific Words. I had the pleasure of sending Vannevar Bush a copy of it. I thought you might be interested in an excerpt that I wrote on Bush's request to us for a coinage to express an idea he had.

Once more I hope to see you soon.

Sincerely yours,



S. Stephenson Smith
Supervising Editor

Enclosure

- * Lemkin coined genocide
Hevener coined humiture

[ans 7/2/58]

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2
3 A well-known technologist put something of a strain on
4 the accepted principle of lexical procedure, that a diction-
5 ary does not invent words, and records them only after they
6 have come into fairly general use. He made an eminently
7 sensible request that the editors either discover an old word,
8 or coin a new one, that would be a better term than hobby or
9 avocation to designate an occupation that a man might take up
10 seriously after retirement from his lifework. With some
11 hesitation, the editors suggested afterwork, on analogy with
12 lifework, and with some reminiscence of aftermath, which has
13 the literal meaning of "second harvest." Needless to say,
14 afterwork does not appear in the columns of this dictionary.
15 The technologist may come up with a better coinage of his
16 own. But from this it is clear that novel social situations
17 call for new terms, and one will eventually emerge for new
18 work taken up in later life.
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MORTON M. HUNT
75 Central Park West
New York 23, N. Y.

March 28th, 1958

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

Dear Professor Wiener:

In case my name is unfamiliar to you, I am a magazine writer who, among other things, does Profiles for The New Yorker. Recently it occurred to me that I'd like to write about what a mathematician does for a living--how he works and thinks, and what interests him. The magazine having already had a strong suggestion made to it from another quarter concerning Richard Courant, the editors told me to go ahead and do the Profile on him as a well-known contemporary mathematician in the New York area.

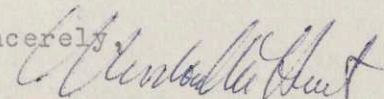
I have begun my work, and of course have been glancing at the relevant portions of your autobiography. You mention in passing that you once wrote a rather amateurish novel based on real people in your life, and someone I have interviewed has told me that two chapters of that novel concerned Courant, and were revealing, though (to say the least) unflattering. Since the novel wasn't published, and I have no way to view a copy here in New York, I am possessed of just enough effrontery to write you directly and ask whether you might not be kind enough to lend me the relevant chapters, which I will read and return rapidly, and from which I promise not to quote without your express permission.

If you prefer not to grant me this privilege, I would be very grateful for any insights and comments you might care to make other than the very brief remarks you have already made in your book. Since your own stature is so very considerable and your own comprehension very great, it would help me to have your own evaluation of Courant's status in the field of mathematics, and of his contribution as an original mind, as an expositor, as an administrator, or however you think him most useful.

You refer to him humorously as the "pope" of Göttingen mathematics; I have prodded a few people with a similar term, asking if Courant was, or is, a kind of Geheimrat. His friends loyally deny that he has any of the pomposity or stuffiness of that extinct species, but perhaps you'd be willing to comment further on it.

I will hope for the favor of a reply.

Sincerely,





WAYNE STATE UNIVERSITY

STUDENT-FACULTY COUNCIL

DETROIT 2, MICHIGAN

March 28, 1958

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

Dear Dr. Wiener:

I am the External Affiliations Commissioner for the Student-Faculty Council at Wayne State University. My job is to coordinate the policies and programs of the National Student Association and the Collegiate Council for the United Nations on our campus.

I was very pleased to learn that you will be visiting our University on April 16-17, 1958. I know your visit will be very beneficial to both the Wayne State faculty and student body.

Several of the student leaders have expressed an interest in meeting with you to discuss informally the problems they have encountered in their positions. These students would be greatly honored if you could meet with them during your visit.

I am quite sure that you can give them new insights in the area of student responsibility to higher education. Our University is becoming more concerned in this area and your views would be of great value to us.

I would like to know if you would be willing to participate in this meeting planned for the evening of April 16. It is hoped that the three other visiting professors will be able to participate also. If you can possibly attend such a meeting please contact me. I will make further arrangements.

Respectfully yours,

Donald A. Peteet
External Affiliations Commissioner
Student-Faculty Council

March 28, 1958

Mr. Bruno de Finetti
via Poggio Catino, 7
Rome
Italy

Dear Mr. de Finetti:

I shall be at the Information Meeting at Como this July, and we may have a chance either to get together or for further correspondence about our plans for the future.

