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CORRESPONDENCE Oct. 20-31, 1957

N. WIENER · MC 22

THE NEW YORK TIMES, SUNDAY, OCTOBER 20, 1957.

Letters to The Times

Mobilizing for Survival

Concerted Efforts to Avert War and to Achieve Security Urged

The writer of the following letter is Associate Professor of Mathematics, Hofstra College.

TO THE EDITOR OF THE NEW YORK TIMES:

As a teacher of mathematics and logic I must protest the illogical reaction now prevalent in this country concerning the launching of the Soviet earth satellite. On every side responsible persons are deploring the loss of the "space race" to Russia, and are calling for a "crash program" regardless of cost, to enable the United States to overtake and surpass Russia in the field of missiles. I submit that, without exaggeration, it would be correct to describe such a program as a crash program leading in the direction of world suicide.

It is well recognized that the mere continuation, at its present rate, of the arms race in nuclear and related weapons almost certainly must result in world disaster, if not complete world destruction. A new crash program by the United States for missiles development would speed up, aggravate and intensify this deadly arms race. In short, it would bring the world much closer than it is already to a point of no return on the road to nuclear and missile war.

The big question, of course, is, what alternative is there?

World Crisis

There is here and now a crisis which threatens the future existence of this planet, or of life on it. All countries of the world are threatened just as surely as they would be by a pending invasion from another planet. I suggest that it is imperative that the whole crisis be viewed from this broad perspective, and that the world's resources be mobilized on whatever scale is required to attack the common problem.

Certainly this necessitates a world project going far beyond the narrow scope of present political negotiations and deliberations under United Nations auspices for arms limitation or control. It presumably calls for a project on a larger scale than the current world scientific program of the International Geophysical Year. It calls for intense thinking in a new dimension, with as high a level of objectivity and logical consistency as would be demanded by mathematicians and scientists in their own research. It calls for participation not only of scientists but of moral leaders, together with intellectual workers and scholars in many fields, backed up by great universities and foundations and government grants.

New Crash Program

All this can be summarized by saying that the world is urgently in need of a new and very different kind of crash program—namely, a determined, sustained and cooperative effort, invoking the aid of the best brains available from both East and West, to make recommendations for averting a new world war, and to draw up plans for achieving permanent world peace and security.

Our representatives in the U. N. could immediately introduce a resolution asking that such a project be initiated—perhaps to be under the care of UNESCO, the intellectual arm of the U. N. A preliminary report could be requested, to point the way to resolving the immediate dilemmas regarding the arms race and critical areas of world tension.

Of course there would be no guarantee of success for the contemplated program. But I am unwilling to believe that the human race is capable of applying the accumulated intellectual tools of the past to produce the means of destroying itself, and is not equally capable of applying these same tools to insure its own survival.

E. R. STABLER,
Hempstead, N. Y., Oct. 14, 1957.

*Not much
to answer
except
general
sympathy
Werner*



The Chubu Nippon Shimbun
(Head Office)

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6241

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October 21, 1957.

Professor Norbert Wiener

Dear Professor Wiener:

It is our great pleasure to inform you that our Chubu Nippon Press is the most influential newspaper in central Japan with its circulation of 1,000,000 and 850,000 daily for morning and evening respectively.

I have the honor to ask you to contribute your article for our paper through the courtesy of Professor Ono of the Nagoya University who is now studying in U.S.

As for the title of the article, we shall be very happy if you will kindly let us know your frank feeling and opinion about the "Prospect of Automation Era". But this is merely our tentative title. It is quite alright for us to leave it to your preference. Any title will do so far as it is related to the automation.

As the Japanese public in general, especially the scientists and technicians are keenly interested in the problems of automation, your article will be very helpful and suggestive for our readers, I am sure. How do you feel about this matter?

Your article is scheduled to be printed on the coming New Year's special edition of our paper. And I hope you will conclude it in 1,200 words. Concerning the deadline of your article, I hope you will kindly mail it by the end of November, will you?

Thanking for your kindness in advance, and hoping your early and favorable reply, I remain,

Sincerely yours,

Toshiaki Ariumi

Toshiaki Ariumi
Chief

Cultural News Section
The Chubu Nippon Press

[ans. 11/7/57]

American Society for



TECHNION-

ISRAEL INSTITUTE OF TECHNOLOGY, Inc.

NATIONAL OFFICE: 1000 FIFTH AVENUE • NEW YORK 28, NEW YORK

Telephone: TRafalgar 9-8400

October 21, 1957

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

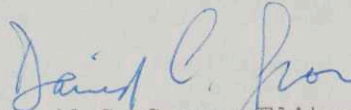
Dear Dr. Wiener:

At the suggestion of Mr. Bern Dibner, I am writing to ask whether we may expect to receive a copy of the paper which you gave before the New England Institute for Medical Research for inclusion in the next issue of the Technion Yearbook.

If it is at all possible, I would appreciate receiving your paper before the end of November, together with a glossy photograph of yourself and a biographical sketch, as well as whatever illustrative material you may have on hand for the paper.

With advance thanks for your cooperation,

Sincerely yours,


David C. Gross, Editor
Technion Yearbook

DCG:bdw

[ans 11/4/57]

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**FRANK L. HARVEY
DRAKESTOWN ROAD
HACKETTSTOWN, NEW JERSEY**

Oct 21, 1957

Dear Dr. Wiener,

I would very much like to get the full text of your speech at Wabash college, as written up in Time. I will be glad to pay for the reprint, or do whatever is necessary to obtain it. If you have time, I would greatly appreciate your help.

Dr. Norbert Wiener
MIT, Boston, Mass.
Professor of Mathematics

Sincerely,

Frank Harvey
Frank Harvey

[also 10/28/57]

Harrisburg, Allinois
Oct. 21, 1957

Dear Doctor Wiener:

The undersigned will appreciate it if you add your signature to the enclosed card - your autograph to be added to my collection covering all fields of activity but space permits mentioning only a few: Dr. James R. Killian Jr. Dr. Linus Pauling, Dr. Harrison Brown, Dr. Edwin C. Kendall, (co-^{discoverer} of cortisone); Henry Ford, #; Harvey Firestone; Dr. Nathan Pusey, Harvard; Dr. Robert Goheen, Princeton; Dr. Webster Jones, Rutgers; M. J. Rathbone, Pres. of Standard Oil, (N.J.); S. J. Russell, Pres. Southern Pacific RR; Dr. J. B. Rhine, Duke; P. C. Spencer, Pres. Sinclair Oil; J. L. Latimer, Pres. Magnolia Petroleum; David Proctor, Pres. Gulf Oil; Chief Justice Warren; P. P. Patton, Pres. Republic Steel; Douglas B. McConnell, Pres. Sears, Roebuck; & Dal!!! the collection is rare & fabulous - your card will help dignify the panel arrangement - to be placed in Washington channels (and under glass) for future generations to appreciate.

Enclosed self-addressed, stamped envelope.

N.B. In respect ^{reasons} please destroy the enclosed information. Thank you for #

Box-
387

Respectfully
Mrs. Walphine O. Jarrell
[ans 10/29/57]

Dr. Wiener

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*This engagement
was cancelled by
telephone on Oct. 22.*

October 21, 1957

Professor Norbert Wiener
Massachusetts Institute of Technology
Massachusetts Avenue
Cambridge 39, Massachusetts

Dear Professor Wiener:

We are delighted that you will appear on The Open Mind program on Sunday, November 3, 1957 to discuss American and Soviet Science and Scientists. Your co-panelists will be Mr. Norman Cousins, Editor of The Saturday Review, and Mr. William Benton, former Senator from Connecticut. Mr. Richard D. Heffner is the moderator of this informal discussion program.

We would appreciate your being at our studio at The RCA Exhibition Hall at 40 West 49th Street, New York, at 11:45 a.m. The format of The Open Mind program calls for a simple round table discussion, and you will have plenty of time before you go on the air to discuss with your fellow guests how you wish to approach the topic.

The program will be broadcast on television from 12:30 to 1:00 p.m. on WRCA-TV in New York and WGBH-TV, the educational channel in Boston, Massachusetts. It will be rebroadcast on radio that same evening from 12:00 to 12:30 a.m. on WRCA, New York.

We will take care of your expenses from Boston to New York in connection with the program.

We will be looking forward then, to meeting with you on Sunday, November 3rd at 11:45 a.m. in New York.

Sincerely,

Eleanor S. Riger

Eleanor S. Riger
Assistant to Richard D. Heffner
Producer, The Open Mind

October 21, 1957

Mr. James O. Avison
Convocation Director
Grinnell College
Grinnell, Iowa

Dear Mr. Avison:

Thank you for your letter of October 16th with the answers to my various questions regarding plans for my visit to Grinnell College.

For your information, I will arrive in Des Moines by plane from Chicago on Thursday, October 24th at 4:10 P. M. It will be agreeable to me to leave on the 9:10 P.M. plane on Sunday evening.

I am looking forward to a very pleasant trip.

Very truly yours,

Norbert Wiener

NW:AD

October 21, 1957

Dr. Hans H. Biberstein
Rudolf Virchow Medical Society in the
City of New York
667 Madison Avenue
New York City, N. Y.

Dear Dr. Biberstein:

I have your letter of October 17th and thank you for including Mrs. Wiener in your invitation. She will be delighted to attend.

We will arrive on Monday, November 4th, by plane in the early part of the afternoon. If you will let us know what reservations have been made, we will go directly to the hotel. Also would you be good enough to advise whether the dinner is to be informal or whether a tuxedo is in order. I am not planning to show slides.

Looking forward to my visit with you, I am,

Sincerely yours,

Norbert Wiener

NW:AD

[ans 10/23/57]

October 21, 1957

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

Dear Prof. Ginsberg:

I trust you will pardon my delay in replying to your letter of October 3rd, but pressure of work has made it impossible for me to write sooner.

I find that March 27, 1958 is the most convenient of the dates you have suggested and hope this is agreeable to you.

Sincerely yours,

Norbert Wiener

NW:AD

[ans 3/19/58]

October 21, 1957

Prof. David Saylor
14 Breese Terrace
Madison, Wisconsin

Dear Prof. Saylor:

Thank you for your interest in the speech which I gave recently at Wabash College. In accordance with your request, I enclosing herewith a rough draft of it which is all that I have available at the present time. I trust it will serve your purpose.

Very truly yours,

Norbert Wiener

NW:AD
Enc.

The City College
CONVENT AVENUE AND 139TH STREET
NEW YORK 31, N. Y.

October 22, 1957.

DEPARTMENT OF PHILOSOPHY

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

Dear Professor Wiener,

I am enclosing copies of the papers by Professors Grünbaum and Scriven who are to appear with you in the symposium on "Determinism in the Light of Recent Physics" at the December 29 meeting of the Philosophical Association at Harvard. Their papers will be published in advance in The Journal of Philosophy.

Let me resume briefly the structure of the meeting. It will take place that Sunday morning, December 29, from 9:30 to 11:30 in Room B of Burr Hall at Harvard. Since you did not do an advance paper for publication, we hope, as I wrote you last time, that you will feel free to take up to a maximum of 30 minutes. Professors Grünbaum and Scriven will have 10 to 15 minutes each. Professor Carl G. Hempel of Princeton, who is to be commentator, will have 10 to 15 minutes; and the rest of the time is intended for discussion. We hope the symposium will be well attended; for, although contrary to our original intentions we had to schedule a concurrent session that morning, we have only the two as compared to five at every other session during the meetings. Professor W.V. Quine of Harvard, who is currently president of the Association, will be chairman of our session.

The other participants have expressed the hope that you will be willing to give them some advance indication of the general direction your remarks will take, so that their participation in cross-discussion can be more considered. If you should find it possible to do this in the form of a brief note or informal outline, I should be glad to forward copies to all concerned.

Very sincerely yours,

Abraham Edel

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

[over 10/24/57]

Prof. Dr. jur. Ulrich Klug

Wiesbaden, 22. Oktober 1957
Humboldtstr. 35
Tel. 57129

*no answer
required*

Prof. Dr. Norbert Wiener
Massachusetts Institute
of Technology
Cambridge, Massachusetts
USA

Sehr verehrter Professor Wiener !

Infolge mehrerer Reisen bin ich leider erst heute in der Lage, auf Ihre freundlichen Zeilen vom 27.7.1957 zu antworten. Ich danke Ihnen für den Hinweis auf Herrn Dr. Claude Shannon, an den ich mich in Kürze wenden werde.

Gestatten Sie mir, Ihnen bei dieser Gelegenheit eine kleine Arbeit eines Freundes von mir beizufügen, die Sie im Hinblick auf die Geschichte der Rechenmaschine vielleicht interessieren wird. Ich habe kein weiteres Exemplar zur Verfügung und mußte das mit der an mich gerichteten Widmung des Verfassers hier mitschicken. Da ich weder Mathematiker noch Techniker bin, kann ich zu den Ausführungen nicht Stellung nehmen.

Mit den verbindlichsten Empfehlungen bin ich

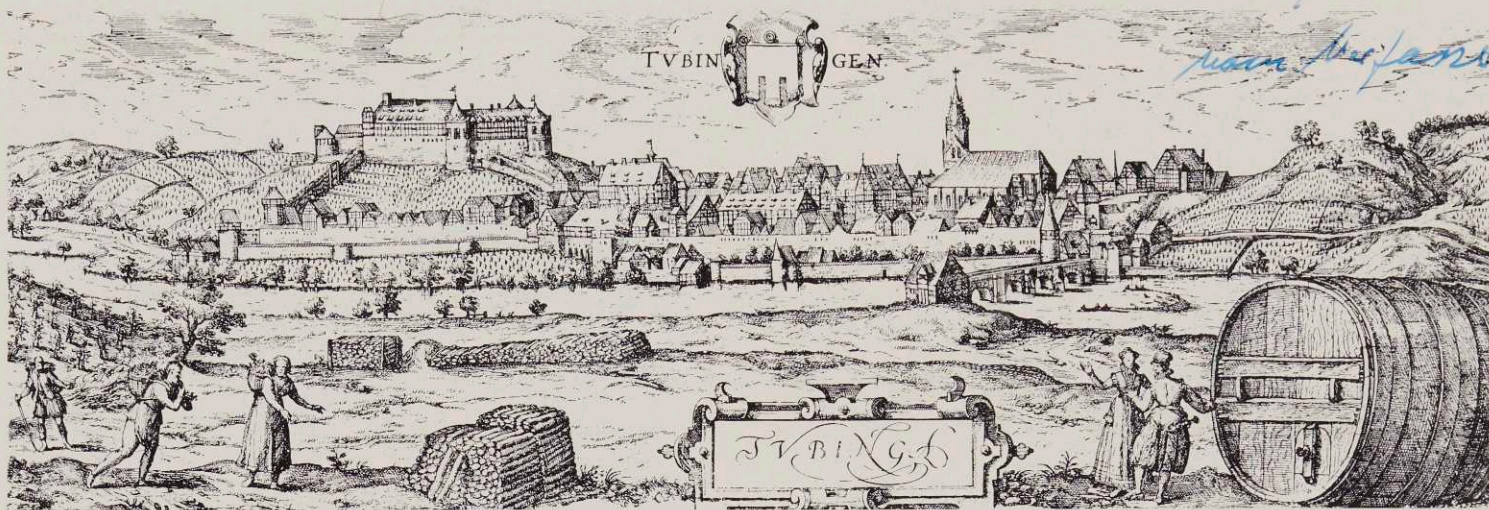
Ihr sehr ergebener

Ulrich Klug

Anlage

(Ulrich Klug)

*Nach mechanisches als die Logistik sein möchte!
In aller Freundschaft*



Heimatkundliche Blätter für den Kreis Tübingen

11. Jahrgang Nr. 3 / Juli 1957

Herausgegeben von Dr. Ernst Müller

Eine Tübinger Rechenmaschine aus dem Jahre 1623

Von Prof. Dr. B. Baron v. Freytag Löringhoff

Eine Reihe von Funden und Zufällen hat kürzlich zur Einsicht geführt, daß die erste brauchbare Rechenmaschine im heutigen Sinne dieses Wortes, d. h. die erste mit einer automatischen Zehnerübertragung, nicht, wie allgemein zu lesen ist, im Jahre 1642 von Pascal erbaut wurde, auch nicht 1674 von Leibniz, sondern bereits 1623, im Geburtsjahr Pascals, von dem Tübinger Professor Wilhelm Schickard, daß diese Maschine im Gegensatz zu der Pascals mehr konnte als nur addieren und subtrahieren und im Gegensatz zu beiden genannten Maschinen zufriedenstellend funktioniert haben dürfte. Das ist Anlaß genug, sich mit ihr und diesem hinterlassenen Mann etwas zu beschäftigen.

