

IMPERIAL COLLEGE OF SCIENCE AND TECHNOLOGY  
(UNIVERSITY OF LONDON)

DEPARTMENT OF ELECTRICAL ENGINEERING

Professor D. Gabor  
Dr.-Ing., F.Inst.P., M.I.E.E., F.R.S.

CITY AND GUILDS COLLEGE  
EXHIBITION ROAD  
LONDON - - S.W.7.  
Telephone: KENSINGTON 5111

Prof. Leo Szilard,  
c.o. Simon & Schuster Inc.,  
Rockefeller Center,  
630 Fifth Avenue,  
New York 20,  
U.S.A.

13th July, 1961.

Dear Leo,


Many thanks for sending me your "Voice of the Dolphins", which I have swallowed eagerly, at one gulp. There is a lot of the old Szilard in it, wealth of ideas, powerful imagination, but closely disciplined by reason. I was somewhat surprised to find in it also a new Szilard, the lawyer. It appears that when you realised that the world is run by lawyers, and scientists who want to influence the world must speak through them, as the dolphins must speak through the scientists, you have studied the Law and assimilated the legal jargon and way of thinking.

How glad I am to write to you, considering that in April 1960, when I had a talk with your biographer Al Rosenfeld, he gave you six months. This made me write a sort of premature obituary for you in the Irodalmi Ujság in November 1960. I think you would not have been displeased to see it. The next thing I knew, was a letter from Robert Jungk, in January 1961, asking me for a copy of Encounter, with my article, because he gave you his in Vienna! I was further reassured at my last visit to the States, in April of this year, by Dr. Lax, that the radiation treatment has worked with you almost miraculously. "Totgesagte haben ein langes Leben", perhaps my premature obituary has done you good. Next time I go to the States I shall not be scared to look you up!

I enclose with my compliments an article on "Light and Information", which I wrote ten years ago, but which appeared only now. It contains a discussion of your Maxwell demon, and I come to the unorthodox conclusion that the Second Principle would be invalid without quantum mechanics. - I enclose also a talk which I gave to the society of Cambridge students who call themselves the "Heretics", on the problems of the future which worry me as much as they worry you. The difference is only that I am less worried by the question of mere survival than by the problem of whether survival will be worth while?

With kind regards,

Yours sincerely,

 [GABOR]

Encls.  
DG/LS.

RECEIVED JUL 9 1963

P. O. Box 127  
San Clemente, California  
phone: (ac 714) 492-1643  
July 8, 1963

Professor Leo Szilard  
Council for a Livable World  
301 Dupont Circle Building  
1346 Connecticut Avenue, N.W.  
Washington 6, D. C..

Dear Professor Szilard:

We citizens of Southern California are forming an organization to maintain our populated areas free from industrial radioactive contamination, and we need your support.

Two civilian nuclear power plants are already in operation at Humboldt Bay and Vallecitos in Northern California. Six others are planned along the California coast at San Onofre (near San Clemente), Malibu, Nipomo (near Santa Barbara), Moss Landing (near Carmel), Bodega Head and Montezuma (both near San Francisco).

We are not opposed to a civilian nuclear power program per se; however, we are opposed to the present program for the following reasons. First, conservative studies by the National Academy of Sciences-National Research Council show there is sufficient fossil fuel until about the year 2000; optimistically, for a few centuries ("Energy Resources," Publication 1000-D, 1962). Second, power produced from fission fuel cannot compete with that produced from fossil fuel until the year 1980-2000 without huge government subsidies (Philip Sporn, Nucleonics, March 1962, p 24, July 1962, p 24). Third, approximately two billion curies of fission products at maximum inventory in a 400 megawatt (electrical) reactor present a potential catastrophe to people, wildlife, and property for a radius of several hundred miles about each reactor (Theodore Stern's testimony, Reporter's Transcript, Application No. 45231, California Public Utilities Commission hearing, 13 June 1963, San Clemente, California, and Theoretical Possibilities and Consequences of Major Accidents in Large Nuclear Power Plants, Report WASH-740, USAEC, March 1957). From these arguments we have concluded that the installation of these reactors within several hundred miles of populated areas is not in the best interests of the public and that in any event civilian nuclear power should not be introduced until it proves as economical as conventional power.

The civilian power reactors are over-designed and are "safe" in the usual engineering sense; however, every reactor has exhibited unexpected aberrations in operation, the causes of which are not completely understood by reactor experts (Nucleonics, March 1962, pp 84-86, 88-90). Furthermore, an act of sabotage or "limited" war could cause total release of fission products from a reactor at maximum inventory with grave consequences to the population. Installation of the reactors along the Pacific Coast will make them easy prey to either landing parties or bombardment from enemy submarines.

The hazards are not reduced once the spent fuel rods containing the fission products are removed from the reactor. Instead, the hazards are increased by the new problems associated with on-site cooling and storage, transportation to fuel processing centers, fuel processing, and storage and disposal of high-level radioactive wastes. Accidents involving transportation of waste and other radioactive

materials were reported during the past several years, some of which required evacuation and decontamination of areas up to a few square miles. The AEC itself controls about 70 million gallons of high-level waste stored in stainless steel containers whose expected life is much less than that of the waste. "Safe" storage or disposal of this waste means that it shall not come in contact with any living thing for at least 600 years. One waste disposal company (Long Beach, California) had its license revoked by the AEC on eight violations of disposal regulations; however, the company's license was not revoked until one year after the violations were detected. Unreported and undetected violations and accidents both in reactor operation and in waste disposal are also of grave concern to the public.

Professor Eugene Wigner, who contributed more to the theory and engineering development of nuclear reactors than any other individual, argued "...that the primary aim of nuclear energy development ought to be to produce electricity economically for the much longer period of human history when we have run out of high-grade fuels, rather than to make electricity which is marginally competitive when we have a great abundance of fossil fuel," and "...that the development of the power breeder is the central technological problem of nuclear energy" (L. Dresner and A. M. Weinberg, Review of Modern Physics, October 1962, pp 760, 765). Furthermore, the report entitled "Energy Resources" (Publication 1000-D, 1962, p 110) recently released by the National Academy of Sciences-National Research Council states in part that

"The development of large-scale power by means of the fissioning of uranium and thorium and their derived isotopes reduces to three fundamental problems:

1. the development of breeder reactors,
2. an adequate supply of uranium and thorium, and
3. proper disposal of the extremely dangerous fission products."