Thanks very much for your letter of the 11th of February.

Sincerely yours,

Norbert Wiener

NW:AD

[ans 4/26/58]

March 28, 1958

Mr. Wallace Givens,
Wayne State University
Detroit 2, Michigan

Dear Mr. Givens:

In reply to your letter of March 20th,
I shall be glad to be available to speak at the
Colloquium on Thursday, April 17th at 4:00 P.M.
and thank you for the invitation.

Sincerely yours,

Norbert Wiener

NW:AD

April 2 - Dr. Wiener called and
Prof. Givens agreed to
talk to mathematicians

March 28, 1958

Professor V. Ganapati Iyer
Indian Mathematical Society
Annamalainagar University
Annamalainagar,
India

My dear Professor Iyer:

I haven't any material for the Indian
Mathematical Society at present but I may well have
in time to get it to you for the 15th of October.
Let us leave the matter this way for the present, and
if anything occurs to me I shall send it to you.

Sincerely yours,

Norbert Wiener

NW:AD

March 28, 1958

Mr. J. Lemaire
Association Internationale de Cybernetique
13 Rue Basse Marcelle
Namur
Belgium

Dear Mr. Lemaire:

I am afraid that at the period between the 9th and 13th of June I shall be unable to participate in the New York meeting on Automation. I wish you every success, both for your International Congress in Belgium and for this meeting, and am very sorry not to be able to attend either of them.

Sincerely yours,

Norbert Wiener

NW:AD

March 28, 1958

Mr. T. C. Roy, Secretary,
Calcutta Mathematical Society
92, Upper Circular Road,
Calcutta 9, India

Dear Mr. Roy:

In reply to your letter of February 15th,
I am very sorry not to have any material at present
which would serve your purpose. However, I wish you
every success in your celebration of the fiftieth
anniversary of the Calcutta Mathematical Society.

Sincerely yours,

Norbert Wiener

NW:AD

Voice of the new west

Frontier

527 North La Cienega Blvd., Los Angeles 48, California

March 31, 1958

Dear Dr. Weiner:

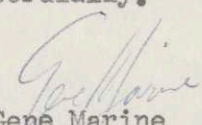
As you will see, in the current FRONTIER, beginning on page 24, there is a letter from Rep. Chet Holifield, taking exception to an editorial of ours, and a reply, written by myself. I have also enclosed, for your information, a copy of the editorial in question, which appeared in our January issue.

The matter here is delicate, and I am far more concerned that FRONTIER's readers should be correctly informed than that I should be "right," or have my own position borne out.

For this reason, I would sincerely appreciate it if you would read the exchange, and then let us have your comments on the matter discussed therein. Of course, I recognize that yours is a busy schedule, and that there is a degree of imposition involved here; but I feel it imperative that some more authoritative comment be sought than my own. My appreciation would, of course, be more than great.

Thank you.

Cordially.


Gene Marine
Associate Editor

[ours 4/11/58]

thousandth of a cent are pretty monopolistic already, but this theory didn't dent the testimony of Blough, or of Bethlehem's president Arthur B. Homer, or of former Secretary of the Treasury George Humphrey, now board chairman of National Steel Corp.

Even if there were no similar practices in the automobile industry, the price of steel would affect the price

ing under the Truman-Pendergast type of political controls and from the James Hoffa-Harry Bridges-Walter Reuther type of labor or political domination." It sounds as though some of those Nixon aides who joined Knowland a while back have begun to write his speeches.

Holifield's Error

IN Southern California, recently, sharp criticism has been leveled at Democratic Congressman Chet Holifield (whose definitive "Fallout and the Facts" appeared in our November and December issues) because of a speech the Congressman made before the Committee Against Nuclear Explosions in Van Nuys.

On examination, there seems to be little doubt but that the speech in question was both inappropriate in tone and, in some respects at least, inaccurate in fact. Holifield said, for instance, that "We have no scientific data which would substantiate the assertion that natural radioactivity has damaged either somatically or genetically the human race." The statement is simply false; it is general scientific knowledge that 150,000 children a year are born defective directly because of natural radioactivity.

Frontier has no information regarding the causes or motives that lay behind Congressman Holifield's Van

(over)

Nuys address. To his sharpest critics, however, we feel that we might call attention to two facts.