Wilhelm Schickard, dessen hier wiedergegebenes schönes Ölbild im Flur der Tübinger Universität zu finden ist, dürfte ein Universalgenie im Stile Leonardos gewesen sein. Er wurde am 22. April 1592 in Herrenberg (Württemberg) geboren, durchlief Schule und Studium an der Klosterschule und am Stift in Tübingen, wo er ein Jahr Repetent war, wurde Diaconus in Nürtingen und 1619 Professor für biblische Grundsprachen in Tübingen. Er ist ein direkter Vetter des bekannteren Baumeisters Schickard.

In Tübingen arbeitete er eng mit Maestlin zusammen, dem insbesondere als Lehrer Keplers bekannten, dazumal hochbedeutenden Mathematiker. Nach dessen Tod übernahm er 1631 seine Stelle, so daß er schließlich seine Hauptleistungen als Mathematiker, Astronom und Landmesser vollbrachte und nicht als Hebraist. Am 23. Oktober 1635 starb er in Tübingen an der Pest.

Es ist nicht möglich, von seinen mannigfachen Leistungen hier ein vollständiges Bild zu geben. Ein Blick in seine nachgelassenen Notizblätter zeigt, daß er voller Pläne und Erfindungen steckte. Einen großen Teil seiner Lebensarbeit stellt die ihm übertragene erste Vermessung des Landes Württemberg dar, an der er sich nicht nur als vorzüglicher Zeichner und Kartograph bewährte, sondern auch für die Feldmesserei grundlegende mathematische Erkenntnisse gewann. So hat er selbständig die später nach Pothenot benannte Aufgabe gelöst. Als Astronom schrieb er über den ersten beobachteten Planetendurchgang und andere Himmelserscheinungen und erfand verschiedene geistvolle astronomische Apparate.

Auf dem Bild sehen wir in seiner Hand eine kunstvolle Apparatur. Es dürfte eine Art Planetarium sein, das gerade eine Mondfinsternis demonstriert. Als Mathematiker war er einer der ersten, welche die Bedeutung der Logarithmen erkannten. Diese gab es erst in der unhandlichen Form, die Neper diesem Gedanken gegeben hatte. Schickard korrespondierte mit Kepler darüber und wollte mit neuen Methoden die Neperschen Tafeln neu gestalten und berechnen. Kepler schätzte ihn hoch, insbesondere als erfindungsreichen Me-

chanicus, und fand in ihm den congenialen Zeichner für die komplizierten Zeichnungen seiner Weltharmonik.

In den Jahren, in denen Kepler wegen des Hexenprozesses gegen seine Mutter in Leonberg längere Zeit in Tübingen weilte, war er viel mit Maestlin und Schickard zusammen. Da ihn die Berechnung seiner Rudolfinischen Tafeln stark beschäftigte, dürfte sich das Gespräch oft um praktisches Rechnen gedreht haben. Dieser Anregung dürfte Schickards Plan zur Rechenmaschine entsprungen sein. Die Skizze, von der gleich die Rede sein wird, fand sich bezeichnenderweise, vom zugehörigen Brief getrennt, unter Aufzeichnungen Keplers zu den Rudolfinischen Tafeln¹.

Am 11. April 1957 berichtete nun Dr. Franz Hammer von der Landesbibliothek Stuttgart, der verdienstvolle derzeitige Redaktor der Kepler-Ausgabe, vor einem kleinen Kongreß für Geschichte der Mathematik im Mathematischen Forschungsinstitut Oberwolfach über eine Zeichnung Schickards, die er kürzlich in Keplers Papieren gefunden und als diejenige erkannt hat, von der in einem bekannten Brief Schickards an Kepler die Rede ist. Diese Zeichnung (Abb. 1) stellt eine Rechenmaschine dar. Dadurch angeregt fand Dr. Hammer im Nachlaß Schickards eine zweite Skizze dieser Maschine (Abb. 2) sowie Bemerkungen für den anfertigen Mechaniker. Dieses Material gab zusammen mit den beiden Briefstellen, die von der Maschine handeln, ein so plastisches Bild, daß es den Verfasser, der heute Professor der Philosophie in Tübingen, aber als einstiger Mathematiker zufällig besonders für Rechenmaschinen interessiert ist und zufällig jenen Vortrag hörte, unwiderstehlich reizte, herauszubekommen, wie diese Maschine im einzelnen konstruiert war und arbeitete. Wieder durch ein unwahrscheinliches Zusammentreffen einiger Einfälle gelang ihm das bei erneuter Lektüre des von Dr. Hammer freundlichst zur Verfügung gestellten Materials zwei Tage später, und der im folgenden zu schildernde Rekonstruktionsversuch konnte noch demselben Kongreß vorgelegt werden. Neben Dr. Hammer gilt der Dank des Verfassers den Teilnehmern an dieser Diskussion.

Danach sollte jetzt möglich sein, der dazumal in Tübingen erfundenen, erbauten und jedenfalls in einem Exemplar zerstörten Maschine ebenda zu einer späten Auferstehung in einem funktionsfähigen Modell zu verhelfen. Dazu fühlt sich der Verfasser dem alten Kollegen über die Zeiten hinweg verpflichtet.

Zunächst seien noch die Briefstellen in Text und Übersetzung mitgeteilt.

Schickard schreibt an Kepler am 20. September 1623 (Kepler, Ges.-Werke XVIII, 142):

„... Porro quod tu logistice, idem ego mechanicus nuper tentavi, et machinam extruxi, undecim integris et sex mutilatis rotulis constantem, quae datos numeros statim, automathos computet, addat, subtrahat, multiplicet,

dividatque. Rideres clare, si praesens cerneres, quomodo sinistros denarium vel centenarium supergressos sua sponte coacervet, aut inter subtrahendum ab eis aliquid suffuretur...“ („Ferner: Dasselbe, was Du rechnerisch gemacht hast, habe ich in letzter Zeit auf mechanischem Weg versucht, und eine aus elf vollständigen und sechs verstümmelten Rädchen bestehende Maschine konstruiert, welche gegebene Zahlen augenblicklich automatisch zusammenrechnet: addiert, subtrahiert, multipliziert und dividiert. Du würdest hell auflachen, wenn Du zuschauen könntest, wie sie die Stellen links, wenn es über einen Zehner oder Hunderter weggeht, ganz von selbst erhöht bzw. beim Subtrahieren ihnen etwas wegnimmt.“)

Schickard schreibt wieder am 25. Februar 1624 an Kepler (ebenda S. 170/71):

„... Arithmeticum organum alias delineabo accuratius, nunc et festinate hoc habe. AAA sunt capitella cylindrorum erectorum, quibus multiplicationes digitorum inscriptae, et prominent, quantum iis opus est, per fenestrellas BBB ductiles, DDD intus habent affixas rotulas 10 dentium, sic contextas, ut mota qualibet decies, proxima sinistra semel; aut illa 10 vicibus circumacta, tertia semel etc. promoveatur. Et quidem in eandem partem; quod ut praestarem, intermedia consimili H opus fuit. Quaelibet intermedia omnes sinistras movet debita proportione, nullam vero dextram, quod singulari cautione indiget. Quotus eorum prominet per foramina CCC in scanno medio. Tandem in pavimento inferiori E vertebas et F similiter foramina pro apparitione numerorum notat, quibus inter operandum usus est. Sed ista sic tumultuarie scribi nequeunt; facilius ex autopsia cognoscentur. Et curaveram tibi iam exemplar confieri apud Joh. Pfisterum nostratam, sed illud semiperfectum, una cum aliis quibusdam meis, praecipue aliquot tabellis aeneis conflagravit ante triduum in incendio noctu et ex improvviso ibi coorto, quod Mütschelinius referre amplius sciet...“

(„Von dem mathematischen Gerät werde ich ein ander Mal eine genauere Abbildung geben; für heute nimm in Eile diese: AAA sind die Köpfechen aufrechter Zylinder, denen die Multiplikationen der Fingerzahlen aufgeschrieben sind, und sie schauen, soweit man ihrer bedarf, durch die ziehbaren Fensterchen BBB heraus. DDD haben innen fest angemachte Rädchen mit zehn Zähnen, die so ineinander greifen, daß, wenn irgendein rechts stehendes zehnmal gedreht wird, das links anschließende einmal herumgeht, oder, wenn jenes hundertmal herumgeht, das dritte einmal vorwärts bewegt wird usw., und zwar nach derselben Richtung, was die Einfügung eines ähnlichen Rädchens erforderlich machte

¹ Weiteres über W. Schickard und seine Werke: Allgemeine Deutsche Biographie, Bd. 31, 1890, S. 174 f. Heyd: Bibliographie der württembergischen Geschichte, Bd. 2, S. 591.

(H). [Bezieht sich auf eine kleine, hier nicht wiedergegebene Randzeichnung.] (Randnote: Jedes Zwischenrädchen bewegt im verlangten Verhältnis alle linken, kein rechtes, was besondere Vorsicht verlangte.) Die jeweilige Zahl wird in den Löchern CCC auf dem mittleren Brett sichtbar. Schließlich deutet E auf dem untersten Brett Wirbel und F in ähnlicher Weise Löcher zum Sichtbarmachen der Zahlen an, deren man während der Operation bedarf. Aber das kann man so hastig nicht schreiben: leichter ist es am Objekt zu verstehen. Nun hatte ich für Dich bei dem hier ansässigen Johann Pfister ein Exemplar in Auftrag gegeben, dieses ist jedoch halbfertig zusammen mit anderen Sachen von mir, vor allem etlichen Metallplatten, vor drei Tagen einer Feuersbrunst zum Opfer gefallen, die bei Nacht unversehens dort ausgebrochen ist. Darüber wird Dir Mütschelin ausführlicher berichten können. Den Verlust nehme ich sehr schwer, jetzt zumal, wo er keine Zeit hat, rasch Ersatz zu schaffen.“)

Ferner fanden sich folgende Bemerkungen für den Mechaniker:

Rechen Uhr betreffend.

1. Die zän seind gar vngleich vnd vnfleißig. Drum treibts bißweil mehr als den zehenden theil, bißweilen minder. (were besser 20 zän)
2. Die vordere glatte scheinlin excentrisch, tregt auch ettwas aus, sollten dran geträht worden sein.
3. Die einzechte zän sollen nit in die mitt zwischen zween andere: sondern just auff ain ordiarj zahn kommen, denn sonsten treibt es zweymal an einer ziffer.
4. Muß nit die null simpliciter, auch nit das 9 simpliciter, sondern jene im Subtrahieren, dieses im Addieren die linkhen zahlen heraufziehen.

Deßwegen die zahlen also aufzuschreiben:

1. fang zu der Rechten am scheinlin I an, treibs dextrorsum, wo es anfangt angreifen schreib oben 9, danach sinistrorsum, wo es anfangt zu bewegen, schreib oben 0, das vbrig gibt sich selbs.
2. weil aber die zän vnfleißig, so mach erstlich heimliche puncten. Endlich nimm das mittel zwischen zweyen.
3. die vordere löchlin stupf gerad vnder den ziffern.

Die rotas Arithmeticas zu beschreiben. Wan ein dextra rota ihre sinistram vmbtreibt, so soll auff der dextra (ante conversionem) oben 9 stehen vnd die vbrige zahlen nach der linkhen geschriben werden.

Nun betrachten wir die beiden Zeichnungen Schickards. Die offenbar ältere (Abb. 2) enthält einige Hinweise auf die innere Konstruktion des Gerätes, ist aber hinsichtlich seiner äußeren Gestalt skizzenhafter als die an Kepler gesandte (Abb. 1). Diese wurde offenbar in Erinnerung an die fertige Maschine gezeichnet, ist reine Außenansicht. Die bei Schickard verbliebene Skizze könnte im Entwurfsstadium der Maschine gezeichnet sein. Auffällig, daß sie nur fünf Walzen und von nun gewiß gemeinten fünf Drehscheiben nur zwei, diese aber vergrößert zeigt.

Rein äußerlich ergibt sich in beiden Bildern ein dreistufiger Aufbau des Gerätes, der dem einer modernen Rechenmaschine auffallend ähnelt: Oben das Zählwerk, in der Mitte das Rechenwerk und unten das Resultatwerk, so könnte man meinen. Es fehlt nur die Kurbel, und man ist versucht anzunehmen, die sei wohl als selbstverständlich in der Zeichnung einfach fortgelassen.

Aber die in den Briefen angegebene geringe Zahl der hinter diesem Gehäuse spielenden Zahnräder läßt es ausgeschlossen erscheinen, daß hier drei mechanisch miteinander gekoppelte Mechanismen vorliegen. Vielmehr handelt es sich um drei ganz verschiedene Apparate, die hier geschickt zusammengestellt worden sind, so daß der Rechner wechselweise mit ihnen arbeiten kann. Dabei braucht er, wie wir sehen werden, nicht im Kopf zu rechnen, sondern nur noch Stellen und Ziffern richtig abzulesen und zu übertragen. Das dürfte dem Erfinder bereits als ein hoher Grad der Mechanisierung erschienen sein, ja wohl als der höchste erreichbare, kannte er doch natürlich nicht die Maschinen, die erst Später concipieren und infolge fortgeschrittenerer Technik auch bauen konnten.

Die 17 Zahnräder, von denen Schickard in seinen Briefen spricht, stecken alle im Mit-

Bildnis des Professors
für Hebräisch
und Astronomie

Wilhelm
Schickard

Im Besitz der
Universität Tübingen

Gemalt 1632

Aufnahme: Göhner



teil und bilden dort in gleich zu erläutern-der Weise eine sechsstellige Additions- und Subtraktionsmaschine mit automatischer Zehnerübertragung, wie sie noch heute in jeder Rechenmaschine, jedem Kilometerzähler, jeder Gas- und Wasseruhr und dergleichen enthalten ist. Das erklärt viele der Angaben Schickards. Offenbar hatte er sich lauter gleiche Zahnräder mit zehn Zähnen anfertigen lassen. Sechs davon „verstümmelte“ er, indem er neun von den zehn Zähnen abfeilen ließ, so daß nur noch einer übrig blieb. Jedes dieser verstümmelten Rädchen wurde fest auf je eine Achse der sechs Drehscheiben montiert, bei drei von ihnen vor, bei den drei anderen hinter ein gleichfalls auf dieser Achse fest sitzendes vollständiges Zahnrad, mit dem einzigen Zahn genau einem von dessen Zähnen gleichstehend. Auf derselben Achse dürfte außerdem noch eine kurze Walze befestigt gewesen sein, in welche die oben im Fensterchen sichtbar werdenden Ziffern graviert wurden. Eine kleine Detailzeichnung rechts auf der Entwurfskizze läßt darauf schließen, daß Schickard daran gedacht hat, dieses ganze Aggregat später aus einem Stück als Walze zu formen. Hier ist ein Ansatz für die spätere Erfindung der Staffelfalze zu spüren. Man sieht deutlich den einzigen aus dieser Walze ragenden Zahn.

Der einzige Zahn des verstümmelten Rades greift nun bei jeder Umdrehung der betreffenden Scheibe einmal nach von vorn gesehen links in ein vollständiges Zahnrad, das allein auf einer von außen nicht sichtbaren Achse sitzt und in festem Eingriff mit dem vollständigen Zahnrad der nach links folgenden Drehscheibe steht. Diese wird so in der gleichen Drehrichtung wie die erste um einen Zahn weitergedreht. Der einzige Zahn des auf dieser zweiten Drehscheibenachse sitzenden verstümmelten Rades wiederum setzt in derselben Weise die nächstfolgende Drehscheibe über ein Umkehrad jeweils hin und wieder um einen Zahn in Bewegung und so fort bis zur sechsten und letzten Drehscheibe.

