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M E M O R A N D U M

From: William Doering and Leo Szilard

to: Cass Canfield

A proposal to create two interdependent research institutes operating in the general area of public health, designated as:

Research Institute for Fundamental Biology and Public Health,

and

Institute for Problem Studies.

There appear to be a number of important problems in the general area of public health which could be solved today and yet for some reason or other progress towards their solution is conspicuously slow. In some cases the state of scientific knowledge is far enough advanced to make it possible to set up projects aimed at finding a practical solution to the problem; in other cases more fundamental research in the biological area involved is needed.

Throughout the United States at present there are scattered many spirited men among ~~the~~ scientists who pursue fundamental research in biology with manifest success. These men engage in fundamental research primarily because it gives them pleasure to do so. Their interest is not limited in any permanent and irrevocable sense to a single specialty, and they are quite prepared to switch from one technique to another when the time comes to shift the emphasis from one set of questions to another. Many of these men are keenly interested, also, in the acute problems of our times, but they have rarely the opportunity to do something about them. Occasionally one or the other strikes out on his own from the realm of pure science into work on one of these problems. Jonas Salk, for instance, responded to the challenge of producing a polio vaccine by taking off several years from pure research (and he did this in the face of the prevailing notion that no dead virus can be successfully used for immunization.) Usually such diversions from pure research involve a great personal sacrifice, and those who engage in them must struggle against heavy odds.

We propose that a setting be created which would offer men of this sort an opportunity for two kinds of activities -

a) to pursue biological problems of great intrinsic interest that lie in the general areas which may ~~have an~~ ultimate by having a bearing on problems of public health (with the same kind of freedom that scientists enjoy in their research at universities) and

b) to shift their attention from time to time to problems of public

importance in the general area of public health and to work on projects aimed at finding practical solutions to such problems.

We believe that within such a setting the abilities of creative men could be brought to bear on problems of public importance - both recognized and unrecognized - where progress is conspicuously lacking.

Recognized Problems

Clearly it would be highly desirable to develop some biological method of birth control, adequate for the needs of the underdeveloped areas of the world. About three years ago the Conservation Foundation conducted a study in order to determine whether the problem was ripe for an attack on a programmed research basis. The results are reported in "The Physiological Approach to Fertility Control", The Conservation Foundation, 30 East 40th Street, New York City, April 1, 1933.

We participated in this study and concluded that there were a number of promising leads around which further research could be centered. Certain recommendations were made concerning the magnitude of the funds that were needed and the way in which they ought to be spent.

Subsequently the Population Council became interested in this problem and took some steps similar to those which had been recommended in the Conservation Foundation report. Currently, the Population Council is making available about $200,000 a year in the form of grants-in-aid for fundamental research in the field of mammalian reproduction. This money, added to the huge amount available at the National Institute of Health, to support pure research in this field, has led to a situation where there is probably more money available now than there are worthy takers. In spite of this, progress is slow and it is by no means certain that any of the present developments, aimed at finding a really satisfactory method for birth control are moving in the right direction. Too few of the men active in this field have the kind of imagination and productivity that one finds among those attracted by fundamental biological problems of intrinsic interest.

Too many are inclined to look upon the solution of the problem as a lifetime job.

The lag in progress in the field of birth control is not unique. It is just one example - though probably the most conspicuous one - of a general phenomenon.

Another example - taken again from the field of public health - is provided by cigarette smoking. For almost thirty years there has been reason to suspect (Doering & Lombard, 1928) that cigarette smoking is harmful to health and by now there is a strong suspicion that smoking one pack per day may shorten a man's life by at least five years. It would not take large funds to settle this question once and for all within a period of three years. There is a great public interest attached to knowing the answer and yet somehow it is not forthcoming with the desirable speed.

There is much public discussion of the topic but no concerted effort to establish the relevant facts. If smoking one pack a day shortens a man's life by five years or more, then cigarette smoking is the single most important public health issue in the U.S., for even if we found a cure for cancer we could do no more than to add two and a half years to a man's life expectancy.

SPACE

More than one-third of the deaths of middle-aged men in America is due to coronary disease. In Italy the contribution of this disease to the total deathrate is believed to be one-twelfth and in Japan one-thirtieth. If the rate in the United States could be reduced to that of Italy, one might be able to add three years to men's life expectancy. For a long time now it has been suspected that the high coronary disease rate in America is associated with the diet. There are plenty of clues but no organized effort to find out what acceptable changes in the diet might remedy the situation. There is no reason why this question could not be settled within a period of five years, if a responsible group of men were to put their minds to it. The path from finding an answer to the relevant questions to the actual suppression of coronary disease in America may be

quite long (it may take a generation's time before this can be accomplished), but the immediate, necessary, steps seem clear.

The examples chosen above were taken from among the problems which are publicly recognized. It might well be that some of the unrecognized problems are of even greater importance. What are these unrecognized problems is, of course, not possible to say but an attempt is made in the Appendix to discuss what some might be.

It appears likely to us that progress will remain slow unless we create a setting that will provide for the scientists, whose help is needed, incentives - intellectual, moral, and material - sufficient to induce them to do something actively about these problems.

Most of these problems have in common that they require work on two levels:

1) The knowledge, which is lacking and without which no effective action can be contemplated, must be produced. In some cases this knowledge can be obtained by a more or less direct attack on the problem - by setting up a "project". In other cases a direct study of the problem would be premature and progress must await advances in ~~the results of~~ fundamental biological research in the general area.
2) Once adequate knowledge is available, its application to the problem must be promoted. Frequently this may involve merely bringing to the attention of the agencies which are responsible for practical action, the knowledge that has become available.

Work at both of these levels might begin to move very fast if the kind of scientist whom we have in mind, can be induced to enter upon the stage. We say this with some degree of confidence because ~~of~~ we have seen what can happen when an old stagnant field is invaded by "outsiders".

The Achievements of Outsiders.

In the last fifteen years a revolution has taken place in the field of

microbiology which had been stagnant in the care of the classical bacteriologists for over thirty years. When suddenly biochemists, geneticists and physical chemists - most of them young - invaded the field, things began to happen.

During the war, soon after the radiation laboratory was set up at M.I.T., nuclear physicists moved in and began to develop radar while the classical electric engineers watched from the sidelines.

In the development of atomic energy theoretical physicists invaded the field of chemical engineering and presented a process design for the Hanford Plutonium Plant which was accepted, while the designs produced by the engineers proved to be useless.

It is conceivable that "classical" nutritionists will solve the problem of "coronary disease and fat metabolism", or that gynecologists will come up with a really satisfactory method of contraception, but it is more likely that an invasion of "outsiders" may provide the right answers.

What kind of organization would it take to provoke such invasion of outsiders?

No organization was needed to provoke the invasion of microbiology. Here were problems of great intrinsic interest which could be pursued even though the new men working in this field were scattered all over the country. There was no need to induce these men to leave their universities and gather under one roof; There were no problems of public importance that required the setting up of projects aimed at their solution.

The situation was different in the case of radar and atomic energy. In these cases it was necessary to establish closer collaboration in order to have a coherent group capable of a concerted attack. And it was possible to organize the invasion because the universities were willing to grant their men leave of absence "for the duration" and because the emergency of war provided the men with a compelling motive to respond to the call.

Our present situation is quite different. There may be at present an emergency also - but the emergency is not recognized. If we are to say what kind of a setting it would take to provoke the needed invasion, we cannot derive our

answer from any precedent and have to rely solely on our imagination. In the following we shall attempt to describe on this basis an organization that we believe might be adequate to accomplish our purpose.

Organization.

There shall be created two interdependent institutes having independent administrations and budgets but being otherwise closely related.

One of these - the Research Institute for Fundamental Biology and Public Health - will engage in pure laboratory research. Its regular Staff Members will have tenure and will be free to work on any biological questions of their ~~choice~~ choosing. Thus the selection of these Staff Members will automatically determine the areas in which the Research Institute will be active. In selecting the Staff Members we would, therefore, have to keep in mind that we want to see the Institute active in areas which are both of intrinsic interest from the point of view of fundamental knowledge and at the same time of relevance for unsolved Public Health problems. An attempt has been made to indicate in the Appendix what some of these areas might be.

The Research Institute will have six to eight regular Staff Members and perhaps nine to twelve Affiliate Members. In addition the Research Institute will have twelve to sixteen Research Associates on its staff, appointed for a maximum of ten years. The Affiliate Members will be distinguished scientists who serve in an advisory capacity. They will have a major role in determining the direction of the development of the Institute.

The second institute - the Institute for Problem Studies - will have no permanent scientific staff. It will have only a small staff of administrators who need not necessarily be all scientists. The choice of problems on which this Institute may work will be determined by the members of the Research Institute both regular and affiliate.

It is assumed that the Institute for Problem Studies will take up only problems where progress is lagging and where there is a gap that it can fill.

It is further assumed that in the next five years perhaps two thirds of the attention of the Institute may be devoted to the problem of birth control and that most of the other problems tackled will also lie in the field of public health in the broad sense of the term. We may envisage two possibilities in regard to the scope of problems to be considered: The Institute for Problem Studies might

a) be limited by charter to the field of public health in the broad sense of the term, or

b) be left free, by the charter, occasionally to take up problems that go outside the field of public health. Thus the Institute could pursue, for instance, some of the major problems of under-developed areas which lie in the area of "political thought" rather than "biological sciences". (This would involve bringing in for limited periods of time scholars whose interests are outside the field of science. See Appendix.) But in this connection the charter shall provide that the Institute may go outside the field of public health only with the approval of two thirds of the Affiliate Members, as well as the approval of two thirds of the Board of Trustees.

The Institute for Problem Studies will operate by bringing in from time to time, for a limited period, groups of men who may wish to collaborate with each other on a given project. If the Institute sets up a project that appeals to the imagination of an individual on the staff of the Research Institute, ~~he~~ such an individual may for as long as he wishes, go off the payroll of the Research Institute and transfer to that of the Institute for Problem Studies, where he may work jointly with others on a project. It is assumed that in the Institute for Problem Studies, ~~will have on the average~~ those who are employed on a temporary basis, about one third to one half ~~of the men that it employs on a temporary basis~~ will be on loan from the Research Institute, and that the rest will

be drawn from elsewhere. The regular Staff Members of the Research Institute might spend on the average perhaps one third of their time with the Institute for Problem Studies.

With respect to the problems assigned to it, the Institute for Problem Studies will assume the responsibility of creating or otherwise procuring and assembling the knowledge that is required in order to make effective action possible. The Institute will assume responsibility also for bringing this knowledge to the attention of those agencies which are in a position to take effective action. In this sense the Institute will promote activities that become possible through the newly derived knowledge. The Institute may have no clinical facilities of its own but it may have to assume responsibility for clinical ~~testing~~ tests in cooperation with medical schools and it may have to assume responsibility for field tests in cooperation with such agencies as the Population Council, Planned Parenthood, U.S. Public Health Service, the World Health Organization or individual National governments.

Dissemination of information to the public, general education, propaganda or the influencing of legislation, will remain outside the scope of the Institute's activities.

The combination of these two institutes will, we believe, attract the type of scientist whose help we need to enlist. Neither industrial laboratories nor research institutes of the classical type, nor universities offer scientists comparable opportunities.

In the industrial laboratory where the emphasis is heavily on commercial applications, the scientist rarely has the opportunity of satisfying his curiosity about fundamental aspects of nature, and he is almost invariably isolated, having few or no stimulating colleagues. He rarely survives.

In a pure research institute a staff member is free to follow his inclination and move in his work anywhere where his scientific curiosity may lead him, but

this great freedom - which he possesses in theory - is to some extent thwarted - in practice - by his being under moral pressure to produce. He is not burdened by any teaching obligation, and he is free to spend all his time laying golden eggs - except that it is difficult to lay golden eggs if you are expected to do so. He may be permitted to follow up his basic discoveries to the point where they can be applied to the solution of a problem of public importance, but he is not encouraged to do so, for setting up projects within a pure research institute would exert a disruptive influence.

In a university a scientist earns his "right to exist" through teaching; therefore the moral pressure to produce is much less strong. Thus it is easier there for a scientist to leave an area of research which is safe, (where he can produce results by just turning a crank,) and to venture into uncharted seas, where he runs the risk that he may obtain no publishable results for many years to come, but where he also has a chance of making a really great discovery. His situation is quite satisfactory if he likes to engage in formal teaching. However his teaching load, even if moderate, leaves him insufficient time to devote attention and energy to the solution of the great acute problems and to develop his basic discoveries to the point where he can see ~~the~~ their fruits ~~of them~~.

In contrast, the Research Institute for Fundamental Biology and Public Health will offer a man the advantage of being able to combine his interest in fundamental knowledge with his desire to see knowledge that has become available applied to the solution of problems which are of public importance. In his research he will be as free as in a university. But he will not be required to teach, and he may, if he so desires, earn his "right to exist" by joining a "project" which appeals to his imagination by going off the payroll of the Research Institute and on to the payroll of the Institute for Problem Studies.

The attraction of the Institutes for scientists - of the kind needed - would, in our opinion, be further enhanced should some of the projects of the Institute for Problem Studies extend into the area of "political thought". If

this were the case, the Institute would presumably bring in, from time to time, for short periods, men whose main field of intellectual activities lies outside the realm of science. Our reason for believing that this would enhance the attraction of the Institutes is based on the impression that, even in an institution which is as strong in science as the California Institute of Technology, spirited men among the permanent staff suffer from the one-sidedness of their contacts. They are deprived of the company of historians, economists and other scholars ~~(whose thinking extends beyond the realm of science)~~ and they are aware of this deprivation.

Affiliate Members.

The Affiliate Members will not be employees of the Research Institute and need not spend very much time at the Institute even though they shall play a major role in guiding its work. They will, together with the regular Staff Members whom they shall outnumber, control the appointment of new members. They will also, together with regular Staff Members, determine the projects which the Institute for Problem Studies may undertake. In order to enable them to fulfill these roles, the Affiliate Members may be expected to spend at least one week each year at the Research Institute, and it is hoped that many of them will spend more time than this. The Research Institute shall make secretarial facilities available to them during their stay, and they may, if they wish, make use of their visit to prepare manuscripts for publication away from the disrupting intrusions of their daily duties at their home base. It is proposed that Affiliate Members be paid their expenses and ~~their~~ a fee of $3,000. a year.

Regular Staff Members.

The regular Staff Members of the Research Institute will enjoy tenure like a professor at a university. Each will have a budget from $35,000 to $50,000, from which his own salary and those of one or two research associates may be paid. It is assumed that each regular Staff Member will, in addition, have outside grants-in-aid averaging perhaps $40,000. It is proposed that each regular Staff Member have at his disposal laboratory space between 2500 and 5000 square feet.

Research Associates.

Research Associates will be chosen by the individual regular Staff Members and may serve in this capacity no longer than ten years. A change of status from Research Associate to regular Staff Member shall not be impossible but shall require the concurring vote of three-fourths of the Affiliate Members. This precaution is proposed in order to avoid the danger of inbreeding.

Staffing of the Research Institute.

Following the selection of the first ~~eight~~ seven Affiliate Members and their acceptance, we may begin to discuss the selection of regular Staff Members. In order to do this intelligently, it will be necessary first to reach a consensus among the Affiliate Members concerning the areas in which they think the Research Institute ought to be active. Upon reaching such a consensus we may then begin to think of individual candidates for regular Staff Membership.

Our aim should be to recruit individuals with a strong overlap of interest, men who are likely to work harmoniously with each other under one roof. If appointments were offered to such men one by one, the most desirable candidates might be less likely to accept than if an offer were made to them as a group. What we must seek is a group of men who look upon fundamental research primarily as a source of pleasure and upon the application of knowledge to the acute problems of our times primarily as an opportunity for adventure; those others who are spurred to activity mainly by their sense of "duty" are not likely to be the most imaginative and productive ones.

The decision to offer initially an appointment to some such group will rest with the Affiliate Members of the Research Institute.

Procedure concerning the appointment of Members.

The procedure that may be adopted concerning the election of new regular Staff Members and Affiliate Members (beyond the appointment of the two initial groups) may well determine whether in the long run the Research Institute may remain productive, or whether it will ~~ultimately~~ decay. It is proposed to discuss this point with the Affiliate Members prior to the drafting of the charter of

the Research Institute.

Financial Need of the Institutes.

The Research Institute will need an endowment of $10,000,000. An endowment of $5,000,000 plus perhaps a fund of $6,000,000 to be spent in ten years would also be satisfactory. In this latter case the income from the endowment would not be spent for the first ten years but rather be added to the capital in order to build up the endowment. An endowment is necessary if the Research Institute is to grant tenure, which it must.

The Institute for Problem Studies will require $5,000,000, spendable in ten years.

It is assumed that the cost of building a laboratory may amount to $3,000,000, half of which may come from the federal government out of a Congressional appropriation of $90,000,000 (to be spent over the next three years). Under the provisions of this appropriation, half the costs of facilities devoted to medical research or public health, may come from the federal government.