The first is that Congressman Holifield's position on nuclear testing is well-known and a matter of public record; he does not favor unilateral cessation of tests, but he does favor an active attempt to arrive at an agreement to cease testing until more information is available. If this position is not as unequivocal as some, it at least shows some grasp of the fact that a serious problem exists—which is more than can be said of a good many Congressmen.

Our second point is that those who are most interested in fighting the nuclear menace owe Congressman Holifield perhaps more than they realize. More than any other single legislator, he has been responsible for the release and dissemination of accurate information about nuclear tests. More than any other public official, he has asked the probing questions, fought the entrenched smugness, provided the very individuals who now criticize him with a large part of the ammunition they use daily in their fight.

We can imagine a number of reasons why the Van Nuys speech may have taken the form it did, but we do not pretend that any of them excuse it. We would interpolate no apology for Congressman Holifield for this event. Nor are we concerned with saving our own "face" for the article in *Frontier*; if that were necessary, Dr. Linus Pauling—who was also at Van Nuys—was kind

enough to do it for us in a later speech in Livermore.

We would merely suggest that some of the criticism be directed at those public officials who continue to issue nonsensical statements about tooth X-rays, and that in discussion of Congressman Holifield, some balance be struck that takes into consideration his accomplishments and achievements.

Fred Seaton asked Congress last year to provide funds to complete a feasibility study of a high Pleasant Valley dam, but was turned down.

Finally, Northwestern members of Congress have not given up hope on getting a federal Hell's Canyon bill out of Congress. With the million

kilowatts of power capacity it would provide, and its three million acre-feet of additional flood-control storage, many observers continue to feel that a high dam at Hell's Canyon remains the area's most urgent need.

—MAX FARRAGUT

PRESS

The Humphrey Speech

On February 4, Hubert Humphrey (D., Minn.) rose on the floor of the United States Senate to deliver an address on foreign policy and, especially, on disarmament.

The address was by any standard a major event, in terms both of statesmanship and of politics. For the first time in several years, a leading Democratic spokesman in the Senate put forth a complete, alternative outline of foreign policy, aimed toward an end of the cold war. The speech, which in transcript ran to over 30 pages, was distributed in advance to newsmen, as well as to other Senators.

Although, except for token occupation of the Minority Leader's chair, Republicans stayed away in droves, the importance of the Humphrey address was underlined by the fact that almost every Democratic Senator, excluding the Dixiecrats, showed up on the floor to lend encouragement (Republican Jacob Javits of New York distinguished himself by defying the party "position" and joining the Democrats on this issue).

I. F. Stone's Weekly, liberal Washington newsletter, devoted the first of its four pages to the Humphrey speech in the first issue after it was made, and in its next issue went to six pages in order to reproduce on three of them significant excerpts from the address itself—an indication of the importance attached to the talk by informed liberalism.

Alerted by the Stone newsletter, *Frontier* went back and checked the various newspapers which we normally monitor.

The *St. Louis Post-Dispatch* ran a full column on Page 2, giving a fairly complete rundown of the main points of the Humphrey address, and making its significance quite clear; the story credited AP. The *Los Angeles Times* also credited AP, but used a different story, giving it 7 or 8 inches on Page 14, below the fold.

The *Times* story discussed, in some detail, the principal point of the Humphrey talk, but gave no impression

of its significance as a Democratic move. The *P-D* headline was SENATOR URGES SEPARATE TALKS WITH RUSSIA ON ATOM TEST BAR, and a prominent subhead read "Humphrey Says President Would Fare Better If He Broke Up His Disarmament Package." The *Times* headline said simply, PACKAGE DISARMAMENT PLAN DECLARED HOPELESS.

In the *Los Angeles Examiner*, nothing. In the *Los Angeles Mirror-News*, nothing. In the *Denver Post*, nothing. We can't report on the *Los Angeles Herald-Express* or the *San Francisco Chronicle*; we can rarely bring ourselves to read the former, and we simply misplaced our copy of the latter.

The Hoover Speech

On the 25th of February, the good gray *Los Angeles Times* offered its readers an excellent example of the curious workings of the editorial mind. The *Times* devoted 10½ editorial inches to a paean of praise for, and a spate of quotations from, Herbert Hoover's address before the Freedoms Foundation at Valley Forge.

"For the discouraged, the confused and those fearful of looking into the future," said the *Times*, "the torch to light their ways has been held up by the former President."