Nimmt man so für jede der sechs Drehscheiben je ein vollständiges und ein verstümmeltes Rad an, für die Erhaltung der Drehrichtung der Scheiben je ein vollständiges Zwischenrad an den fünf Übergängen, so kommt man auf die von Schickard angegebene Zahl von elf vollständigen und sechs verstümmelten Rädern. Überlegt man sich diese Anordnung genauer, so bemerkt man,

daß das vollständige Rad auf der rechter Achse und das verstümmelte auf der linken ohne Eingriff in andere Räder sind. Aber sie dürften wichtige Funktionen gehabt haben. Jede Scheibe braucht hier ein Zehnerad, in das irgendeine, hier nicht angegebene Bremse Zahnweise einrasten kann, damit die Ziffern genau und fest in den Fensterchen stehen. Das dürfte die einzige Funktion des rechten Rades für seine Achse gewesen sein. Und der einzige Zahn an der linken Achse dürfte an eine Sperre, eine Warnvorrichtung, Klingel oder was es war, gestoßen sein, wenn die Addition 1 000 000 erreichte oder überschritt und wenn die Subtraktion die Null erreichte oder überschritt. Das dürfte insbesondere bei dem gleich zu schildernden Verfahren der Multiplikation bzw. Division wichtig und fehlerverhütend gewesen sein, wie wir Entsprechendes auch bei modernen Maschinen kennen.

Zunächst aber muß überlegt werden, wie man mit dem bisher beschriebenen Teil der Maschine addierte und subtrahierte. Dazu sind die Drehscheiben selbst zu erläutern, von denen die erste Zeichnung der Klarheit halber nur zwei zeigt, die zweite sechs, aber ohne Details. Zusammen mit den darauf bezüglichen Bemerkungen ergibt sich daraus wohl: Die Scheiben saßen fest auf ihren Achsen und trugen zehn Löcher zum Einstecken eines Stiftes, mit dem man sie drehte, wie wir heute die Scheibe des Telefonwählers drehen. Um die Scheibe herum trug eine am Gehäuse feste Skala die Ziffern 1 bis 0. Beim Addieren stach man mit dem Stift in das Loch bei der 0 und drehte rechts herum bis zu der zu addierenden Ziffer. Beim Subtrahieren stach man bei der zu subtrahierenden Ziffer ein und drehte links herum bis zur 0 zurück. Infolge der automatischen Zehnerübertragung addierte und subtrahierte das Maschinchen augenblicklich alle Zahlen, die man so hineinschrieb, ähnlich, wie das heute der allbekannte Addiator nicht ganz so automatisch besorgt.

Nun zum oberen Teil der Maschine, in dem sich nach Schickard's Angabe sechs aufrecht stehende Walzen befanden. Was stand auf ihnen, und wozu dienten sie?

Die „multiplicationes digitorum“ waren darauf vermerkt, also das kleine Einmaleins. Und gerechnet wurde im Grunde nach dem noch heute üblichen Algorithmus für die schriftliche Multiplikation.

Das eigentliche Vorbild aber dürften die damals sehr bekannten Rechenstäbe dessel-

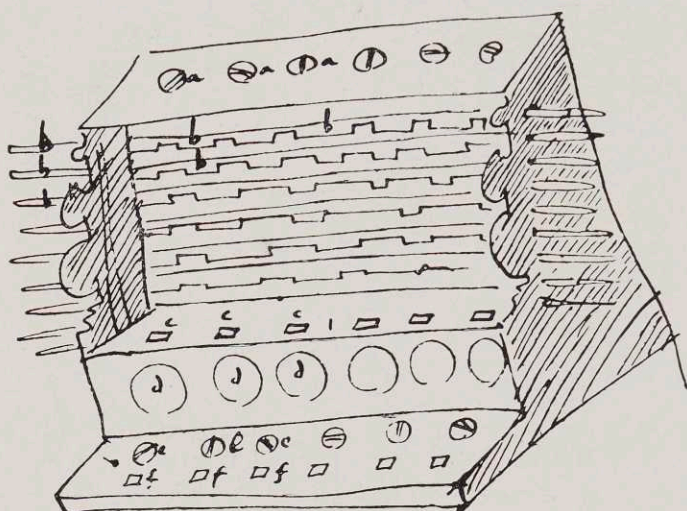


Abb. 1: Die in Keplers Papieren aufgefundene Zeichnung der Rechenmaschine

1	2	3	4	5	6	7	8	9	0
2	4	6	8	10	12	14	16	18	0
3	6	9	12	15	18	21	24	27	0
4	8	12	16	20	24	28	32	36	0
5	10	15	20	25	30	35	40	45	0
6	12	18	24	30	36	42	48	54	0
7	14	21	28	35	42	49	56	63	0
8	16	24	32	40	48	56	64	72	0
9	18	27	36	45	54	63	72	81	0

Abb. 3: Beschriftungsschema der aufrechten Zylinder

ben Neper gewesen sein, für dessen Logarithmen sich Schickard so einsetzte. Diese Stäbe waren so etwas wie eine umlegbare Einmaleins-Tafel auf vierkantigen Stäben, mit der man sehr elegant und sicher große Zahlen miteinander multiplizieren konnte, ohne im Kopf multiplizieren zu müssen. Allerdings brauchte man daneben Papier und Stift und die Fähigkeit sicheren Addierens. Die Zylinder und Schieber, mit denen Schickard arbeitet, sind nun, insbesondere in Verbindung mit dem Addierwerk, eine bedeutende Verbesserung dieser Neperischen „Raptologie“. Hier stand auf jedem Zylinder das ganze Einmaleins, während man bei Neper sich unter den zehn Stäbchen die richtigen mit den richtigen Seitenflächen bei Beginn der Aufgabe herausuchen mußte, genügte nun Einstellung durch einfaches Drehen der Zylinder. Jeder davon war wohl so beschriftet, wie es Abb. 3 am längs geschlitzten und ausgebreiteten Zylindermantel zeigt. Die Schreibung zweistelliger Zahlen ist hier den Neperischen Rechenstäben entlehnt.

Stellt man dann durch geeignetes Drehen der Walzen an den als Wirbel ausgebildeten oberen Enden ihrer Achsen den Multiplikatoren einer Multiplikationsaufgabe (z. B. 1427 mal 213) in die oberen Fenster, so daß dort 0 0 1 4 2 7 zu sehen war, so standen in den Fenstern darunter, noch durch die horizontalen Schieber verdeckt, die der Nummer des Schiebers entsprechenden Vielfachen dieser Ziffern.

Zur Ausführung der Multiplikation beginnt man etwa mit der rechten Ziffer des Multiplikators, zieht also den Schieber 3. Sichtbar werden in den sechs Fenstern seiner Zeile die Zahlen 0 0 3 1/2 6 3/1. Sie werden, rechts beginnend, in die darunter befindlichen Drehscheiben, deren Fensterchen zuvor auf Nullstellung gebracht sein müssen, addierend eingedreht. Bei zweistelliger Zahl kommt die vordere Ziffer mit in die links folgende Scheibe. Dann schließt man diesen Schieber und zieht den für die nach links folgende Ziffer des Multiplikators. Im vorliegenden Fall ist das eine 1. Die erste Zeichnung läßt diese Fensterchen permanent offen, die zweite Zeichnung aber läßt auch sie durch einen Schieber verdeckt sein. Jedenfalls finden wir, daß die Ziffern 1 4 2 7 addiert werden müssen. Wir beginnen wieder rechts, dieses Mal aber bei der zweiten Drehscheibe von rechts. Sie nimmt die Ziffer 7 auf, die dritte von rechts die 2 usw. Endlich wird der Schieber 2 gezogen und die erscheinenden Zahlen 2 8 4 1/4 werden gleichfalls auf die Drehscheiben übertragen, indem man dieses Mal mit der dritten Scheibe von rechts beginnt. Die Fenster über den Drehscheiben zeigen dann bereits das Ergebnis der Multiplikation, nämlich 3 0 3 9 5 1.

Dieses Vorgehen entspricht genau dem folgenden Rechengang beim schriftlichen Rechnen und beim Rechnen mit Neper's Stäben:

$$\begin{array}{r}
 1427 \times 213 \\
 \hline
 21 \\
 126 \\
 3 \\
 \hline
 1427 \\
 14 \\
 284 \\
 \hline
 303951
 \end{array}$$

Die Walzen und Schieber ersparten dem Rechner dabei die Kenntnis des Einmaleins, was in der damaligen Zeit keine Kleinigkeit war. Die Drehscheiben ersparten ihm das Merken der Zehnerübertragung und die gesamte Schlußaddition. Automatisch konnte man sich diesen Prozeß damals kaum vorstellen. Kein Wunder, daß Schickard entzückt von seiner Erfindung war, die übrigens so ganz zum Stil seiner in mechanische Spielereien verliebten Zeit paßte.

Für den unteren Teil der Maschine findet sich erst bei der Division eine Verwendung. Er besteht aus sechs einfachen, an Wirbeln auf ihrer Achse drehbaren Scheiben, welche rundum die Ziffern 1 bis 0 tragen und in je einem Fensterchen einzustellen erlauben. In diesen unteren Fenstern können also bis zu sechs Ziffern angemerkt werden.

Eine Divisionsaufgabe (z. B. 303951 : 1427) könnte man, wieder dem heute noch üblichen Algorithmus und dem Verfahren der Stäbchenrechnung folgend, etwa folgendermaßen lösen (vergleiche die folgende schriftliche Rechnung):

$$\begin{array}{r}
 303951 : 1427 = 213 \\
 \hline
 14 \\
 284 \\
 \hline
 18551 \\
 1427 \\
 \hline
 4281 \\
 21 \\
 \hline
 126 \\
 3 \\
 \hline
 0000
 \end{array}$$

Mit Hilfe der Drehscheiben bringt man den Dividenden 303951 in die mittleren Fenster, durch Drehen der Walzen den Divisor 1427 in die obersten Fenster. Nun sucht man durch Ziehen der Schieber dasjenige Vielfache des Divisors, das sich ohne negatives Ergebnis noch gerade vom Dividenden abziehen läßt. In unserem Fall liefert Schieber 2 die Zahlen 2 8 4 1/4. Links unter der linken Ziffer des Dividenden beginnend ziehen wir diese Zahlen ab, indem wir sie subtrahierend in die betreffenden Drehscheiben drehen. Die 2, die Nummer des Schiebers, wird im linken unteren Fenster angemerkt.

Die mittleren Fenster zeigen derweil bereits den neuen Dividenden 0 1 8 5 5 1. Wir verfahren weiter wie soeben. Schieber 1, bzw. entsprechend der ersten Skizze die permanent offenen Fenster der obersten Zeile zeigen, was hier abzuziehen ist, nämlich 1 4 2 7, die 1 ist unten rechts neben der 2

anzumerken. Die mittleren Fenster enthalten als Rest und neuen Dividenden nach der Subtraktion 0 0 4 2 8 1. Ein dritter Schritt genau derselben Art ergibt bei Schieber 3 die Zahlen 3 1/2 6 3/1. Zieht man sie entsprechend ab, so stehen die mittleren Fenster alle auf Null, die Division ist aufgegangen, und vermerkt man in den unteren Fenstern die Schiebernummer 3 an dritter Stelle von links, so steht dort das Ergebnis der Division 213.

Etwa in dieser Weise, viel leichter und schneller, als sich durch eine solche langatmige Beschreibung wiedergeben läßt, kann man mit dieser Maschine also tatsächlich die vier Rechenarten ausführen und unter Anwendung geeigneter Algorithmen und Handhabungsschemen gewiß auch höhere Rechnungsarten, Freilich nicht vollautomatisch im späteren Sinn des Wortes. Das Wesentliche an den späteren Maschinen ist die Kurbelbedienung und der damit und mit dem verschiebbaren Wagen mögliche andere Algorithmen von Multiplikation und Division. Diese werden bekanntlich in Additionen bzw. Subtraktionen gleicher Summanden zerlegt, die ihrerseits als Kurbeldrehungen gezählt werden. Schickard übertrug bekannte Algorithmen nur streckenweise ins Mechanische. Sein Rechner brauchte nur noch die sechs Stellen richtig zu zählen und abgelesene Ziffern richtig in Drehscheiben zu übertragen. Das Herzstück seiner Maschine, das Zehnerübertragungswerk, aber war im Prinzip schon das aller späteren.

Sollte dieser Rekonstruktionsversuch der einstigen Wirklichkeit entsprechen, so war diese Vorläuferin der bekannten Rechenmaschinen nicht zu verachten und wird man ihrem Erfinder eine ehrenvolle Erwähnung am Beginn der Geschichte der Rechenmaschinen kaum mehr versagen können. Zumal sich Gedankengänge angeben lassen, die folgerichtig von dieser alten zur modernen Rechenmaschine führen. So könnte ein Rechner an Schickards Maschine bald bemerkt haben, daß die von den Schiebern enthüllten Ziffernreihen sich durch wiederholte Additionen der obersten ergeben, daß man also prinzipiell, nur unter häufigerem Drehen der Scheiben, mit diesen Fensterchen allein auskommen könnte. Damit wäre er auf das Prinzip gekommen, mit dem die späteren Maschinen arbeiten. Er würde nach Wegen gesucht haben, die Addition der ganzen Zeile auf einmal und rein mechanisch zustande zu bringen und hätte so früher oder später die Kurbel, dann die bekannten Staffelwalzen oder Sprossenräder erfunden und bald die ganze, an Zahnrädern und anderen Teilen so viel reichere moderne Rechenmaschine.

So etwas aber war zu Schickards Zeiten aus einem ganz anderen Grund undenkbar: Die damaligen Zahnräder hatten noch nicht die erst um 1650 von Desargues und um 1676 von Römer erfundene, meist aber Huyghens zugeschriebene, reibungsarme und in beiden Drehrichtungen feste Cycloidenverzahnung. Schon mit den wenigen Rädern, die in seiner

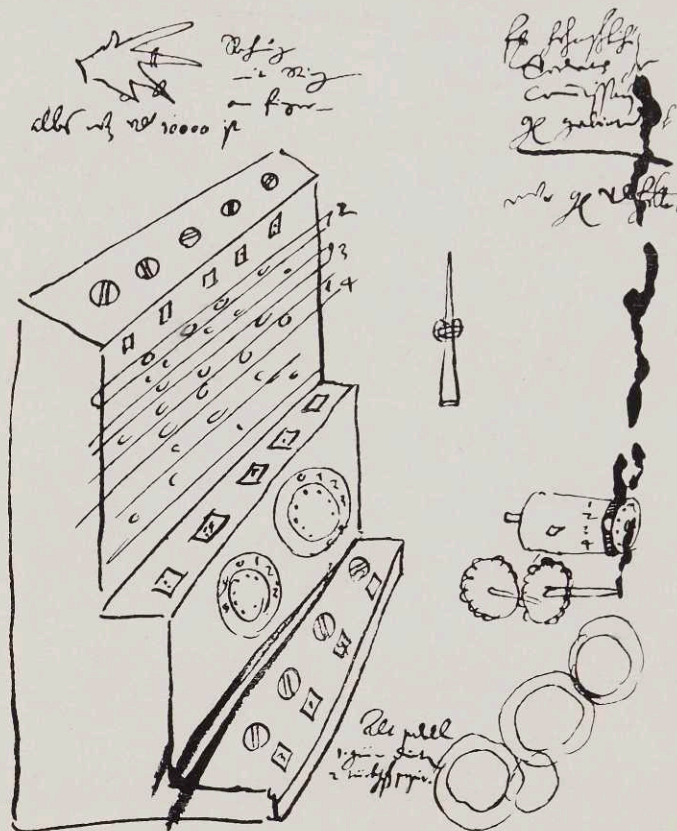
Maschine ineinandergriffen, hat Schickard offenbar seine liebe Not gehabt, wie auch später Pascal und Leibniz an solchen Schwierigkeiten scheiterten. Denn die Ungenauigkeiten und Reibungen addieren sich bei einer solchen Zehnerübertragung. Wenn z. B. zur Zahl 0 9 9 9 9 9 eine 1 an letzter Stelle addiert werden soll, so müssen von der letzten Scheibe aus alle Räder zugleich um genau einen Zahn gedreht werden. Nur zu leicht wird man bei den vielen Spielräumen an der rechten Scheibe einen Weg von mehr als einem Zahn brauchen, um die Scheibe ganz links um einen Zahn weiterzubringen. Und die aufgewandte Kraft wird ganz erheblich sein müssen, um neben dem Widerstand der sechs bremsenden Rastfedern die Reibungen der Achslager und vor allem der Verzahnungen zu überwinden. Wir sehen, daß Schickard sich bemühte, durch geeignetes Anbringen der Ziffern auf den Walzen der Drehscheiben diese Fehlerquellen seiner klapprigen Mechanik auszugleichen, aber das wird nur wenig Erfolg gehabt haben, da sich solche Fehler bei Addition und Subtraktion in verschiedener Richtung auswirken.