One could not arrive at these conclusions from the Atomic Energy Commission's report to the President in November 1962. The arguments advanced by the AEC in support of the Civilian Nuclear Power Program will not stand up under close scrutiny. According to the AEC, the Program is justified by (1) the economic stimulation of a few large corporations, (2) public acceptance of an increase in ionizing radiation levels, and (3) the production of plutonium for breeder reactors. The inanity of the first two arguments is obvious; the third is also pointless since even the AEC admits that the problems associated with the development of efficient breeder reactors will not be surmounted for some time, if ever (Ralph Lapp, Kill and Overkill).

Our organization will use the proposed San Onofre reactor as a test case; however, we expect to become directly involved with those proposed for Malibu and Nipomo, and indirectly with the others. The California Public Utilities Commission held a public hearing on the application for a "Certificate of Public Convenience and Necessity" submitted jointly by Southern California Edison and San Diego Gas and Electric Companies for the San Onofre plant on 12-13 June 1963. Some of us attended this hearing and by cross-examination were able to discredit most of the utility companies' testimony. As a result,

Commissioner William M. Bennett told the companies that he would not approve their application on the basis of hearsay testimony, and he gave them two weeks to submit additional evidence to the PUC.


A second public hearing will commence on 17 July 1963, at 9:30 a.m., in the PUC hearing room of the State Building, 107 South Broadway, Los Angeles. At that time we hope to have a sufficient number of expert witnesses to testify on the arguments presented above and to aid in the cross-examination of witnesses appearing for the utility companies. Our testimony should cover at least the following areas: somatic and genetic effects of ionizing radiation, power and breeder reactor technology and safety, meteorology, oceanography, marine biology, geology, ecology, comparative fuel costs, storage and disposal of radioactive waste, conservation, natural resources, technology versus democracy, professional ethics and morality, law, and insurance.

We respectfully urge you to concern yourself with this transcendent problem and to bring your own special knowledge to bear as rapidly as possible. Would you also consider taking immediate action in any or all of the following areas?

1. Permit us to use your name on our organization letterhead under Advisors. Your endorsement will greatly facilitate our membership and fund-raising drive. Your role as advisor would not necessarily involve membership in the organization; however, your support as a member is also solicited. Our organization probably will be named "Association to Protect Against Industrial Radioactive Contamination."
2. Educate the California Public Utilities Commission and the public at the 17 July 1963 hearing and/or subsequent hearings on the San Onofre reactor and/or other reactors by testifying and cross-examining in your areas of knowledge. The testimony is taken under oath, but the hearings are quite informal compared to a court of law (i.e., the public is permitted to cross-examine witnesses). Your testimony may be restricted to one of the areas discussed above, or it may embrace several; however, it should be prepared for a lay audience. The Commissioner assigned to the hearing will base his decisions on the evidence presented since his knowledge in the area of nuclear power is limited.
3. Help us assemble a team of scientists to testify at the PUC hearings.

Please advise us of your decisions as soon as possible. You may phone me collect between 6:00 a.m. and 7:30 a.m., or after 7:00 p.m., P.D.S.T., at (area code 714) 492-1643.

Sincerely,

  
A. E. Gaede, chairman  
ad hoc committee

P. O. Box 127  
San Clemente, California  
telephone: (area code 714) 492-1643  
July 1, 1963

AIRMAIL

Professor Leo Szilard  
University of Chicago  
Chicago, Illinois

Dear Professor Szilard:

We citizens of Southern California are forming an organization to maintain our populated areas free from industrial radioactive contamination, and we need your support.

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July 1, 1963

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Please advise us of your decisions as soon as possible. You may phone me collect between 8:00 a.m. and 9:30 a.m., or after 9:00 p.m., C.D.S.T., at (area code 714) 492-1643.

Sincerely,



A. E. Gaede, chairman  
ad hoc committee

July 23, 1963

Mr. A. E. Gaede, Chairman  
Ad Hoc Committee  
P. O. Box 127  
San Clemente, California

Dear Mr. Gaede:

Thank you for your letter to Professor Leo Szilard concerning your efforts to oppose industrial radioactive contamination in your area. As Dr. Szilard is presently spending a few weeks abroad, it is impossible for him to contribute to your present activities. However, we are holding your letter for his return, and we know he will be interested in your efforts.

With best wishes,

Sincerely yours,

Lois Gardner,  
Acting National Director

LG/evp



GENERAL  ELECTRIC  
COMPANY

GENERAL ENGINEERING LABORATORY

ONE RIVER ROAD, SCHENECTADY 5, NEW YORK . . . TELEPHONE 4-2211

August 27, 1953

Dr. Leo Szilard  
Department of Physics  
University of Chicago  
Chicago, Illinois

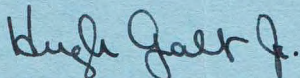
Dear Dr. Szilard:

At the present time I am conducting a literature search in the General Engineering Laboratory Library of the General Electric Company for information concerning the Einstein-Szilard electromagnetic linear induction pump that was developed by you in association with Dr. Einstein.

I would appreciate any information you may have concerning the theory and practical application of this pump.

Thank you very much for your cooperation.

Sincerely yours,



Hugh Galt Jr.  
GENERAL ENGINEERING LABORATORY LIBRARY  
Building 5, Room 130

HG/bjk

June 24, 1957

Professor Joe Gamow  
Physics Department  
University of Colorado  
Boulder, Colorado

Dear Joe,

I have analyzed the amino acid sequences contained in Brenner's manuscript, which you loaned me, and you will see my conclusions in the attached memorandum. Because I had felt uncertain of my grounds, I had asked that the paper be held until further notice, and therefore I can now withdraw it without causing any inconvenience.

With kindest regards,

Sincerely,

Leo Szilard

*Gen file*  
NATIONAL ACADEMY OF SCIENCES  
2101 CONSTITUTION AVENUE  
WASHINGTON 25, D. C.

July 5<sup>th</sup> 1957

Address Reply to:  
P.O. BOX 131  
WOODS HOLE, MASS.

Dear Leo,

Sorry your thing didn't work, but the problem is damned complex . . . .

I am at present enjoying the exposure to the elements (sun, wind, water & sand) under the auspices of NAS and USAF.

Yours  
Geo.



April 22<sup>d</sup>  
1961

G. GAMOW

Dear Leo,

I approve everything from  
Dolphin's fins and neurons  
to war criminals and  
bacteria .... Ich habe  
gehört dass Du eine gute  
Zeit in Europäische Tour  
has. Höffe du wirst uns  
hier besuchen. All I  
can say in Hungarian  
is: "Kis disno" but this  
does not pertain.

Dein Geo Gamow

May 12, 1964

Dr. Horseley Gantt ✓  
Medical School  
Phipps Clinic  
Johns Hopkins University  
Baltimore, Md.

