

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

March 31, 1954

Mr. William V. Consolazio  
Program Director for Molecular Biology  
National Science Foundation  
Washington 25, D. C.

Dear Mr. Consolazio:

To my regret, even though I know the applicant Mr. Papazian and have a favorable impression of him, because of pressure of other work I am not able to give this matter the attention which it deserves. I therefore suggest that you send it for evaluation to someone else.

Sincerely,

Leo Szilard

LS:j

Consolazio

The Quadrangle Club  
The University of Chicago  
Chicago 37, Illinois  
September 18, 1956

Mr. William Consolazio  
National Science Foundation  
Washington 25, D. C.

Dear Mr. Consolazio:

There was some slight mix-up, as you will see from the copy of the enclosed letter which I sent to Dr. Beadle today. I am sending you enclosed twenty copies of revised form of my memorandum. It does not differ from the original draft in any way except that it has references to a "research grant" in conformity with the application submitted by the California Institute of Technology. I shall phone you Friday morning to ask if you think it desirable that Dr. Hotchkiss also revise his letter to refer to a "research grant" in conformity with the rest of the application.

I am sorry about this mix-up which was mainly caused by Dr. Beadle's absence.

With kind regards,

Sincerely yours,

Leo Szilard

m  
Encl.

Consolazio

The Quadrangle Club  
The University of Chicago  
Chicago 37, Illinois  
September 18, 1956

Mr. William Consolazio  
National Science Foundation  
Washington 25, D. C.

Dear Mr. Consolazio:

Enclosed you will find twenty copies of  
a letter addressed to you by Warren C. Johnson, Dean,  
Division of the Physical Sciences, University of Chicago.  
The original of this letter has been sent to you  
directly by Dr. Johnson's office.

Sincerely yours,

Leo Szilard

m  
Encl.

The Quadrangle Club  
The University of Chicago  
Chicago 37, Illinois  
September 21, 1956

Mr. William Consolazio  
National Science Foundation  
Washington 25, D. C.

Dear Mr. Consolazio:

After I talked to you over the telephone this morning, I talked to Dr. Hotchkiss. He said he wants to change his letter a little in any case, and he will mail the new letter to you today. You should, therefore, have it on Monday morning.

I did not want to ask him to have twenty mimeographed copies made so that I am afraid your office will have to make twenty copies. I regret the inconvenience which this may cause you.

With kind regards,

Very sincerely yours,

Leo Szilard

NATIONAL SCIENCE FOUNDATION

WASHINGTON 25, D. C.

November 4, 1959

Dr. Leo Szilard  
Department of Biophysics  
The University of Chicago  
5801 South Ellis Avenue  
Chicago 37, Illinois

Dear Dr. Szilard:

This is to let you know that your proposal, B-7839, to the National Science Foundation has been reviewed. All those whose advice we sought urged that your proposal be given every consideration.

Because of the ever present need to spread our funds as far as possible I wish to propose the following. Would you be willing to accept \$5,000 per year to cover travel and incidental expenses during 1960, 1961, & 1962, \$24,000 per year in 1963 and \$23,000 per year in 1964? It seems to us that this would allow you to do what you wish to do and would secure your first two 'retirement' years. If such an arrangement will be satisfactory, I shall be honored to recommend it for further administrative action.

Sincerely,

*F J Reithel*

Francis J. Reithel  
Program Director  
Molecular Biology

*If you have any questions  
please call me.  
FJR*

*Grant  
cancelled  
Jan 6/1960*

OCT 1 '59

NATIONAL SCIENCE FOUNDATION  
WASHINGTON 25, D. C.

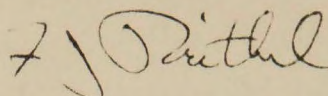
September 21, 1959

Dr. Leo Szilard  
Professor of Biophysics  
The University of Chicago  
5801 South Ellis Avenue  
Chicago 37, Illinois

Dear Dr. Szilard:

Your research proposal referred to below has been assigned to the Molecular Biology Program of the National Science Foundation and will be reviewed in November. Proposals recommended at that time will be considered for activation early in 1960 if adequate program funds are available.

Sincerely yours,



Francis J. Reithel  
Program Director for  
Molecular Biology

Reference: B-7839  
"Study of the Molecular Bases  
of General Biological  
Phenomena"

NOTE: It is requested that one more copy of proposal be sent to National Science Foundation with Dr. Szilard's signature as well as Dr. Zachariassen's and Mr. Harrell's signatures.

*gen files*

NATIONAL SCIENCE FOUNDATION  
BIOLOGICAL AND MEDICAL SCIENCES

Prop. B 16948 M

PROPOSAL EVALUATION SHEET

Title Theoretical Studies in Molecular Biology

Investigator Linus Pauling Institution Center for the Study of Democratic Institutions

COMMENTS (If more space is required please use additional page).