Housing.

The character of the housing problem will depend on the location of the two institutes which in turn shall be determined by the preference of the regular Staff Members of the Research Institute.

We believe that it is essential for the success of the Institutes that ~~its~~ the scientific staff live within walking distance of the laboratory. If they do, many of them will return to the laboratory after dinner, perhaps two or three times a week, as the need arises, and they will have many more informal contacts with each other (proved so valuable to creative individuals).

The Boards of Trustees.

It is proposed that one-half of the Trustees of each of the Institutes be drawn from the Affiliate Members of the Research Institute, and that the Affiliate Members take turns in serving on the two boards of trustees. Who the other members of the two boards might be is not for us to say, but we do wish to submit the

following point of view:

For the Institutes to be successful it is desirable that the non-scientist members of the Boards of Trustees and the Affiliate Members be congenial. In looking over the boards of trustees of other foundations it would appear as if their members had been selected primarily on the basis of "respectability". For a member of a board of trustees to be respected is necessary but in our particular case he needs to be also imaginative and courageous. This holds particularly for the trustees of the Institute for Problem Studies; the activities of the Research Institute will not be controversial in any way, but those of the Institute for Problem Studies probably will be.

Perhaps in thinking of prospective non-scientist trustees it might be a good guiding principle to aim at bringing together a group of men who will take real pleasure in exchanging ideas with each other and with the Affiliate Members.

January 25, 1957

Vaccination of the Delayed Type

By Leo Szilard

By "vaccination of the delayed type" we shall mean a vaccination of an individual against an infectious agent (virus, bacterium, etc.) by injecting the killed infectious agent (or its surface antigens) in circumstances in which the injection evokes strong delayed type hypersensitivity to the surface antigens of the infectious agent. Pappenheimer and his co-workers have shown[1] for diphtheria toxoid and egg albumen that delayed hypersensitivity ensues against any one of these two antigens if a mixture of the antigen and an excess of the specific antibody is injected intradermally (or, together with an adjuvant, subcutaneously). I assume that delayed hypersensitivity can be evoked in this manner also against the surface antigens of infectious agents, such as polio virus, influenza virus, typhoid bacteria, etc.

It appears to me likely that the reactions which manifest themselves in the phenomenon of delayed hypersensitivity exist in nature because these very same mechanisms are involved in the defenses of the body which are active at the infected site. Thus hypersensitivity of the delayed type against the surface antigens of the infectious agent should reduce the severity and the duration of the infection. If this assumption is correct, then we must conclude that we ought to resort to "vaccination of the delayed type" in the case of diseases where ordinary vaccination with the killed infectious agent does not afford maximum protection.

In the case of polio, for instance, ordinary vaccination with a killed virus (Salk vaccine) produces circulating antibodies. In case of

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(1) Uhr, J. W., Salvin, S. B., and Pappenheimer, A.M., Jr., Journal of Experimental Medicine, Vol. 105, p. 11 (1957).

a subsequent polio infection of the intestinal tract, there is a rapid rise in the titre of the circulating antibody. Therefore, such a vaccinated individual is immune against polio in the sense that the infection cannot spread from the intestinal tract via the blood circulation to the brain. But such a vaccination does not confer on the individual resistance against the infection of the intestinal tract itself. The intensity and duration of the infection is the same for such a vaccinated individual as it is for individuals who had not been previously exposed to the virus in any way. This is in contrast to individuals who had been infected with live polio virus and who on a subsequent infection of the intestinal tract with polio virus show a resistance to this infection inasmuch as the virus will remain alive for a shorter period of time in the intestinal tract and will be shed for a shorter period of time by the intestinal tract.

We surmise that the same kind of resistance to the intestinal infection which is manifested by such persons could be conferred on an individual (who may have been rendered immune by ordinary vaccination - Salk vaccine) by giving him a polio vaccination of the "delayed type". This does not involve the use of live polio virus and could be accomplished by injecting intradermally (or together with an adjuvant subcutaneously) killed polio virus mixed with an excess of the specific antibody.

Such a vaccination of the delayed type with the killed infectious agent might prove useful also in the case of influenza and typhoid fever. It might prove useful in general in all those infections of mucous membranes in which ordinary vaccination (that leads to circulating antibodies but not to delayed type hypersensitivity) does not afford maximum protection.

February 1, 1957

On the Possibility of detecting "Transformation" of somatic cells of mammals or birds.

By Leo Szilard

If skin is transplanted from rabbit A to rabbit B, the transplanted skin is sloughed off after a period of apparent healing. If subsequently another skin transplant is made from rabbit A to rabbit B, this second skin transplant does not survive as long as does the first transplant. We may express this fact by saying that the first transplant has induced "intolerance" in rabbit B against some genetically determined specific substances of rabbit A, to which we may refer, somewhat sloppily, as "antigens" - in quotes. What is the nature of these "antigens"?

It has been recently shown by Billingham, Brent and Medawar[1] that intolerance against skin of a strain A of mice can be induced in mice of strain CAB by injecting into CAB mice extract made from nuclei of spleen cells of A mice, and they have further shown that the active agent in these cell extracts is

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(1) Dr. R. E. Billingham, Dr. R. Brent and Professor P. B. Medawar, F.R.S., Nature, Vol. 178, p. 514 (1956).

destroyed by desoxyribonuclease. The authors interpret this result by assuming that, if skin is transplanted from A mice to CAB mice and induces intolerance against a subsequent transplantation, the "antigens" of A mice which are responsible for producing this intolerance are substances that are destroyed by desoxyribonuclease, and are therefore presumably nucleo-proteins or nucleic acids. They write:

"So far as we are aware, only one hypothesis can accommodate these findings: that the antigenic substances responsible for skin transplantation immunity are desoxyribonucleoproteins endowed with antigenic and therefore with genetic specificity. This hypothesis is made likely by our evidence, but the evidence falls short of proof."

We wish to point out here the possibility of another hypothesis which would appear to be even more likely and which is as follows:

The extract prepared from nuclei of spleen cells of A mice (in which the active agent can be destroyed by the addition of desoxyribonuclease) induces intolerance in CAB mice against a subsequent skin transplant from A mice not because this extract contains the "antigens" of A mice but rather because this extract - if injected into CAB mice - is capable of causing a certain number of cells of injected CAB mice to produce the relevant "antigens" of A mice.

If this hypothesis is correct, then we would deal here with a phenomenon strictly analogous to that known as bacterial transformation. In bacterial transformation nucleic acid extracted from a strain of bacterium, A, is taken up by a different strain of bacterium, B, and this nucleic acid induces a certain fraction of the bacterium ~~of strain B~~ to produce certain specific antigens of strain A.

In the circumstances one feels impelled to devise a different sort of experiment that might be adequate to detect whether transformation of somatic cells of mammals or birds can, in fact, be accomplished by injecting nucleic acids of one individual into another individual. The principle of an experiment that might accomplish this purpose is as follows:

We shall assume that rabbit B and rabbit A have different blood groups and that rabbit B carries no natural iso-antibodies against the red cell antigens of rabbit A. An extract may then be prepared from spleen cell nuclei of rabbit A which contains the nucleic acids and nucleo-proteins but as far as possible very little else. We would regard it as having accomplished evidence for "transformation" if we can show the following:

(a) The purified desoxyribonucleic-acid-containing fraction which is prepared from cell nuclei of rabbit A is treated with desoxyribonuclease and injected into rabbit B. There appear no antibodies against the RED cell antigens of rabbit A ~~antigens~~ in the serum of rabbit B.

(b) When the treatment with desoxyribonuclease is omitted, the injection of the extract is followed by the appearance of antibodies in the serum of rabbit B against the red cell antigens of rabbit A.

(c) The purified desoxyribonucleic-acid containing fraction prepared from cell nuclei of rabbit A is treated with desoxyribonuclease. Subsequently, the desoxyribonuclease is destroyed and a purified desoxyribonuclease acid containing fraction, prepared from cell nuclei of rabbit B, is added -- to serve as an adjuvant in lieu of the destroyed cell nuclei of rabbit A. This mixture is then injected into rabbit B. No antibodies against rabbit A ~~antigens~~ RED cell antigens of must appear in the serum of rabbit B.

If ~~the cell~~ an extract ~~from~~ Prepared from spleen cell nuclei of rabbit A is indeed capable of forcing a small But appreciable fraction of the cells of rabbit B (say, a total of about one million cells) to produce ~~the relevant~~ RED cell antigens of rabbit A, then rabbit B could be expected to respond by the production of antibodies specific for these antigens. Such circulating antibodies, if present, can be demonstrated by modern, sensitive, methods that permit the detection of very small quantities of type specific antibodies.

Arrangements are now being made for carrying out experiments of this type.

Should it turn out that transformation can, in fact, be effected in mammals (and the technique discussed above coulld also show whether transformation can be effected in birds), then there is a remote possibility that transformation might provide the basis for a "cure" for a class of rare hereditary diseases. In these diseases -- galactosemia, phenolpyruvic oligophrenia, hemophilia, etc. -- a defective gene is responsible for the absence of a specific protein in its functional form. Conceivably injecting into the patient DNA taken from nuclei of the spleen of a healthy individual repeatedly and in sufficiently large quantities might transform a sufficient fraction of the cells of the patient to remedy the disturbing manifestations of the defect.

16 Dec. 1957

WHAT METHODS ARE USEFUL TO ADVANCE BIOLOGICAL RESEARCH IN GERMANY

by

Leo Szilard

There is a lot of discussion in Germany today about the question of how to improve the education of biology students at the universities. In this connection, one thinks about examinations for a diploma which would require experience in the fields of mathematics, physics and chemistry. Another proposal is that special professorial chairs should be created for genetics, biochemistry and microbiology. If this would be possible now--the money for sixty new professorial chairs would be required--one could obtain that those students who would choose a teaching career would have a better education in biology and that a very small number of graduate biologists with a diploma could get a position in the pharmaceutical industry.

As I see it, all these proposals are not adequate and I think that one has to see the following points.

In the near future, industry will be able to give positions to a very small number of people only. Thus, talented young people who do not want to be teachers will not study biology as their principle subject. As a field of research, modern biology will become more and more interesting, and one must ask oneself where the research worker should come from.

Experience has shown that excellent research workers will be found only if there are many research workers available in the field of the natural sciences. Since most people of moderate ability will try to get positions in industry, only a small percentage, about 10% - 20%, will choose a university career and, in connection with this, much less salary than that given by industry.

On the other hand, it is possible that young people who are interested in biology should begin their studies in the fields of physics, chemistry or medicine and try to obtain, in addition to their main studies, the necessary biological experience. After getting a diploma in one of these disciplines, most of these people--perhaps after one or two years of biological research work--will find a position as a chemist, a physicist or a physician, and only those who are really dedicated to biology will try to obtain a research position in this field.

Something like this can be observed in the United States at the present time.

During the last fifteen years a kind of revolution has taken place in the field of biology in the United States. This revolution began with the invasion of the stagnate field of bacteriology by geneticists, physicists and chemists and spread from there to the other branches of the biological sciences. This new kind of biology is called, more or less officially, molecular biology. A better name would be quantitative biology, for the progress which was realized did not come from the molecules but from young research workers who were not satisfied with qualitative results alone.

It took about fifteen years for biological institutes in the United States to open their doors for these young people. Until then, this new kind of biology was undertaken in institutes of physics where young physicists who turned to biology lectured in physics but did their experimental work in the biological field. Today in the United States, these biologists no longer need the protection of institutes of physics.

As I see it, the United States experience will show that most of the young biologists of this type will come, not from the group of biology students, but from those who have graduated in chemistry, physics or medicine and who have worked in biology after their graduation. The reason for this is the fact that, even in the United States where the pharmaceutical industry is very important, it is very difficult for a normally educated biologist to get a proper position.

The situation in biology in the United States resembles the situation for physicists in Hungary during the first half of the century.

No reasonable man studied physics in Hungary. Practically all of the well known Hungarian physicists studied chemistry, engineering, electrical engineering or medicine. Most students with a special interest in physics realized that their capacities were insufficient to follow a research career, and after finishing their university studies, they took a position in industry or practiced medicine. Only the very few who felt that they were outstanding attempted to become physicists after finishing their studies.

It was very difficult for these people in Hungary to get enough experience in physics in addition to their main studies. Those who went into physics could not find any positions in Hungary and had to emigrate. The situation is much more favorable for students in the United States who are attracted to biology. During the last year the University of Illinois, Urbana, Illinois, had a conference concerning the teaching of biophysics. I arrived one day late and when I met my colleagues they told me that they didn't want me to say what they had agreed upon in the meantime. I told them that young students interested in biology should graduate as physical chemists and should try to obtain their knowledge of biology in special courses given during summer vacation. Within one or two years after graduation, most of these students who are not interested in pure research would try to get a well paying position in the chemical industry and only the very few who are attracted to research would stay in low-paid university positions. Afterwards I saw that all the other colleagues had agreed to exactly the same proposal during the time of my absence.

But the following must be said about the situation in the United States. The student who is interested in biochemistry can take a course with Stanley in Berkely during the summer months. He can take a summer course about microbiology with Van-Niel in Pacific Grove. There are summer courses about genetics of bacteria and bacteriophages in Cold Spring Harbor. He can take different kinds of biological courses during the summer months in the Marine Biological Laboratory in Woodshole. He can take special courses about tissue culture which are given each summer, sponsored by the Tissue Culture Association, and so on.

With these possibilities, it is not difficult for a student of physics, chemistry or medicine to acquire the necessary knowledge in biology during the summer months in the United States.

If such a person has worked for some time in a biological laboratory after finishing his studies, he will soon find out if he has sufficient talent for research work or if it would be better for him to practice in his original field as a chemist, physicist or physician.

Most of the people will go into industry or into medical practice and only a few will remain in the field of research, but for these few the chances for an academic career are very favorable in the United States.

The first point is that the medical schools of the universities have a very liberal policy with regard to their professorial chairs in pharmacology, bacteriology, pathology, physiology and biochemistry. These subjects are studied during the first two years and every biologist can take the responsibility for lectures in this field. If one professorial chair of this kind is empty the board asks only who is the best man in natural sciences who is interested in biology without requiring that the person have any special experience in the field of his teaching position.

After the war, the New York University got the biochemist Ochoa for its professorial chair of pharmacology, although he was not interested in pharmacology at all, and a few years later when this professorial chair was again empty, they got the microbiologist Bernard Davis who was not interested in pharmacology either. In the same way, the immunologist Lewis Thomas had the chair for pathology.

Added to this situation in the medical schools is the situation in the faculties of natural science and the professorships in the departments of zoology and botany. In these departments one can encounter a lot of different biological research work which has no resemblance to the classical field of zoology and botany. When I was asked by Detlev Bronk a short time ago how to define a zoologist, I could only answer - "A zoologist is a biologist who has no knowledge of botany."

It is not to be expected that in the near future the medical schools in Germany will take a similar attitude and that the natural science chairs of the universities will be occupied in Germany by zoologists and botanists of the classical style.

Given this situation, two things should be done in Germany. (1) The Germany Research Foundation should give money to students who want to take summer courses, and this money should be used for their travel expenses and fees.

If such summer courses should be created, one for each specialty would be sufficient for the whole country. Perhaps it would be sufficient for some of these special courses to be given every other year.

At this time the universities of Cologne and Frankfurt and the Max-Planck-Institutes for Biology and Virus Research in Tubingen could hold such courses.

I do not want to discuss the question of how to give the students of chemistry, physics and medicine an interest in these biology courses.

The best education for a student who wants to work in the field of quantitative biology is the education which an American student who graduates from one of the leading universities in the field of physical chemistry receives. Most Germany universities do not give a degree in physical chemistry and the student must study for a degree in chemistry in order to write his thesis in physical chemistry. It would be very helpful if at least a few German universities would make it possible to receive a degree in physical chemistry so that students interested in biology could first obtain an education in physical chemistry.

(2) According to the attitude of the faculties of natural science and medicine in German universities, very talented young people who work in the field of quantitative biology cannot expect to obtain a university position. If we are to prevent the young generation of biologists from emigrating to the United States, we must create research positions for quantitative biologists outside the universities. It would be quite sufficient to enlarge the research institutes of the Max-Planck-Gesellschaft or to create new research institues within it. This expansion should be proportional to the appearance of young, talented biologists.

WHAT METHODS ARE USEFUL TO ADVANCE BIOLOGICAL RESEARCH IN GERMANY

by

Leo Szilard

There is a lot of discussion in Germany today about the question of how to improve the education of biology students at the universities. In this connection, one thinks about examinations for a diploma which would require experience in the fields of mathematics, physics and chemistry. Another proposal is that special professorial chairs should be created for genetics, biochemistry and microbiology. If this would be possible now--the money for sixty new professorial chairs would be required--one could obtain that those students who would choose a teaching career would have a better education in biology and that a very small number of graduate biologists with a diploma could get a position in the pharmaceutical industry.