Dear Dr. Gantt:

The enclosed preprint might perhaps interest you. If you should visit the West Coast and come down as far south as Los Angeles, if not San Diego, I should appreciate your letting me know ahead of time. There are a number of things which I would very much like to discuss with you on some suitable occasion.

My telephone number at The Salk Institute is 453-4100, Aread Code 714.

Sincerely yours,

Leo Szilard

LS:jm

Miss Lois Gardner *cannot for a*  
Room 306  
~~Castle Livable World~~  
1346 Connecticut Avenue, N.W.  
Washington 6, D.C.  
United States of America.

Geneva, Friday 16th August, 1963

Dear Lois,

I understand that Mrs. Shannon will be absent until Thursday and that you will look after my mail. Please leave all letters addressed either to my wife, or jointly to my wife and me, at the hotel, but pick up all the mail addressed to me. Anything that is not important should be left until Mrs. Shannon comes back. If there is anything that is important, I should appreciate your taking care of it.

In my last letter to Mrs. Shannon, which should have arrived yesterday, or which might arrive on Monday at the office of the Council, I gave detailed instructions on how my mail should be handled.

~~There is one important matter: if Mrs. Shannon has received, or if you find in the mail at the hotel, application forms for the renewal of the research grant for the N.I.H., please send these to me at once, airmail, to the following address:~~

c/o Dr. Martin Kaplan  
World Health Organization  
Palais des Nations  
Geneva, Switzerland.

If you cannot find these applications forms, which ought to have been sent to me from Chicago directly to Geneva, please call up over the telephone Miss Irene Fagerstrom in the office of the Vice-President - Special Projects, and tell her that to date I have not received these forms and <sup>ask</sup> what happened to them. If you

*at the University of Chicago*  
*ask*  
*at Midway 3 0 P 00*

cannot reach Miss Fagerstrom, or if she cannot give you this information, then call Mrs. Mann at Chicago over the telephone, at Fairfax 45575 and find out whether she has received these forms, and what she did with them. Her address in Chicago is 5646 Maryland Avenue, Chicago 37, Illinois.

All mail sent to me to Geneva should be sent to me

c/o Dr. Martin Kaplan  
World Health Organization  
Palais des Nations  
Geneva, Switzerland.

I apologise for bothering you with all this.

With kind regards,

Sincerely,

Leo Szilard

October 27, 1950

Dear Dr. Gare:

Enclosed I am sending you a manuscript which might perhaps interest you. We are thinking of using the same method which we have applied to the investigation of mutations in bacteria to the investigation of the formation of decarboxylases to one of the six amino acids which you list in your paper,

It should be easy to determine by our method whether the amount of decarboxylate formed in the presence of the amino acid is a function of time or whether it is a function of the number of cell generations. We can distinguish between these two alternatives because we are able to vary the rate of growth at some given temperature. We thought of using arginine in this experiment and I wondered whether you could let us know whether apart from your paper there is anything else we should read before actually starting the experiment. If you have any other relevant papers on the subject which we ought to read before starting our experiments, we should appreciate your sending us reprints of them.

Very truly yours

Leo Szilard



UNIVERSITY OF PITTSBURGH  
PITTSBURGH 13, PENNSYLVANIA

DEPARTMENT OF PHYSICS

Dear Mr. Brower,

Enclosed is my check for ten dollars (<sup>\$</sup>10<sup>00</sup>) both in payment for twenty more copies of Szilard's revised speech and to help in the printing of more copies.

I have already distributed the first 100 copies that I obtained from you. The response was rather enthusiastic, but without further instructions, most of us are not yet sure as to how we should proceed, other than by the letters we have written to Szilard. It would be useful to get something started before a lot of the initial enthusiasm is dissipated.

Sincerely yours,

Myron Garfunkel

10.00

6, Halliwick Road,  
Muswell Hill,  
London, N.10.

9th May, 1934.

Dr. Maxwell Garnett,  
League of Nations Union,  
15, Grosvenor Crescent,  
London S.W.1.

Dear Sir,

On leaving your office to-day I wondered whether my point of view had been too rigid and unpractical. It occurred to me, however, that something might be said in its favour from the practical point of view.

If a number of leading scientists were asked individually whether they thought it likely that the majority of the Nobel Prize Winners would give their consent, each of them might possibly reply that he himself would consent but that he did not believe the others would. This is the trouble with "public opinion". It may, therefore, be well not to ask any individual leading scientist to know anybody's mind but his own, but right from the beginning to ask

On the other hand I do realise the difficulty which you pointed out, and I think that perhaps it might be lessened if one proceeded in the following way: when writing to the holders of the Nobel Prize and (emphasizing the tentative character of the action,) one need not post all the letters at once but could begin by sending out some 10 letters, and withhold the rest if the first answers show that one cannot get the consent of the majority of the group.

May I mention that if the action succeeds it should be possible to get a strong echo from the Universities in America, which could and should be organised in advance. The Presidents of Johns Hopkins, Harvard, Mass. Inst. of Technology happen to be scientists at the moment, and the influence of Millikan at the Cal. Inst. of Technology and A.H. Compton at the University of Chicago is strong.

I should like to thank you for your kind help in this matter.

Mr. Lloyd K. Garrison,  
575 Madison Avenue,  
New York 22, N.Y.

May 16th. 1960.

Dear Mr. Garrison,

Attached is the article which I mentioned to you over the telephone. It will probably appear in "Look" magazine early in July. I am sending this to you for your information only and it seems to me that there would not be much point in your forwarding this material to Governor Stevenson at the present time.

As you know I should be happy to discuss with Governor Stevenson the serious problem relating to the bomb which will face the next President of the United States if he were able to set aside enough time to permit a thoughtful discussion of the problems involved. Should it be possible to schedule such a discussion then you can tell me whether Governor Stevenson would want to read an exposition of the problem ahead of time or rather during the discussion, perhaps, at the outset of it.

The attached article attempts to indicate where the real difficulty lies that will stand in the way of a serious attempt to get rid of the bomb. It also discusses what might happen if we are forced to live with the bomb and are lucky enough to avoid an all-out war.

With the exception of May 18th, when I might fly down to Washington to attend the Atoms for Peace Award ceremony, you can get hold of me at ext. 133 at Memorial Hospital, Trafalgar 9 - 3000.

With kindest regards,

Very sincerely yours,

Leo Szilard.