Derselbe Grund dürfte damals eine Ausweitung der Maschine Schickards auf mehr als sechs Stellen verhindert haben. Andererseits dürfte diese Beschränkung ihrem praktischen Wert und damit der Verbreitung entscheidend geschadet haben. Auf Abb. 2 oben ist eine Hand mit Ringen abgebildet, und eine dabei stehende Notiz zeigt, daß Schickard empfehlen wollte, bei größeren Zahlen, als die Maschine aufnehmen konnte, entsprechende Anzahlen von Ringen auf die mit Stellenwert versehenen Finger der linken Hand zu streifen und so die Anwendbarkeit der Maschine zu erhöhen.

Schickard hat auch gesehen, welche Schwierigkeiten in der Verzahnung liegen, und notiert ganz richtig, daß es mit 20 Zähnen wohl besser ginge. Vielleicht wurde die für Kepler bestimmte und so tragisch verbrannte zweite Maschine bereits aus solchen Rädern zusammengesetzt. Diese Schwierigkeiten aber zeigen, daß bereits Schickards Entwurf den technischen Möglichkeiten seiner Zeit um gerade das noch fruchtbare Maß voraus war.

Um diese Maschine, die im Mittelteil im Wesentlichen genau die Pascals war, im ganzen aber weit geistvoller als diese, ist es still geblieben. Als der 19jährige Pascal seine Maschine gebaut hatte, gab es großes Aufsehen. „So schildert etwa ein Gedicht von Loret, wie die Maschine im Luxembourg aufgestellt wurde, und wie Herzoginnen und Leute von hohem Adel hinströmten, um die Wunder dieser Erfindung zu schauen.“ (E. Wasmuth, Blaise Pascal, Berlin 1938,

Abb. 2:
Entwurfszeichnung
zur Rechenmaschine
aus dem Nachlaß
Schickards



S. 110). Pascals Schwester schreibt in der Lebensbeschreibung ihres Bruders: „Dieses Werk wurde als Naturwunder angesehen, weil dadurch eine Wissenschaft, die ganz und gar im Geiste wohnt, in eine Maschine eingefangen wurde, und weil damit die Mittel gefunden waren, alle Operationen dieser Wissenschaft mit absoluter Sicherheit auszuführen, ohne die Vernunft zu benötigen“ (Übersetzung nach Paul Rüttenauer, Blaise Pascal, Leipzig 1938, S. XXXIII). In Tübingen aber war es anscheinend schon neunzehn Jahre früher gar nicht weiter aufgefallen, daß der Professor Schickard wieder einmal ein Teufelswerk ausgeknobelt hatte!

Wenn Heutige versuchen wollen, diese alte Maschine nachzubauen, dann wird es nicht darum gehen können, eine genaue Kopie des einst in Tübingen zur Freude seines Erfinders und wohl zum Schauer manches Frommen hurtig klappernden Mechanismus zu liefern. Dazu reichen Zeichnungen und Angaben nicht aus. Vielmehr sollte man mit modernen präzisen Zahnrädern, Lagern und Walzen die Idee des Erfinders so gut verwirklichen, wie er sie nur irgend vor seinem geistigen Auge sehen konnte. Man sollte nach seiner Idee eine Maschine bauen, die das wirklich sicher leistet, was die seine wohl nur unter seiner liebevollen Hand konnte.

72 Barrow St .
New York 14, N.Y.

Oct. 22, 1957

Dear Professor:

I am really sorry to have taken so long in going over the manuscript, but I have been harassed by various pressures in the last couple of weeks, and didn't want to read the work in short snatches. I did think though about the problem and the dangers of my going into fiction writing at this stage of the game, and before I sat down in earnest with the manuscript I decided that I should stick to my last, and not hazard a fling at what is really an unfamiliar trade. I regret having to say this, but it's hard enough work banging away at this particular last.

I took most of today to read the manuscript, and while I agree with you that parts of it are in quite unfinished ~~state~~ form, and while I have the impression that the motivations of some of the characters and the conflicts between them need major realignment, I do think the subject matter deeply interesting. If you don't mind my offering advice, may I suggest this: don't rework the manuscript yourself -- hand the whole business over to a competent playwright as the basis for a dramatic work. There are several advantages to this course. First -- and this I think is important -- your position vis-a-vis the adapter is clear: you are an author whose work is being adapted for the stage, and not a novelist whose work is being adapted by another novelist. Second, if the thing comes off you make more money out of it. Third, ~~it~~ for a play it is primarily the dramatic development and the motivations that need strengthening; a playwright ~~would do the strengthening~~ ~~and~~ require comparatively little more background material about the period and the area that concerns you presently, but a novelist might have to do quite extensive further research on the period in order to carry the characters along in a really satisfactory manner. Furthermore, if you decided to have the idea put into dramatic form you could just hand the manuscript over to a capable agent -- William Morris or MCA, for example -- and let the agent do all the worrying and negotiating.

I hope you will give some consideration to this suggestion, because I think it might well provide a good answer to a problem that might otherwise cost you a lot of sweat. Warning: If you do get a collaborator, may I suggest that you have a competent lawyer draw up your agreement. With such arrangements, things are always easier when the rules are laid down in advance.

My best regards to Mrs. Wiener.

Sincerely,

Thomas Whiteside

Thomas Whiteside

[ans 10/29/57]

October 22, 1957

Professor Ulf Grenander
Brown University
Providence 12, Rhode Island

Dear Professor Grenander:

Thank you for your letter of October 11th, which I am sorry has had to remain so long unanswered because of pressure of work.

In regard to the proposed volume of papers to be dedicated to Harald Cramer, I will be happy to prepare an article entitled "The Degenerate Case of Multiple Prediction, and trust this is what you have in mind.

Sincerely yours,

Norbert Wiener

NW:AD

[ans 11/27/57]

October 22, 1957

Mr. I. F. Stone
301 E. Capitol Street
Washington 3, D. C.

Dear Mr. Stone:

I am very much complimented by your having my article reprinted. I am also touched by your offer to give me a subscription to your Journal. However, I am afraid I would not have much opportunity to read it, although I should most certainly like to do so, as at present there are so many articles which must claim my attention. Nevertheless I would like very much to receive any articles which may carry material of particular interest to my work.

Sincerely yours,

Norbert Wiener

NW:AD

Rudolf Virchow Medical Society in the City of New York

October 23rd, 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:

I thank you for your prompt answer. We are especially glad that Mrs. Wiener decided to come with you.

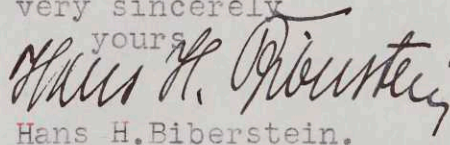
Reservations have been made at the Hotel Plaza, corner Central Park South & Fifth Avenue, by Dr. Henry Lax, our Vice-President (Tel: Regent 7 1790).

The chairman of our Program Committee, Dr. Hans J. Behrend (Tel: Endicott 2 9656) will call for you at the hotel at 6:15, to take both of you to the Academy for the dinner, which is to start at 6:30.

The presidents of the regional medical societies have been invited. We are expecting a large audience. If it does not cause an inconvenience for you we intend to put on the tuxedo for the occasion.

Looking forward to a very enjoyable evening I am with kindest regards

very sincerely
yours



Hans H. Biberstein.

National Education Association

LYMAN V. GINGER, President

WILLIAM G. CARR, Executive Secretary



1201 SIXTEENTH STREET, N.W.
WASHINGTON 6, D. C.
ADAMS 4-4855

October 23, 1957

Dr. Norbert Wiener
Massachusetts Institute of Technology
Cambridge, Massachusetts

Dear Mr. Wiener:

A member of the National Education Association has sent me a clipping from the Indianapolis News which reports an address by you at Crawfordsville.

I am not writing to take issue with the views you expressed about the schools. In spite of your adverse comments, I am glad that you are turning your attention to the public schools, for university scholars can certainly do much to improve them.

However, the purpose of this letter is to ask you a question regarding the following paragraph in the newspaper account of your address:

"The MIT professor charged that the American school system is in the hands of the National Education Association, which he called 'a powerful and self-perpetuating lobby of vested interests.'"

I should like to ask you if these words were, in fact, uttered by you. If your answer is in the affirmative, I should like to ask you a second question:

What evidence led you to such conclusions? When a distinguished scholar at a distinguished institution is quoted as making statements of this kind, I feel that it is my duty to ascertain whether he has been correctly quoted and upon what evidence he has relied.

If you did indeed make the statement, it is clear that you know nothing about the National Education Association, its work, its policies, or its control. The American school system is certainly not "in the hands" of the NEA. No organization in America has more consistently emphasized the desirability of local and state control of education. It certainly is not "self-perpetuating." The Massachusetts Institute of Technology may be governed by a self-perpetuating Board of Regents, -I do not know about that, -but the officers of the National Education Association are elected by delegates representative of the entire membership. None of the officers have more than a three-year term; most of them serve a single year.

The National Education Association does express the views of its members with respect to national legislation affecting the schools and colleges. I can hardly believe that you would argue that school people should refrain from informing the Congress as to the opinion of the profession on such matters.

I shall be greatly obliged to you if you will advise me whether or not you made the statement attributed to you and what caused you to announce such a fantastic conclusion, with all the support of your great scholastic reputation, without some reasonable effort to acquaint yourself with the facts.

Very truly yours,

William G. Carr

Executive Secretary

WGC:lo

Room 12-104

DEPARTMENT OF CHEMICAL ENGINEERING

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

CAMBRIDGE 39, MASSACHUSETTS

October 23, 1957

To be answered

Professor Norbert Wiener
Room 2-276
Massachusetts Institute of Technology
Cambridge 39, Massachusetts

Dear Professor Wiener:

Since, at our brief meeting last Friday morning, you agreed to speak at one of the colloquia of the Chemical Engineering Graduate Society, this letter is to acquaint you with a few pertinent details.

The Chemical Engineering Graduate Society is an organization of the graduate students of the department. The Society sponsors a faculty-student dinner and several other social affairs in addition to presenting three colloquia per semester. The audiences at these colloquia are usually composed of first- and second-year graduate students and members of the faculty. While not wishing to restrict the topic of your talk, we feel that perhaps a qualitative discussion of automatic process control, possibly of non-linear systems, might be of interest to the group.

In the past, each colloquium has been preceded by a coffee hour which begins at 3:30 p.m. The talks are scheduled for 4:00 p.m. and, as often as possible, are followed by a small dinner, limited to twelve to fifteen persons, for the speaker. If you will be our guest for dinner, we shall consider it an honor.

We have tentatively scheduled our second colloquium between the 2nd and the 18th of December, and our third colloquium between the 6th and 17th of January. If you should be able to speak during either of these periods, please acquaint me with the date and subject of the talk at your earliest convenience.

Sincerely yours,

David B. Cotton

David B. Cotton
(For the Colloquium Committee)

DBC

cc: Mr. D. H. Klipstein

[ans 11/4/57]

October 23

Dear Robert, at the Faculty Club yesterday you vanished so suddenly that I had no occasion to say good bye to you and to tell you how I enjoyed your company and all the interesting new things you showed me. Some of the viewpoints are really new to me, and I am glad to have learned from you.

Hope it won't be so long next time before we have a chat again.

Thanks again! It was also very pleasing to find you in so good spirits and good health

Yours

Will

Feller

FUNK & WAGNALLS UNIVERSAL STANDARD **ENCYCLOPEDIA**

UNICORN BOOKS, INC. 53 EAST 77TH STREET NEW YORK 21, NEW YORK

RICHARD M. GORDON
Executive Editor

October 23, 1957

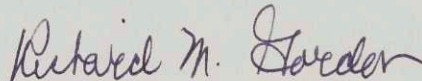
Dear Professor Wiener:

I was very glad to receive your comments on our articles on Cybernetics and Probability, and pleased to know that you found them in good shape.

Enclosed is our check for thirty dollars.

Many thanks for your continued assistance.

Very truly yours,



Richard M. Gordon
Executive Editor

Professor Norbert Wiener
Massachusetts Institute of Technology
Cambridge 39, Massachusetts

CONFERENCE ON METHODS IN PHILOSOPHY AND THE SCIENCES

66 WEST 12TH STREET, NEW YORK 11, NEW YORK : at THE NEW SCHOOL FOR SOCIAL RESEARCH

Honorary President

HORACE M. KALLEN

Chairman

HENRY MARGENAU

Secretary-Treasurer

WILLIAM GRUEN

October 23, 1957

Dear Professor Wiener,

EXECUTIVE COMMITTEE

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William Barrett

Eleanor D. Berman

Peter van De Kamp

Charles Frankel

Mason W. Gross

William Gruen

James Gutmann

Banesh Hoffmann

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George E. Kimball

Bernard O. Koopman

Henry Margenau

Sidney Morgenbesser

Milton K. Munitz

Ernest Nagel

Paul Oppenheim

I. I. Rabi

Sidney Ratner

Robert Bruce Raup

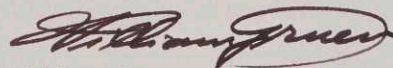
The next meeting of the Conference on Methods in Philosophy and the Sciences is to be devoted in part to the subject: "New Ideas of Man and the Machine". We wish to invite you to participate in this conference by presenting a brief talk on some topic in this general area. Our meeting will be held on Sunday morning, December 1, 1957.

You have appeared on our program on a previous occasion. (In 1949, I believe.) I assume then that you are acquainted with the nature and interests of our organization. The enclosed announcements of two past meetings will give you some impression of our recent activities.

As you know, the papers read at our meetings are usually of less than 40 minutes duration. Some of our participants prefer to speak informally from notes.

In view of the fact that printed announcements must be made ready well in advance of our meeting, I will be very grateful to you if you would send me your reply this week. Please send it to me at New York University, Washington Square, New York 3, N.Y.

Cordially yours,



William Gruen

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

P.S. I enclose a stamped and addressed envelope for your convenience. Incidentally, the Conference on Methods would reimburse for traveling expenses incurred in connection with our meeting.

W.G.

[ans 10/24/57 and
11/1/57]

CONFERENCE ON METHODS IN PHILOSOPHY AND THE SCIENCES

You are cordially invited to attend the
40th SEMI-ANNUAL MEETING on

SUNDAY, NOVEMBER 25th, 1956

To be held at

NEW SCHOOL FOR SOCIAL RESEARCH

66 WEST 12th STREET, NEW YORK 11, N. Y.

Registration, 9:30 to 10 A.M.

FEE \$1.50

CONFERENCE ON METHODS IN P

AT THE NEW SCHOOL FOR S

Horace M. Kallen
Honorary President

Arthur F. Bentley
Honorary Vice-President

James Gutmann
Chairman

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Eleanor D. Berman
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James Gutmann
Banesh Hoffmann
Albert Hofstadter
Sidney Hook
Horace M. Kallen
George E. Kimball
Bernard O. Koopman
Henry Margenau
Sidney Morgenbesser
Milton K. Munitz
Ernest Nagel
Paul Oppenheim
I. I. Rabi
Sidney Ratner
Robert Bruce Raup

THE Conference on Methods in Philosophy and the Sciences was organized in the spring of 1937 by a group of men who were concerned about the strong trend towards dogmatic authoritarianism, and who believed in the fundamental value of free critical inquiry.

THE Conference has met semi-annually since then. Among its discussions have been the following:

The Concept of Law in the Sciences
Method in Psychology
The Premises of Legal Thinking
Validity in Religion
Naturalism and Anti-Naturalism
Value in a World of Fact
The Theory of Language
Methods of Social Planning
Assumptions of Statistical Methods
Methods of Economic Theory
Psychological Approaches to Cultural Problems
Field and Particle in Contemporary Physics
Genesis and Genetics
Meaning in the Visual Arts
Fundamental Problems in Mathematics
Calculated Risk: its Theory and Applications
Scientific Method in Psychoanalysis
Entropy and Man
Mathematics and Social Sciences
Evolution: Cosmic and Stellar
The Image of Man
Science and its Social Context
Art and its Interpretation
"Thinking" Machines

PHILOSOPHY AND THE SCIENCES

OR SOCIAL RESEARCH, 66 WEST 12TH STREET, NEW YORK

Morning Session, 10:00 A.M.