Somehow, though, the *Times* had apparently failed to note that the address quoted was the one in which Hoover confessed, at the end, that he had merely repeated an old speech dating from 1931. The *Los Angeles Examiner*, editorializing on the same address, seemed to feel that Hoover's "stunt" was in questionable taste and was, at best, poor "public relations." But the *Times*, with plenty of room for praise, not only didn't comment on, but didn't even mention, this curious aspect of the Hoover speech in their editorial.

Local Boy

On March 15, the *Los Angeles Mirror-News* front-paged a story about a Democratic "revolt against Knight" in the State Assembly. There

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Los Angeles

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was a quotation from Minority Leader Bill Munnell of Montebello, and mention of remarks by another southerner, Jesse Unruh, but the meat of the story was that San Francisco's Phil Burton planned to introduce a resolution calling on the Governor to add unemployment to the special session issues. Burton had 27 co-authors for his resolution.

The next morning (the *M-N* is an afternoon paper), the *San Francisco Chronicle* ran a similar story across the top of Page 6. They quoted southerner Munnell and southerner Unruh, and threw in a quote from Senator Burns of Fresno. They said that "the Democratic caucus of the Assembly has urged Knight to place unemployment on the agenda of the current special session."

But in this election year, with unemployment a burning issue, nowhere did the *Chronicle* story mention the name of the local San Francisco Assemblyman, Phillip Burton. Burton has a rough re-election fight this year, but unemployed voters, it seems, will never know he cared.

APRIL 12 • SATURDAY • 7 P.M.

**SOBELL
FREEDOM
BANQUET**

\$10.00 per person

PARK MANOR
607 S. Western Ave., L.A.

Program guests:

Rev. Erwin A. Gaede, Chairman
Westwood Unitarian Society

Prof. Malcolm P. Sharp
Law School, University of Chicago

and

Mrs. Morton Sobell

auspices:

L.A. SOBELL COMMITTEE
HO 4-4275

LETTERS

A letter from Chet Holifield . . .

Sir: First, I wish to thank *Frontier* for printing the original article on "Fall-out and the Facts" in the November, 1957, issue. Second, I appreciate that part of your article in the January issue, entitled "Holifield's Error," which referred in complimentary terms to my work in the atomic energy field for the past ten years. Third, I wish to reply to your criticism of my speech at the Van Nuys rally under the auspices of the Committee Against Nuclear Explosions.

When I was first contacted by my friend, Leonard Shane, Chairman of the rally, I explained, very carefully, that I could not, in good conscience, take an *unqualified* position against nuclear weapon testing. I made it clear that my position would not coincide with the views of Dr. Linus Pauling, as reported by various newspaper articles. I anticipated, of course, that a majority of those who would attend a rally advertised under the auspices of the above named Committee would not be pleased by the speech of anyone who refused to "go all the way" and take an *unqualified* position against testing all sizes and types of nuclear weapons, under any or all conditions.

Mr. Shane, after conferring with his Committee, renewed the invitation to me to speak and assured me that even though my position was a qualified one, they believed my experience on the Joint Committee on Atomic Energy for the past ten years fitted me to express an informed opinion.

Fair Analysis

I accepted and prepared my speech. I gave it without any other motive than that of presenting a fair analysis of the testimony given by a majority of the scientific witnesses who appeared before my Special Subcommittee on Radiation. I believed then and believe now that my analysis was an accurate reflection of the majority opinion expressed by those witnesses.

I would like to refer to the one sentence in my speech which your article branded as false: "We have no scientific data which would substantiate the assertion that natural radioactivity has damaged either somatically (nongenetic body cells) or genetically (genes and chromosomes pertaining to reproductive cells) the human race."

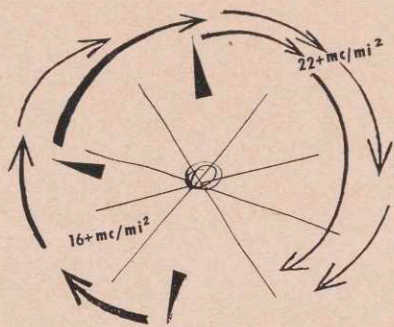
By "scientific data," of course, I mean established facts based on actual laboratory experiments; I do not mean theoretical extrapolations based on assumptions.

By "substantiate," I meant the word as the commonly accepted synonym for "prove."

By "assertion," I meant "claim."

I contend my statement is true when interpreted in common layman's language, and in context with the sections of my speech in which I explain the laboratory experiments upon which some geneticists base their *theory* or *assumption* that natural radioactivity is damaging to human body cells.