COLORADO AGRICULTURAL AND MECHANICAL COLLEGE  
FORT COLLINS, COLORADO

June 18, 1953

Dr. Leo Szilard  
Institute of Radio Biology and Biophysics  
University of Chicago  
Chicago, Illinois

Dear Dr. Szilard:

A few days ago, I spent some time with my friend, Dr. Puck, at Colorado Medical Center. He told me about the interesting work you are doing with spermatozoa. I am not certain that Dr. Puck ever told you about our work over the past four years concerning the metabolic activity of bull spermatozoa.

I heard that you have developed an accurate method of measuring motility of spermatozoa. I am naturally most interested in this phase of the work, and I would appreciate hearing from you as to whether any reprints on publications concerning this are available, or if you would care to let me have the method in case it is not published.

Dr. Puck also tells me that you are periodically in Denver, and I would consider it a privilege and an honor to meet you there whenever your time permits. Please call me collect, and I shall try to come to Denver. I am sure you will be interested in our findings concerning fructose, metabolism, and the role steroids and amino acids play in this situation.

Sincerely yours,



F. X. Gassner  
Professor of Endocrine Research

FXG:ff

# The Gazette and Daily

*A Real Honest-to-Goodness Newspaper*

YORK GAZETTE COMPANY, PUBLISHERS

31 EAST KING STREET,

YORK, PA.

March 6, 1950

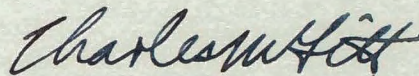
Dr. Leo Szilard  
Institute of Radiobiology  
and Biophysics  
University of Chicago  
Chicago, Ill.

Dear Dr. Szilard:

We should like very much to reprint your reply to David Lilienthal which appeared in the March 4th edition of the New York Herald Tribune. We feel that the American people should be informed on these facts and we want to do everything possible to give them the widest possible dissemination. May we have your permission to use the article in THE GAZETTE AND DAILY?

Sincerely yours,

THE GAZETTE AND DAILY



Charles M. Gitt,  
Executive Editor

CMG:MMB

The University of Chicago

CHICAGO 37, ILLINOIS

Institute of Radiobiology and Biophysics

6200 Drexel Avenue

March 15, 1950

Mr. Charles M. Gitt  
Executive Editor  
The Gazette and Daily  
31 East King Street  
York, Pennsylvania

Dear Mr. Gitt:

Many thanks for your letter of March 6th.

As far as I am concerned, you are perfectly free  
to reprint my letter to the Editor of the New  
York Herald Tribune which appeared in the March  
4th edition.

Sincerely yours,

Leo Szilard

LS/sds

Washington, D.C.  
24 December 1961

Professor Ronald Geballe  
7516 28th Avenue, N.E.  
Seattle 15, Washington

Dear Dr. Geballe:

I am enclosing a copy of the current version of my Speech and a sheet giving you the response to date. The press reaction continues to be favorable - so far not a single hostile voice. I am attaching a copy of a clipping from Commonweal, a Catholic publication.

In case we can arrange that I give a talk in Seattle, you may need some advertising material and I am therefore enclosing a text, "About the Author".

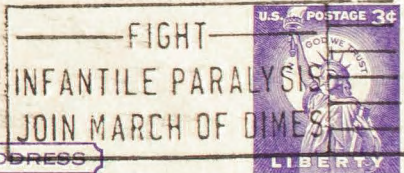
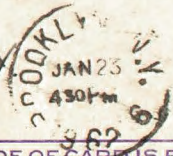
I expect to talk to you over the telephone at the end of the week and we shall then see whether we can fix a date for my talk or whether we have to defer the matter.

With kind regards.

Sincerely,

Leo Szilard  
Hotel Dupont Plaza  
Washington 6, D.C.

S. Gelernter  
33-27 93 ST  
Flushing 72, N.Y.



THIS SIDE OF CARD IS FOR ADDRESS

WBAI  
30 E 39 ST  
N.Y. 16, N.Y.



1-19-61

Dear Sir;

I would like to contact  
Dr Leo Szilard so that I  
may obtain a copy of his  
speech, "Are we on the Road  
to War", that was broad-  
cast on WBAI on Fri Jan 19.  
Would you send me his  
address or would you  
forward this card to him.

Thank You  
Sanford Selenter  
33-24 93 St.  
Flushing 72, N.Y.

73 Edentfield Ave.  
Watertown 72, Mass.  
21 Nov 61

Dear Dr. Szilard,

I was in your radio audience Sun Nov 19<sup>th</sup> when you spoke to the Harvard Law Forum.

Your Washington lobby of scientists is at once the most desperate and the most hopeful idea broadcast today; it deserves to prevail. Altho I'm not a scientist but a history student, I want to enlist with you for the duration.

For the moment please send me a copy or two of your Harvard address in the enclosure. I want to start spreading your excellent ideas on a "grass roots" level. Several of my friends have asked to see your speech. I could effectively distribute as many as I can get. But if you can only send me one I will have it duplicated. May you live to be president!

Sincerely, John Gell

*Leo Szilard*

June 7, 1957

Mr. Emery Geller  
320 West End *Workend Ave*  
New York City, New York

Dear Mr. Geller:

I would appreciate your forwarding  
the enclosed letter to Mr. Gabor Kemeny, whose address  
I do not know.

Sincerely yours,

Leo Szilard

m  
Encl.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY  
DEPARTMENT OF PHYSICS  
CAMBRIDGE 39, MASSACHUSETTS

May 2, 1963

Dr. Leo Szilard  
Hotel DuPont Plaza  
Washington 6, D. C.

Dear Leo:

I am writing to express my willingness in principle to take part in the talks anytime during the next few months, provided my participation is cleared with IDA, the Defense Department, and the AEC. Of course the period of the Jason Study (June 15-Aug. 1) would be a very difficult one.

Enclosed find the curriculum vitae you requested.

Yours as ever,



Murray Gell-Mann

MG-M/cs  
enclosure

May 20, 1964

Professor R.W. Gerard  
The University of California  
Irvine, Calif.

Dear ~~Gerard~~:

On April 1st I joined The Salk Institute and Trudi and I hope very much that you and your wife will pay us a visit soon. You can reach me over the telephone at The Salk Institute, at (714) 453-4100, or at my residence through the switchboard of the Hotel Del Charro in La Jolla, at (714) 454-6134.

Enclosed is a preprint which might perhaps interest you.