As I see it, all these proposals are not adequate and I think that one has to see the following points.

In the near future, industry will be able to give positions to a very small number of people only. Thus, talented young people who do not want to be teachers will not study biology as their principle subject. As a field of research, modern biology will become more and more interesting, and one must ask oneself where the research worker should come from.

Experience has shown that excellent research workers will be found only if there are many research workers available in the field of the natural sciences. Since most people of moderate ability will try to get positions in industry, only a small percentage, about 10% - 20%, will choose a university career and, in connection with this, much less salary than that given by industry.

On the other hand, it is possible that young people who are interested in biology should begin their studies in the fields of physics, chemistry or medicine and try to obtain, in addition to their main studies, the necessary biological experience. After getting a diploma in one of these disciplines, most of these people--perhaps after one or two years of biological research work--will find a position as a chemist, a physicist or a physician, and only those who are really dedicated to biology will try to obtain a research position in this field.

Something like this can be observed in the United States at the present time.

During the last fifteen years a kind of revolution has taken place in the field of biology in the United States. This revolution began with the invasion of the stagnate field of bacteriology by geneticists, physicists and chemists and spread from there to the other branches of the biological sciences. This new kind of biology is called, more or less officially, molecular biology. A better name would be quantitative biology, for the progress which was realized did not come from the molecules but from young research workers who were not satisfied with qualitative results alone.

It took about fifteen years for biological institutes in the United States to open their doors for these young people. Until then, this new kind of biology was undertaken in institutes of physics where young physicists who turned to biology lectured in physics but did their experimental work in the biological field. Today in the United States, these biologists no longer need the protection of institutes of physics.

As I see it, the United States experience will show that most of the young biologists of this type will come, not from the group of biology students, but from those who have graduated in chemistry, physics or medicine and who have worked in biology after their graduation. The reason for this is the fact that, even in the United States where the pharmaceutical industry is very important, it is very difficult for a normally educated biologist to get a proper position.

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16. Dezember 1957

WELCHE METHODEN EIGNEN SICH ZUR FÖRDERUNG DER BIOLOGISCHEN FORSCHUNG IN DEUTSCHLAND ?

von Leo Szilard.

Es wird in Deutschland gegenwärtig viel über die Frage diskutiert, wie man die Ausbildung der Studenten an den Universitäten in Biologie verbessern könnte. In diesem Zusammenhang wird von einer Einführung einer Diplomprüfung für Studierende der Biologie geredet, zu deren Ablegung ausreichende Kenntnisse auf dem Gebiete der Mathematik, Physik und Chemie erforderlich sein sollen. Man hört auch Vorschläge, daß an allen Universitäten Lehrstühle für Genetik, Biophysik und Mikrobiologie errichtet werden sollen. Wenn diese Vorschläge durchführbar sind - es käme ja dabei auf die Finanzierung von insgesamt fast 60 neuen Lehrstühlen an -, so könnte man allenfalls erreichen, daß Studenten, die Lehramtskandidaten werden wollen, eine bessere Ausbildung in Biologie erhalten und daß eine kleine Anzahl von Diplombiologen in der pharmazeutischen Industrie Anstellung finden könnten.

Vom Standpunkt der Förderung der biologischen Forschung sind aber - soviel ich sehe - die empfohlenen Maßnahmen nicht die adequaten Mittel zum Zweck. Es scheint mir, daß man von diesem Standpunkt aus sich folgendes vergegenwärtigen muß:

Es werden in der absehbaren Zukunft, selbst wenn man für eine adequate Ausbildung der Diplombiologen sorgt, die Anzahl der Biologen, die von der Industrie aufgenommen werden können, klein bleiben. Aus diesem Grunde werden sich für Naturwissenschaften begabte junge Leute, die nicht Lehramtskandidaten werden wollen, vom Studium der Biologie allgemein fernhalten. Die moderne Biologie wird aber vermutlich als Forschungsgebiet in der nahen Zukunft sehr viel an Bedeutung gewinnen, und deswegen muß man sich fragen, von wo die Forscher auf diesem Gebiet herkommen sollen.

Die Erfahrung zeigt, daß die Voraussetzung für das Entstehen einer größeren Anzahl von hervorragenden Forschern auf irgendeinem Gebiet der Naturwissenschaften nur dann gegeben ist, wenn die Mehrzahl der jungen Leute, die sich für

auf diesem Gebiet aneignen, in die Industrie abfließen sobald sie sich von der Mittelmäßigkeit ihrer Fagat... überzeugt haben. Eine kleine Minderheit von etwa 10-20% wählt unter solchen Umständen die akademische Laufbahn und ... gleich für viele Jahre hinaus ein geringeres Einkommen ... in der Industrie geboten wird.

In der Biologie können diese Voraussetzungen auch ... sein, wenn die jungen Leute, die sich für Biologie ... ren, ursprünglich Physik, Chemie oder Medizin studieren ... nebenbei während ihres Studiums die notwendigen ... schen Kenntnisse erwerben. Nach Erlangen des Diploms in dieser broterwerbsfähigen Fächer werden die meisten dieser jungen Leute dann (vielleicht nach ein bis zwei Jahren ... gischer Forschungsarbeit) als Chemiker, Physiker oder ... ner im Wirtschaftsleben unterkommen, und nur die besonders Befähigten und Begeisterten werden ihrer unüberwindlichen Zuneigung zur Biologie erliegen und die Forscherlaufbahn ... greifen.

Ein ähnlicher Vorgang spielt sich zur Zeit in der Biologie in Amerika ab, un es ist deswegen ganz lehrreich, sich das amerikanische Beispiel etwas näher zu betrachten.

In den letzten 15 Jahren hat sich eine Art Revolution der Biologie in Amerika abgespielt. Angefangen hat diese Revolution mit einer Invasion eines stagnierenden Wissenschaftszweiges, der Bakteriologie, durch Genetiker, Physiker und Chemiker und breitete sich dann von dort auch auf andere Wissenschaftszweige der Biologie aus. Man nennt diese neuartige Biologie, zur Zeit mehr oder weniger offiziell, Molekulare Biologie. Eine treffendere Bezeichnung wäre jedoch Quantitative Biologie, denn die Fortschritte, die man erzielt, kommen nicht von den Molekülen her, sondern von den jungen Wissenschaftlern, die sich nicht länger mit qualitativen Erwägungen zufrieden geben.

Es hat in Amerika etwa 15 Jahre gedauert, bis sich die Tore der biologischen Universitätsinstitute der führenden Universitäten für diese jungen Leute geöffnet haben. Bis dahin entwickelte sich diese neue Biologie vielfach unter dem

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Schutz der physikalischen Institute, wo junge Physiker, die Biologen geworden sind, weiter Physik unterrichteten, jedoch experimentell auf biologischem Gebiet arbeiteten. Zur Zeit dürfen in Amerika diese Biologen des Schutzes der physikalischen Institute nicht mehr.

Die Entwicklung wird sich aber auch weiterhin in Amerika, glaube ich, so abspielen, daß die meisten jungen Biologen dieser Sorte nicht aus der Gruppe der Biologie-Studierenden hervorgehen werden, sondern, daß ein kleiner Bruchteil derjenigen, die in Chemie oder Physik promovieren, oder ein Diplom in Medizin erwerben, nach ihrer Promotion zur Biologie übergehen. Der Grund hierfür ist die Tatsache, daß es selbst in Amerika, wo die pharmazeutische Industrie zur Zeit doch schon ziemlich bedeutend ist, auch für einen richtig ausgebildeten Biologen schwer ist, eine Stellung zu finden.

In der Biologie ist die Situation in Amerika in dieser Beziehung zur Zeit so ähnlich, wie sie etwa für die Physik in der ersten Hälfte des Jahrhunderts in Ungarn bestanden hat.

Kein vernünftiger Mensch studierte in Ungarn Physik. Praktisch alle bekannten ungarischen Physiker studierten Chemie, Maschinenbau, Elektrotechnik oder Medizin. Von denjenigen Studenten, die sich besonders für Physik interessierten, erkannte die große Mehrzahl mit der Zeit, daß ihre Fähigkeiten doch nicht für eine Forscherlaufbahn ausreichten und ging dann nach Beendigung ihres Hochschulstudiums in die Industrie oder in die medizinische Praxis. Nur eine kleine Minderheit, die sich aus irgendeinem Grund für besonders begabt hielten, machten, nachdem sie das Studium beendet hatten, einen ernsthaften Versuch, Physiker zu werden.

Während es aber in Ungarn für diese Männer schwierig war, während des Studiums ihres Hauptfaches sich auch noch nebenbei ausreichende Kenntnisse in der Physik zu verschaffen und diejenigen, die den Übergang zur Physik erfolgreich bewältigten, in Ungarn keine Stellung finden konnten und auswandern mußten, ist in Amerika in dieser Beziehung die Situation derjenigen Studenten, die sich von der Biologie angezogen fühlen, wesentlich günstiger.

Im Laufe des letzten Jahres dachte die Universität von Illinois, Urbana/Illinois, daran

einen Studiengang für Biophysik einzurichten und es wurde eine kleine Konferenz einberufen, um sich darüber klar zu werden, was man in dieser Beziehung den Studenten empfehlen soll. Ich kam zu dieser Konferenz mit einer eintägigen Verspätung und als ich eintraf, sagten die anderen: "Wir wollen jetzt dem Szilard nicht sagen, was wir denken, er soll uns erst sagen, was er meint und dann werden wir ihm sagen, was wir ausgedacht haben". - Ich sagte darauf, daß die jungen Studenten, die sich für Biologie interessieren, als physikalische Chemiker promovieren sollen und sich die biologischen Spezialkenntnisse, die sie benötigen, während des Sommers durch Beteiligung an Spezialkursen, die zur Verfügung stehen, aneignen sollten. Innerhalb von ein oder zwei Jahren nach der Promotion werden die meisten dieseb Studenten - eben diejenigen, die sich nicht besonders für reine Forschung eignen oder interessieren - dann vorziehen, eine hochbezahlte Stellung in der chemischen Industrie anzunehmen und eine kleine Minderheit, die sich von der Forschung stark angezogen fühlt, wird lieber als Biologe eine schlecht bezahlte Universitätsstellung akzeptieren. Es stellte sich dann heraus, daß die Anwesenden auf Grund ihrer vorangegangenen eintägigen Besprechung zu derselben Überzeugung gekommen sind.

Hierzu muß man allerdings folgendes über Amerika bemerken: Ein Student, der sich für Biochemie interessiert, kann einen intensiven Kursus im Sommer bei Stanley im Institut für Virusforschung in Berkely absolvieren. Er kann einen Sommerkursus über Mikrobiologie bei Van-Niel in Pacific Grove (Stanford University) absolvieren. Er kann im Sommer Kurse über Genetik von Bakterien und über Bakteriophagen in Cold-spring Harbour nahmen. Er kann im Sommer biologische Kurse verschiedener Art im Marine Biological Laboratory in Woods Hol nehmen. Er kann an Spezialkursen über Gewebskultur teilnehmen, die jeden Sommer von der Tissue Culture Association abgehalten werden (in den letzten 2 Jahren in Denver), etc.

Angesichts dieser Sachlage ist es in Amerika für einen Studenten der Physik, Chemie oder Medizin leicht, sich neben seinem Hauptfach auch noch biologische Spezialkenntnisse im Sommer zu erwerben.

Wenn er dann nach Abschluß seines Studiums eine Zeit lang in einem biologischen Laboratorium arbeitet, so stellt es sich gewöhnlich sehr bald heraus, ob seine Begabung für selbständige Forschung ausreicht, oder ob er besser daran ist, wenn er in seinem ursprünglichen Hauptfach als Chemiker, Physiker oder Mediziner berufstätig wird.

Die Mehrzahl wird in die Industrie oder in die medizinische Privatpraxis gehen und nur eine Minderheit wird bei der Forschung verbleiben. Für diese begabte Minderheit sind aber die Aussichten für ein Vorwärtskommen in der akademischen Karriere in Amerika dann auch sehr günstig.

Dies liegt in erster Linie daran, daß die Medical Schools der führenden Universitäten eine äußerst liberale Politik bei der Besetzung der Lehrstühle der Pharmakologie, Bakteriologie, Pathologie, Physiologie und Biochemie befolgen. Diese Lehrgegenstände werden von Studenten in den ersten 2 Jahren ihres Studiums absolviert und jeder biologisch gebildete Naturforscher kann die Verantwortung für den Unterricht irgendeiner dieser Gegenstände übernehmen. Daher wird, wenn ein Lehrstuhl dieser Art frei wird, nur gefragt: "Wer ist der beste biologisch interessierte Naturwissenschaftler, der verfügbar ist", ohne zu fordern, daß er Spezialfachkenntnisse auf dem Lehrgebiet besitzt.

So hat z.B. die New-York University nach dem Krieg den Biochemiker Ochoa auf den Lehrstuhl der Pharmakologie berufen, obwohl er sich gar nicht für Pharmakologie interessiert hat. Als dieser Lehrstuhl vor ein paar Jahren wiederum frei wurde, wurde er mit dem Mikrobiologen Bernard Davis besetzt, der sich auch nicht für Pharmakologie interessiert. Ähnlich wurde der Lehrstuhl für Pathologie vor ein paar Jahren mit dem Immunologen Lewis Thomas besetzt.

Zu dieser flexiblen Haltung der medizinischen Fakultäten kommt nun noch hinzu, die Haltung der naturwissenschaftlichen Fakultäten bei der Ernennung von Professoren in den Departments für Zoologie udn Botanik. In diesen Departments werden eine Anzahl von verschiedenen biologischen Forschungsrichtungen gefördert, die kaum noch eine Ähnlichkeit mit der klassischen Zoologie oder Botanik haben. Als mich kürzlich Detlev [illegible] fragte, wie man heute noch den "Zoologen" definieren könne, konnte ich nur antworten: "Ein Zoologe ist ein Biologe, [illegible]"

Es ist natürlich nicht anzunehmen, daß in der absehbaren Zukunft die medizinischen Fakultäten in Deutschland eine [illegible] Haltung einnehmen werden. Und die naturwissenschaftlichen Fakultäten der Universitäten werden wohl in Deutschland voraussichtlich auch weiterhin klassische Zoologen und Botaniker berufen.

Angesichts dieser Situation müßte man in Deutschland 2 Richtungen hin Maßnahmen treffen:

1.) Die Deutsche Forschungsgemeinschaft sollte Stipendien Studenten zur Verfügung stellen, die biologische Spezialkurse im Sommer absolvieren wollen und diese Stipendien sollten Reisekosten, Lebenshaltungskosten und Teilnahmegebühren decken.

Bezüglich der einzurichtenden Sommerkurse muß man sich vor Augen halten, daß für jede Spezialität eine Sommerkurs für das ganze Land genügt. Und es genügt sogar vielleicht, wenn man manche solcher Spezialkurse jeden zweiten Sommer abhält.

Zur Zeit kommen für solche Sommerkurse hauptsächlich die Universitäten Köln und Frankfurt und die Max-Planck-Institute für Biologie und für Virusforschung in Tübingen in Frage. Mit der Zeit werden sich voraussichtlich noch weitere Zentren entwickeln, die bereit sein werden, Sommerkurse abzuhalten.

Auf die Frage, wie man Studenten der Chemie, Physik und Medizin für Biologie interessieren könnte und wie man ihnen die Existenz solcher Sommerkurse bekannt geben sollte, möchte ich hier nicht eingehen.

Die beste Ausbildung für Studenten, die ernsthaft daran denken, später auf dem Gebiet der quantitativen Biologie Forschungsarbeit zu leisten, ist wohl die Ausbildung, die ein amerikanischer Student erhält, der an einer führenden Universität in physikalischer Chemie promoviert. An den meisten deutschen Universitäten ist es zur Zeit jedoch nicht möglich, ein Diplom in ~~Chemie~~ physikalischer Chemie zu erwerben, und der Student muß ein Diplom in Chemie erwerben, um in physikalischer Chemie zu promovieren. Es wäre wünschenswert, daß wenigstens an einigen wenigen deutschen Universitäten ein Diplom in physikalischer Chemie geboten wird und man könnte dann biologische interessierte Studenten, die zunächst physikalische Chemie studieren wollen, auf diese Universitäten auf-

merksam machen.

2.) Bei der jetzigen Haltung der naturwissenschaftlichen und medizinischen Fakultäten an deutschen Universitäten können auch begabte junge Leute, die auf dem Gebiet der quantitativen Biologie Forschungsarbeit leisten nicht auf eine Universitätskarriere rechnen. Wenn man nun verhindern will, daß die heranwachsende Generation von Biologen nach Amerika abwandert, so wird man Forschungsstellen für quantitativ orientierte Biologen außerhalb der Universitäten schaffen müssen. Einstweilen wird es vermutlich genügen, die bestehenden Forschungsinstitute der Max-Planck-Gesellschaft zu vergrößern oder neue Forschungsinstitute innerhalb der Max-Planck-Gesellschaft zu schaffen. Das Tempo einer solchen Expansion müßte mit dem Auftauchen von jungen, begabten Biologen Schritt halten.