Let us trace the steps by which the theory or assumption is evolved. Most scientists believe our body cells contain genes, and chromosomes. Most scientists



believe there are normal genes and chromosomes and abnormal genes and chromosomes. A normal gene or chromosome becomes abnormal as a result of some physical or chemical stimulus, such as radiation.

Most scientists agree abnormal genes are usually detrimental to the organism, although occasionally an abnormal gene is advantageous.

For the purpose of this discussion we will only consider the case of detrimental mutations resulting from damaged genes or chromosomes.

Most scientists believe there are many causes for damaged genes other than radiation and that it is impossible to separate the causes. In other words, a microscope may reveal a damaged chromosome, but it cannot tell the scientist the origin of the damage to that specific chromosome. For instance, it might have been caused by deleterious chemical action, physical injury or radiation.

In considering gene damage by radiation on human cells, we must also

consider the kind of radiation (natural environmental radioactivity) and the degree or intensity of the radiation. A reference is here made to the controversial sentence, and we note that I used the term "natural radioactivity."

No scientist has been able to detect a damaged human gene or chromosome and prove the damage was caused by natural radioactivity. Such damage may exist. There are scientists who *believe* such damage exists. There are scientists who *assume* that such damage occurs from this cause.

Others Disagree

There are other scientists who doubt that natural radioactivity, which varies in degree from place to place in the earth's environment, is of a high enough degree of intensity to affect human genes.

I am not a scientist nor a geneticist. I do not know. I am basing my analysis on my understanding of the testimony before my subcommittee.

I will try to summarize the pertinent points in further argument against the charge of falsity in my speech. Geneticists, in order to trace gene or chromosome damage through several generations, use short lived insects such as fruit flies, or short lived mammals such as mice. Natural radioactivity is too low in intensity to enable the scientist to observe or measure damage to the fly or mouse gene and to trace the effects of such damage through successive generations. Therefore, the scientist *increases the intensity of the radiation above the level of natural environmental radiation until he can cause detectable and measurable gene or chromosome damage*. When the scientist does this he begins to *substantiate* or *prove* gene damage from radiation, but not from levels of intensity possessed by natural radioactivity.

Remember, this laboratory experiment was on the gene of the fruit fly or the mouse — both lower forms of life than man.

The scientist has not yet *proved* the low intensity level of natural radioactivity has damaged the fruit fly gene, the mouse gene, or the human gene. He has used a *higher level of radiation*.

Now the second gap in scientific data occurs. The scientist resorts to extrapolation of the laboratory experiment on fruit flies and mice genes to what he believes might occur to human genes. Perhaps he is right. Perhaps he is

wrong.

All honest scientists will admit, at this point, they leave the proved experimental data of the laboratory and enter a guessing game. A game which they all admit has an inherent undeterminable factor of error. From this point facts cease and theory and assumption begin.

I do not cavil against the practice of building theories or assumptions on scientific facts. It is the normal, the inevitable prelude to establishing truth or error. A hundred or a thousand theories may have to be explored before a specific theory becomes an established fact.

But no scientist who is honest will confuse a theory or an assumption with a proved fact, nor will he try to palm off on his scientific colleagues, figures based on theory, under the guise of facts.

Because of the technical nature of the controversy, Frontier's Associate Editor, Gene Marine, steps from behind the mask of editorial anonymity to reply personally. Mr. Marine has written regularly on atomic energy matters for the past several years for The Nation, The Bulletin of the Atomic Scientists, and other publications.

First of all, I take it that Mr. Holifield's views on nuclear testing are not at issue here; nor is there, of course, any question of his sincerity, his integrity, or his desire for accuracy. No one familiar with Mr. Holifield's record in the field of atomic energy could have any question about his devotion to the public welfare in these matters.

There are, I think, several ways in which I might reply to the foregoing letter. For one thing, the audience at Van Nuys, who heard the disputed sentence, did not have the advantage of Mr. Holifield's semantic exegesis, and I question whether most of that lay audience, hearing that sentence, took "substantiate" to mean "prove," in the strict logical sense. Rather, I think most people would take "substantiate," in this context, to mean "strongly support." "Data" simply means "information," and I think most people would take "scientific data" to mean simply "information obtained scientifically," without the qualifications imposed by Mr. Holifield. These distinctions alone, I suggest, would make the statement scientifically questionable.