With kind regards to you and your wife,

Sincerely,

Leo Szilard

LS:jm

Enclosure

UNIVERSITY OF CALIFORNIA, IRVINE

*file, C.N.S.* ✓

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SANTA BARBARA • SANTA CRUZ

CLARK KERR  
*President of the University*

IRVINE, CALIFORNIA

DANIEL G. ALDRICH, JR.  
*Chancellor at Irvine*

May 25, 1964

Dr. Leo Szilard  
The Salk Institute for Biological  
Sciences  
PO Box 9499  
San Diego, California 92109

Dear Leo:

It is pleasant to know that you are now officially neighbors of ours, and Frosty and I reciprocate your warm invitation for a visit. Our home in Corona del Mar is just back of 101 Highway and MacArthur Boulevard - 1007 Goldenrod Avenue, telephone 675-2421 - and the University is further up MacArthur, phone 714-546-1500. Our area code is also 714. We will be away from about mid June to mid July, otherwise expect to be on tap pretty steadily.

I found your paper on ~~Memory~~ stimulating, and like some of the possibilities opened up by your postulate of complementary specific membrane proteins that interact under specified conditions - even though I doubt that this will prove to be the correct mechanism. A number of your other assumptions bother me:

Your separation of neurons into "congenitally determined" and "memory" seems to me not only unnecessary but pretty certainly incorrect. Neurons become modified by their experience from the time they are formed and through life, and even the normal racial patterns are easily altered by pathological or human interference during the developmental stages.

I greatly mistrust the "all or none" one-shot transprinting. Quite aside from our own evidence on a repetitive activity for fixation, which you know, there is much other indication that a single transmission does not leave an irreversible change.

The salivary response to food is itself at least partly conditioned - a puppy raised on bread and milk will not salivate to meat until it "learns" to do so.

On page 7 you assume the transprintable neurons are kept repressed by inhibitory neurons. This is not very tenable, since a variety of conditions (drugs, anesthesia, anoxia, etc.) would almost certainly knock out the inhibitory neurons relatively early and these should then fix all "memories" in the nervous system at that particular time. Nothing

of this sort happens. This is not to say that inhibition is not of prime importance; it is.

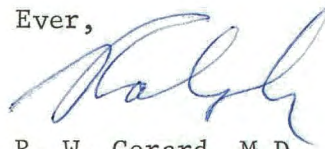
Your rather top-heavy neural networks to explain interaction of senses and higher mental functions seems to me contrived. Net circuits in the nervous system are fairly extensive but I believe they are inherently rather simple ones and essentially alike in all mammals, at least. The main difference between monkey and man is in the number of like units, not in more complicated ones. This is not proved, of course.

It is pretty well proved that, contrary to the implied assumption of your last paragraph, there is not one memory to one neuron or to one synapse. Again, natural and experimental damage to the nervous system excludes this 1 to 1 relationship.

A number of these points are developed, I think, in my summary article in volume 3 of the Handbook of Neurophysiology. You might find this of interest. Then, let's talk.

Kind regards.

Ever,



R. W. Gerard, M.D.  
Director of Special Studies and  
Professor of Biological Sciences

RWG:lk

THE UNIVERSITY OF CHICAGO  
CHICAGO 37 · ILLINOIS  
INSTITUTE OF RADIOBIOLOGY AND BIOPHYSICS

1155 East 57th Street  
Chicago 37, Illinois  
January 19, 1950

Mr. Edward Gerjuoy  
University of Southern California  
3518 University Avenue  
Los Angeles 7, California

Dear Dr. Gerjuoy:

Enclosed you will find a manuscript which might perhaps interest you and some of your biologists. I have some plans to go out to the West Coast in the last half of February, and if that trip materializes, I could give a seminar to your biologists if that appears to be desirable to them.

With best wishes--

Sincerely,

Leo Szilard



UNIVERSITY OF SOUTHERN CALIFORNIA  
3518 UNIVERSITY AVENUE  
LOS ANGELES 7

December 26, 1950

Dr. Leo Szilard  
1155 East 57th Street  
Chicago 37, Illinois

Dear Dr. Szilard:

Thank you for your comments regarding the letter which Morandini and I sent to the Times. I am pretty much in agreement with everything you say. The letter arose out of a conversation between Morandini and myself regarding the possibility of a peaceful solution to the crisis. I did not feel the letter was particularly good or even unique, and like yourself I felt the question at issue was not the inability of the parties to formulate a plan but rather their unwillingness to do so. However Morandini was rather insistent on sending the letter and on having me sign it, and he is so sincere and earnest and good that I acceded, as I almost always find myself pleased to do. I am sure the letter can't do any harm but because of its length I think its chances of publication rather minute. m

So much for that. It was a pleasure to hear from you and I hope to have the opportunity to meet you some day. My regards to Novick.

Sincerely,

  
Edward Gerjuoy

*Pa.C. and a N.Y.!!*

PUBLISHER OF  
RADIO-ELECTRONICS  
MAGAZINE

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New York 11, N. Y.

May 17, 1961

Dr. Leo Szilard  
Room 812, Medical Division  
MEMORIAL HOSPITAL  
444 East 68 Street  
New York, New York

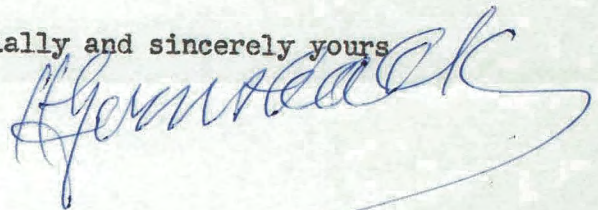
Dear Dr. Szilard:

While I am an old fan of yours and have seen most of your writing, I did not know that you also went into science fiction. I recently read with great pleasure "The Voice of the Dolphins" and I did, in fact, read it twice, marveling at your ingenuity.

I thought you would like to read an early exercise of mine which I wrote in 1911, RALPH 124C 41<sup>+</sup>, which you may not have seen. The book has been called a "bible" for most latter-day science fiction people.

It would make me very happy if I could see you for a few minutes one of these days, if you feel up to it.

Cordially and sincerely yours

A handwritten signature in blue ink, reading "Hugo Gernsback". The signature is written in a cursive, flowing style. Below the signature, there is a long, thin, curved line that extends across the width of the page.

Dr. Leo Szilard  
Imperial Hotel  
Russell Square

London, June 13, 1933

Dear Professor Gibson:

I would like to put down on paper what I discussed with you the other day so that a decision of the executive committee can be brought about.

Professor Franz Boas, the well-known anthropologist of Columbia University has invited Dewey, Pound, Taussig, Raymond Pearl, Walter Cannon and possibly some others to serve on a board which was supposed to be put up for the purpose of giving advice on matters of fellowships and to have as members scientists or scholars who would be willing to give advice if required, each in his own field.