Wishik

fundamental biology = human biology

public health = human health

non-scientific persons — O'Connor
Morrow
Osgood ?
Gow ?
Whitehead ?

Wolff — M.D.
? Eric Fromm

what are objectives for which support is being sought?

what are the activities to accomplish?

what need exists that can be met only in this way?

will this solve the whole problem?

will this be a gesture or a forceful & effective action that can & will be sustained?

Availability of more money than
fakes is a clue to part
of problem & indicates that
limiting factor is not money
per se — but perhaps, in part,
how it is used.

Both control may be ultimate goal —
but it is the result, for part,
of scientific advances in human
health. I might consider this
as a natural & later consequence
of the 1° consideration which is
"human requirements for human
health & happiness" — &
in effectiveness (evaluation of)

Man ought to be a subject of
fundamental theology — I can
then understand religion —
moral behavior, etc.
At present distinction is made
between fundamental & applied
in terms of relation to man
& society.

Can say I'm interested — but
defer judgment about plans as
they have now projected. — only
because I'm not clear what
ultimate place of these activities
in relation to what problem. —

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Creation of a setting – can this be done at universities where men are – or that would give opportunities to young men who might find it better to move from where they may be.

Idea – decentralized institute – to create idea of universality of concept & importance of spreading idea that this is attainable & part of university responsibility. This would serve to get local as well as central support & give greater substance & strength &

by identifying talent in teaching & training. Provide opportunity opportunity & also collaboration to less intensely focussed people. It would stimulate more people & would interest more into going into & relating ~~their~~ or orienting their work in this direction.

would allow people who don't want to move to stay where they are. would avoid conflicts between jurisdictions. would

reduce duplication of administrative costs. would not compete — but would supplement & support institutions of higher learning.

by university
would require willingness to set up institutions that was flexible so as to take on large problems on full-time basis.

Then, institute idea could spread & could be coordinated by federal overall institute idea to guide that defines & orients

but does not direct — i.e. —
it leads — & ~~also~~ those who will
can join & follow.

"Practical" solutions must not be
kept so far from "fundamental" work.
Should have a body that can change
readily so as to add, subtract,
multiply, divide & — grow as
the need indicates —

Problem is world-wide — & world
as a whole is the laboratory &
man is the subject.

Reorganized Biology —

Birth control is lost in lost — but not the largest.

Progress is slow because it is haphazard & lacks dedicated direction.

Direction is that seen by single individuals who may not have ability to see beyond self. (agree ē top p. 3)

Importance of prolonging life is that the last 2½ – 3 yrs ~~in the~~ contains experience & wisdom that is not purchasable.

due to unpopularity & ignorance in

working on "practical" problems. —

∴ men of talent & ability shy

away. — It can & should be made

more attractive ~~i.e.~~ intellectually. —

it is fascinating. — It is complex &

is not different from cells — i.e.

the amino acid requirement of cells —

discovery of vitamins & antibiotics —

of metabolites & antimetabolites —

But, what about man & not

microorganisms —

what about efforts now going on

in nature — & effects of past years & in different cultures.

? Effects of civilization on relation between men & viruses. Effect on factors, of changes in disease & stress control of population

But, science of Man — "humanology" & not "anthropology"

Page 4 — Is creation of a "setting" the group & the solution?

Page 5 — Must have plan that would continually bring in outsiders. —

& avoid uniform character of

most self-interested & self-satisfied

groups.

P6. Pure research?

why this separation?

many non-M.D.'s should invade

medical or human field.

It is too important to be left

only to M.D.'s.

Organization – selection of permanent staff that

would not become "fixed".

Pg. 7 — (B) — political skylights
within the realm of Human health

(Stress — Selye
Wolff,
JGS)

No dichotomy of mind & body

Birth control is but one small
part of a much larger whole

Institute for Problem studies is the
most critically needed — because
we can accomplish more by
application of what we know —
or by adding slightly — than can
be accomplished by new discoveries.

we might address ourselves to the question as to "what can be done for mankind <u>now</u> or c̄ what slight additional work for which new knowledge is needed.

But, there should also be a place for serious & capable dreamers can go in be encouraged & coddled. — Talent scouts & patrons to make use of more than 6-p regular staff members & their apparatus.

Does Dr. Fullbecker or others have to leave their present place? If so — is there a place that will bring a respectable "premium" salary & provide the milieu for work & contemplation ō distractions.

Can they be distinguished by titles & be selected by appropriate & trustees & be accepted by university that will provide tenure. This will be a bonus to university & to individual.

Thus, there need be no forced

limit to size of staff and

scope and to diversion of

activities.

Institute for problem studies could be

used building that would lend

itself to lab & clinical methods

to which people can move &

base center for meetings of

"fundamental" workers. Could

be center for world problems

& from which groups go to other

parts of the world.

This institute would take on work
for which support is provided
& function like wellcome institute.
Basic people ∴ need not
be taken away from universities
& can be aided & abetted
by association with the "institute".
These can go to university beyond
& join problem institute & then
return.

(Tech. advisory committee &
Bodian & others help in
relation to NIH & univs.)

Cancer — Heart — Muscular dystrophy —
Multiple Sclerosis — Cerebral Palsy —
mental disease, etc. — all need
guidance & direction from an
independent group. —

Even NIH advisers are not of
this character or quality.

Common Cold Foundation
Commonwealth, etc.

For reasons at bottom of p 9 & top of p 10
it would be well to leave them where they
are or put them where they can
flourish best & in the university
environment.

SZILARD Memo —

Page 1 — Accumulative Reproduction —
Is the problem that of availability of method — or application?

Is the problem not "religion" & "education"

What factors have brought Birth Control into U. S. — for example?

Is the idea merely that of a better mouse-trap? — or one easier to use?

If — If available, would it be used? if not, — would not solution of that problem bring out solution now — or, are you asking for presence of an easy method to bring use into play for effective controls & to by-pass religion & education?

There are 2 aspects of birth control problem
a) In underdeveloped countries

b) In U.S., etc.

In a) is not this part of total problem?
& i.e. is problem biological or
sociological?
will it not be checked automatically
c̄ drop in death rate & c̄ increased
understanding?

who will have to decide about use
of any method?

In b). Sperm bank idea is good — but
again, who will decide to use
& is this only part of problem?
other part being the question
of qualification for parenthood.
How is this to be handled &
is this not the more basic?

Is this not the, ^part that is^ unusually human?

Is not the pursuit of "instincts" complicated in that instincts are, by adulthood, affected by the nature of the life-experiences up to this date?

But, so much of our problem is adequacy of parenthood. —
To what extent are we taking care of, & treating well, our present babies & children?

How much do they need of training, feeding, etc — & how much love?

& what is love?

what makes for a full functioning human?

what proportion of population want different ways for mothers & fathers?

But, I can see value of ~~X~~ chromosome studies & eventual application of that — then, secondarily, I can see sperm banks coming into use, & the added advantage, if desired, & that is "freedom from chance or custom" & "freedom to select sex & other characteristics". This might not be good — but also, might be better — Don't know.

Agree about Protein Synthesis — Antibody — allergy — microbiology = (cellular biology & chemistry)

What is difference between
Fundamental biology Institute or
Rockefeller Institute & Biology
& Rockefeller Foundation?

Why are these not adequate now?

What does NIH not provide?

" " industry & universities
not provide?

what is it this is really needed? and
what will provide it, not on a
one-step growth cycle — but
continuously.

should there be a group that "goes into
business itself" — or a group that
influences direction & intensity of
activity, — one that selects

men to be distinguished & to be protected & allowed to continue in most profitable direction — & not have to become something else for prestige or survival.

(So as they do in USSR — but the Research Institutes to each of several universities — where full-time research becomes admittedly acceptable & attractive. — then, men will be protected & produce as would be ideal.

What we want to do is to make the parting — efficiency for creative scientists in human health as great as possible — then we

can test the limits to which they are available & can survive in "continuing culture".

---

what about the "Institute" providing the basis for life-tenure & "generous" salary at the university where a man is — or where he would like to go — & justified on basis of his research activity & not teaching or administrative duties.

The selection could be then of all the men listed. In this way the spirit of competitiveness might be made more constructive. New additions can be made as per recommendations

for Nobel Prize — but selection might be based on same criteria suggested for selection of appointees of staff & of trustees. —

The financial requirements might be less for this — since additional support to such people is readily available. — ; endowment would be for salaries to relieve university & to distinguish these men by title & by title. They would be obligated to serve the purposes of the Institute idea by virtue of what they get & therefore would willingly give

in return. Stimulation would
come from periodic meetings —
like inter-urban chess ideas, and/or
working group conferences.

In this way, insights can work
on many subjects — depending only
on # of good ones available.
Foundations at present (NSF) do not
provide salary for possible investigator
— but do so for others. Thus, the
possible investigator has to devote
self only part time to research.
Thus is the real need.

P16—

There are many world problems — including peace.

But, there is not a body of "intellectuals" concerned w/ it.

There are prizes for those who do the most — but not many to do the best that can be done by the people who would deserve these prizes.

Politicians — who are not philosophers — now control the world.

This cannot long exist. There are TV programs that credit themselves w/ Hiss-Chambers + Geneva Conf. etc.

These are possible because of a large vacuum.

agree ō letter to my views on
fight against war & for
future — but who can
lead?

we need a new religion — of the
mind & not the spirit alone.

Religion must be brought up to date —
i.e. be replaced: — This is
greatest single obstacle to
solution of some of problems —

other is absence of philosophy & of
intellectual qualifications for
world problems —

original intent in
p18 — The Nobel Prize idea — but
done effectively & brightly — would be
the ideal immediate goal — ō
those brushed ō the

effectively to do more giving &
keeping together to do even more
than they can do singly.

Nobel had a good idea — but it
has to be modernized & be kept to
good use. —

Ford also had a good idea — but, it, too,
has not be carried out as intended —
The objective must be, if possible, to
carry out the idea effectively, & not
merely to emasculate it.

A man who brings £3 5,000 per yr
to a university, and in addition attracts
money to do more work, is a valuable
Commodity !

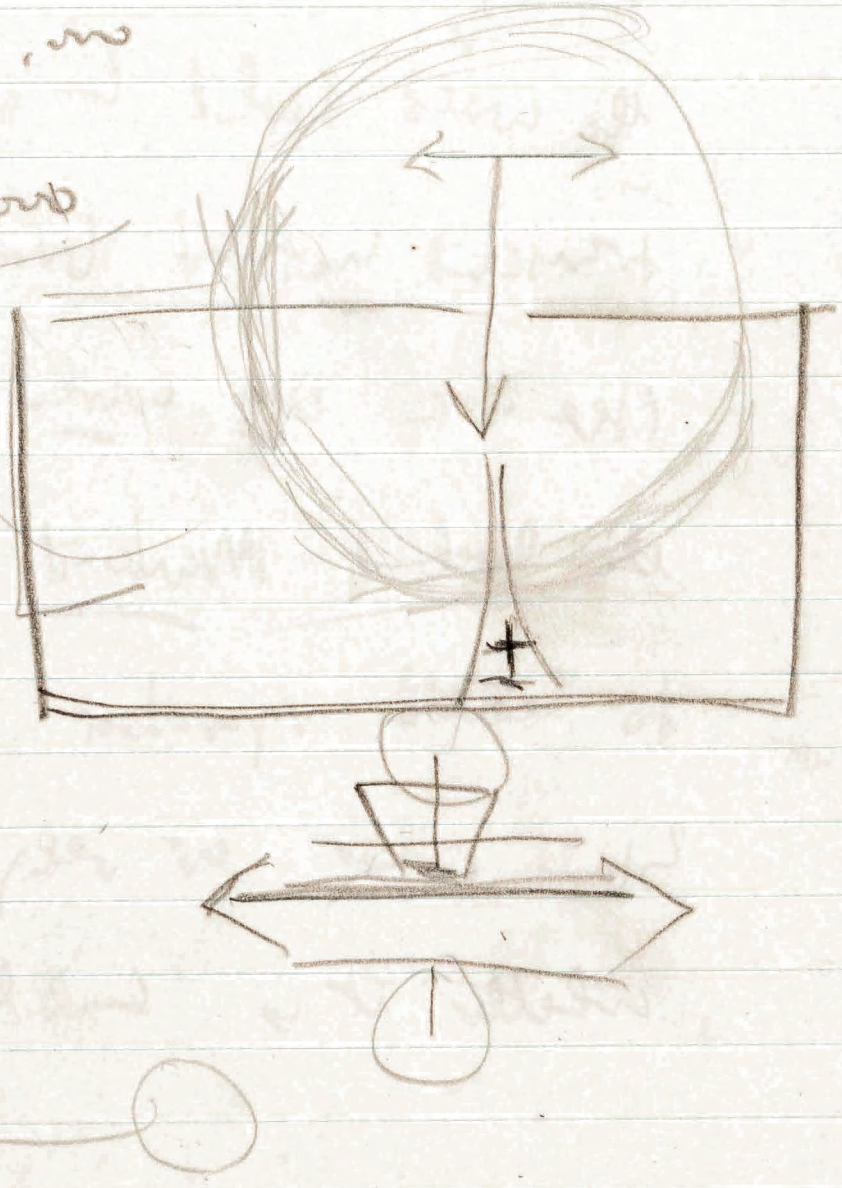
In this way, universities could provide
what is suggested by the fundamental
institute — but this leaves the
problem of — How to handle the Problem
Institute's functions.

Fellowships could be provided for men
to go to work in Institute themselves
throughout the world —

Peace, an institute covering all the world could be established to transcend national boundaries — There is a one world idea at the level of Maryland — in relation to health regardless of prejudices or skin color or religion — or whether it is Communism or Democracy

10, ∞, ∞

20 (4 ∞, ∞)



A STUDY OF

WORLD SECURITY PROBLEMS RAISED BY NUCLEAR WEAPONS

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___	___	I will attend the first meeting in the United States of American scientists to be held on Saturday and, possibly, Sunday a.m., September 6 and 7, 1958, at the Hotel Shoreham in Washington, D. C.
___	___	I would definitely attend the meeting in Moscow, beginning on September 24, 1958, if invited by the USSR Academy of Sciences.
___	___	I would require reimbursement of expenses for travel to meeting in Washington, D. C.
___	___	I would require reimbursement of expenses for travel to meeting in Moscow.
___	___	I wish to receive copies of mailings in order to follow the work of this study.

Comments:

_____
Signature

WORLD SECURITY PROBLEMS RAISED BY NUCLEAR WEAPONS

Proposed Scope of Study

It is proposed to carry out a study of world security problems raised by nuclear weapons through informal discussions among a group of American scientists, and also through informal discussions between American and Russian scientists to be held under the auspices of the USSR Academy of Sciences.

A committee appointed by the American Academy of Arts and Sciences will have over-all responsibility for this study. The initial meeting among American scientists will be held on September 6, 1958, in Washington, D. C. Informal discussions between American and Russian scientists will be held in Moscow, starting on or about September 23, 1958, and lasting about two weeks.

I propose that American scientists who participate in this study, including those who may attend the Moscow discussions, meet informally perhaps six to ten times a year for an exchange of views, and that further meetings with Russian scientists be arranged through the USSR Academy of Sciences as the need may arise. I further propose that for the next year we narrow down somewhat the subjects of our discussions and deal with issues which appear to have the greatest urgency.

I, personally, am inclined to assume that both Russia and America are going to retain large stockpiles of hydrogen bombs of high power (either of the dirty or of the clean variety, or both) for the next ten years, and perhaps throughout the entire foreseeable future. As far as I can see, we find ourselves at present in a transitional phase of a stalemate between the atomic striking forces of Russia and of America; and the character of the stalemate is still rapidly changing. We appear to be moving towards a more advanced, and possible much steadier, stage of the stalemate, which may be based on solid-fuel, long-range rockets capable of carrying hydrogen bombs of high power. Such rockets could be launched from bases scattered inside of America and of Russia, which could, and presumably would, be made invulnerable against an aerial attack.

If these assumptions are correct, then I believe that the most important first step would be for America and Russia to reach a meeting of the minds on the measures which would be needed in order to render the atomic stalemate stable so that there may not break out an all-out atomic war that neither America nor Russia wants. Such an all-out atomic war might come about as a result of an accident or an error in judgment. Even more likely, it might come about as a result of America and Russia intervening militarily in a conflict that might arise between two other nations; in such a case, what might start out as a local war could end up as an all-out atomic catastrophe.

World Security Problems Raised by Nuclear Weapons (Proposed Scope of Study)

Therefore, we ought to examine, first of all, from a long-term point of view, what kind of policies, that America and Russia might pursue, would be adequate to stabilize the atomic stalemate. Subsequently, we could then examine, from the long-term point of view, the policies that Russia and America may be driven to adopt in the present transitional phase of the stalemate. Some short-term policies, were they once adopted and implemented, might make it very difficult for Russia and America later on to adopt the measures which are desirable from the long-term point of view; i.e., from the point of view of rendering the atomic stalemate stable. For this reason, we ought to try to find out as soon as possible what kind of an understanding America and Russia would need to reach at an early date in order to make it possible for them to refrain from adopting, in the present transitional phase of the stalemate, policies that would be detrimental from the long-term point of view.