It would, of course, be quite simple

I rest my case on the controversial sentence.

In conclusion, I challenge *Frontier* to document, with proved scientific data (not assumption, theory, or extrapolation) the statement which follows the controversial sentence, i.e., "It is general scientific knowledge that 150,000 children a year are born defective directly because of natural radioactivity." I assert that this is an unproven statement. The figure used, like other figures regarding the effects of present level of radiation from bomb testing and natural radioactivity on cancer and leukemia incidences, is an estimate based on theory which is based, in turn, on extrapolations based on assumptions. Such figures certainly cannot be classified as "general scientific knowledge."

CHET HOLIFIELD

Member of Congress
Washington, D.C.

. . . and a reply

to cite our source for the statement which Mr. Holifield asks us to "document" — obviously we did not invent the figure — and then to let the reader balance the unquestionable scientific knowledge and prestige of that source against Mr. Holifield's "I am not a scientist . . . I do not know."

Actually, however, Mr. Holifield raises an important point — one that should be met, and one whose avoidance would be in my opinion a disservice to the reader. For that reason — since *Frontier* is, of course, dedicated not to justifying its past statements but to informing its readers — the simple citation of a source seems both unfair and unwise.

Before going on to the meat of the question, one other comment seems in order. According to Mr. Holifield's letter, his motive at Van Nuys was "that of presenting a fair analysis of the testimony given by . . . scientific witnesses . . . before my Special Subcommittee on Radiation."

In the January, 1958, issue of the *Bulletin of the Atomic Scientists*, a special issue on "Radiation and Man" which should be required reading for everyone, Congressman Holifield has an article in which he gives his purpose as a summing up of those same subcommittee hearings; in other words, the *BAS* article has the same announced motive as the Van Nuys speech.

Mr. Holifield's letter, and the Van Nuys speech, both present as dubious the idea that radiation, at natural levels, brings about genetic damage. But in the

Bulletin, the Congressman writes that

There was general agreement that any amount of radiation, *no matter how small the dose*, increases the rate of genetic mutation (change) in a population [emphasis added].

And in *Frontier* for last November, Mr. Holifield wrote that "the degree of error cannot be accurately estimated. All agree, however, that any radiation causes mutations of the genes . . ." I am afraid that between "general scientific knowledge" (our phrase) and "general agreement" among "scientific witnesses" (Mr. Holifield's phrases), I find very little difference.

The principal point to be made, however, is that Mr. Holifield's letter appears to embody a common layman's confusion — a misunderstanding of the nature of "theory" and "fact" in science, and of the nature of "scientific evidence."

It is quite true, for instance, that "no scientist has been able to detect a damaged human gene or chromosome and prove the damage was caused by natural radioactivity." It is also true that no scientist has ever observed two hydrogen atoms fusing into a helium atom, with an accompanying release of energy — but that hole in the ground at Bikini "proved" something.

What I am trying to say is that "general scientific knowledge" does not often rest on the simple single experiment that conclusively demonstrates a hypothesis. More often, it rests on *statistical* observation of large masses of data, or on the *cumulative* effect of a number of small and individually inconclusive observations, or both. Nobody has to have seen an atom, ever, in order for there to be a lot of "general scientific knowledge" in the field of atomic energy.

31 Years Ago

Let's note, then, that experiments have been conducted in the field of radiation genetics, not only on fruit flies and mice but on dogs, monkeys, and virtually every other animal available to researchers. After all, Muller's publication of the results of his first fruit-fly experiments was 31 years ago.

A study of American pathologists showed that the radiologists among them had a somewhat lower proportion of normal births; a study of French parents showed that those with heavy X-ray treatment histories showed in their offspring a significant difference in sex ratios.

Neither study is conclusive. No one study, no one experiment, is very often conclusive. But when a scientific theory

is put forth, and when every known experiment, embodying dozens of approaches over more than thirty years, supports that theory, then to tag the idea as "general scientific knowledge" is by no means irresponsible. The fission of the atom, the chain reaction, the fusion of hydrogen, are all theoretical insofar as actual observation of a single case is concerned.

In selecting the following observations of James Crow, I think Mr. Holifield will agree that I am not selecting, from a number of sharply conflicting opinions, one that just happens to support our position. The quotations are from the same January *Bulletin of the Atomic Scientists*, from an article set forth as a general rundown on "Genetic Effects of Radiation," and it seems clear that Crow would not make strong general statements about radiation genetics in such a context unless he were certain that the statements were considered "general knowledge" in his field.