Correspondence with Boas has been carried on in my absence from London before the Academic Assistance Council came into existence, and Boas acted on the assumption that similar steps are being taken in Europe and that formal invitations to serve on such a board will be made from here through Professor Gilbert Murray, Chairman of the League of Nations Committee for Intellectual Cooperation.

The situation being different from what he supposed it to be, I would like to suggest the following: It is doubtful whether scientists and scholars who will be granted a fellowship by the Academic Assistance Council for a certain period of time will all get permanent appointments in England. It is therefore important to take up every case as soon as possible with America and other countries in order to get a more uniform distribution as far as permanent appointments are concerned. A certain number of American scientists and scholars should in view of this problem be asked to act as correspondent members of the Academic Assistance Council and those who have already been approached by Boas could act in such a capacity. In order to cover every field, the Academic Assistance Council could suggest further names, and I am enclosing a list of names which might be helpful as a basis of discussion.

If it were possible to get the decision of the executive committee on this subject and to let me know

- a) if the committee is in favour of asking American scientists and scholars to act as correspondent members,
- b) if they accept those who have already been asked by Professor Boas and what other names they wish to add,
- c) if Professor Murray or somebody else will undertake to invite the professors in question, and if the committee wishes that Professor Boas should go on to get the provisional consent of all of these,

then I would be able to inform Professor Boas accordingly and stop diverging actions.

Yours sincerely,

SK138

SWN692

STOCKHOLM 38 15 1343 =

OCT 16 1959

LT

PROFESSOR SZILARD HOTEL STATLER NEWYORK =

YOUR CASE CAN UNDOUBTEDLY BE EVALUATED AND OPERATED AS  
SKILFULLY BY AMERICAN SURGEON STOP FOR POST OPERATIVE  
TREATMENT AND CONTROL HIGHLY PREFERABLY OPERATION BE DONE  
USA AND PERSONALLY STRONGLY RECOMMEND THIS

GIERTZ

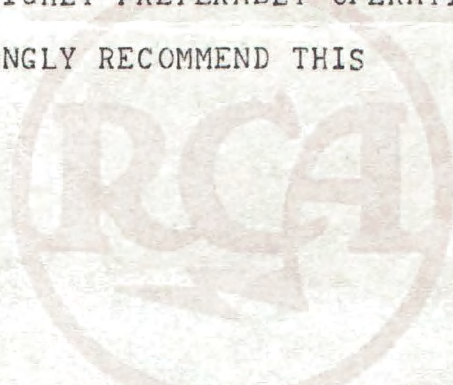
COLL 692 SZILARD



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WHEATON COLLEGE  
NORTON  
MASSACHUSETTS

DEPARTMENT OF  
PSYCHOLOGY AND EDUCATION

August 4, 1955

Professor Leo Szilard  
Department of Physics  
University of Chicago

Dear Professor Szilard:

In the last few months I have felt strongly that some none-governmental "grass root" effort should be made by an international team of competent persons toward peaceful co-existence of "East" and "West" and that their suggestions should be conceived very broadly. I wrote a letter spontaneously to Mr. Harold Stassen, Special Assistant to the President on Disarmament, the receipt of which was acknowledged by letter of June 13, 1955. I enclose copies of this correspondence.

I also talked with Dr. Joseph E. Johnson, President of Carnegie Endowment for International Peace. He told me about your project and suggested that I contact you. I am now working on an implementation of my suggestion presented to Mr. Stassen.

Please find enclosed here also a reprint of my paper, "Inter-Ethnic Tensions and Their Mediation: A Strategy for a Research Campaign," read and discussed at the Second World Congress of Sociology, 1963, Liège, Belgium; and, in addition, another publication which is taken from a book M/S I have written on a strategy for joint research into peace.

My permanent position and address is at Wheaton College, Norton, Mass. I will, however, be at New York from August 5 to approx. Aug. 20 at the address below.

I would appreciate hearing about your project and about a possibility of cooperation.

Yours sincerely,

*Albin R. Gilbert*  
Professor of Psychology

2 enclosures

Address, Aug. 5-20: Mr. Albin R. Gilbert, c/o Rizzoni  
56- Seventh Avenue, Appt. 15 A  
New York 11, N.Y.  
Phone: Algonquin 5-0658, *best a.m. until 9:00, or  
p.m. around 6:00*



TELEPHONE: ARDWICK 2681.

ARG/LAT.

817  
THE UNIVERSITY OF MANCHESTER,  
DEPARTMENT OF CHEMISTRY,  
MANCHESTER, 13.

28th July, 1939.

Professor E Wigner,  
Department of Mathematics,  
Princeton University,  
PRINCETON,  
New Jersey,  
U.S.A.

Dear Sir,

I am directed by Professor Polanyi to enquire when you propose to return our Beryllium Block. Although we do not require same at the moment we should be glad of this information as we might need the Block in the near future.

Yours faithfully,

A.R. Gilson.  
STEWARD.

Sir Sir:

Thank you for your letter of July 28, written on behalf of Prof. M. Polanyi in matters of the Beryllium Block which you have so kindly loaned to me. I am on vacations at present but the Block is being used for experiments in nuclear Physics.

I would very much appreciate if you <sup>send me a</sup> could cable ~~me about~~ two weeks before you have actual need of the block. I would forward it to you at once by <sup>a fast</sup> boat, together with a check covering your expenses in sending the cable.

I hope that this arrangement ~~which~~ ~~is~~ ~~very~~ ~~satisfactory~~ ~~to~~ ~~Prof.~~ ~~Polanyi.~~ ~~Thanking~~ ~~you~~ ~~for~~ ~~your~~ ~~country~~ ~~again,~~  
~~that~~ ~~it~~ ~~is~~ ~~satisfactory~~ ~~to~~ ~~Prof.~~ ~~Polanyi.~~ ~~Thanking~~ ~~you~~ ~~for~~ ~~your~~ ~~country~~ ~~again,~~  
~~relay~~ ~~may~~ ~~be~~ ~~very~~ ~~satisfactory~~ ~~to~~ ~~Prof.~~ ~~Polanyi.~~ ~~Thanking~~ ~~you~~ ~~for~~ ~~your~~ ~~country~~ ~~again,~~  
I am

Very truly yours

Professor Polanyi knows about the conditions which made me to borrow your block and I hope that this arrangement may be satisfactory with him

Mrs. Louis S. Gimbel, Jr.

163 East 78<sup>th</sup> Street



My love and  
hope to see  
you soon -  
Elmer

*File M*

Quincy House 319  
Harvard University  
Cambridge 38, Massachusetts  
5 December 1961

Dr. Leo Szilard  
Hotel Dupont Plaza  
Washington, D. C.