Should the other participants of the study agree with this general approach to the security problem, then this approach could perhaps serve as the basis of the first informal discussion that our group will have in the fall.

The background leading up to this study is described in an enclosed communication which has been prepared by Richard S. Leghorn.

Leo Szilard

August 6, 1958

AMERICAN ACADEMY OF ARTS AND SCIENCES

280 NEWTON STREET · BROOKLINE STATION · BOSTON 46, MASSACHUSETTS · JAMAICA 4-0303

15 August 1958

Dear Dr. Salk:

The members of the Academy's Operating Committee on the Study of World Security Problems Raised by Nuclear Weapons invite your participation in this study.

I understand that you have already received verbally some particulars on the project from Mr. Richard S. Leghorn who is a member of the Committee. The enclosed material will serve to further acquaint you with the details and the Committee's immediate plans.

We wish to have as soon as possible your indication of interest in this study and your availability for participation in the meetings which are scheduled on 6 September 1958 in Washington, D. C., and on 24 September 1958 in Moscow. Your completion of the attached sheet, therefore, is requested and prompt mailing of it in the envelope which has been provided for your convenience will be appreciated.

Sincerely yours

Ralph W. Burhoe

Ralph W. Burhoe
Executive Officer

L/s

Enclosures

C O P Y

DEPARTMENT OF STATE

Washington

August 5, 1958

Dear Colonel Leghorn:

I refer to your letter of June 20, 1958 to Mr. Smith and to Mr. Davis' telephone call to you of July 8, 1958 concerning the possibility of organizing informal exploratory talks between Soviet and American scientists to discuss the arms control problem in relation to the security needs of the two countries. You asked Mr. Davis if the Department could send a follow-up letter setting forth the substance of the points made in Mr. Davis' call and I am glad to do so.

The Department is not in a position, of course, to give official sanction to the meeting you propose. You will appreciate, moreover, that the Soviets might well exploit any such meeting to embarrass both the American participants and the United States Government. I am confident you will also understand that American participants should not include any one with policy advisory responsibilities toward the United States Government.

However, the Department does not wish to discourage your proposed visit to Moscow, which we understand is unofficial, informal and exploratory. We also understand that your group desires to avoid publicity. In this connection, we believe that any formal meeting, which would inevitably be publicized, would be undesirable.

As you know, our exchange program envisages exchanges of scientists. We also hope that meetings between American and Soviet scientists at international scientific conferences will become more and more numerous. We believe that your objectives can best be pursued in the context of informal and unpublicized contacts.

Sincerely yours,

(Signed) Foy D. Kohler

Foy D. Kohler
Deputy Assistant Secretary
for European Affairs

Colonel Richard S. Leghorn,
Itek Corporation,
1605 Trapelo Road,
Waltham, Massachusetts.

A STUDY OF

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Comments:

_____

Signature

A STUDY OF

WORLD SECURITY PROBLEMS RAISED BY NUCLEAR WEAPONS

Summary of Program

This study, recently organized under the auspices of the American Academy of Arts and Sciences, will explore world security problems raised by nuclear weapons. A suggested approach is set forth in the adjoining communication by Leo Szilard.

It is anticipated that participating American scientists (some engaged in theoretical activities, and others with backgrounds in weapons technology and military affairs) will meet periodically in the United States for discussion of papers and ideas, and that occasional meetings will be arranged with Russian scientists through the cooperation of the USSR Academy of Sciences.

The first meeting in the United States of American scientists is scheduled for Saturday and, possibly, Sunday a.m., September 6 and 7, 1958, at the Hotel Shoreham in Washington, D. C.; and the first meeting in Moscow with Russian scientists for two weeks is to begin on September 24, 1958. Those traveling to Moscow will convene at the Hotel Regina in Vienna on September 21 for an all-day meeting on September 22, prior to traveling to Moscow on September 23.

Purpose of Activity

Broadly, the study has two purposes: (1) to explore technically and politically feasible security arrangements which might be effected in the world during the 1960's to avoid wars which nobody wants; and (2) to develop a communication channel with the Russians for dispassionate and objective consideration of these longer range, mutual security goals. The formation or influence of public opinion is not a direct objective of this study.

A Study of World Security Problems Raised by Nuclear Weapons

The techniques of scientific study--individual papers, seminars, and the like--will be employed. Any formal meeting aimed at proclaiming a consensus of the participants will be strictly omitted from the program. While seeking to avoid any impression of secrecy, every attempt will be made to keep meetings fully quiet and private in character. No public communication of results is currently planned, but it is foreseen that individual participants may wish to communicate their thoughts and impressions privately to officials and to leaders of organizations concerned with public opinion formation in this problem area. Individual papers presented and discussed as part of the study may be published separately in a normal manner.

Origin of Activity

At the Quebec Conference of international scientists in April, 1958, Richard S. Leghorn, Leo Szilard, and Jerome B. Wiesner discussed the possibilities of informal meetings of Russian and American scientists with Professor Topchiev, then General Secretary and now, additionally, Deputy Chairman of the USSR Academy of Sciences. A memorandum was prepared, and key excerpts follow:

April 6, 1958.

FROM: Richard Leghorn, Leo Szilard and Jerome Wiesner

TO: Academician Topchiev.

> We propose that there shall be held a meeting in Moscow in which ten to fifteen American scientists, of the kind to be described later, would participate, and about an equal number of Russian scientists of approximately the same sort. This meeting might last two weeks and it should take place at the earliest time that will suit those who are to participate and, if possible, not later than July of this year.
>
> About one third of the American group might be scientists

who are familiar with the technology of modern weapons and who, by virtue of their relationship to the United States government, are in a position to communicate their own thinking to the government, but who are not, themselves, officials of the United States Government. About three or four of the Americans may be mathematicians or theoretical physicists or theoretical chemists.

The topic of the proposed discussions at Moscow might be circumscribed as follows:

"There exists, in the present state of the atomic arms race, a serious danger that an atomic war might break out which neither America nor the Soviet Union wants. What are the circumstances which might lead to the outbreak of such a war, and how could these circumstances be modified in order to diminish, and later on to eliminate completely, this danger?"

At the meeting in Moscow we would propose to discuss, as frankly as we have discussed in Quebec, controversial issues, including the difficulties which stand in the way for America to accept certain proposals which have been made by the government of the Soviet Union and for the Soviet Union to accept certain proposals that have been put forward by the American government. Sometimes these difficulties come from apprehensions of one government, of which the other government is not fully aware. The proposed discussion at Moscow should enable both the American participants and the Russian participants to think about ways that may enable us to get around such difficulties.

After the conclusion of the conference, the participants may be able to explain to their own governments their, perhaps greatly improved, understanding of the difficulties which stand in the way of an agreement between the two governments and which relate to the question of controlled arms reduction, as well as certain other problems which are intimately related to this question. Our reasons for believing that the informal talks between American and Russian scientists, which we propose, might be fruitful are essentially as follows:

Our talks at Quebec have convinced us that among Russian, as well as among American, scientists there are many who are not only men of good will, but who are also able to explore dispassionately controversial issues. Such men should be able to clarify, in their own minds, what the difficulties are that are impeding progress towards reaching an understanding between America and Russia even in areas where these two nations have a strong common interest.

* * *

A Study of World Security Problems Raised by Nuclear Weapons

The American participants in the proposed meeting would want to prepare, in advance of the meeting, memoranda which may be helpful in focussing the discussion on what they believe to be the relevant topics. Some of these American documents will be concerned with problems which they believe to represent valid apprehensions of the Soviet Union.

* * *

We suggest that, similarly, our colleagues in the Soviet Union, who are to participate in the proposed meeting, may prepare documents on topics which are concerned with those apprehensions of the American government which they may recognize as valid.

In addition, both the American and Russian participants might prepare documents which relate to topics that represent apprehensions of both America and the Soviet Union, such as the danger of an accidental outbreak of an atomic war, and the risks involved in the possession of atomic weapons by nations other than America and the Soviet Union and Britain.

We believe that the invitations to the proposed Moscow meeting should not come from us, but rather that certain Americans be invited individually by the Soviet Academy of Sciences. However, we are prepared to say who, among American scientists, could be particularly useful - in our opinion - at the proposed meeting. We are also prepared to offer our good offices in exploring who, among those whom we regard as desirable participants of the meeting, is likely to be able to attend the meeting. We propose to keep in touch with each other on the subject of the selection of American participants, and one of us may keep in touch with Academician Topchiev in order to keep him informed on who, among the proposed American participants, may be available at the date set for the meeting.

After his return to Russia, Professor Topchiev replied on June 18 in a letter to Richard Leghorn:

I received your letter and a signed copy of the Memorandum. Upon my return to Moscow from Canada I informed my colleagues in the USSR Academy of Sciences about the Second Pugwash meeting of Scientists, which in my opinion was fruitful and also of your proposal to hold a private conference of soviet and american scientists in Moscow in July to discuss the possible ways to eliminate dangers of an atomic war as well as the actions that might be taken in this connection by the scientists of USSR and USA.

My colleagues met this proposal with interest and expressed a hope that such a Conference will contribute towards eliminating the threat to humanity of a devastating atomic war and towards establishment of mutual understanding and trust between our countries.

The problems put forward in your memorandum arouse no objections on our part and can be included into the number of problems to be discussed at this Conference. We would appreciate your letting us know before the beginning of the Conference, if your time permits, other considerations and proposals on your part referring to the topic of the discussions.

The Academy of Sciences will invite to this Conference american scientists as its guests in the USSR for 2-3 weeks. The Conference could begin on July 28 if it is convenient for you.

We would like to have particulars on your american colleagues in order to be able to extend invitations and help with getting visas in time.

* * *

Both because the Russian invitation did not reach us until late in June, which made arrangements difficult for a July 28 meeting in Moscow, and because Washington officials were apprehensive of even a private meeting at that particular time, the Moscow meeting has been postponed, in agreement with Professor Topchiev, until September 24.

Attitude of United States Government

A considerable number of discussions have taken place between members of the Operating Committee and key government officials in the White House, State Department, and other interested agencies. The official government attitude as expressed in a letter from the State Department, copy attached, is essentially one of "no objection" to such informal, private talks with the Russians.

Financial Support

For the first year's operation, a budget of $50,000 is envisioned;

$20,000 of this amount is to cover transportation expenses in connection with the Moscow meeting.

Fifteen thousand dollars has already been received or pledged--$5,000 from the William C. Whitney Foundation, $5,000 from the Christopher Reynolds Foundation, and $5,000 from Mrs. Ralph Pomerance. Gifts in support of this study can be made directly to the American Academy of Arts and Sciences which qualifies as a non-profit organization for tax purposes, or to the University of Chicago which qualifies as an educational institution for tax purposes; each has also consented to act as a disbursing agent for the study.

Participants

The Operating Committee for the study is presently constituted as follows:

Leo Szilard, Chairman
Harrison S. Brown
Richard S. Leghorn
Walter G. Whitman
Jerome B. Wiesner

Richard S. Leghorn

August 15, 1958

Attachment

American Academy of Arts and Sciences
280 Newton Street
Brookline Station, Boston 46, Mass.

AIR MAIL

AMERICAN ACADEMY OF ARTS AND SCIENCES
280 NEWTON STREET BROOKLINE STATION
BOSTON 46, MASSACHUSETTS

C O P Y

DEPARTMENT OF STATE

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who are familiar with the technology of modern weapons and who, by virtue of their relationship to the United States government, are in a position to communicate their own thinking to the government, but who are not, themselves, officials of the United States Government. About three or four of the Americans may be mathematicians or theoretical physicists or theoretical chemists.

The topic of the proposed discussions at Moscow might be circumscribed as follows:

"There exists, in the present state of the atomic arms race, a serious danger that an atomic war might break out which neither America nor the Soviet Union wants. What are the circumstances which might lead to the outbreak of such a war, and how could these circumstances be modified in order to diminish, and later on to eliminate completely, this danger?"

At the meeting in Moscow we would propose to discuss, as frankly as we have discussed in Quebec, controversial issues, including the difficulties which stand in the way for America to accept certain proposals which have been made by the government of the Soviet Union and for the Soviet Union to accept certain proposals that have been put forward by the American government. Sometimes these difficulties come from apprehensions of one government, of which the other government is not fully aware. The proposed discussion at Moscow should enable both the American participants and the Russian participants to think about ways that may enable us to get around such difficulties.

After the conclusion of the conference, the participants may be able to explain to their own governments their, perhaps greatly improved, understanding of the difficulties which stand in the way of an agreement between the two governments and which relate to the question of controlled arms reduction, as well as certain other problems which are intimately related to this question. Our reasons for believing that the informal talks between American and Russian scientists, which we propose, might be fruitful are essentially as follows:

Our talks at Quebec have convinced us that among Russian, as well as among American, scientists there are many who are not only men of good will, but who are also able to explore dispassionately controversial issues. Such men should be able to clarify, in their own minds, what the difficulties are that are impeding progress towards reaching an understanding between America and Russia even in areas where these two nations have a strong common interest.

* * *

A Study of World Security Problems Raised by Nuclear Weapons

The American participants in the proposed meeting would want to prepare, in advance of the meeting, memoranda which may be helpful in focussing the discussion on what they believe to be the relevant topics. Some of these American documents will be concerned with problems which they believe to represent valid apprehensions of the Soviet Union.

* * *

We suggest that, similarly, our colleagues in the Soviet Union, who are to participate in the proposed meeting, may prepare documents on topics which are concerned with those apprehensions of the American government which they may recognize as valid.

In addition, both the American and Russian participants might prepare documents which relate to topics that represent apprehensions of both America and the Soviet Union, such as the danger of an accidental outbreak of an atomic war, and the risks involved in the possession of atomic weapons by nations other than America and the Soviet Union and Britain.

We believe that the invitations to the proposed Moscow meeting should not come from us, but rather that certain Americans be invited individually by the Soviet Academy of Sciences. However, we are prepared to say who, among American scientists, could be particularly useful - in our opinion - at the proposed meeting. We are also prepared to offer our good offices in exploring who, among those whom we regard as desirable participants of the meeting, is likely to be able to attend the meeting. We propose to keep in touch with each other on the subject of the selection of American participants, and one of us may keep in touch with Academician Topchiev in order to keep him informed on who, among the proposed American participants, may be available at the date set for the meeting.

After his return to Russia, Professor Topchiev replied on June 18 in a letter to Richard Leghorn:

I received your letter and a signed copy of the Memorandum. Upon my return to Moscow from Canada I informed my colleagues in the USSR Academy of Sciences about the Second Pugwash meeting of Scientists, which in my opinion was fruitful and also of your proposal to hold a private conference of soviet and american scientists in Moscow in July to discuss the possible ways to eliminate dangers of an atomic war as well as the actions that might be taken in this connection by the scientists of USSR and USA.

My colleagues met this proposal with interest and expressed a hope that such a Conference will contribute towards eliminating the threat to humanity of a devastating atomic war and towards establishment of mutual understanding and trust between our countries.

The problems put forward in your memorandum arouse no objections on our part and can be included into the number of problems to be discussed at this Conference. We would appreciate your letting us know before the beginning of the Conference, if your time permits, other considerations and proposals on your part referring to the topic of the discussions.

The Academy of Sciences will invite to this Conference american scientists as its guests in the USSR for 2-3 weeks. The Conference could begin on July 28 if it is convenient for you.

We would like to have particulars on your american colleagues in order to be able to extend invitations and help with getting visas in time.

* * *

Both because the Russian invitation did not reach us until late in June, which made arrangements difficult for a July 28 meeting in Moscow, and because Washington officials were apprehensive of even a private meeting at that particular time, the Moscow meeting has been postponed, in agreement with Professor Topchiev, until September 24.

Attitude of United States Government

A considerable number of discussions have taken place between members of the Operating Committee and key government officials in the White House, State Department, and other interested agencies. The official government attitude as expressed in a letter from the State Department, copy attached, is essentially one of "no objection" to such informal, private talks with the Russians.

Financial Support

For the first year's operation, a budget of $50,000 is envisioned;

$20,000 of this amount is to cover transportation expenses in connection with the Moscow meeting.

Fifteen thousand dollars has already been received or pledged--$5,000 from the William C. Whitney Foundation, $5,000 from the Christopher Reynolds Foundation, and $5,000 from Mrs. Ralph Pomerance. Gifts in support of this study can be made directly to the American Academy of Arts and Sciences which qualifies as a non-profit organization for tax purposes, or to the University of Chicago which qualifies as an educational institution for tax purposes; each has also consented to act as a disbursing agent for the study.