The question is not the artificial one of whether these statements are "theory" or "fact"—the line between the two in subatomic science is a vague and shimmery one at best. Nor does it seem important whether they are the result of extrapolation; the question would seem to be whether the extrapolation is the tight and exact extrapolation of science or the wild extrapolation of the Sunday supplement—there's a difference.

The Uses of Theory

After citing some experimental data—individually inconclusive—Crow writes:

... Much stronger evidence comes simply from the consideration that man is, after all, an animal. So far, of all the dozens of plants and animals that have been adequately tested, not one has failed to produce more mutations when irradiated, and it is improbable in the extreme that man differs from all others in this respect. For this reason, as well as because of the supporting data just mentioned, geneticists have no doubt that radiations do increase the mutation rate in man...

A very general and very simple principle has emerged from the hundreds of experiments by scores of workers in radiation genetics: *The number of mutations is strictly proportional to the total amount of radiation reaching the reproductive cells* [emphasis Crow's].

Geneticists are convinced that there is no threshold, i.e., no dose too low to produce any mutations.

Different uses of "theory" are valid in science. Hoyle's theory of the continuous creation of matter appears to

fit the known facts in cosmology, but it is almost completely unsupported by experiments designed to test it; Heisenberg's "uncertainty principle" is widely accepted among nuclear physicists, yet so renowned a physicist as Einstein refused to accept it; the theory of the atomic constitution of matter is so well supported that, in spite of the fact that no one has ever seen an atom (and, if the theory is correct, no one ever will), it is certainly describable as "general scientific knowledge."

In this specific case, I think that the disputed sentence at Van Nuys, and Mr. Holifield's letter to *Frontier*, would tend to give most readers the impression that the theory of genetic damage by natural radiation is an out-in-the-blue theory, with no direct experimental support, based entirely on somewhat wild extrapolation from a



few experiments on mice and fruit flies. In this sense—the sense in which I believe the statement was generally understood—I believe that it is false. I believe that, either in layman's terms or in terms of a scientist's definition of scientific knowledge, the Van Nuys statement and the *BAS* article in January are incompatible. In this same sense, I believe that the statement that radiation damage to genes is "general scientific knowledge" is true, and that Crow's reference to "hundreds of experiments by scores of workers," as well as Mr. Holifield's "there was general agreement," supports me.

The selection of the figure, 150,000, is admittedly arguable. It comes from a leading authority, and is described as a conservative estimate—a description borne out by examination of other estimates. For better accuracy, we should perhaps have said "at least 150,000," or possibly "150,000 or more."

But selecting a figure is routine statistical method. What is important is the validity of using such a statistical method, and I believe that the genetic arguments of which the Crow quotations are a sample, and the history of the entire field of genetics, are on my side.

Finally, I might note that *all* scien-

tific knowledge is ultimately subject to revision. In atomics, the so-called "principle of parity"—long a basic structural part of atomic theory—has only recently been disproved. A "fact," at any given time, is only our best knowledge in the light of the information available at that time. "General scientific knowledge" is always tentative—but I recall Wiener's observation that he would have no hesitation in leaving a *probably* sinking rowboat in mid-ocean to board a *probably* seaworthy steamer.

A Matter of Criteria

The simple quotation of a scientific authority or two would, I think, have ended this matter to the satisfaction of most readers. I feel, however, that the importance of Mr. Holifield's letter is that it embodies common laymen's misapprehensions about the nature of "fact" and "theory" and "scientific knowledge"—a kind of misapprehension which, in less sophisticated form, makes possible patent-medicine ads, sloppy news stories from Cape Canaveral, and irresponsible AEC information policies. Consequently, I have tried to go into these matters as briefly and clearly as possible.

There is a sense in which everything Congressman Holifield says is true—a legalistic sense. If the case rests on the kind of reasoning involved in a courtroom case, he is quite correct. But scientific "proof" doesn't work like legal "proof," and "fact" and "theory," in science, are often so blurred as to be indistinguishable. This, I feel, is the point of difference. Since this is a scientific matter, I feel that scientific criteria are the ones that should be used.

In his report last month on the San Francisco Film Festival, Alan Rich noted that

... the national and international movie industry... can and does make or break festivals the world over by the power of its sanction. In this case the sanction was withheld...