As is generally known, Dr. Linus Pauling is a first class scientist and I unreservedly recommend your granting him the five-year support for which he is asking.

The research which Dr. Pauling contemplates is of a fundamental nature and is well conceived; he rates among the first in contemporary research and thinking.

Dr. Pauling is abreast of the developments in all the fields in which he is active and his past contributions entitle him to the fullest confidence.

Numerical Rating For Merit  
(please check one)

- 1. Highly meritorious
- 2. Meritorious
- 3. Acceptable
- 4. Questionable
- 5. Declined

Name Leo Szilard  
(please print or type)

Institution The Salk Institute for Biological Studies

Date May 22, 1964

*file: gen file*

**B16948**

Center for the Study of Democratic Institutions

The Fund for the Republic, Inc.

Box 4068, Santa Barbara, California — WOODLAND 9-3281

New York Office

133 East 54th Street, New York 22, New York — PLaza 3-1340

February 26, 1964

Application to the National Science Foundation for a Grant for Support of Linus Pauling during a period of five years beginning 1 November 1964.

Attention: Molecular Biology

Submitted by the Center for the Study of Democratic Institutions, Box 4068, Santa Barbara, California.

The Center for the Study of Democratic Institutions is a project of the Fund for the Republic, a non-profit educational enterprise, established to promote the principles of individual liberty expressed in the Declaration of Independence and the Constitution of the United States. Professor Linus Pauling has been a Member of the Staff of the Center for the Study of Democratic Institutions since 1 November 1963. Under his appointment he is free to carry on his research in various fields of science and medicine and also, to the extent that he desires, in other fields, such as war and peace in relation to democratic institutions, and the clarification of basic questions of freedom and justice, for which participation in the conferences of the Center may be especially valuable to him.



In his own statement of plans for the future, which is attached to this proposal, Professor Pauling has mentioned his desire to be free to carry on his work in whatever location seems to him to be most favorable to its successful prosecution. For some of his proposed studies in science and medicine it might be desirable for him to assume residence in a university or medical school especially suited to his research, and for some of his proposed work of writing books and carrying on theoretical research he might desire to live in considerable isolation.

Professor Pauling is now receiving a salary of \$25,000 per year from the Center for the Study of Democratic Institutions. Application is herewith made for a Grant of \$198,924, during the five-year period beginning 1 October 1964, to cover his salary during this period and the other items listed in the attached budget.

This application is not being submitted to any other agency or organization.

Robert M. Hutchins  
President

# Center for the Study of Democratic Institutions

The Fund for the Republic, Inc.

Box 4068, Santa Barbara, California — WOODLAND 9-3281

New York Office

133 East 54th Street, New York 22, New York — PLaza 3-1340

## PROPOSED BUDGET FOR THE YEAR OCTOBER 1, 1964 TO SEPTEMBER 30, 1965

Salary - Linus Pauling (75%)	\$ 18,750.00
Secretarial Salary (37½%)	1,800.00
Employee benefits -- retirement, health, accident, etc. (21% of above)	4,315.50
Center overhead (20%)	4,973.10
	<hr/>
Total for one year	\$ 29,838.60
Total for five years at same rate	\$149,193.00

Statement by Linus Pauling in connection with the application by the Center for the Study of Democratic Institutions for a Grant.

14 February 1964

I was born in Portland, Oregon, on 28 February 1901, and was educated in the schools of Oregon. I received the degree of Bachelor of Science in Chemical Engineering from Oregon State College in 1922 and the degree of Ph.D. in Chemistry, with minors in physics and mathematics, from the California Institute of Technology in 1925. I have been a member of the staff of the California Institute of Technology from 1922 until 30 June 1964, when my resignation as Professor of Chemistry becomes effective. During the period 1 November 1963 to 30 June 1964, I am on leave of absence without salary from the California Institute of Technology. Since 1 November 1963 I have been a Staff Member of the Center for the Study of Democratic Institutions.

During the past four decades I have devoted myself largely to teaching chemistry and to carrying on research in physics, chemistry, biology, and medicine. For a number of years I have also devoted part of my time to work in the field of world peace and world law.

I am a member or honorary member of many professional societies. I have been awarded a number of medals, including the Presidential Medal for Merit (President Truman, 1948), the Nobel Prize for Chemistry for 1954, and the Nobel Peace Prize for 1962.