Participants

The Operating Committee for the study is presently constituted as follows:

Leo Szilard, Chairman
Harrison S. Brown
Richard S. Leghorn
Walter G. Whitman
Jerome B. Wiesner

Richard S. Leghorn

August 15, 1958

Attachment

AMERICAN ACADEMY OF ARTS AND SCIENCES

280 NEWTON STREET · BROOKLINE STATION · BOSTON 46, MASSACHUSETTS · JAMAICA 4-0303

15 August 1958

Dear Dr. Salk:

The members of the Academy's Operating Committee on the Study of World Security Problems Raised by Nuclear Weapons invite your participation in this study.

I understand that you have already received verbally some particulars on the project from Mr. Richard S. Leghorn who is a member of the Committee. The enclosed material will serve to further acquaint you with the details and the Committee's immediate plans.

We wish to have as soon as possible your indication of interest in this study and your availability for participation in the meetings which are scheduled on 6 September 1958 in Washington, D. C., and on 24 September 1958 in Moscow. Your completion of the attached sheet, therefore, is requested and prompt mailing of it in the envelope which has been provided for your convenience will be appreciated.

Sincerely yours

Ralph W. Burhoe

Ralph W. Burhoe
Executive Officer

L/s

Enclosures

Kremslehner Hotels · Wien

Hotel Regina
IX Rooseveltplatz 15
45 76 81, Telex 01/1599

Graben Hotel
I Dorotheergasse 3
52 15 31

Hotel Royal
I Singerstraße 3
(im Bau)

Dr. Jonas S a l k
The Medical School
The University of Pittsburgh, ~~Penn~~.
PITTSBURGH, Penn.
U.S.A.

Vienna, 4th August, 1959.

Dear Salk,

I am just writing to inquire whether Revelle has been in touch with you lately and whether you have visited La Jolla. If you drop me a line ~~to~~ at my Chicago address, it will be forwarded to me in due time. I am about to leave Vienna and if there is no particular reason for me to return earlier, I expect to be back in the States early in October.

With kindest regards,

sincerely yours

Leo Szilard

(LEO SZILARD)

Letter to Szilard at Chicago

25 August

Dear Szilard —

I visited Revelle in La Jolla from 17-21 August. Both he and the place are very interesting, ~~This looks very favorable~~ even in comparison with Palo Alto. I will need time to evaluate, ~~but have [illegible]~~ ~~I ha~~ I will be glad to hear from you on your return and will let you know should a decision be made before then.

THE ROCKEFELLER INSTITUTE

NEW YORK 21, NEW YORK

November 23rd, 1959

Dr. Jonas E. Salk
College of Medicine
University of Pittsburgh
Pittsburgh 13, Pennsylvania

Dear Dr. Salk:

Just before Leo Szilard went into the hospital he asked me to send you the address of Henry Harris. It is:

Building 10
Room 5B-43
National Institutes of Health
Bethesda 14, Maryland.

He will be at this address until May or perhaps June.

Sincerely yours,

Maurice S. Fox

Maurice S. Fox

MSF:js

JOINT CENTER FOR URBAN STUDIES OF THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY AND HARVARD UNIVERSITY

66 Church Street, Cambridge 38, Massachusetts · UNiversity 4-8060

March 22, 1960

Professor Leo Szilard
Sloan-Kettering Memorial Hospital
East 68th Street
New York City, New York

Dear Leo:

This is the program of the Princeton meeting. Harry Brown sent a wire saying that he was held up by "professorial duties." Clayton was also missing. The foreign visitors were particularly impressive. As you can see, this is another Harold Oram promotion.

This meeting was intended to get Oram enough backing to start a mail campaign and was planned to get $50-100,000. At the time we left it was $94,050 and the proceedings not quite finished.

At lunch I talked to Frank Notestein, who is more or less the father of demography in the U.S. and has recently become president of the Population Council. He mentioned that interest in the medical studies had veered to immunological possibilities for fertility limitation. He is a social scientist, however, and was not explicit about the reasons for the new optimism. When I reviewed the possibilities a few years back it looked like the creation of immunity to the husband's sperm was more expensive than sterilization.

If anything new comes up I'll let you know. It was good to see you in such fine fettle. From the enclosed reprint you get a glimmering of what I am attempting these days. As you can see, I owe a great deal both in style and approach to the giants of your generation with whom I have had the fortune to associate.

Sincerely,

Dick

Richard L. Meier

RLM/ds

P.S. Please pardon the delayed response. I came back to find myself and the office buried in a flurry of work.

To: Dr. Salk
for info + file
L.S

A STATEMENT OF PURPOSE

WORLD POPULATION EMERGENCY CAMPAIGN

PRESENTED TO THE
FRIENDS OF THE CAMPAIGN

Sunday, March the twentieth, 1960

Princeton Inn — Princeton, New Jersey

A NOTE OF THANKS

The undersigned Convenors wish to thank all those who have come from near and from far to participate in this Founding Conference of the World Population Emergency Campaign. We well appreciate the sacrifice of time entailed, particularly for those who have come from as far away as India, Hawaii, the Far West and the Caribbean area to be with us in Princeton.

It is our belief that this gathering of distinguished men and women from every section of our country gives evidence of the awakened interest in the population problem on the part of the American public. To all who are participating today, we extend our gratitude for their coming and our hope that they, in turn, will assume the leadership in their communities so essential if this great work is to prosper.

BRUCE BARTON
HARRISON BROWN
WILL CLAYTON
LAMMOT DUP. COPELAND
WILLIAM H. DRAPER, JR.
HUGH MOORE

WORLD POPULATION EMERGENCY CAMPAIGN
51 East 42nd Street
New York 17, N. Y.

THE WORLD POPULATION EXPLOSION AND ITS ECONOMIC AND POLITICAL CONSEQUENCES

A Symposium

MORNING SESSION . . . 11:00 a.m. — 1:00 p.m.

CHAIRMAN: GENERAL WILLIAM H. DRAPER, JR., *former U. S. Ambassador to NATO; recently Chairman, President's Committee to Study the United States Military Assistance Program*

SPEAKERS: THE HONORABLE SIR GRANTLEY H. ADAMS, C.M.G., Q.C., M.C.P., *Prime Minister, West Indies Federation*

"A Statesman Looks at The Population Problem"

DR. ANSLEY J. COALE, *Director, Office of Population Research, Princeton University*

"Population Growth and Economic Development"

DR. PHILIP M. HAUSER, *Chairman, Department of Sociology, University of Chicago; formerly U. S. Representative to the Population Commission, United Nations*

"The World Political Import of Population Growth"

DR. J. MURRAY LUCK, *Professor of Biochemistry, Stanford University*

"Hunger and Want or Population Control"

DISCUSSION

LUNCHEON . . . 1:15 p.m. — 2:45 p.m.

CHAIRMAN: MR. LAMMOT DUP. COPELAND, *Vice President, E. I. duPont de Nemours and Company, Inc.*

SPEAKERS: MRS. MARGARET SANGER

LADY DHANVANTHI RAMA RAU, *Chairman, International Planned Parenthood Federation; President, Family Planning Association of India*

"The Shackles We Must Break in Asia"

AFTERNOON SESSION . . . 3:00 p.m. — 5:00 p.m.

SUBJECT: The World Population Emergency Campaign

CHAIRMAN: MR. HUGH MOORE, *Board Member, St. Lawrence Seaway Development Corporation; President, The Hugh Moore Fund*

SPEAKERS: THE HONORABLE MRS. LENWORTH JACOBS, M.L.C., *Jamaica, W. I.; Vice President, International Planned Parenthood Federation*

"Our Needs in the Caribbean"

DR. FRANK W. NOTESTEIN, *President, The Population Council*

"The Importance of An International Action Program"

MR. RUFUS S. DAY, JR., *Treasurer, The Brush Foundation*

"The Rising Tide of Appeals for Aid"

MR. HAROLD L. ORAM, *President, Harold L. Oram, Inc.*

"The Development of Public Support"

DISCUSSION

AFTERNOON TEA . . . 5:15 p.m.

GUESTS

The Honorable Sir Grantley H. Adams, C.M.G., Q.C., M.C.P.
Prime Minister of the West Indies Federation
Trinidad, West Indies

His Excellency Mr. Aziz Ahmed
Ambassador to the United States from Pakistan
Washington, D. C.

Dr. and Mrs. Frank L. Babbott, Jr.
Philadelphia, Pennsylvania

Mr. James M. Barker
Chicago, Illinois

Mr. Bruce Barton
New York, N. Y.

Mrs. George E. Bass
Ardmore, Pennsylvania

The Honorable John Biggs, Jr.
Philadelphia, Pennsylvania

Mr. Eugene R. Black
Washington, D. C.

Mr. Jacob Blaustein
Baltimore, Maryland

Mr. Thomas C. Boushall
Richmond, Virginia

Mrs. T. Nash Broaddus
Wilmington, Delaware

Mrs. Charles F. Brush, Jr.
New York, N. Y.

Mr. and Mrs. John C. Bullitt
Princeton, New Jersey

Dr. C. Lalor Burdick
Wilmington, Delaware

Mr. Henry B. Cabot
Boston, Massachusetts

Mr. Cass Canfield
New York, N. Y.

Mr. Thomas H. Carroll
New York, N. Y.

Dr. Ansley J. Coale
Princeton, New Jersey

Mr. and Mrs. Richard Stockton Conger
Princeton, New Jersey

Mr. Robert Cook
Washington, D. C.

Mr. Lammot duP. Copeland
Wilmington, Delaware

Mr. Timothy Coss
Washington, D. C.

Mr. Rufus S. Day, Jr.
Cleveland, Ohio

Mr. Harry S. Dickey
Oella, Maryland

Mr. John V. N. Dorr
New York, N. Y.

Mrs. Mary C. Draper
Brooklyn, New York

General William H. Draper, Jr.
Palo Alto, California

Mr. and Mrs. Theodore M. Edison
West Orange, New Jersey

Mr. and Mrs. Brooks Emeny
Princeton, New Jersey

Mr. Fred Ferber
Englewood, New Jersey

Mrs. Robert M. Ferguson
New York, N. Y.

Dr. Simon M. Frazer
Director of Health Services
Bermuda

Mr. and Mrs. Graham French
Philadelphia, Pennsylvania

Mrs. Joseph Glass
Mt. Kisco, New York

Mr. and Mrs. Albert M. Greenfield
Philadelphia, Pennsylvania

Mr. T. O. Griessemer
New York, N. Y.

His Excellency Mr. R. S. S. Gunewardene
Ambassador to the United States from Ceylon
Washington, D. C.

Dr. Philip M. Hauser
Chicago, Illinois

Mr. Leland Hazard
Pittsburgh, Pennsylvania

Mr. F. Peavey Heffelfinger
Minneapolis, Minnesota

Mr. Howard J. Hook, Jr.
New York, N. Y.

Mr. Prynce Hopkins
Santa Barbara, California

Mrs. Raymond Vail Ingersoll
New York, N. Y.

The Honorable Mrs. Lenworth Jacobs, M.L.C.
Vice President, International Planned Parenthood Federation
Jamaica, West Indies

Mr. Joseph E. Johnson
New York, N. Y.

Mr. Masayoshi Kakitsubo
Deputy Permanent Representative of Japan to the United Nations
New York, N. Y.

Mr. J. M. Kaplan
New York, N. Y.

Dr. Antonie T. Knoppers
New York, N. Y.

Mr. James N. Land
Pittsburgh, Pennsylvania

Mr. John W. Leslie
Chicago, Illinois

Dr. Lena Levine
New York, N. Y.

Mr. and Mrs. Goodhue Livingston, Jr.
New York, N. Y.

Mrs. Madeleine M. Low
New York, N. Y.

Dr. J. Murray Luck
Stanford, California

Mr. and Mrs. Carson McClain
New York, N. Y.

Mr. Robert T. McCracken
Philadelphia, Pennsylvania

Mr. Frederick C. McKee
Pittsburgh, Pennsylvania

Mr. A. Ross Meeker
Short Hills, New Jersey

Dr. and Mrs. R. L. Meier
Cambridge, Massachusetts

Mr. Craig Moore
Easton, Pennsylvania

Mr. and Mrs. Hugh Moore
Easton, Pennsylvania

Mr. Hugh Moore, Jr.
Easton, Pennsylvania

Mr. Lloyd L. Morain
San Francisco, California

Dr. Frank W. Notestein
New York, N. Y.

Mr. John Nuveen
Chicago, Illinois

Mr. Serge Obolensky
New York, N. Y.

Mr. Harold L. Oram
New York, N. Y.

Mr. and Mrs. Glen Perry
Wilmington, Delaware

Mrs. Philip W. Pillsbury
Minneapolis, Minnesota

Dr. Gregory Pincus
Shrewsbury, Massachusetts

Mr. and Mrs. Allan M. Pope
New York, N. Y.

Miss Polly Pope
New York, N. Y.

Lady Dhanvanthi Rama Rau
President, Family Planning Association of India
Bombay, India

Mrs. Margaret Sanger
Tucson, Arizona

Dr. Karl Sax
New Haven, Connecticut

Mr. Harry Scherman
New York, N. Y.

Mr. Adolph Schmidt
Pittsburgh, Pennsylvania

Mr. Charles E. Scripps
Cincinnati, Ohio

Dr. and Mrs. Clarence Senior
New York, N. Y.

Mr. J. H. Smith, Jr.
Washington, D. C.

General Robert J. Smith
Dallas, Texas

Mrs. John W. Starr
Kansas City, Missouri

Mr. and Mrs. Julius Long Stern
Princeton, New Jersey

Mr. and Mrs. Joseph Sunnen
St. Louis, Missouri

Mrs. Elise S. Untermyer
New York, N. Y.

Mr. and Mrs. William H. Vanderbilt
Chestnut Hill, Massachusetts

Dr. Joseph Van Vleck, Jr.
Montclair, New Jersey

Dr. Henry H. Villard
New York, N. Y.

Dr. and Mrs. William Vogt
New York, N. Y.

Mrs. G. J. Watumull
Honolulu, Hawaii

Mr. George D. Widener
Philadelphia, Pennsylvania

Mr. L. Wilkinson
New York, N. Y.

Mr. William L. Wilson
New York, N. Y.

Dr. Martin Wong
Minister-Counselor, Embassy of the Republic of China
Washington, D. C.

The Population Problem

"It is the basic problem of the world today, and unless we can solve it, no other major problem of our world society can be solved at all."

HARRY EMERSON FOSDICK

"All other problems fade into insignificance by comparison. Until the population problem is dealt with, we are wasting time trying to solve the others."

MARRINER ECCLES

"It is at the very heart of the problem of our existence."

UNITED NATIONS REPORT

THE POPULATION EXPLOSION

From the time of the first man and woman it took thousands of years for the race to reach the number of one billion living people. That occurred about 1830. It required only one century to add the second billion — around 1930. It is now taking less than 35 years for world population to add a third billion — probably before 1965.

According to the most recent estimate of the United Nations, it will take only 15 years to add the fourth billion and another 10 years to add the fifth billion. Six or seven billion people may be living on this planet at the end of this century — in the lifetime of many of us — *if nothing is done to arrest the growth.*

World food production is barely keeping pace with the increase in world population. Significantly, increase in food production in most underdeveloped countries has been falling behind population growth. The poor are getting poorer in the second half of the 20th Century.

Nearly two thirds of the world's people, more than one billion six hundred million, live in countries which have an annual per capita income of less than $200. More than one billion people, 40 percent of the world's population live in countries whose 1957 income averaged $120 per person. Annual per capita income in India today is less than $70. (By comparison, per capita income in the United States is more than $2,000.) These statistics, whose meaning is human misery, are worsening year by year in most countries having the lowest income levels. Unchecked, population growth robs their peoples of any gains from capital investment, foreign aid or technological advance. If this fantastic growth continues during the next decades, the pauperization of humanity will stagger the imagination and be beyond remedy.

THE MOST NEGLECTED PROBLEM OF OUR TIME

In the past, the ravages of war and disease and infant mortality have kept populations in balance with the resources on which life depends. In this century, these population checks have largely lost their function. World public opinion is now fully aware of the apocalyptic consequences of full-scale nuclear war. No one today seriously suggests modern war as a solution for the population explosion.

Since Pasteur's time, epoch-making scientific and medical advances have challenged and largely conquered many of mankind's major ills. These developments in public and private health measures have had a revolutionary effect in accelerating world population growth. With the consequent lengthening of the life span, decrease of the death rate and dramatic drop in infant mortality, we are reaching an historic crisis recalling Malthus' most pessimistic warnings.

But world public opinion has been almost totally unaware how tragic and how speedy will be the consequences of this struggle for peace and for health. A human population tripled within the lifetime of our children, the increase largely concentrated in the "have-not" countries, will present a series of economic and social crises which will make the trials of our own times seem paradisical.

DANGER OF COMMUNIST EXPLOITATION

There is a side effect of the population problem which relates it to every other effort to create a world of peace with freedom. A focal point of the population explosion is in the Far East — in India, China, the Indonesian archipelago and surrounding areas in which more than one half of the people of the world live.