Immediately after we went to press—which seems to be when everything happens—the International Federation of Film Producers Associations, headquartered in Paris, announced that next fall's "second annual" festival in San Francisco will receive its endorsement. This will raise the San Francisco Film Festival to the level of Cannes and Venice in international import, and assure the full cooperation of the industry both here and abroad.

The San Francisco Festival will be the first such affair to be officially sanctioned in the United States.

Registered

This was sent [^] Air Mail
Return Receipt Requested.
It was sent from Tech Post office
and paid for by them on April 2, 1958
March 31, 1958

Professor B. Ulin
Department of Mathematics
Tradgardsgaten 18
Uppsala
Sweden

Dear Professor Ulin:

& Ms.

Thank you for your letter of March 21. I am returning herewith the corrected proof sheets of Part II of the paper on "The Prediction Theory of Multivariate Stochastic Processes" by Professor Wiener and myself. We would like 100 additional reprints in all.

The new symbols \underline{L} and \underline{M} used by the printer look good, and as the symbols are defined anew in Part II we would have no objection to their retention; but please decide any way you see fit.

I would like to draw your attention to the following points:

1. I would suggest that the numeral II should follow the title rather than precede the sub-title; for otherwise it will be impossible to distinguish between reprints of Parts I and II.
2. Could the footnote (1) on Page 2 be inserted as a second paragraph to the footnote (1) on Page 1? If so I would prefer it.
3. Perhaps the cross references will read better if printed without spacing, e.g. $I, 2.1(a)$ instead of $I, 2.1(a)$.
4. The ordering relation between hermitian operators introduced on Page 4 should be symbolized \langle and \rangle as in the ms. and not $<$ and $>$. It is desirable to leave a space before and after these symbols. The necessary corrections should be made on Pages 4, 7, 9, 25, 26, 27, 38.
5. ^{On} Page 11 where we deal with scalar functions bold face F, C, Φ should be replaced by these letters in italics.

$$\{f_n^{(i)}\}_{n=-\infty}^{\infty}$$

6. On Pages 12, 13 it is better not to change $(f_n^{(i)})_{n=-\infty}^{\infty}$ to λ . The former is a sequence. The latter we use for a set.
7. I have made a slight change in the enunciation and proof of (4.7) on Pages 21 and 22.
8. On Pages 21, 22, 24 the printer has printed capital bold face \underline{V} instead of small bold face ψ in several places. This should be changed.
9. On Pages 24 and 28 the vertical bars seem too big. The size used in (1.7) seems right.
10. On Page 26 it would be preferable to label as (iii) the sentence labeled (iv) and vice versa. This would correspond to the actual order in the paper.
11. On Pages 27, 28 I have numbered the equations (3) (4) (5) instead of (1) (2) (3) as the latter may be confused with the equations on Page 26.
12. On Page 31 it would be better to use $\tilde{F}, \tilde{f}, \tilde{\Phi}$ instead of \tilde{F} as the space has a different meaning in the rest of the paper.
13. Certain display passages should be italicized.

$$\tilde{F}, \tilde{\Phi}, \tilde{f}$$

The changes numbered 2, 3, 9, 10 are not absolutely essential. Of the remaining, only 7, 11, 12 are departures from the ms. I trust the latter will be easy to make and will not cost us anything additional. There are, of course, minor changes made throughout the paper.

Unless you feel differently, we do not see the need for another set of proofs.

I might say that the readers of the Acta will find it convenient if the paper by H. Helson and D. Lowdenslager appears in the same issue as ours.

I would like to thank you very much for the trouble you are taking for our papers.

Yours sincerely,

P. Masani

PM:AD
Enc.

[see 1/22/58]



WAYNE STATE UNIVERSITY

STUDENT-FACULTY COUNCIL

DETROIT 2, MICHIGAN

March 31, 1958

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

Dear Dr. Wiener:

Since writing to you on March 28, more definite plans have been made concerning the proposed evening meeting on April 16. We would be honored if you would be our guest for dinner in the University Room of the Student Center from 6-8 p.m. We plan to invite about twenty-five student leaders to dine with you. Following dinner the meeting would involve an informal discussion on student responsibility to higher education.

If you can accept our invitation I would appreciate hearing from you at your earliest convenience.

Sincerely yours,

Donald A. Peteet
External Affiliations Commission
Student-Faculty Council

[ans 4/2/58]