November 25, 1956

METHODS OF EVOLUTIONARY BIOLOGY AND ANTHROPOLOGY

THEODOSIUS DOBZHANSKY, Columbia University

JOSEPH BIRDSSELL, University of California at Los Angeles

Comments by:

HOWARD LEVENE, Columbia University

THEODORE C. SCHNEIRLA, American Museum of Natural History

Discussion from the floor



Afternoon Session, 2:30 P.M.

MEANING AND TRUTH IN RELIGION

JOHN A. HUTCHISON, Columbia University

JULIAN HART, Yale University

Comments by:

HERBERT W. SCHNEIDER, Columbia University

HANS JONAS, Graduate Faculty, New School

Discussion from the floor

JOSEPH BIRDSSELL

Professor of Anthropology, University of California at Los Angeles. Visiting Professor, Institute for the Study of Human Variation. Co-author of **Races**.

THEODOSIUS DOBZHANSKY

Professor of Genetics, Columbia University. Author of **Genetics and the Origin of Species; The Biological Basis of Human Behavior**; and other books.

HOWARD LEVENE

Associate Professor of Mathematical Statistics and Biometrics. Staff member, Institute for the Study of Human Variation, Columbia University.

THEODORE C. SCHNEIRLA

Curator, Department of Animal Behavior, American Museum of Natural History. Author of **Learning and Orientation in Ants**; co-author of **Principles of Animal Psychology**.

JOHN A. HUTCHISON

Professor of Religion, Columbia University. Author of **Faith, Reason and Existence** and other books.

JULIAN HART

Noah Porter Professor of Philosophical Theology, Yale University. Author of **Towards a Theology of Evangelism**; co-author of **Humanism versus Theism**. Contributor, *Journal of Religion and Review of Metaphysics*.

HERBERT W. SCHNEIDER

Professor of Philosophy and Religion, Columbia University, Head of Division of Philosophy and Humanistic Studies, UNESCO. Author of numerous books of which the most recent are: **A History of American Philosophy; Religion in Twentieth Century America; Three Dimensions of Public Morality**.

HANS JONAS

Professor of Philosophy, The Graduate Faculty of Political Science, New School. Author of **Augustine und das paulinische Freiheitsproblem; Gnosis und spätantiker Geist**.

**CONFERENCE ON METHODS
IN PHILOSOPHY
AND THE SCIENCES**

You are cordially invited to attend the
38th SEMI-ANNUAL MEETING

on
SUNDAY, NOVEMBER 20th, 1955

To be held at

THE NEW SCHOOL FOR SOCIAL RESEARCH

66 WEST 12th STREET, NEW YORK 11, N. Y.

Registration, 9:30 to 10 A.M.

FEE \$1.50

CONFERENCE ON METHODS IN PH

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Value in a World of Fact
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Methods of Social Planning
Assumptions of Statistical Methods
Methods of Economic Theory
Psychological Approaches to Cultural Problems
Field and Particle in Contemporary Physics
Genesis and Genetics
Meaning in the Visual Arts
Fundamental Problems in Mathematics
Calculated Risk: its Theory and Applications
Scientific Method in Psychoanalysis
Entropy and Man
Mathematics and Social Sciences
Evolution: Cosmic and Stellar
The Image of Man
Science and its Social Context
Art and its Interpretation

PHILOSOPHY AND THE SCIENCES

NOVEMBER 20, 1955
Morning Session, 10:30 A.M.

JOSIAH ROYCE, 1855 - 1955

JACOB LOEWENBERG, University of California
ROYCE'S SYNTHETIC METHOD

HARRY TODD COSTELLO, Trinity College
RECOLLECTIONS OF ROYCE'S SEMINAR
IN METHODOLOGY

Comments by

JOSEPH BLAU, Columbia University

HOWARD B. WHITE, New School for Social Research

Concluding remarks by

HORACE M. KALLEN

Discussion from the floor



Afternoon Session, 2:30 P.M.

"THINKING MACHINES"

JOHN G. KEMENY, Dartmouth College
THE UNIVERSAL COMPUTING MACHINE

JULIAN BIGELOW, Institute for Advanced Study
AUTOMATIC COMPUTERS AND THE PROBLEM
OF INDEPENDENT THOUGHT

Comments by

HERBERT E. ROBBINS, Columbia University

Discussion from the floor

JACOB LOEWENBERG

Visiting Professor, Columbia University; Carus Lecturer, American Philosophical Association, 1953; editor of Royce's "Lectures on German Idealism."

HARRY TODD COSTELLO

Professor of Philosophy, Trinity College; author of "A Philosophy of the Real and the Possible."

JOSEPH L. BLAU

Assistant Professor of Philosophy, Columbia University; author of "Men and Movements in American Philosophy."

HOWARD B. WHITE

Associate Professor of Political Science, New School for Social Research; formerly Rockefeller Fellow and Fellow of the Ford fund for the Advancement of Education.

JOHN G. KEMENY

Chairman, Department of Mathematics and Astronomy, Dartmouth College.

HERBERT E. ROBBINS

Professor of Mathematical Statistics, Columbia University

JULIAN BIGELOW

Permanent member of the Department of Mathematics at the Institute for Advanced Study at Princeton, New Jersey, where he is concerned with the theory and design of automatic computers and information handling systems.

Philadelphia College of Osteopathy

SPRUCE STREET AT 48TH

PHILADELPHIA 39, PA.

JEH

Office of the Dean

SHERWOOD 8-1000

October 23, 1957

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

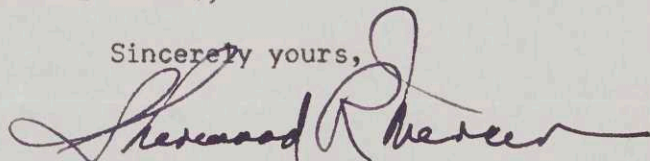
Dear Dr. Wiener:

I want to express to you my hearty personal appreciation of your tremendous contribution to the conference at Arden House. I cannot tell you how important your being there was and how helpful your comments and suggestions were.

It was a great personal privilege to meet you and to have the opportunity of working with you.

With warm regards and cordial thanks,

Sincerely yours,



Sherwood R. Mercer
Dean

SRM:mm



CASE POSTALE 6128
MONTRÉAL, October 23, 1957.

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

Dear Professor Wiener:

Each year it is the custom of the staff members and graduate students of this Institute to invite a few eminent investigators to spend one or two days with us so that we may become more familiar with their thoughts and experimental techniques than would be possible by merely reading their papers. These events are highlights of our academic year, and they are made possible through the Claude Bernard Professorships which are described in the enclosed leaflet.

According to the tradition of our Institute, the graduate students themselves select the Claude Bernard Professors among those investigators whose work has been stimulating to them. In the past we were fortunate to have Professors Bernardo A. Houssay of Buenos Aires, Henrick Dam of Copenhagen, Dwight J. Ingle of Chicago, U. von Euler of Stockholm, and many others have accepted our invitation to participate in this program.

We have followed your investigations with the greatest interest and the graduate members of this Institute would be especially pleased if you could arrange to visit us for two days, between November 14th and January 1st. Should these dates not be convenient, would you kindly let us know which dates would be most suitable for you in the near future.

We would like you to give us two lectures during the two consecutive mornings if this is acceptable to you. Let me add that our gatherings are quite informal.

The treasury will take care of your travelling expenses and there is also a nominal fee of \$50.00 per day to cover incidentals.

I know your schedule must be a very busy one, but would like to assure you that your acceptance of this invitation would be highly appreciated by all of us, including Professor Selye, who has often spoken of your work with the greatest appreciation in our staff meetings.

Hoping to receive an affirmation reply from you, I am,

Sincerely yours,

R.K. Mishra
R. K. Mishra, M.D.
Institut de Médecine et de
Chirurgie Expérimentales.

RKM/sg
Encl;

{ans 11/1/57}



LES CONFÉRENCES

CLAUDE BERNARD

INSTITUT DE MÉDECINE ET DE CHIRURGIE
EXPÉRIMENTALES

CONFÉRENCES CLAUDE BERNARD

Voulant élargir le champ de son enseignement post-scolaire dans le domaine de la recherche médicale, l'Université de Montréal vient d'établir la coutume d'inviter un certain nombre d'autorités scientifiques à venir passer quelques jours à son Institut de Médecine et de Chirurgie Expérimentales, à titre de professeurs visiteurs. Cette formule d'enseignement a été associée au nom du grand physiologiste français Claude Bernard, un des fondateurs de la médecine expérimentale.

Les étudiants de l'Institut sont pour la plupart des jeunes médecins désireux de se perfectionner dans le domaine de la recherche médicale. On a donc pensé qu'il serait opportun de leur donner la possibilité d'entrer en contact personnel avec ses représentants les plus qualifiés qui viendraient exposer devant eux, leurs propres travaux et démontrer leurs techniques.

Les professeurs des Conférences Claude Bernard sont invités par les étudiants eux-mêmes, par l'intermédiaire du Directeur de l'Institut. Ils choisissent un ou plusieurs d'entre eux pour assister le professeur visiteur au cours de son séjour. Ces assistants lui préparent à l'avance tout le matériel qui lui sera nécessaire (instruments, animaux, produits chimiques, etc.). Un laboratoire est mis à sa disposition, ainsi que les services d'une secrétaire. Il est considéré, en somme, comme un des professeurs réguliers de l'Institut.

Plutôt que des exposés formels on lui demande de donner un aperçu des faits qu'il considère les plus importants dans le domaine de ses propres investigations, mettant en relief particulièrement les apports qu'il a faits à la science médicale. Cela est généralement réalisé sous forme de deux ou trois causeries ou de discussions, suivies de démonstrations pratiques au laboratoire. Les élèves s'efforcent de s'y préparer en étudiant préalablement les publications du professeur invité; et durant son séjour à l'Institut se familiarisent, sous sa direction, avec des manières de penser et des techniques qui ont fait leurs preuves.

En vue d'établir un contact plus étroit entre les étudiants et le professeur visiteur, il est d'usage que pendant son séjour à l'Université ce dernier prenne part à toutes les activités habituelles de l'Institut, discute de leurs travaux avec les élèves et même — s'il le désire — partage leurs repas au restaurant universitaire.

Cette formule se prête particulièrement, croyons-nous à l'enseignement post-scolaire: elle permet non seulement d'accroître la connaissance des faits acquis, mais d'assister véritablement, en un sens, à la genèse de la découverte scientifique.

L'Institut assure au professeur invité, en plus de ses frais de déplacement, des honoraires en rapport avec la durée de son séjour.

THE CLAUDE BERNARD VISITING PROFESSORSHIP

In order to increase the scope of its post-graduate teaching in medical research, Montreal University has established the custom of inviting prominent scientists to spend a few days at its Institute of Experimental Medicine and Surgery, as visiting professors. These professorships are named in memory of the great French physiologist Claude Bernard, one of the founders of experimental medicine.

The students of the Institute are mostly young physicians who wish to train themselves for medical investigation. It was considered highly desirable therefore to devise a plan enabling these men to establish personal contact with outstanding representatives of medical research, who would discuss their own investigations and demonstrate their own technics.

The Claude Bernard visiting professors are invited, through the Director, by the students themselves. The latter also appoint one or more, from among their number, to act as personal assistants to the visiting professor during his stay. Before his arrival these assistants procure and prepare for the visitor whatever materials (instruments, experimental animals, chemicals, etc.) he may require.

During his visit the professor will be assigned a personal laboratory and will hold a rank equivalent to that of a resident professor at the Institute.

He is not required to give any formal lectures and is merely asked to summarize the facts which he considers most important in his field, placing particular emphasis upon his own contributions to medicine. This is usually done in the form of two or three informal colloquia, or round table discussions, which are followed by practical laboratory demonstrations. The students make every effort to prepare themselves for this by a preliminary study of the visitor's publications; during the professors' stay at the Institute, they mainly hope to familiarize themselves with the personalities and technics of men whose work proved to be successful and stimulating.

In order to establish the closest possible contact between the visiting professor and his students, it is customary for the former, while in residence at Montreal University, to participate in all the normal activities of the Institute, discuss his own research topics with the students and even take his meals with them at the University restaurant, if he so desires.

It is felt that while undergraduate instruction consists mainly in the teaching of facts, post-graduate training for research can best be acquired in this manner, since its principal object is not to teach known fact but to show by example how new discoveries are made.

The Institute will provide all the materials as well as secretarial and technical help which the visiting professor may require. Travelling expenses and an honorarium (commensurate with the length of his stay) will also be provided.

THE CHINESE BOARD
VIETNAM PROFESSORS

The board is composed of 12 members, 6 of whom are professors and 6 are associate professors. The board is responsible for the selection and appointment of professors and associate professors to the board. The board also has the authority to recommend the removal of professors and associate professors from the board.

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UNIVERSITY OF MICHIGAN
ANN ARBOR
SCHOOL OF EDUCATION

October 23, 1957

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

Dear Dr. Wiener:

Local papers carried an account of a speech of yours reported from Crawfordsville, Indiana. Despite the possibilities of journalistic mishandling, the reports suggest that you may have run across the pronouncements of the discredited Arthur Bestor, Jr., and made the natural assumption that his facts were correct.

When you make statements in your own field of specialization, they are based on your knowledge of what you are talking about. But Bestor is a historian sounding off in a different area. And his bias leads to a distortion of the facts that amounts to misrepresentation.

It is disappointing to us who have been working in this field sometime to see occasional scholars or scientists caught off base by Bestor's plausible phrases, when they are perhaps not on the lookout for the false statements and fallacies that are built into his discourse.

I went through his Wastelands a while back and pointed up a few of these features. I am sending a reprint in case you might be interested.

Needless to say we depend on the scholars and scientists for educational content, but their help is more appreciated when they are well informed.

Sincerely yours,



Wm. Clark Trow
Professor of Education

WCT:mh
Encl.

October 23, 1957

Ref: T-17,933/1580

Mrs. C. Bernstein
The Ericsson Corporation
100 Park Avenue
New York 17, New York

Dear Mrs. Bernstein:

Your letter of September 4th seems to have been mislaid and has just come to my attention. In the event that it has not been sent before, and that you still wish to have a photograph of Professor Wiener, I am enclosing one herewith. I trust it will serve your purpose.

Regretting any inconvenience this delay may have caused you,

Very truly yours,

Secretary to
Norbert Wiener

[and 10/29/57]

October 23, 1957

Mr. John Kobler
R.D. 4,
Westport,
Connecticut

Dear Mr. Kobler:

In accordance with your request,
I am enclosing a copy of "Time and Organization"
by Professor Wiener which we were unable to
locate when you were in the office yesterday.

Very truly yours,

Secretary to
Norbert Wiener

[ens. 11-1-57]

October 23, 1957

Mr. James P. McCormick
Assistant to the Vice President
Academic Administration
Wayne State University
Detroit 2, Michigan

Dear Mr. McCormick:

I have your letter of October 17th. The dates of April 16 and 17 are perfectly agreeable to me. At the moment I do not have any one in mind that I wish to have you contact, but if such should be the case I will be glad to let you know.

As you request, I will endeavor to have a copy of my paper in your hands by February 1, 1958.

Sincerely yours,

Norbert Wiener

NW:AD

*To be answered
July*

October 23, 1957

Mr. Thomas Marshall, Jr.
4306 Bettis Drive, No. 6
Houston,
Texas

Dear Sir:

Your letter of October 19th with its enclosure has been received. Professor Wiener is about to start on a short trip, but this will be brought to his attention at the earliest possible opportunity.

Very truly yours,

Secretary to
Norbert Wiener

October 23, 1957

Prof. G. Olive, Chairman
Department of Mathematics
Anderson College
Anderson, Indiana

Dear Sir:

I am in receipt of your letter of
October 18th with reference to my recent lecture
at Wabash College.

A write-up of my speech which recently
appeared in "Time" I believe will answer the questions
outlined in your letter.

Very truly yours,

Norbert Wiener

NW:AD

[ans 10/30/57]

October 23, 1957

Miss Anita Stead
Assistant to the President
The Science of Society Foundation
1502 Montgomery Road
Elkridge 27, Maryland

Dear Miss Stead:

Your letter of October 14th with its enclosure has been received. Dr. Wiener is about to start on a short trip, but this will be brought to his attention at the earliest possible opportunity.