In these areas, the level of life has generally lowered since the turn of the century. In rural India, for instance, individual peasant landholdings have been halved and quartered. There are 8 million new mouths to feed each year. Hungry people feel that their first loyalty belongs to their families. If free institutions cannot provide the bare

necessities of life, those deprived may turn to Communism for an illusory answer to their basic human needs.

"Communism travels on empty bellies."

— FIDEL CASTRO

Closer to home a strident warning signal has sounded in Latin America, which has today the largest rate of annual population increase of any continent coupled with increasingly intense social unrest.

In countries like Brazil 40 percent of the people are children under 15 years of age. President Eisenhower's recent visit may have raised hopes which cannot be fulfilled, for it is obvious that the United States cannot feed the continuing flood of new people, and bitter repercussions may follow the promise inherent in his visit.

THE DRAPER REPORT

For the first time in American history the population problem was officially recognized last year by the Draper Committee appointed by the President to examine United States foreign aid.

The Committee recommended that the government: 1) assist countries, on request, with plans to deal with rapid population growth, and 2) support studies and appropriate research to meet the challenge.

However, President Eisenhower has taken the position that this is a task for private organizations.

Subsequently, a Gallup Poll has indicated that the American public is overwhelmingly behind the Draper recommendations. Therefore, in the not distant future it may well be that Government will yet respond to private leadership and make available resources necessary to deal more adequately with the problem. Meanwhile, American citizens can no longer close their eyes to the many urgent appeals for assistance from abroad.

PROGRAM

To meet this challenge we propose the following twin programs:

1. *Education* within the United States to lead public opinion to an understanding of the population problem. This program will be designed to facilitate constructive *action*.

2. *Action* in various individual countries to meet immediate and long range needs of millions of suffering people by providing technical aid and other assistance upon request. Such programs will be administered, whenever possible, through their representative local private organizations.

EDUCATION

Millions of Americans, both educated and relatively uneducated, believe that no problem exists, that the world can readily support a rapidly increasing population for centuries to come if modern technology is harnessed to the task. Other millions think that the problem is beyond human planning and must be left to God. If such attitudes were to be permitted to have the major weight with public opinion, the accomplishment of constructive results would be hopeless. Accordingly, we propose a large scale informational campaign through the mass media institutions of the American system — print, radio, television, motion pictures, etc.

Prospects within this field of popular education are hopeful. Within the past year unprecedented attention has been directed to the population problem by many leading organs of mass circulation. In the wake of the Draper Report, thoughtful publicists have become aware of the immense importance of this subject. To mention but a few — the Columbia Broadcasting System's television reports; articles in *Life* and *The Reader's Digest;* the repeated comments of the *New York Times'* Arthur Krock — all give evidence of this awakened interest. This interest must be strengthened and mobilized in support of our *action* program.

REQUESTS FOR HELP

In February 1959 students, scholars and professionals in the field of population planning from throughout the world met at New Delhi in the Sixth International Conference of the International Planned Parenthood Federation to discuss and take action in the face of the mounting world crisis. Held under the patronage of Prime Minister Nehru, who delivered a major address, the Conference brought American participants together with their foreign colleagues and enabled the American delegation to learn of specific world needs. A

vast amount of aid is required. Initial urgent needs include the following:

• Professional training programs at the level of one hundred doctors and two hundred nurses annually. Training may take place in the United States but other appropriate national training facilities will be used. On the average, travel, maintenance and essential subsidies to the training centers will cost $2,000 for each doctor, $1250 for a nurse. Thus, the annual budget for this essential training program totals $450,000.

• Experienced professional field workers to provide liaison with foreign organizations are indispensable. For a beginning it is recommended that eight field workers be employed together with secretaries to be stationed in appropriate regions to familiarize themselves with regional conditions and to interpret the local need. Approximately $100,000 annually is budgeted for this need.

• A Director of outstanding reputation and ability, able to develop support in United Nations groups and within governments and organizations, is a prime necessity. He should spend a large part of the year in travelling and overseeing the regional network. Necessary expenses are placed at approximately $50,000 annually.

• Contraceptive materials are totally unavailable in many areas owing to the lack of indigenous manufacturing facilities or of hard currencies to provide for their purchase, or both. In the beginning a program of subsidizing the purchase of materials should be undertaken to be gradually replaced by the establishment of local sources of supply. $100,000 annually is needed.

• There are already a number of well established indigenous organizations through which the programs outlined above could be carried out in their respective areas. In addition, it is expected that the work of the field staff will result in the creation of about four new national organizations each year in each of four world regions. Initially, they will need outside financial help for rent, equipment, personnel, etc., with the expectation that they will become self-supporting in a reasonable time. An estimated expenditure of $100,000 annually will meet this need.

• We need to learn a great deal more about the effectiveness of new techniques. Research and testing of new contraceptives — the "pill" and others — must be stepped up. Clinics and organizations working in the field are our best testing ground and laboratory. Unfortunately, few of them are now financially able to maintain the staff essential for scientifically valid recording. The sum of $200,000 will be well spent in this research work annually.

• Throughout the world educational material keyed to the cultural levels of the various peoples is desperately needed. This includes printed materials, films and film strips, photographs, recordings, etc., together with the finances necessary for their effective distribution. A sum of $10,000 monthly or $120,000 annually is needed.

The total of the above urgent needs alone is $1,120,000.

We seek only to aid suffering people — upon their request — to meet their own population problems. To the extent of our ability to help and consistent with the resources made available by American friends, we will respond to their appeals. In this humane work we seek no issue with those whose beliefs forbid their participation. We ask only that they look with compassion upon the millions of human beings whose entire lives are shadowed by the spectacle of their suffering families.

To accomplish these objectives, we call today for leadership and support in the organization of a *World Population Emergency Campaign.*

We call upon outstanding citizens in every section of this country to give this leadership to their fellow Americans.

We call upon the business community, from which leadership is indispensable, to appraise this issue in the light of its importance to the future of our country and of all humanity.

We call upon every element within the public, including thousands of philanthropic foundations, to consider this matter — not as just another cause but as *the* problem of our time.

FINANCIAL NEEDS OF THE WORLD POPULATION EMERGENCY CAMPAIGN

This Founding Conference of the World Population Emergency Campaign was called together by Bruce Barton, Harrison Brown, Will Clayton, Lammot duP. Copeland, William H. Draper, Jr., and Hugh Moore "to consider what private citizens can do in the face of the mounting world population crisis."

The attendance of so many leading citizens coming from every section of our country as well as the presence of distinguished guests from overseas gives heartening evidence of a desire to share in the accomplishment of our common purpose. Our objectives were stated in the letter of invitation as follows: "It is expected that out of our deliberations will come the formation of a Steering Committee to chart the organization of a World Population Emergency Campaign and that the essential seed money to launch it will be forthcoming."

The convenors of the Conference feel that the extent and urgency of the need make it essential that the Steering Committee to be chosen be persons of commanding stature and broadly representative and that an initial campaign for public support with a goal in excess of $1,000,000 be launched without delay. It is estimated that $100,000 in "seed money" will be required and it is hoped that those friends attending the Founding Conference will provide that sum. Contributions to this end are being sought in the following amounts:

One Contribution of $20,000

Two Contributions of $10,000

Two Contributions of $7,500

Four Contributions of $5,000

Six Contributions of $2,500

Ten Contributions of $1,000

Contributions are deductible for U. S. income tax purposes. All subscriptions in excess of $100,000 will be applied immediately to the needs outlined in the Statement of Purpose. Substantial gifts toward this goal have already been pledged by members of the initiating group.

WORLD POPULATION EMERGENCY CAMPAIGN
51 East 42nd Street
New York 17, N. Y.

THE ROCKEFELLER INSTITUTE
NEW YORK 21, NEW YORK

March 25, 1960

Dear Dr. Salk

Here are a few more things Leo asked me to send on to you —

Best regards
Maurice S Fox

15 November 1960

Dear Leo:

Just a note to wish you Bon Voyage and great success in Moscow.

Dulbecco is going to be in the east about 1 December at which time I will have further talks with him. In the meantime, he has suggested that I use my judgment in filing the legal documents.

I appreciate your having C nfield's office send a copy of your memoranda to me. I have seen these, as you may recall.

I am sure you will enjoy speaking to the Russians, and they will enjoyyou. I know you put pleasure before business, but hope you will stay long enough to get to the business part.

My best to you and Trudy.

Sincerely,

Jonas E. Salk, M. D

Dr. Leo Szilard
c/o Memorial Hospital
New York, New York

12 December 1961

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

Dear Leo:

I want you to have the enclosed and I look forward to meeting with you for a good talk about the future.

Sincerely,

Jonas E. Salk, M. D.

lm

Encl.: 8 Dec. letter to J. Monod

cc: Seymour Benzer
Edwin Lennox

bc: Bronowski

24 March 1961

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

Dear Leo:

Thanks for the information about Herb York. I had not known of his appointment. Tell me what he is like when I see you.

I was in Washington for just a few hours on Friday last. I hope to be in touch with you sometime soon.

Sincerely,

Jonas E. Salk, M. D.

lf

THE UNIVERSITY OF CHICAGO
CHICAGO 37 · ILLINOIS

THE ENRICO FERMI INSTITUTE
FOR NUCLEAR STUDIES

March 14, 1961

Dr. Jonas Salk
The Medical College
The University of Pittsburgh
Pittsburgh, Pennsylvania

Dear Jonas:

I expect to stay in Washington, at the Hotel Dupont Plaza, for another four weeks. As you may have heard, Herb York will be the Chancellor of the University of California in La Jolla.

Sincerely,

Leo Szilard

27 December 1960

Dear Leo:

The enclosed comes to you with all good wishes for a satisfying New Year and for many more than you pessimistically imagine.

My best to Trudy.

Sincerely,

Jonas E. Salk

Dr. Leo Szilard
c/o Memorial Hospital
New York, New York

Telefax

WESTERN UNION

SENDING BLANK

Telefax

Copy

CALL LETTERS _____ _____

CHARGE TO Pol St. WIRE 12/20/61

Dr. Leo Szilard
Hotel Dupont Plaza
Wash. D.C.

Building funds assured. hand
Deed outs. Will call soon.

Jonas.

Send the above message, subject to the terms on back hereof, which are hereby agreed to

PLEASE TYPE OR WRITE PLAINLY WITHIN BORDER—DO NOT FOLD

1269—(R 4-55)

THE UNIVERSITY OF CHICAGO
CHICAGO 37 · ILLINOIS
THE ENRICO FERMI INSTITUTE
FOR NUCLEAR STUDIES

Washington, D.C.
24 December 1961

Dr. Jonas Salk
School of Medecine
University of Pittsburgh
Pittsburgh, Pennsylvania

Dear Jonas:

Enclosed is the latest version of my "Speech" which will show you what I am up to. The reaction of the press continues to be exceedingly favorable - so far not a hostile comment. I am attaching a sample taken from Commonweal, a Catholic publication.

It seems to me that since your Institute will not be in operation until the middle of 1963 and since we do not yet know who the staff might be, it would be just as well to defer any discussion of what my exact relationship with the Institute should be - if I am alive and well-when it goes into operation. I should be glad, however, to receive a formal offer, similar to the standard type offer you may make to others, at this time. I would regard this as an option which would enable me

a. currently to decide whether to accept or reject other,

conflicting, offers;

b. Later on, ~~I would~~ to decide whether to accept your offer, as it stands, or make a counter proposal which would involve a lesser financial commitment on the part of your Institute and a less tight relationship.

It would be useful if we could meet before you leave for Europe in order to discuss -

1. your general plans about the development of the Institute.

2. the staffing of the Institute.

I could then on my trip west perhaps keep my eyes open and look for young, as yet undiscovered, geniuses.

With kindest regards.

Sincerely,

Leo Szilard

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

been given duties which would use their technical skills. In many cases these men have been given nothing at all to do while in others they are assigned duties which have no bearing on their skills. While this kind of bungling is an old tradition in the Army, there seems little reason to excuse it today.

The most curious and disturbing criticism, however, has been that many of the reservists have no idea what they are doing back in the service. At least two explanations are possible for this criticism. Either a great many Americans, including reservists, are just ignorant or the Administration has failed to g[illegible]oss its reasons for the recall.

What undoubtedly complicates the situation is that the Berlin threat has subsided somewhat. It is not surprising, given this change since last summer, that many wonder if there was ever a genuine crisis in the first place. The irony, of course, is that the recall may itself have contributed to the easing of tensions by forcing the Soviets to back down in their Berlin demands.

Nevertheless, there are far deeper reasons for much of the ignorance and dissatisfaction. For many years now this country has suffered from the baneful effects of the Dulles' "massive retaliation" doctrine. We have for so long relied upon nuclear weapons as our main line of defense, so long boasted of our ability to destroy the Soviet Union, so long neglected conventional means of warfare, that it is hardly surprising that many Americans fail to grasp the Administration's military policy.

That policy, while often put in a vague fashion, was summarized adequately by President Kennedy in his most recent press conference. "While we rely," he said, "on our nuclear weapons, we also . . . have a choice between humiliation and a holocaust." What gives us this choice, he implied, is the maintenance of the means to fight a conventional war if at all possible; to have some means to fulfill our commitments without an exclusive reliance upon massive nuclear destruction.

This is hardly a subtle or very complicated position. But after years of hearing that we would have no choice but to use nuclear weapons, many are simply not going to grasp the rationality of this approach. While it is good to see that what was a minority opinion during the Eisenhower Administration—the conceivability of limited warfare—has now been recognized, the Administration clearly has a major educational task on its hands.

Not only must it root out the last vestiges of "massive retaliation," it must also show that preparation to wage conventional warfare does provide at least one way out of the nuclear dilemma. America does have the choice the President suggested. But it has to see it if it is to be a meaningful one.

Lobby For Peace

DR. LEO SZILARD was one of the pioneers in developing the system of nuclear reaction which enabled this country to produce the atomic bomb. Now, pioneering in another direction, Dr. Szilard is calling for a nationwide Council for Abolishing War, an organization that could spend twenty-five million dollars a year lobbying in the cause of peace.

In a recent address at the University of Chicago, the eminent biophysicist declared that without drastic political changes, the world is "headed toward an all-out war." One of the ways to avoid this disaster, he said, would be to create the organization he described.

Most importantly, the "movement to abolish war" would ask all those who joined it to contribute two per cent of their total income. Starting with a base of 50,000 students, Dr. Szilard estimated that the movement could reach 500,000 members in a year, which would raise a fund of fifty million dollars. The Council would use every form of personal and group lobbying to influence politicians, editors, columnists, television commentators and all those who influence public opinion. It would also contribute directly to political campaigns and "deliver the votes" of its members, who would promise to vote solely on the issue of "war and peace." It would be, said Dr. Szilard, "the most powerful lobby that ever hit Washington."

Dr. Szilard's idea is exciting and impressive. What is perhaps most notable about it is its rare combination of idealism and hard practicality, which is of course the essential combination. On the one hand, the plan envisaged by Dr. Szilard is single-minded and uncompromising in its idealistic objective of peace; on the other, it calls for hard, politically sophisticated action in the achievement of that objective.

On this score we think that Dr. Szilard is entirely right. The cause of peace is certainly of desperate importance today, and yet it has nothing like the immense pressure apparatus maintained at our government centers by dozens of special-interest groups. If peace has this vital importance, why should its cause not be supported as diligently and as effectively as the cause of the medical associations, or war veterans, or trucking interests?

We hope that Dr. Szilard is right in believing that his movement will attract millions of Americans, especially young people. Certainly it is a movement which offers youth today a need, a cause and a program. For the sake of all mankind, may it be a success, and may Dr. Szilard's greatest claim to fame—he has many—be that he fathered this inspiring plan to advance the cause of peace.

corrected

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

November 15, 1961

ARE WE ON THE ROAD TO WAR?

by Leo Szilard

For a number of years now, you have had an opportunity to observe how we, as a nation, respond to the actions of the Russians, and how the Russians respond to our responses. Those of you who have watched closely the course of events in the past six months may have been led to conclude that we are headed for an all-out war. I myself believe that we are, and that our chances of getting through the next ten years without war are slim.

I, personally, find myself in rebellion against the fate that history seems to have in store for us, and I suspect that some of you may be equally rebellious. The question is, what can you do?

War seems indeed to be inevitable, unless it is possible somehow to alter the pattern of behavior which America and Russia are exhibiting at present. You, as Americans, are not in a position to influence the Russian government; it follows that you would have to bring about a change in the attitude of the American Government which, in turn, may bring about a similar change in the attitude of the Russian Government.

It is conceivable that if a dedicated minority were to take effective political action, they could bring about the change in attitude that is needed. But such a minority can take effective action only if it is possible to formulate a set of political objectives on which it can unite.

I shall try to outline to you tonight a set of political objectives and you shall be the judges of how satisfactory these objectives may be.