Dear Dr. Szilard:

I am enclosing a preliminary statement about the February 16 student demonstration in Washington. I welcome your comments and suggestions as to policy, plans, and so on; if you have time to make one up, I would also like from you a list of professors throughout the country who you think will be interested in this project and interested in introducing it to others.

We have reserved the Uline Arena in Washington (capacity c. 9000) for the late afternoon of February 16. Since the audience will have been on their feet for several hours in winter weather, I would hope you could take a half hour or even less for your remarks; but if that presents any problem, please let me know.

As the preliminary statement says, the final policy will not be approved until December 30; but after discussing it with the relevant student leaders I can guarantee that the completed policy will be only an expansion of the outline herein enclosed--for example, we may expand the "no first strike" initiative to your amplification of it (no first use of nuclear weapons "on the other side of the line"--by the way, exactly how do you define that line, say in Southeast Asia?).

We think this project could be quite significant, and I look forward to hearing your further reaction to it.

Sincerely yours,

*Todd Gitlin*

Todd Gitlin  
Chairman, Boston Ad Hoc Committee  
for the Demonstration in  
Washington

1641 Metropolitan Avenue  
New York 62, New York

24 December 1961

Dr. Leo Szilard  
Hotel Dupont Plaza  
Washington 6, D. C.

Dear Dr. Szilard:

Since I saw you Thursday evening, the plans for the December 30 meeting in New York have been changed. Substantial agreement on policy has been achieved already between representatives of TOCSIN, the Student Peace Union, Student Sane, and the Turn Toward Peace. The policy, as you suggested, treats of the "specialized deterrence" policy and argues against it; it also emphasizes the need for a general political settlement in Europe. As soon as we can duplicate the policy, I will send a copy to you. In other words, the December 30 meeting will be held--re policy--purely as a matter of form because of the agreement already arrived at. What we will discuss then will be organization on campus and the mechanics of the march, all of which will probably bore you to distraction. What I am suggesting that your time could be more valuably spent than by coming to the December 30 meeting.

About your speech at the February 16 rally: the students who are organizing the march are quite happy you are going to speak about counterforce. Alsop's article in the December 21 paper reinforces this feeling, as well as the general feeling that perhaps the most important thing the demonstrators might have to say would be their opposition to a policy of credible-first-strike-if-necessary.

Thank you again for the time you spent with us and for the effort you are putting into the February 16 project. Merry Christmas and a viable new year.

Most sincerely,

*Todd Gitlin*

Todd Gitlin

(I can be reached at the above address up to January 3, inclusive.)

# GLAMOUR

*file*

*The Condé Nast Publications Inc., 420 Lexington Avenue, New York 17 - Murray Hill 9-5900*

January 18, 1962

Leo Szilard  
Hotel Dupont Plaza  
Washington 6, D.C.

Dear Mr. Szilard:

I am enclosing the typed version of your conversation with Connie Lien on January 5th and the paragraph on you which will appear in the 'great gift' article in March.

Miss Lien asked me to thank you for your help and cooperation.

I will send you tear sheets of the article as soon as the March issue is on the stands.

Sincerely,

*Carol Dimmitt*

Carol Dimmitt  
Feature Department

Washington, D. C.  
March 3, 1962

Professor Donald Glaser  
Department of Physics  
University of California  
Berkeley, California

Dear Dr. Glaser:

The attached letter is meant for you and those others whose names are listed in the memo, "The Next Step". I should be very grateful to you for reading the attached letter and the enclosures, and for advising me as soon as possible whether you are willing to serve as an Associate.

I hope very much that you are willing to serve as a Fellow and that you are not going to disqualify yourself from serving as a member of the Board of Directors of the Council.

Sincerely,

Leo Szilard

Hotel Dupont Plaza  
Washington 6, D. C.  
Telephone: HUDson 3-6000

Enclosures

P.S. I am enclosing the revised and final version of my speech, which will be printed in the April issue of the Bulletin of the Atomic Scientists.

LS

Washington, D. C.  
March 4, 1962

Professor Donald Glaser  
Department of Biology  
Massachusetts Institute of  
Technology  
Cambridge, Massachusetts

Dear Dr. Glaser:

The attached letter is meant for you and those others whose names are listed in the memo, "The Next Step". I should be very grateful to you for reading the attached letter and the enclosures, and for advising me as soon as possible whether you are willing to serve as an Associate.

I hope very much that you are willing to serve as a Fellow and that you are not going to disqualify yourself from serving as a member of the Board of Directors of the Council.

Sincerely,

Leo Szilard

Hotel Dupont Plaza  
Washington 6, D. C.  
Telephone: HUDson 3-6000

Enclosures

P.S. I am enclosing the revised and final version of my speech, which will be printed in the April issue of the Bulletin of the Atomic Scientists.

LS

Note: This same letter was through an error sent to you to Berkley and will presumably reach you also after considerable delay.

LS

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# WESTERN UNION

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LEO SZILARD

DUPONT PLAZA HOTEL WASHDC

ENLIST ME AS ASSOCIATE IN YOUR COMMITTEE FOR A LIVABLE WORLD

GLASER.

UNIVERSITY OF COLORADO  
MEDICAL CENTER  
4200 EAST NINTH AVENUE  
DENVER 20, COLORADO

OFFICE OF THE VICE-PRESIDENT  
FOR MEDICAL AFFAIRS AND  
DEAN, SCHOOL OF MEDICINE

July 27, 1961

Dr. and Mrs. Leo Szilard  
The Hotel Dupont Plaza  
Washington, D.C.

Dear Trude and Leo:

I can't tell you how pleased Helen and I were to receive a copy of "The Voice of the Dolphin" which you were good enough to send to us. We have both been looking forward to reading it, and had planned to pick up a copy before we go to Estes Park next month. Your thoughtfulness in providing us with a complimentary copy is most appreciated.

I do look forward to seeing you both on one of my trips to Washington.

With warmest regards,

Very sincerely yours,



Robert J. Glaser, M.D.  
Vice-President for Medical Affairs  
and Dean, School of Medicine

RJG:cb

Have just finished the book - superb!



*file*

April 16, 1957

Dr. Bentley Glass  
Department of Genetics  
Johns Hopkins University  
Baltimore, Maryland

Dear Dr. Glass:

I just returned to Chicago from a short visit to The Oak Ridge National Laboratory, and I was wondering whether you have thought of inviting Russell and Hollaender to the Gatlinburg conference. I am under the impression that they may have something to contribute and that it might be a mistake not to include them.

I am looking forward to seeing you at Gatlinburg.