Very truly yours,

Secretary to
Dr. Norbert Wiener

October 24, 1957

Gentlemen:

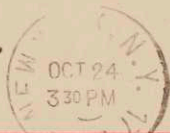
We wish to thank you for your letter of October 23, enclosing photograph of Mr. Norbert Wiener which we had requested. Our records show that on September 23 we received a photo of Mr. Wiener from MIT. However, we shall forward this one to our head office also in the event that they might be able to use another one.

Your co-operation in the matter is sincerely appreciated.

Very truly yours,
THE ERICSSON CORPORATION

C. Bernstein
(Mrs.) C. Bernstein

Ericsson Corp.
100 Park Ave.
N. Y. 17, N. Y.



GRAND CENTRAL
STATION

THIS SIDE OF CARD IS FOR ADDRESS



Massachusetts Institute of Technology
Department of Mathematics
Cambridge, 39
Massachusetts
Attention: Alice R. Dewsnap
Secy. to Norbert Wiener

October 24, 1957 ^{6:50 PM}
late

Dear Dr. Weiner;

Enclosed with this letter is a bound copy of a hypothesis I originated.

I believe it will bring closer the day when man may construct an electronic brain that functions very much as a human brain.

The fact that this hypothesis — I call it "neo-psychology" — points out that thoughts are composed of immutable units, brings closer the construction of a workable brain, as does the fact that it describes the motivator of our conscious acts and thoughts.

Please read it most carefully, and contact me if you would like

to discuss the subject thoroughly
with me.

Very truly yours,
Frank Wenzel

Frank Wenzel
10007 Hulda Avenue
Cleveland 4, Ohio.

[ans 11/4/57]



OFFICE OF THE PRESIDENT
TUFTS UNIVERSITY
MASSACHUSETTS

October 24, 1957

Professor Norbert Wiener
53 Cedar Road
Belmont, Massachusetts

Dear Professor Wiener:

This time my "dunning" letter in connection with the annual Alumni Fund drive will reach you, I trust, in Belmont, Massachusetts, rather than in India or some other far part of the world.

I know I need not belabor the point with you, for you understand all too well the special financial needs of the private college or university. If your circumstances permit you to make a contribution this year, regardless of its size, we will all be very appreciative and will be much encouraged.

Sincerely yours,

A handwritten signature in cursive script that reads "Nils Y. Wessell".

Nils Y. Wessell

NYW:m

[and 11/4/57]

Handwritten notes in top right corner:
K...
...
...
...

October 24, 1957

Mr. Abraham Edel
Department of Philosophy
The City College
Convent Avenue and 139th Street
New York 31, New York

Dear Sir:

Your letter of October 22nd enclosing
copies of the papers by Professors Grunbaum and
Scriven has been received. Professor Wiener is at
present on a short trip, but this will receive his
attention immediately upon his return the early part
of next week.

Very truly yours,

Secretary to
Norbert Wiener

October 24, 1957

Professor William Gruen
New York University
Washington Square
New York 3, New York

Dear Sir:

Your letter of October 23rd has been received. At the moment Professor Wiener is away on a short trip, but this will receive his attention immediately upon his return early next week.

Very truly yours,

Secretary to
Norbert Wiener

October 24, 1957

Mr. Robert Wallace
LIFE
9 Rockefeller Plaza
New York City, N. Y.

Dear Sir:

I am enclosing herewith a rough draft
of the speech given by Professor Wiener at
Wabash College recently, and which you requested
on your visit to this office.

Very truly yours,

Secretary to
Norbert Wiener



ADDRESS ONLY
THE REGIONAL DIRECTOR
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AND REFER TO

UNITED STATES
DEPARTMENT OF THE INTERIOR
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1006 WEST LAKE STREET
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MICHIGAN
ILLINOIS
INDIANA
OHIO

October 25, 1957

FA-Z General

Dr. Norbert Wiener
Massachusetts Institute of Technology
Cambridge, Massachusetts

Dear Dr. Wiener:

We have read with a good deal of interest the news reports and the references in Time Magazine to the talk you gave on the anniversary of the founding of Wabash College at Crawfordsville, Indiana. If available, we would surely appreciate receiving a copy of your paper. May we thank you in advance for this courtesy.

Sincerely yours,

R. W. Burwell
Regional Director

[enc 10/29/57]

OFFICE OF THE CONTROLLER
 COLUMBIA UNIVERSITY
 NEW YORK 27, N. Y.

PAY ORDER

DATE 10/25/57

Please
 send
 check to

Dr. Norbert Wiener
NAME
Massachusetts Institute of Technology
STREET AND NUMBER
Cambridge 39, Mass.
CITY STATE

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GREEK and BYZANTINE STUDIES

2504 N. St. Mary's St.
San Antonio, Texas

PE 5-6783

28 October 1957

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

Dear Professor Wiener:

The enclosed progress report describes a new and scientific quarterly devoted to Greek and Byzantine studies which will appear this winter and represent the highest level of scholarly activity.

The leading scholars in the United States and abroad are being invited to contribute serious and original papers for publication in this new periodical. They may write on any subject of their choosing: science, philosophy, law, linguistics, literature, history, art, theology, architecture, or reviews. We ask only that the papers be in some way relevant to Greek or Byzantine studies. We hope to include the best in scholarship, printing, and art work in this new enterprise.

In 1952 Ambassador Charles Malik of Lebanon wrote to President Conant that the present split between East and West goes back a thousand years to the split between Rome and Byzantium. He suggested that Harvard take the lead and become a center for Greek and Byzantine studies in the West. The enclosed progress report will show you how closely our work is integrated with work now in progress at Harvard.

In addition to scholars, we also have endorsements for GREEK AND BYZANTINE STUDIES from such outstanding figures as Dr. Malik, Governor Harriman, Governor Meyner, Dr. Paul Dudley White, Senator Wayne Morse, Archbishop Michael of the Greek Orthodox Church of North and South America, and Senator Clifford P. Case. Each of these men has expressed his willingness to collaborate with us in the publication of the Studies. It will also be of interest to you to know that both the RUTGERS UNIVERSITY PRESS and THE UNIVERSITY OF CHICAGO PRESS have expressed a definite interest in handling the distribution of the Studies.

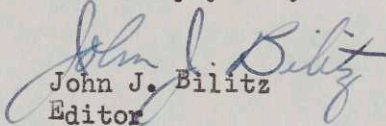
In addition to the six agencies listed on the progress report, we will be aided in the distribution and promotion of the Studies by UNESCO, the World Council of Churches, The United States Information Agency, the Department of Health, Education and Welfare, the Greek Information Agency, and the U. S. cultural attaché in Athens.

page 2 - Professor Norbert Wiener

I am writing to you because we would very much like to have a contribution from you for the Studies. Your work represents the highest level of scholarly achievement in several important fields, and it is therefore fitting that your views and findings in the History and Philosophy of Science be published in the Studies. We know that you are extremely busy, but we are hopeful that you will find time in your schedule to prepare a paper for the Studies. You may include illustrations with your article. It would indeed be an honor to print your paper. I regret very much to say that our funds do not permit us at the present time to pay contributors for their work.

Should there be any further questions, please let me know and I will be happy to reply to them promptly.

Sincerely yours,


John J. Bilitz
Editor

3 Enclosures

[ans 11/6/57]

GREEK and BYZANTINE STUDIES

2504 N. St. Mary's St.
San Antonio, Texas

PE 5-6783

PROGRESS REPORT NO. 7

1 NOVEMBER 1957

The following scholars will contribute papers to the Studies:

- * Professor George Huntston Williams.....Harvard Divinity School
- * Professor Erwin R. Goodenough.....Yale University
- *# Professor Andre Michalopoulos.....Fairleigh Dickinson Univ.
- * Professor Radoslav A. Tsanoff.....The Rice Institute
- * Professor Georges Florovsky.....Harvard Divinity School
- * Professor Morton Smith.....Columbia University
- * Professor Ivor Sevcenko.....Columbia University
- * Dr. Serge Zenkovsky.....Harvard Russian Research Center
- # Professor Peter Charanis.....Rutgers University
- # Professor Albert Bates Lord.....Harvard University
- # Dr. Sergei I. Gaposchkin.....Harvard College Observatory
- # General L. M. Chassin.....NATO, Allied Air Forces
- Professor Quentin Anderson.....Columbia University
- Professor Roman Jakobson.....Harvard University
- Professor William K. Pritchett.....University of California
- Professor Gregory Vlastos.....Princeton University
- Professor Cyril C. Richardson.....Union Theological Seminary
- Professor Matthew Spinka.....Hartford Theological Seminary
- Professor T. F. Torrance.....University of Edinburgh
- Professor Peter H. von Blanckenhagen.....University of Chicago

- * First Issue of Quarterly
- # Second Issue of Quarterly

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John J. Bilitz
Editor-in-Chief

Business Office: 603 East Ashby Place, San Antonio 12, Texas Tel. PE 5-7471

ADLAI E. STEVENSON
231 So. LA SALLE STREET
CHICAGO

September 25, 1957

Dear Mr. Bilitz:

I was glad to have your letter and to learn of the forthcoming publication of your new scientific quarterly. I think that the Greek and Byzantine Studies will close an important gap in our knowledge of that important period in our history and I am confident that it will contribute in a constructive way to a better understanding of some of the issues which both perplex and confuse so much of the world. I wish you and the Studies well.

Sincerely yours,

Adlai E. Stevenson

Mr. John J. Bilitz
Greek and Byzantine Studies
2504 North St. Mary's Street
San Antonio, Texas

The First Unitarian Church

3114 HARNEY STREET . . . HARNEY 3039

Chas. W. Phillips

~~JOHN WILLOUGHBY CYRUS~~, Minister

OMAHA 2, NEBRASKA

October 28, 1957

Dear Professor Wiener:

We have heard glowing reports of your recent participation in the convocation at Grinnell.

The First Unitarian Church of Omaha sponsors an Annual Lecture in which we attempt to present a person of competence on a subject of current significance.

This lectureship, of recent establishment as the Frank R. Hoagland Memorial Lecture, is modest in resources, but to date has been high in quality. Recent speakers have been the late A. Powell Davies and Henry Steele Commager. You would find a perceptive, appreciative audience.

Will you be in the vicinity of our city at some near future date? Because our resources are limited, we should like to arrange a date that might lessen somewhat the travel expenses for us.

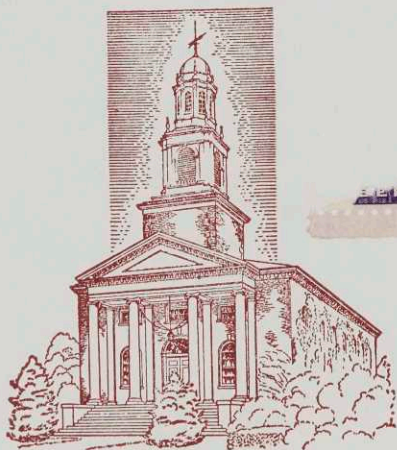
Is there such a possibility? If so, please let us know the date and honorarium.

Very truly yours,

Marie Helms

Chairman

MARIE B. HELMS
2910 North 49th Avenue
Omaha 4, Nebraska



*Mr
Wiener*

[ans 11/4/57]

S. A. R. L.

RUA DO COMÉRCIO, 49

Nº 3809/57/021

LISBOA (PORTUGAL)

28th October 1957.

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

Dear Prof. Wiener,

After my last letter of the 28th May 1957¹⁹⁵⁷ which I thanked you very much for the bibliography of cybernetics you so kindly had sent me and the books suggested as the first step for the creation of a library, now I have the pleasure to announce you the visit of two members of the group created in our Company to handle the problems connected with "Automation".

Please, forgive me in taking your precious time, but I want to let you know that after my trip to the States, we formed a group of seven members, all University-Graduated, which has started to work some months ago.

In order to improve their knowledge, we are going to send to the States, for a short stay, two of these members, Mr. Vístulo de Abreu and Mr. Cardoso Igreja.

I have advised them to contact with the M.I.T. and particularly with you.

So I would be very grateful if you could help our representatives during their short stay of about 4/5 days in Boston, in order that they can visit the departments of more interest connected with Automation.

The probable date of their arrival in Boston will be around the 27th next January 1958, but we will let you know the exact date in the near future.

Thanking you in advance, I remain

Yours sincerely,

António Gouveia Portela

António Gouveia Portela

October 28, 1957

Mr. Frank L. Harvey
Drakestown Road
Hackettstown, New Jersey

Dear Sir:

Your letter of October 21st has been received. A rough draft of the speech given by Dr. Wiener at Wabash College is enclosed herewith. I trust this will serve your purpose.

Very truly yours,

Secretary to
Dr. Norbert Wiener

JOHN J. BILITZ

EDITOR, GREEK AND BYZANTINE STUDIES

2504 N. ST. MARY'S STREET

SAN ANTONIO, TEXAS

HUNTER COLLEGE

OF THE CITY OF NEW YORK

695 PARK AVENUE

NEW YORK 21, N. Y.

Department of Speech and Dramatics

29 October, 1957

Professor Norbert Weiner
Massachusetts Institute of Technology
Cambridge, Mass.

Dear Professor Weiner:

The 1958 Annual Convention of the Speech Association of the Eastern States will be held at the Sheraton-McAlpin Hotel, New York, April 17-19. The program will include a sectional meeting on Linguistics and Speech.

We would be honored if you would wish to present a paper or a talk at this meeting.

The larger purpose of the meeting is to present, by exemplar, the area of relationships between the two disciplines and to explore the possibilities of an applied linguistics.

But there is an evangelical substratum: linguistics and "Information Theory" have, willy-nilly and piecemeal, worked into the 'Field of Speech' often simply as seminal metaphor and/or useful (and colorful) terminology. We are hopeful that a more orderly disciplinary understanding could be sketched. Additionally, the fields of pathology and therapy are suddenly aware of theoretical constructs and practical methods probably useful to them. Finally, the SAES members among its members secondary school teachers not least in the hope of introducing them to scholarly procedure and result.

The gamut of specialist interest, therefore, runs from linguistics per se and acoustic phonetics through various therapies and elocution and rhetoric. It seemed advisable therefore not to restrict the theme of the papers, but rather to present specimen problems within a given discipline and let the auditors draw their own particular implications.

Not least because "The Human Use of Human Beings" is and has been so often cited in these discussions, we are hopeful that you will be able to be present. That is not meant as flattery, actually: the book's influence ~~is~~ amongst Speech people has been considerable, but largely below the level of scholarly practice.

The meeting will be on either the 18th or 19th and probably can be set to your preference. If you can attend, might I have the title of your paper by November 10th? In hopes of your acceptance, and with thanks, I am, sir,

Yours sincerely,

William Kay Archer

William Kay Archer

Lecturer (Phonetics)

Department of Speech

Sponsor, Linguistics & Speech Section, SAES

Ms

W. Weiner

[ans 11/4/57]

13550 Kittridge Street.
Van Nuys. California.
October. 29. 1957.

Norbert Weiner.
Department of Mathematics..
Massachusetts Institute of Technology.
Mass..

Dear Sir,

To one so much alone in his efforts of the past twenty years of independent and relatively unorthodox research, it is indeed a pleasure to note that even among the scientifically dedicated there is an awakening to its natural trend as affecting individual intelligence. However--as I have indicated by terming the trend natural, I conceive this to be in the common interests regardless of how contradictory this may seem from within the evolutionary system of which its phenomenon is a part and a part only. In other words, the subdividing of an original concept and of its intelligence to something resembling the bacteriological by relationship with the original may have far more profound implications than first meet the eye..

You have no doubt read Kalmus's "Separation and Re-integration as Phases of Evolution" something that rang the bell for me as far back as the July 1943 issue of the British Institute of Philosophy Journal, in which it was published. The point is, that I look for a reversing of the trend--towards "re-integration" to occur following increasing shocks to the public intelligence as to the incapability of relatively sub-normal intellects to solve the problems resulting from the abstract behaviour for which the latter are properly designed.. The inability to recognise a relationship within a particular science must ~~less~~ less of science as a whole assures a positive lack of understanding by its individuals of the relationship of science to humanity and vice-versa, ~~apart from science~~.

I am not a scientist nor a dedicated professional in any particular sense whatsoever, though I do possess an understanding common to the same and as must anyone as conscious of his common background as he may be of anything particular about this.. For many years I have known much of value to hydraulics, aerodynamics and so forth and have been able to demonstrate this, in limited practise, but since its understanding requires the general knowledge of which you decry its lack among established authorities, ~~many~~ in charge of our natural resources and in more senses than one, I can but hope for the time when some dynamic event will rid our economy of the accumulated deadwood left over from former productive eras, originally but now no longer of appreciable value except as resistance to what the future requires to be equally resilient, receptive and adaptive..