#### SCIENTIFIC WORK

I have published about 350 scientific papers, about 100 communications relating to world peace and world law, and six books. My contributions to science, made for the most part in collaboration

with students and colleagues, may be summarized as follows:

1. Experimental determination by X-ray diffraction of the structures of many minerals and other inorganic crystals.
2. The formulation of a set of structural principles for silicates and other inorganic crystals.
3. The derivation of a set of ionic radii of atoms for use in crystals with largely ionic structure.
4. Discovery of the rotational motion of molecules in crystalline hydrogen and other crystals.
5. The formulation of the quantum mechanical description of molecules in terms of hybrid bond orbitals, the electronegativity of atoms, the resonance of molecules among several electronic structure, and other contributions to the theory of the chemical bond.
6. The explanation of the residual entropy of ice at low temperatures in terms of randomness of orientation of hydrogen bonds.
7. The experimental determination of the structure of a large number of gas molecules by the electron-diffraction method.
8. The formulation of the resonating-valence-bond theory of metals and intermetallic compounds, and the use of interatomic distances in the discussion of the structure of metals and related substances.
9. The discovery of the change in magnetic properties of hemoglobin on combination with oxygen, and the application of the magnetic technique to the study of the structure and reactions of hemoglobin.
10. The invention of an instrument to measure the partial pressure of oxygen.

11. The discovery of the alpha helix and other spatial configurations of polypeptide chains in proteins.

12. The formulation of a theory of the structure and process of formation of antibodies, and its test by an extensive series of experiments with antigens containing haptens with known structure.

13. The proposal (1940) that the gene consists of two mutually complementary molecules, each of which can act as a template for the synthesis of a duplicate of the other.

14. The discovery of an abnormal protein (sickle-cell anemia hemoglobin) associated with a disease, the development of the concept of molecular disease, and the study of the molecular basis of mental retardation.

15. The development of a molecular theory of general anesthesia.

#### PROPOSED ACTIVITIES

During the past forty-two years I have carried on both theoretical and experimental research in chemistry, physics, mineralogy, biology, and medicine. The experimental and theoretical researches have been closely associated. I think that it has been valuable to be able, in association with my students and collaborators, to carry out the experimental studies that have been suggested by my theoretical investigations.

At the present time, however, there are so many theoretical problems that I wish to attack that I feel that I cannot afford to devote time to the continued supervision of experimental work. Moreover, I believe that it would be possible for me to get other people to carry out any worthwhile experiments that were suggested by my

theoretical work in the future. I have accordingly made the decision that it would be wise to bring my supervision of experimental work to an end, at least for the most part. I am planning to be associated as consultant with some experimental programs in which I am interested, such as the work on the biochemical and molecular basis of mental disease.

I propose accordingly, if circumstances permit, to devote myself almost entirely to theoretical researches and to writing during the coming years.

I am not sure about the fields to which I shall devote myself in the future. One of the reasons for my desire for an appointment that would give added freedom to my actions is that I am looking for fields to which I might make some interesting contribution by developing a new point of view. I have made contributions in several fields of biology and medicine - immunology, molecular disease (the hereditary hemolytic anemias), anesthesia - and I feel that, if I associate with people engaged in medical research and continue to think about various problems of biology and medicine, I may be able to make some additional contribution, along some unforeseen line.

Some of the researches and activities that I have begun and would like to continue during the next few years are the following:

1. The completion of a book on the molecular basis of biological specificity. This book would represent the expansion of lectures that I gave at Princeton (the Vanuxem Lectures) and at Harvard (the Prather Lectures). Arrangements have been made that the book would be published jointly by the Princeton University Press and the Harvard University Press.

2. Completion of a book on science and civilization - an expansion of the Messenger Lectures that I gave at Cornell. This book would be published by the Cornell University Press.

3. Theoretical work on the molecular properties of substances with general anesthetic activity, in relation to their effectiveness as anesthetics.

4. Completion of theoretical work on the development of a new theory of antiferromagnetism and ferrimagnetism - the one-electron-bond theory.

5. Extension of the resonating-valence-bond theory of the structure of electron-deficient substances, such as the boranes.

6. Preparation of a book on the chemical-bond theory of metals and intermetallic compounds, which was initiated in my 1938 paper on the structure of metals and alloys and has been discussed in a number of papers that I have published since then.

7. Continuation of the search for information bearing on the question of the molecular basis of mental deficiency and mental illness.

8. Continuation of studies of the factors responsible for aging and death.

9. Studies of evidence provided by molecular structure about the process of evolution of species.

10. Continuation of the development of a somewhat novel theory of the structure of atomic nuclei and the nature of the process of nuclear fission.

11. Preparation of a fourth edition of my book, The Nature of the Chemical Bond.

12. Continued work on the scientific aspects of world peace.

In carrying on this work, I hope to have the help of a research assistant trained in theoretical chemistry and physics. I believe that funds for the support of an assistant can be obtained from other sources.

Linus Pauling