With kind personal regards,

Sincerely yours,

Leo Szilard

sent D

# BALTIMORE SEMINAR ON ARMS CONTROL

P. O. BOX 4673, BALTIMORE 12, MARYLAND

April 20, 1960

Professor Leo Szilard  
Memorial Hospital  
444 East 68th Street  
New York 21, New York

- DONALD H. ANDREWS
- CHARLES A. BARKER  
CHAIRMAN
- LEON EISENBERG, M. D.
- JEROME D. FRANK, M. D.
- OLCOTT GATES  
TREASURER
- H. BENTLEY GLASS
- LOUIS LASAGNA, M. D.
- WILLIAM L. NEUMANN
- CLIFFORD R. NOLL, JR.
- ABRAHAM G. OSLER, M. D.
- FRANCIS J. PETTIJOHN
- DAVID SPRING
- ROBERT W. TUCKER
- C. VANN WOODWARD

A group of faculty members at the Johns Hopkins University and Goucher College, concerned about the threat of the nuclear arms race to human survival, have been meeting at fortnightly intervals since the fall of 1959 in order to share knowledge and explore points of view. Spurred to action early in March by the scheduled resumption of talks on a nuclear test ban, we drafted the enclosed statement to Secretary of State Herter and circulated it among a few faculty members over a two-day period. We were enormously gratified by the support it received: 106 signatures were obtained during those two days from members of the two institutions. It has since been endorsed by 61 others, making a total of 167. The forty from Goucher represent more than 60% of that faculty. The 127 from the Johns Hopkins represent one-third of the people we canvassed - the full-time members of the Baltimore faculties holding the rank of instructor and higher.

The public notice the action received is sampled on the second enclosure. Such reaction, considered together with favorable comments from members of Congress and others, prompt us to think that the present is a good time for sober statements from people in academic life.

The Baltimore Seminar on Arms Control - a name chosen to stress the search for answers rather than the possession of formulas - is sending this letter and the supporting enclosures to the presidents of a large number of chapters of the A.A.U.P. and to other people in universities throughout the nation in the hope that our experience will serve as an incentive to action elsewhere. We do not ask that you necessarily join with us in approving our statement, though we would be pleased if you and your associates would decide to do so. We are principally interested in stimulating discussion at other campuses in the belief that those in the academic profession have a contribution to make to the cause of arms control and world peace.

We are eager to know what you think and to learn of any action you may already have taken or that you may take.

Yours sincerely,

*J. of faculties  
Johns Hopkins*

*Bentley Glass*

FRANK M. ALBRECHT  
MARGARET H. NEUSTADT  
SECRETARIES

January 15, 1955.

Mr. Samuel Gladstone  
RFD 1, Box 322  
Santa Fe, New Mexico

Dear Mr. Glasstone,

Please excuse me for the delay in answering your very kind letter of November 28th. In the Spring of 1934 I applied for a provisional British application on a chain reacting system which was based on the concept that beryllium may give off two neutrons when it reacts with one slow neutron. The general concepts of a chain reaction including the critical size of the chain reacting system, were derived in this application. This application contained <sup>also</sup> the following passage:

"(a) Pure neutron chains, in which the links of the chain are formed by neutrons of the mass number 1 alone. Such chains are only possible in the presence of a metastable element. A metastable element is an element the mass of which (packing fraction) is sufficiently high to allow its disintegration into parts under liberation of energy. Elements like uranium and thorium are such metastable elements; these two elements reveal their metastable nature by emitting alpha particles. Other elements may be metastable without revealing their nature in this way."

About one year later a patent application was filed by me in England based in part on this provisional application. This patent application was subsequently divided in two parts, one part was issued as a patent and the other part was assigned without financial compensation to the British Admiralty and was sealed secret. I assigned this patent to the British

From G-2

per. file

RFD 1, Box 322  
Santa Fe, New Mexico

November 28, 1956

Professor Leo Szilard,  
Dept. of Biophysics,  
University of Chicago,  
Chicago, Illinois

Dear Dr. Szilard :

There is an interesting little matter of scientific history concerning which I think you can give me some information. I am at present working on a revision of the "Sourcebook on Atomic Energy" and I would like to run the story to earth, since I think it merits a place in the book.

Some years ago I picked up information at Oak Ridge to the effect that as far back as 1933 you had suggested the possibility that the (n,2n) reaction with beryllium-9 might be made the basis of a self-sustaining divergent nuclear chain reaction. Further, along the AEC "grapevine" I was told that a patent application for such a process had actually been filed, but that the matter had been kept secret.

In 1954, Dr. O. R. Frisch gave a talk in England on the origins of the concept of atomic energy release, and he referred to an attempt that had actually been made to blow up a mass of beryllium by bombarding it with neutrons. Privately, he has informed me that he is sure that someone did make this attempt, but he cannot recall who told him about it or any other names connected with the project.

Since your name was specifically mentioned -- actually in an ORNL report by Dr. A. M. Weinberg -- I am taking the liberty of writing directly to you, in the hopes that you may be able to give me the facts of the situation. If they are substantially as outlined above, I would like to say something about them in the revised edition of the "Sourcebook". It is a matter of considerable interest that the concept of a divergent chain propagated by neutrons was in someone's mind even before the discovery of fission. The fact that the process is now known to be energetically impossible does not affect its historical significance.

I would greatly appreciate any help you can give me in this matter.

Sincerely yours,

*Samuel Glasstone*  
Samuel Glasstone

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*John Raper*

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## APPOINTMENTS

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RFD 1, Box 322  
Santa Fe, New Mexico

January 17, 1957

Dr. Leo Szilard,  
1155 East 57th Street,  
Chicago 37, Illinois


Dear Dr. Szilard :

This is to thank you for your very interesting letter of January 15, 1957. As you perhaps know, in the "Sourcebook on Atomic Energy" I have tried to include a number of points of historical interest, and it seems to me that your conception of a neutron chain reacting system with a critical size as far back as 1934 is worthy of mention. I presume that I have your permission to make use of the information contained in the letter. If you do happen to come across the original of your U. S. patent application, I would very much like to see it.

Although you refer to your conviction that a nuclear chain reaction might be used to set up a violent explosion, you do not say anything about an attempt to blow up a mass of beryllium. Can you confirm the statement by Dr. O. R. Frisch that such an attempt was made? He told me that he is sure somebody tried to do so, but he cannot recall who gave him the information. It seems to me that you are the most likely person to know about this. It is possible that the experiment may have been made by the British Government after you left England,

Please forgive me for bothering you again, but I would greatly appreciate any further information you can give me.

Sincerely yours,

  
Samuel Glasstone