For seven long ~~many~~ years, I have offered, to give a practical demonstration--free of charge, plus the transferring of patents as may be required and without personal profit, towards resolving what I now know to be an extremely simple problem concerning

Migratory fish (salmon trout etc.) and hydro-electric structures 2 etc. in the path of migration..I have chosen this particular problem merely towards demonstrating a universally common principle of formation, fluid as considered here..

~~If~~ Science, as demonstrated by the sub-divided intellects now in charge of the particular bureaucracy indicated here, is anything but capable..Indeed, if I could be assured of a better reception in the Soviet Union I would surrender my American citizenship immediately.. Yet somehow--in spite of Sputnik--I doubt there being more complete intellects there than are to be found on our side of the artificial, idealogical barrier.

It must be remembered, that the end product of human endeavour must be in the ability of the species to--as it were--recreate itself and not merely to have this occur without consciousness of the event. The translating of ideas into physical reality may be realistic for some people in its immediate creative sense only, by the manufacturing of machines capable of equal translations but in its reverse sense of purpose. Nevertheless, since we can but create according to like principles inherent in our own physical make up, it follows that what is created thereby plays a part in what we may become as a species. In other words, though it may be necessary to seem critical of one's fellows and of the patterns to which dedicated, it would seem more in keeping with the human stature as Man, complete and unalterable, to achieve understanding of the relationships so exposed for his viewing if but he accept a common viewpoint for so doing.

As anyone should know from experience, criticism comes easiest where responsibility is least..Indeed, it is the mark of one's own "relative" status, of the subjection of ones own inherent personality to an immediate consideration of time and place, to criticise that which may require the elimination of time and of space and, indeed, of all such immediate identities for its comprehending..Otherwise it is to grant to the "part" the quality of the whole of which it is so, and quite as you ~~now~~ recognise to be the case among the highly specialized media now active in a conscious sense of behaviour, that to achieve final reality, must be aligned with the unconsciousness of another as to its ~~ultimate~~ ultimate purpose.

Every system carries within itself the right to achieve its excesses, as these provide the necessary imbalances of value ~~to~~ in continuing the system to the fulfillment of its purpose. The oscillatory or alternating factor in progress is not limited to its physical representation in organic form or otherwise. In other words, complete consciousness should be of the principles by which progress occurs as well as of in the contrasting senses in which it appears to do so or not as the case may be. *practising these principles*

The alternating pattern whereby one scientific, political, religious and so on down the line of social identities in general, is supplanted by its opposite in meaning grants an abulatory character to what does so mentally quite as much as to what does so with like unconsciousness physically..Why then--if the opportunity occurs, *not* disassociate oneself from the pattern towards its understanding as opposed to remaining a critic of its oscillations "within". In other words, why not get on the "outside" of your subject after experiencing its innards.

The contemporary denaturing of the human mind, for its subjecting to the requirements of social relativity or group practises, is most necessary towards fulfilling the pattern of growth initiated in idea form by some original thinker, a Galileo, Newton and so forth. Otherwise, a mind free to express itself lacks the direction in which to do so, other than by its reversing towards a still more original status than that for which created or pro-created as the case may be. That such a mind develops machines in reflection of its own limited scope of attention and towards providing balance for the same, demonstrates the principle of re-creation involved in human practises where, in this case, ~~whereby~~ we have people creating machines to respond like people while themselves responding in a much larger sense like machines, for unless one feeds the right questions, in a strictly specified sense, in contacting the established professional, at this or at any time or place his responsive are equally negative and as the Galileo's, Newton's and others must have learned in their particular attempts to impart a collective appreciation of events to people interested primarily in but that of the moment for which designed--intellectually...

The nature our specialists would "conquer" is precisely their own as specialized for its time and place, all its concepts and all its meanings, as identified in a language having equally limited meaning, is as taken out of context or abstracted from the nature of man as a completely organic whole. I personally have yet to meet a physicist or a mathematician in the flesh, for I do not know of such a species other than is suggestively unreal by comparison with the nature so imposed upon. It is not that the imposition is not necessary. Most certainly it is so, but with all disciplines the purpose behind them ~~is~~ ^{is to} ~~is~~ ^{is to} their elimination to the extend of its fulfilling. In other words, in man the end purpose is equally that for the individual who does not require disciplining. *and so is worthy of a higher level of authenticity.*

If your faith is in the process of evolution but without its recognition as such, you must continue to feel at odds with its detail and as I most certainly continue to do when contacting its media, towards reducing its complexity to reasonable simplicity. If you prefer to be a functionary within the system that must involve its own destruction and so be unable to observe the function, ~~except~~ as it offends your equally subjective disciplines, then by all means continue to do so, since even this aids in the process. However, if you have the courage to step out of the production line--as it were, and to risk your professional reputation, to its discarding perhaps by doing so--then it may be you will be able to resolve the apparent contradictions always to be noted among a purportedly juxtapositioned order within and a quite organically related group from without..

I appear to have been very much on the outside of human society from birth onwards but I presume that I am not alone in this. However, since it has been unfashionable of recent years to express one's individuality ~~or~~ to be subject to misinterpretation while doing so, it follows that we are not generally aware of our likenesses to the degree by which we are made aware of our unlikenesses..

Sincerely,
Albert E. Dane.

Albert E. Dane

October 29, 1957

Mr. R. W. Burwell, Regional Director
Fish and Wildlife Service
1006 West Lake Street
Minneapolis 8, Minnesota

Dear Sir:

Your letter of October 25th has been received. Enclosed is a rough draft copy of the talk given by Professor Wiener recently at Wabash College. I trust this will serve your purpose.

Very truly yours,

Secretary to
Norbert Wiener

October 29, 1957

Mr. Jason Epstein
Doubleday and Company
575 Madison Avenue
New York 22, New York

Dear Epstein:

Whiteside does not find it possible to do it. He suggests that I look for another collaborator. My own reaction is that it is undignified for me to peddle my peanuts all around the lot, and I have the gravest doubts about finding a collaborator whom I would want, and with whom I could get on terms of understanding, even though Whiteside suggests I look for another collaborator.

I am thinking of putting off all work on the novel until next summer and then rewriting it myself. This time I intend to try to put it in the first person in the mouth of Gregory James. I think that this is an expedient which will allow me to make the sort of comment that is not acceptable to the modern novel but to make it in character and to make it contribute to the development of James' character.

Your letter of the other day heartened me very much. As you see, however, I am betwixt and between realizing very well how much more work there is to do and not at all sure of my competence to do it. I don't want to interrupt my other work with a major project like this until I am fully free for the summer.

With best regards from house to house.

Sincerely yours,

Norbert Wiener

NW:AD

October 29, 1957

Mr. W. Ballentine Henley, President
College of Osteopathic Physicians and Surgeons
1721 Griffin Avenue
Los Angeles 31, California

Dear Mr. Henley:

I am in receipt of your letter of October 22nd regarding my book "The Human Use of Human Beings". You have my permission to quote the passages to which you refer.

I am sorry there has been such a delay in replying to your letter but I have been away from my office for several days.

Sincerely,

Norbert Wiener

NW:AD

October 29, 1957

Mrs. Katherine O. Jarrell
Box 387
Harrisburg, Illinois

Dear Mrs. Jarrell:

Professor Wiener has asked me to write and tell you that because of a policy to which he must adhere he will be unable to comply with your request for his autograph. He is sorry this is so.

Very truly yours,

Secretary to
Norbert Wiener

October 29, 1957

Mr. Thomas Whiteside
The New Yorker
Rockefeller Center
New York City, New York

Dear Whiteside:

If you can't, you can't. I am very grateful to you for looking over the manuscript, and I understand the problems of calling in another author to what he can never feel to be completely his own work. I am going to work over the material myself, because it is going to be almost impossible to get the right man.

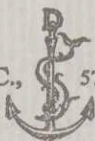
I don't agree with you that it will be necessary to change the motivation of the story, but I am quite thoroughly convinced that I have not presented the details well. I am going to rewrite it in the first person of the character of Gregory James. The sort of comment that is intolerable in the author's name may be tolerable coming in character from one of the characters of the novel. I am going to put off further work on the story until next summer. I am notifying Epstein.

Meanwhile, again accept my sincere thanks for looking the junk over.

Sincerely yours,

Norbert Wiener

NW:AD



October 30, 1957

Mr. Norbert Wiener
Massachusetts Institute of Technology
Cambridge 39, Massachusetts

Dear Norbert:

I am extremely sorry that Whiteside finds it impossible to go ahead. You are right that it would not be a good idea for you to try to make other arrangements on your own, though I shall keep my mind on the problem, and should I run across the right person, I'll let you know. In the meantime, perhaps the best plan for you is to devote your summer to revision as you suggested. Perhaps at the end of that time, you will feel inclined to go ahead with publication more or less as we discussed it in Cambridge last month.

Perhaps just before you get to work on the novel again, we can have a long discussion in person to see if we can't prepare some effective strategy.

Regards to your and Margaret.

Sincerely,

Jason Epstein

*9 saw Mrs. Ruesman
She would like to
see M.S.
How about it?*

JLE:jas

*Friendly acknowledgment
and agreement
Wiener*

Ems 11/1/57

Anderson College

Anderson, Indiana

October 30, 1957

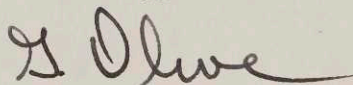
Professor Norbert Wiener
Department of Mathematics
Massachusetts Institute of Technology
Cambridge 39, Massachusetts

Dear Professor Wiener:

Thank you for your letter of October 23. You indicate that a write-up of your speech involving General Education appeared in a recent issue of "Time". I would very much appreciate it if you could tell me the exact issue.

Thank you for any assistance you may give me in this matter.

Sincerely,



G. Olive, Chairman
Department of Mathematics

GO:ph

Oct. 21, 1957

[and 11/6/57]

COPY

UNIVERSITY OF CALIFORNIA MEDICAL CENTER
San Francisco 22, California

Oct. 30, 1957

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

Dear Doctor Wiener:

It has recently been brought to my attention through Dr. Lawrence Frank that you and Dr. Rosenbluth are working on a way of measuring and recording frequency-amplitude in connection with EEG work. This was of great interest to me, and I am writing to inquire about this work.

I am engaged in a study of sound from the standpoint of human communication. The biggest stumbling block at the moment is that I am unable to make any definite statements about frequency-amplitude changes. Part of the problem seems to be that frequency analysis of the human voice is possible for short segments (2-3 seconds) of speech only and the other -- more crucial -- problem is that we do not really hear frequency and amplitude separately, but the "pattern" made by frequency-amplitude and rhythm.

Being a psychiatrist, the technical aspects of acoustics, engineering, and wave analysis are rather hard to grasp at times, but I am prepared to apply whatever mathematical skill I possess to this problem and would be most indebted to you for any information that you would feel free to share.

With my warmest thanks for your kindness,

Sincerely yours,

Peter F. Ostwald, M.D.
Associate Research Psychiatrist

[25/11/12/57]

Prof. Dr. Norbert Wiener
M.I.T.
Cambridge, Mass.

JOSEPH WILDER, M. D.
5 EAST 73RD STREET
NEW YORK 21, N. Y.

10/30/57.

BUTTERFIELD 8-8510
RIVERSIDE 9-1153

Dear Doctor Wiener,

this my second attempt to keep you informed on the rapid developments in the field of the "law of initial value" is prompted by your forthcoming lecture on biological rhythms.

It might interest you that "Time in Biology" and "The Law of Initial Value" were the two main topics at this years "International Conference on Biological Rhythms" in Semmering (Austria).

The first articles concerning encephalography (electro-) and this law have just begun to appear.

I am looking forward, like many others, with great interest to your lecture.

Sincerely yours

J. Wilder

that as this child grows older he will learn to accomplish complete rectal occlusion by contracting the levator muscle and by contracting the buttock muscle. At least this patient seems to have developed some continence so that he is able to get his formal education without the stigma of bowel and bladder incontinence.

Comment

The incidence of imperforate anus and some type of urethral communication is about 1 in 180,000.¹⁻⁴

Opinion varies as to the treatment of these cases. Young⁵ stated that two schools have developed: (1) physicians favoring a primary colostomy with secondary perineal repair, and (2) physicians favoring an immediate perineal plastic repair. Today we find some prefer to delay surgery.⁶ A newer group led by Rhoads *et al.*⁷ in 1948, Moore and Lawrence⁸ in 1952, and Butcher⁹ in 1953 propose abdominoperineal operation in the newborn for imperforate anus.

Success and failure have been reported by different earlier groups. It is hard to compare the great contributions of these men when it is realized that most of these technics developed were prior to modern antibiotics on which we rely so much to combat our minor and major complications. Our case, no doubt, would not have survived to reach the point of reconstructive surgery if it were not for modern drug advances.

We also were fortunate in our case that no other congenital defects could be found by x-ray studies and at the time of abdominal operation. The high degree of differentiation of external genitalia made this case more satisfactory to reconstructive surgery in comparison with others.

In reviewing the works of earlier surgeons we find all have had some success with the manner in which they approached the subject. Cases vary and may be classified into different categories if that is your desire, but we do feel certain facts should be pointed out in the early management of

these cases. In the newborn, uremia and/or intestinal obstruction must early be considered, and an early exit must be made for the fecal stream so that it is adequately diverted from the urinary tract. It must also be ascertained that the urinary passages are adequate. These two factors must be established in the first forty-eight hours. Variations of reconstructive work may be done at that time or delayed, depending on the general condition of the child. In the case presented the physicians were forced to make the latter choice, and it worked. If we see another similar case at an earlier stage, we may choose another method.

Summary

A case of congenital absence of the anus with a persistent cloacal duct has been presented. Its repair has been described.

As has been pointed out by Lowsley,¹⁰ even though a sphincteric muscle cannot be definitely identified, a continent anus may be made, as was done here, by carefully separating the muscle fibers of the perineal floor and fixing the anal wall to the skin of the perineum.

The authors wish to thank Dr. Meredith Campbell and Dr. Leslie B. Arey for their kindness in reviewing this report.

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Chronic Micrococcal Bacteremia Without Fever

Chronic micrococcal bacteremia without fever or cardiac murmurs is a rare syndrome, and the authors report this case to call attention to the fact that it can occur. The case is that of a man of seventy-one who, though he had no elevation of temperature or signs of bacterial endocarditis, apparently had experienced a staphylococcal bacteremia for six months, before it was permanently cleared up by intensive antibiotic therapy. Usually the course of this infection is acute, fulminating, and often fatal;

and even in the minority of cases that lapse into chronicity, temperature is almost always present, and bacterial endocarditis is a frequent complication. In the absence of these signs, bacteremia is seldom suspected.

A year after treatment, this patient was apparently in good health.—*Drs. Richard T. Messick, Lloyd G. Bartholomew, and Joseph E. Geraci, Staff Meetings of the Mayo Clinic, March 20, 1957*

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Paradoxical Reactions to Treatment

JOSEPH WILDER, M.D., NEW YORK CITY

(From the Department of Neurology, New York Medical College, Flower and Fifth Avenue Hospitals)

WE ARE all very familiar with the experience of hearing our patients complain that the medicine or the physical treatment prescribed had no effect at all or an effect opposite to the one predicted by the physician: "Doctor, I think the bromide makes me very nervous." "I have found that the aspirin makes my temperature rise." "The morphine (or Serpasil) makes me sleepless." "I have lost my sleep since you told me to stop coffee."

As long as we are young and smug we explain more or less patiently that this is simply impossible because bromides, morphine, etc. are sedatives, because aspirin is an antipyretic, and coffee is an analeptic. The effect described must therefore be due to some other factor, or the patient is a hypochondriac who simply imagines those things so contrary to what we have learned in school.

With growing experience, however, we are forced to acknowledge that many instances of what I shall call here "the paradoxical reaction" are by no means the products of imagination but are objectively verifiable facts. With most drugs a certain percentage of cases can be found which respond contrary to our theoretical expectancies. Thousands of examples could be given. The following figures from a recent article are typical.

They refer to a chlorpromazine compound. Out of 16 patients pallor occurred in six, flushing in four, no change in six, drowsiness in 11, insomnia in one, weight increase in 12, weight loss in two, no change in two, and so on.

There are numerous examples of paradoxical reactions known to every physician. In many instances the patient is not even aware of this phenomenon. Aspirin, which depresses the elevated body temperature, is likely to raise normal temperature. Caffeine may produce either tachycardia or bradycardia. The skin will respond with red dermographism to a stroke with a hard object. The same skin will respond with blanching after a hot bath or exposure to sunlight. Atropine may produce diarrhea or constipation. It may relieve or provoke a sphincter spasm. Iodine may either aggravate or ameliorate symptoms of hyperthyroidism. Adrenalin may increase or lower the blood pressure, and so on.

The physician who is willing to acknowledge that these paradoxical reactions are *not* a product of the patient's imagination now has several hypotheses available. One is that patients with different constitutions react differently. This is true, but there are few instances where the diagnosis of a specific constitution helps us in predicting the kind of reaction to be expected.

At best we know it by hindsight only. Then there is the "psychosomatic factor." There is hardly any doubt that this factor may influence somatic reactions in many cases. Much too often, however, this explanation is used in a vague sort of way and without scientific proof. The same is true for another popular explanation that the response depends to a high degree on the "condition of the effector organs." We frequently find statements like, "the response depends on the degree of hyperemia," without any specification how this occurs. Fortunately the body of well-known specific correlations in this area is constantly growing. I am reminded of such well-known examples as the weakened heart muscle responding to digitalis better than the normal one, the histologic response of the partly atrophic testicle to androgens being much stronger than that of the normal testicle, or the diabetic lapsing into a hypoglycemic coma with just a few units of insulin too many while we sometimes need 1,000 units or more to produce such a coma in a normoglycemic schizophrenic. The same is true for the response of a myxedema case to very small doses of thyroid as compared to the unresponsiveness of the normal and the frequent paradoxical response of the hyperthyretic case.

Behind all these explanations, however, there looms one tacit assumption, namely, that we are dealing here exclusively with varieties of *individual* reactions. Individual *A* differs in his reactions to drugs and physical agents from individual *B*, whatever the cause may be. Studies with repeated applications of identical doses of various drugs in one individual at various times have shown in many cases that this is not applicable, even under the optimal equality of external conditions. Let us quote here our own experiments with atropine, adrenalin, and pilocarpine and the response of blood pressure and pulse rate to fixed doses during identical time periods. We observed many examples of paradoxical responses in individuals who at other times reacted in the usual manner. Such phenomena have been described in connection with a host of other drugs and physical agents like Benzedrine, acetylcholine, insulin, ether, Novocain, chlorpromazine, Rauwolfia, and also for x-rays, various light rays, heat, muscular effort, etc.

As we were studying the possible causes of such marked *intra*individual variations, we discovered a rather simple correlation which has

somehow escaped the attention of previous investigators. The intensity and even the direction of the response in 75 to 80 per cent of the cases showed a relation to the *initial* or pre-experimental level of the function tested, in our case blood pressure and pulse rate. This correlation was specific and quantitative and has been summed up by us in the "Law of Initial Value." For tonight's purposes we shall divide it into two parts:

Part I.—The response of any body function to a given stimulus depends to a large extent on the initial level of that function at the start of the experiment. The higher that level the weaker the response to function-raising stimuli and the stronger the response to function-depressing stimuli. For example, the higher the blood pressure the weaker its increase after adrenalin and the stronger its drop after acetylcholine, or, the ^{lower} ~~higher~~ the initial blood sugar the stronger the *hyperglycemic* effect of oral glucose, the weaker the *hypoglycemic* effect of insulin. Exceptions are mostly pathologic.

Part II of the Law of Initial Value is the one that interests us at present. It says: with extremely low and extremely high initial values we see a progressive tendency to reversal of the usual type of response or to "paradoxical reactions." By extreme values we mean values outside the normal range. For example, the normal effect of a cigaret on the blood pressure is a rise. Our own statistics confirm previous observations that in a considerable percentage of cases we see instead a drop in blood pressure. If we take a look at the initial levels of these cases, which has never been done before, we can see the following correlations: The percentage of paradoxical reactions at initial values of between 70 and 90 systolic is only 12.5 per cent. In the range of initial values between 90 and 110 this number increases to 30 per cent. It is twice that figure, namely 62 per cent, at initial values between 110 and 120 (all this after eight hours bed rest and in recumbent position, hence the low average initial values). Now, where the initial values were still higher (between 120 and 130 and between 130 and 190), about 80 per cent of the cases showed the paradoxical hypotensive and only 20 per cent the normal hypertensive effect of a cigaret.

Let us stop and ask ourselves what that implies. Depending on our medical philosophy we shall say that this is either caused by or that

it just amounts to a very nice autoregulation. If blood pressure is too low, the cigaret will raise it in almost 90 per cent of the cases; if it is high, it will lower it in 80 per cent of the cases. This seems to correspond to the subjective observations that the cigaret obviously serves a dual purpose: it will mostly pick us up when we are tired or depressed, and it will relax and sedate us when we are tense or excited. This was not so in our group of cases with outspoken clinical oversensitivity to nicotine. Here we had not only a tendency to comparatively stronger elevation of the blood pressure, but the percentage of paradoxical reactions was much smaller; and the parallelism between the height of initial level and the response was disrupted. A group of cardiovascular cases was characterized by a complete lack of compliance with the Law of Initial Value.

We have not included in these statistics the cases of complete absence of response which, rightly, also belong to the paradoxical reactions.

I do not wish to leave the false impression that we are dealing here only with casual observations of minor imperfections in our therapy and experimental work. Contemporary European literature, particularly in Germany, Switzerland, and Russia, contains hundreds of articles confirming the validity of our law. The Law of Initial Value became part of official teaching in many medical schools. We are dealing here with a basic physiologic law. Hence, no wonder that these articles are widely scattered among all specialties of theoretical and practical medicine: physiology, pharmacology, internal medicine, neurology, psychiatry, otolaryngology, surgery, x-ray therapy, sport medicine, etc. No survey of this large body of knowledge has been undertaken as yet.

It is important to keep in mind that the significance of the initial value is such that even small differences in initial values lead to considerable differences in responses. Very often the difference in the initial value actually determines the outcome of the experiment much more than, for example, differences in doses. If we inject adrenalin and a few minutes later, after a higher blood pressure has been obtained, we inject a second dose, the following reaction will usually be very small or even paradoxical. It has been found that when the initial value increases in arithmetic progression the response increases in logarithmic progression. Specific logarithmic formulas have

been calculated for such drugs as adrenalin, acetylcholine, and insulin, as well as for x-rays. One is immediately reminded of one of the few existing quantitative general laws in physiology, Weber-Fechner's psychophysical law in the physiology of senses. According to that law, by increasing the stimulus in arithmetic progression we increase the sensation logarithmically. Recently this law has been objectively confirmed by measuring the electric potentials from the retina of the eye, etc. It seems obvious that Weber-Fechner's law is only a special instance of the more general Law of Initial Value.

Returning to Part II of our law, it is easy to see that many important conclusions can be drawn from the data on paradoxical reactions. For instance, if we accept that there is a rule in these reactions as described before in our example with the cigaret, could we then achieve every kind of response, positive or negative, with drugs of opposite type, for example, parasympathetic stimulation by sympathomimetic drugs and vice versa, depending on the initial value, or sedation by stimulants as well as by sedatives? Actually the number of such observations is much larger than we ordinarily would assume. Depending on the initial value of the experiment, we can achieve similar effects with atropine and its antagonist, pilocarpine or acetylcholine, and with adrenalin and its antagonist ergotoxin. The well-known stimulant Benzedrine, used successfully in combating fatigue and depression, has frequent "side-effects," such as sleeplessness and sexual overstimulation. The same drug, given to overactive and agitated individuals, especially children, has a sedative effect, diminishes psychomotor activity and the tendency to masturbate, and improves sleep. The recent literature on the modern "ataractics" such as Rauwolfia and chlorpromazine is replete with such contradictory observations. Unfortunately we do not have good measuring methods for psychologic processes. We fare better with measuring those bodily changes that accompany emotional states. Thus, for example, the literature on hypnotic experiments appears as one mass of completely contradictory observations. Kleinsorge has given one explanation for this confusion: The effect of hypnotically suggested fear on blood leukocytes, calcium, and other components depends on their initial values; the low values rise and the high values drop under the effect of this suggested emotion. Such ques-

tions arise as whether the emotional shock of transportation to the hospital in a case of a suspected appendicitis will not lower previously elevated leukocytes and raise the previously low white cell count.

As another example, we really do not understand the curative effect of shock therapies in psychoses, in spite of thousands of data available and many hypotheses propounded. If we consider the Law of Initial Value, a new light is shed on these contradictions. Selbach and others have shown that pulse, blood pressure, leukocyte count, electrolytes, capillary fragility, response to autonomic drugs, etc. change according to the initial value prior to the shock. If they were low before the convulsions, they rise, and if they were high, they drop. The same is true for the genuine epileptic attack. Interestingly enough it proved to be true also for the ordinary brain concussion. Still more interestingly, it is also true for injuries in other parts of the body. It has been known for a long time that such accidental injuries may occasionally bring about a remission in psychoses. Recently we have had an article by Charles H. Jones and coworkers reporting remissions in psychoses induced by a kind of peripheral electric shock.

The results of the application of the Law of Initial Value in fields other than my own, which is neurology and psychiatry, seem even more remarkable. Depending on the initial value we can lower the blood iron by iron injections, blood cholesterol by cholesterol injections, and blood calcium by calcium injections, provided the initial values were high. The cooling of an exposed extremity, the protein effect on basal metabolism, the effect of insulin or sugar on blood sugar, the effect of muscular work on hypertension, of x-ray or ultraviolet irradiation on leukocytes, of vestibular stimulations on various blood minerals depend largely on the Law of Initial Value.

On the other hand the absence of paradoxical reactions where such were to be expected is often a pathologic sign. Some authors consider it to be a sign of diencephalic lesion and base not only neurologic diagnoses but even basic ideas on diseases and legal opinions in cases of head injuries on that absence. I believe that such deviations from the expectations of our law occur in hypothalamic lesions, but on the other hand my hypothesis is that the Law of Initial Value governs the functions of every single cell.

The following experiment by Seitz may serve as an illustration of my thesis. With the help of phase microscopy we can observe and photograph the amoeboid movements of leukocytes in the blood. If we test the effect of adrenalin, of muscular effort, etc. on these movements, we find the following: Where the motility has been low it increases under the influence of these factors, and where it has been high it decreases. Another approach has been taken by Schattmann. He found that, contrary to the usual response of leukocytes to x-rays, which follows nicely the Law of Initial Value, cachectic individuals in last stages of carcinoma show a behavior exactly opposite to that law. Schattmann considers this as characteristic of Selye's exhaustion stage of the stress syndrome.

The scientist will find some good and some bad news in the Law of Initial Value. The bad news is that his experimental results can hardly be used for other conclusions if they can be explained by the differences in his initial values. It should be a must for the scientist either to work with strictly equal identical values or at least to state the initial values of his experiments to enable the critical reader to draw his own conclusions. This is very rarely practiced. Even in Germany today I find in a famous archive that in 74 per cent of the articles no attention whatsoever is paid to the initial values, and very often these initial values are not even stated. A big screening job seems to be in store for us. The good news (and quite a number of authors emphasize this) is that our law permits us to find rules and draw conclusions from experiments which otherwise seem only completely irregular and contradictory.

What about the practitioner of medicine? Much work still has to be done until simple rules of thumb can be evolved which he can use in his everyday practice. Some start has been made. Thus, for example, one author uses adrenalin systematically in the treatment of arterial hypertension, etc. We have already gained a better insight into the rules governing the various paradoxical reactions which may become so unpleasant and even dangerous. We can understand that what matters here is the level of the various functions of body or mind at the very moment of the application of the treatment. We can better understand why the continuation of the treatment beyond a certain point of no return will lead to aggravation and reversal rather

than to improvement. (See Plummer's method of treatment of hyperthyroidism with iodine.) We shall understand that a second dose if given too early may reverse the effect of the first and why the prescription, "one tablespoon every three hours," may be right for one patient and wrong for the other. The art of stopping treatment in time may receive new attention.

Various diagnostic tests will have to be interpreted in a new way. The conclusion "ex juvantibus," that is, from what has helped the patient, will have to be supplemented by the statement of his initial condition at the time of the application

of the treatment in order to be valid. The know-what in therapy would have to be supplemented in a greater measure by the know-how.

The developments I have tried to predict here will, however, come to pass only if our medical and biologic scientists will not only know the Law of Initial Value but actually make use of it in their research work. Then only will the paradoxical reaction be promoted from the role of an obscure and confusing phenomenon to the role of a guidepost in research and therapy.

5 EAST 73RD STREET

Voting Privileges Should Be Exercised

Women voters may already outnumber the males and are likely to increase their numerical advantage in future elections, according to the statisticians of the Metropolitan Life Insurance Company.

Statistical proof is not available since election records do not classify voters according to sex, the statisticians point out. Their belief that more women than men are now voting is based on a Bureau of the Census estimate that there were about 4,600,000 more women than men in the civilian population of voting age last November.

The effect of the female vote was first felt in the national election of 1920—the first year that women exercised nation-wide suffrage—when the vote for Presidential electors jumped to 26.8 million over the 1916 figure of 18.5 million. Women certainly played their part in increasing the vote in succeeding elections up to last year, when the total vote passed 62 million.

While the 1956 vote constituted a record as to number, the proportion of the population of voting age going to the polls dropped to 60.4 per cent from the 62.7 registered in 1952. The 1956 figure was $1\frac{1}{4}$ times that in 1940, and $2\frac{1}{3}$ times that in 1920.

In addition to the women, other groups have been added to the voting population since 1920. From 1921 through 1940, an average of 160,000 aliens became citizens each year. During World War II,

the average increased to 300,000 per year. An additional million aliens were naturalized in the post-war decade 1946-55.

Also, two states enlarged their voting populations by lowering the age qualification to eighteen (Georgia in 1944 and Kentucky in 1956).

The proportion of the population of voting age going to the polls in last year's elections varied widely from state to state and section to section, the statisticians report, with the southern and southwestern sections ranking lowest. Mississippi was last with only 22.1 per cent of its people of voting age casting ballots, while South Carolina and Alabama were not much higher. At the other extreme, Idaho was top with 77.3 per cent voting. In Connecticut, Massachusetts, Utah, and New Hampshire, more than 75 per cent voted.

"The American people are very proud of their democratic institutions, yet many who are eligible to vote fail to exercise that precious right," the statisticians conclude. "Our record with respect to the proportion voting falls short of that for a number of other countries in the free world. The American Heritage Foundation and other organizations are performing a valuable public service with their educational programs directed towards increasing participation in our elections."

CENTRE FOR ADVANCED STUDY AND
WORLD ASSEMBLY OF YOUTH

TELEGRAPHIC ADDRESS

"ALOKA"

31st October, 1957.

Professor Norbert Wiener,
Professor of Mathematics,
Massachusetts Institute of Technology,
Boston, Massachusetts, U.S.A.

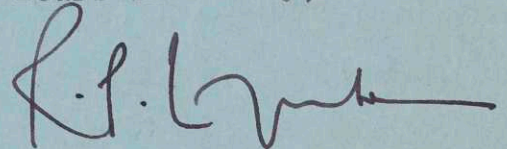
Dear Professor Wiener,

We have read the account in "Time", October 21st, 1957, of your address at Indiana's Wabash College about the specialization of scientists and are much interested in it. Would it be possible for you to send us an unabridged or at least longer version of your address?

We are here running a training programme designed to guard against some of the problems you have described. We work each year in three 3-months' residential courses with successive groups of leaders and administrators between the ages of twenty-five and thirty-five, one from rural organizations, another from urban organizations, and the third from formal educational institutions. We would be happy to send you more details if you were interested and will certainly be grateful to you if you could mail us your address for use here.

Thank you.

Yours sincerely,



R.P. Lynton.
Director.

RPL/rt.

BY AIR MAIL

AEROGRAMME
AIR LETTER

Prof. Norbert Wiener,

Professor of Mathematics,

Massachusetts Institute of
Technology,
Boston, Massachusetts,

U.S.A.

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First fold here
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← Second fold here →

Sender's name and address: Aloka, Bandaragama, Ceylon.

IF ANYTHING IS ENCLOSED THIS LETTER
MAY BE SENT BY ORDINARY MAIL.

Approved by the Postmaster General, Ceylon-GA. 58/350W.