Next, I would like to discuss with you what kind of political action it would take to alter the course of events; cause the present danger of war to recede, and to open the door to a constructive effort to abolish war.

To abolish war is a tall order, and I speak of it therefore with reluctance. It has been apparent, however, ever since the end of the war, that the bomb would pose a problem to the world for which there is no precedent and which cannot be solved short of abolishing war.

Ever since the end of the war, the policies of the great powers have consistently followed the line of least resistance, and this line leads to an unlimited arms race.

There have been repeated attempts to stop the arms race by negotiating an agreement that would provide for some form of arms control. So far, all such attempts have failed, and each time they were followed by the continuation of the arms race, with renewed vigor.

2, Leo Szilard, "Are We On the Road to War?"

Towards the end of the Eisenhower Administration, it was generally expected that the next administration would adopt a new approach to this problem and that a fresh attempt would be made to bring the arms race under control.

When Khrushchev was in New York last October, I tried to see him, in the hope of finding out how responsive he might be to such a new approach. I was told that they had scheduled fifteen minutes for me but, as it turned out, the conversation went on for two hours. At that time, it was not known whether Kennedy or Nixon would get elected, and I started off the conversation by saying that no matter who is elected, the Government would try to reach an understanding with Russia on the issue of stopping the arms race. Khrushchev answered--and he spoke in all seriousness--that he believed this also.

On November 25 of last year, I checked out of the hospital in New York, where I had been confined for over a year, took a taxi to the airport, and flew to Moscow to attend the 6th Pugwash Conference. I was accompanied by my wife, who is also my doctor, and I stayed on in Moscow for about a month beyond the end of the conference. I stayed on in Moscow in order to engage in private conversations with our Russian colleagues, because I knew from experience that only in private conversation is it possible to get anything across to them or to discover what they really believe to be true. None of our Russian colleagues brought up the issue of bomb tests in any of these conversations in Moscow, even though two years earlier some of them had been passionately interested in this issue. I found, however, an undiminished interest in far-reaching disarmament which would result in substantial savings. On one occasion, I had tea with Fedorov, the General Secretary of the Soviet Academy of Sciences, with no one present except my interpreter. I had met Fedorov before and I always got along well with him. On this particular occasion, he spoke to me as follows:

"You must really believe me when I tell you that we want general disarmament. You have seen all this construction work going on in Moscow; it has been going on for many years; still we are not able to catch up with the housing shortage. If we had disarmament, we could not only solve this problem, but many of our other economic problems as well. Also, we could develop other nations on an unprecedented scale. So far, we are building only one hydro-electric dam in Africa--the Aswan Dam in Egypt; if we had disarmament, we could, and we would, build twenty such dams in Africa."

I tried to impress upon our Russian colleagues that the Kennedy Administration would make a serious effort to reach an understanding with Russia on the issue of arms control, but that the new Administration would need time--six months and more than six months, perhaps--to find its bearings on this issue and to get organized to deal with it.

When I returned to this country in February, I decided to stay in Washington for a while.

In Washington, my friends told me that the Government was going to make a sincere effort to reach an agreement with Russia on the cessation of bomb tests and that a

reasonable proposal would be made to the Russians on this issue. They would have liked to hear from me that Russia would be likely to accept such a proposal, but coming fresh from Moscow, I had serious doubts on this score.

The Cuban invasion took me by surprise. When I first heard about it, it was not clear, as yet, whether we were going to give air support to the invading Cuban exiles and whether we would, if necessary, send in the Marines also. My immediate reaction was that of alarm, for I believed that if we did any of these things, we would seriously risk war with Russia. I did not think that Russia would try to intervene in the Caribbean area. Nor did I think that the Russians would launch long-range rockets aimed at our cities. I thought, however, that Russia would make some military move elsewhere, perhaps in the Middle East.

In retrospect, it would seem that I was wrong, for Tom Slick of San Antonio, Texas recently disclosed, apparently on good authority, that, if America had openly intervened in Cuba at that point, Russia would have moved into West Berlin.

I would not venture to appraise just how close we came to an all-out war on the occasion of the Cuban incident. I am reasonably certain, however, that if our intervention in Cuba had been successful, this would have blocked for many years to come any possibility of reaching an agreement on arms control with Russia. Failure to reach an acommodation on the Berlin issue might, of course, produce the same result.

I would not entirely exclude the possibility of war over Berlin, but, to me, it seems more probable that this crisis will be resolved by some uneasy compromise, and that it will not lead to an all-out war. Russia may bring pressure on West Berlin, in order to promote any one of a number of her foreign policy objectives, but, on the larger issue, the issue of Germany, the true interest of America and Russia is the same. The true interest of both is to have Europe politically as stable as possible.

Neither Russia nor America really knows how to accomplish this goal. America may favor certain solutions and Russia may favor certain other solutions; still, it would be rather odd if America and Russia went to war with each other over the issue of what is the best solution for securing the peace in Europe.

I am convinced that the Berlin issue could be satisfactorily resolved by negotiations, but this conviction is based on the belief that there is something that the Russians want that we should be willing to give them, and that there is something that we want that the Russians should be willing to give us in return.

There are many people who do not share this belief. They hold that the Berlin issue was artificially created by Russia for the purpose of humiliating America, for breaking up NATO, and for converting West Germany into a Communist state.

4, Leo Szilard, "Are We on the Road to War?"

Many people, probably the majority, believe that the Russians are very much like the Nazis; that they have concrete plans for bringing about, one way or another, our total defeat in Europe, and also for subjugating the whole world to their rule.

Many people have a black and white picture of the world; they believe that the nations fall into two classes: the peace-loving nations, and those who are not peace-loving. America, France and England, and generally speaking our allies, including Germany and Japan, are peace-loving nations. Russia and China are not peace-loving nations. Twenty years ago, the situation was somewhat different; at that time, Russia was a peace-loving nation, but Germany and Japan were not.

Many people believe that Russia, by supplying arms on a vast scale to the Chinese Communists, managed to take control of China. They recollect, further, that when American troops, fighting under the flag of the United Nations, crossed the 38th parallel, moved up across North Korea to the Yalu River, and destroyed the hydro-electric power plant which supplied Manchuria with electricity, all at once--and without any provocation--Chinese Communist hordes crossed the Yalu River and thus frustrated the efforts of the United Nations to unify Korea under free elections.

Many people believe that ever since the atomic bomb forced the unconditional surrender of Japan, America has unceasingly tried to rid the world of the bomb, but that all her efforts were frustrated by Russian intransigence.

When I listen to people who hold such views, I sometimes have the feeling that I have lived through all this before and, in a sense, I have. I was sixteen years old when the first World War broke out, and I lived at that time in Hungary. From reading the newspapers in Hungary, it would have appeared that, whatever Austria and Germany did was right and whatever England, France, Russia, or America did was wrong. A good case could be made out for this general thesis, in almost every single instance. It would have been difficult for me to prove, in any single instance, that the newspapers were wrong, but somehow, it seemed to me unlikely that the two nations located in the center of Europe should be invariably right, and that all the other nations should be invariably wrong. History, I reasoned, would hardly operate in such a peculiar fashion, and it didn't take long until I began to hold views which were diametrically opposed to those held by the majority of my schoolmates.

Many of my schoolmates regarded me as something of an oracle because I was able to cope with the mysteries of lower arithmetics which baffled them; some of them asked me one day quite early in the war who would lose the war. I said that I didn't know who would lose the war, but that I thought that I knew who ought to lose the war. I thought that Austria and Germany, as well as Russia, ought to lose the war. Since Austria and Germany fought on one side, and Russia on the other side, it was not quite clear how this could happen. The fact is, of course, that it did happen.

I am not telling you this in order to impress you with how bright I am. Nobody at sixty can claim to be as bright as he was at sixteen, even though in most cases it is not

the intelligence that deteriorates, but the character. The point I am trying to make is that even in times of war, you can see current events in their historical perspective, provided that your passion for the truth prevails over your bias in favor of your own nation.

After the war, when I lived in Berlin, a distinguished friend of mine, Michael Polanyi, asked me one day what I thought ought to be the rule of human conduct regulating the behavior of an individual in society. "Clearly," he said, "you cannot simply ask a man to be generous to other people, for if the other people are mean to him, and if he follows your rule, he will starve to death." "But," said Polanyi, "perhaps the rule ought to be 'Be 1 percent more generous to people than they are to you.'" This should be sufficient, he thought, because if everyone were to follow this rule, the earth would, step by step, turn into a livable place.

I told him that, to my mind, this would not work at all, because if two people behave the same way toward each other, each is bound to think that he is 30 percent more generous than the other. Clearly, the rule would have to allow for this bias. Perhaps if we were to stipulate as the rule of conduct, "Be 31 percent more generous to the others than they are to you," such a rule might work.

America and Russia are not following any such rule of conduct. Moreover, their bias greatly exceeds 30 percent.

Most Americans apply a yardstick to America's actions which is very different from the yardstick which they apply to Russia's actions. Whenever their bias in favor of their own nation gets into conflict with the truth, the odds are that the bias will prevail. As a result of this, they are not capable of seeing current events in their historical perspective. They may well realize that we are in trouble, but they cannot correctly diagnose the cause of the trouble and therefore, they are not in a position to indicate what the right remedy might be.

The people who have sufficient passion for the truth to give the truth a chance to prevail, if it runs counter to their bias, are in a minority. How important is this "minority?" It is difficult to say at this point, for, at the present time, their influence on governmental decisions is not perceptible.

If you stay in Washington, you may gain some insight into the manner in which important governmental decisions come about; you may get a feel of what kind of considerations enter into such decisions, and what kind of pressures are at work.

With President Kennedy, new men moved into the Administration. Many of them fully understand the implications of what is going on and are deeply concerned. But, they are so busy trying to keep the worst things from happening, on a day-to-day basis, that they have no time to develop a consensus on what the right approach would be, from the long-term point of view.

There are also a number of men in Congress, particularly in the Senate, who have insight into what is going on and who are deeply concerned, but they lack the courage of their convictions. They may give a lucid analysis of the trouble in private

conversations and then at some point or other, they will say: "Of course, I could not say this in public."

In Washington, wisdom has no chance to prevail at this point.

Life Magazine printed an article about me in September which said that I was in Washington trying to find out if there was a market for wisdom. Thereupon, I received a flood of letters from colleges and universities inviting me to give lectures. Most people get some pleasure out of hearing themselves talk, and so do I, yet I did not see much point in going around the country giving talks, if all I had to say was that there was no market for wisdom. Therefore, I declined all these invitations; that is, I declined them all, until Brandeis University invited me to attend a Special Convocation and to receive an honorary doctor's degree. At that point, my vanity got the better of me, and I accepted. At Brandeis, I spoke at dinner informally to the Trustees and Fellows of the University, and this was my closest contact with the grass roots since I moved to Washington--if indeed, you may regard the Trustees and Fellows of Brandeis as grass roots.

I told them at Brandeis that I thought we were in very serious trouble; people asked me what they could do about it, and I had no answer to give.

Is there, indeed, anything that these people--or for that matter I, myself--could do that would make sense?

When I got back to Washington, I started to think about this, and I believe it will be best now if I simply recite to you how my thoughts developed from this point on.

The first thought that came to my mind was that--in cooperation with others--I could try to set up an organization in Washington--a sort of lobby, if you will--which would bring to Washington, from time to time, scholars and scientists who see current events in their historical perspective. These men would speak with the sweet voice of reason, and our lobby could see to it that they shall be heard by people inside the Administration and also by the key people in Congress.

The next thing that occurred to me was that these distinguished scholars and scientists would be heard, but that they would not be listened to, if they were not able to deliver votes.

Would they be listened to if they were able to deliver votes?

The minority for which they speak might represent perhaps ten percent of the votes, and ten percent of the votes alone would not mean very much, just as the sweet voice of reason alone would not mean very much. Still, the combination of ten percent of the votes and the sweet voice of reason might turn out to be an effective combination. And, if the minority for which these men speak were sufficiently dedicated to stand ready not only to deliver votes, but also to make substantial political contributions, then this minority would be in a position to set up the most powerful lobby that ever hit Washington.

7, Leo Szilard, "Are We on the Road to War?"

The problem which the bomb poses to the world cannot be solved except by abolishing war, and nothing less will do. But first of all, we must back away from the war to which we have come dangerously close.

Could such a dedicated minority agree not only on the long-term political objectives which need to be pursued in order to attain a livable world but also on the immediate political objectives which must be pursued in the next couple of years in order to make the present danger of war recede to the point where attention can be focused on the task of abolishing war?

I do not propose to say here much about the long-term objectives, but I want to discuss now a set of immediate political objectives on which a dedicated minority could perhaps unite. Please keep in mind, however, that this is just a first try.

The issue of bomb tests and the issue of bomb shelters are peripheral issues; they are more the symptoms of the trouble we are in than the causes of the trouble.

I would not want to say that a foolish large-scale shelter program might not also become the cause of serious trouble. But still I think that political pressure should not be focused on this issue, and the same holds for the issue of bomb tests.

The central issue which will face the Kennedy Administration is, whether America shall try to retain her strategic striking forces as a deterrent, or whether she shall retain them merely as protection. This issue has been brought into focus by the current Berlin crisis.

Currently, voices are heard demanding that free access to West Berlin shall be defended at all cost. Spokesmen of the Administration emphasize that, if necessary, we would drop the bomb on Russia. We are told that our atomic striking forces are far superior to those of Russia, that, at this time, Russia has only 50 long-range rockets and only 150 long-range bomber planes, and that we have many more than that, and many people believe that this threat deters Russia from contesting our rights in Berlin.

If we intend to drop our bombs on Russia in case of war and expect Russia to drop her bombs on us, so that both countries would be wholly devastated, then our threat to drop bombs on Russia is tantamount to a threat of murder and suicide.

The threat of murder and suicide is not a believable threat, in the context of the Berlin conflict, and it would not be a believable threat in the context of any other similar conflict.

The threat of dropping bombs on Russia, in case of war, would be a believable threat however if America's strategic striking forces were able to cripple most, if not all, of Russia's rocket and bomber bases by one sudden single blow, and if it were America's intention to "strike first" in case of war.

Opinions differ on how successful such a first strike against bases would be today, and whether the Russian counterblow would demolish twenty, ten, one, or none of our cities.

Be that as it may, the Administration will have to decide whether the strategic striking forces of America shall be maintained in the long run at a level where they would have an adequate first strike capability, and whether America should adopt a "first strike against bases if necessary" policy.

Let us pause for a moment to examine what such a policy would involve. It would involve, first of all, a great increase in the projected number of solid fuel long-range rockets, and the development of more powerful hydrogen warheads for these rockets. This would be necessary because the Russians would, of course, harden their rocket bases.

Secondly, it would involve the manufacture of a large number of rockets that would function as decoys, in order to neutralize the anti-missile missiles, by means of which the Russians may be expected to defend their rocket bases.

Further, since we could not expect to destroy every single Russian base and submarine in a first strike, we would have to embark on a major development program in order to have adequate anti-missile missiles available for the defense of our cities.

And lastly, we would be more or less forced to embark on a shelter program involving an annual expenditure of perhaps $20 billion. The shelters would have to protect not only against fall-out, but also against heat and blast. The problem of getting the people into the shelters at the right time would probably offer no major obstacle, since if we plan to strike first, the Government should be in a position to get the people to take shelter at the right time.

Only if such defensive measures were included in the program would the maintenance of a first strike against bases capability permit America to retain the bomb as a deterrent.

To me it seems conceivable that America's strategic striking forces could be boosted to the level where, for a limited period of time, they would be capable of an adequate first strike against bases. It is not likely, however, that they could be maintained indefinitely at such a level. Presumably periods when America has a first strike capability would alternate with periods when she does not have such a capability. And if there were a major international crisis during one of the periods when we have a first strike capability, the Government would be under strong pressure to start a preventive war.

The decision to start a preventive war would always be a hard decision for any President to take, particularly since he would never be quite certain just how many of our own cities would be hit. But in certain circumstances, his hand could be forced by a commander of an overseas strategic base, or a submarine capable of launching rockets.

9, Leo Szilard, "Are We On the Road to War?"

If a commander of a strategic base or a submarine were to drop bombs on, say, three Russian cities, then the Russians would be expected to strike back with all they have, and the President would have no choice but to order an all-out first strike against the bases of the Russians.

A "first strike against bases if necessary" policy would mean an atomic arms race, with the sky as the limit. I do not believe that America could be made secure by trying to keep ahead in such an arms race, and I would be in favor of resisting the adoption of such a policy, if necessary through vigorous political action.

In deciding against such a policy, we must, however, recognize, that if America renounces the "first strike if necessary" policy, she loses the deterrent effect of her strategic striking forces. For, clearly, if these forces are not capable of a first strike against Russian bases, then any threat that America would attack Russia with bombs, in case of war, would be tantamount to a threat of murder and suicide and would, therefore, not be believable.

If America renounces the first strike policy, then the strategic striking forces of America could thereafter function only as protection. If these forces are arranged in such a manner that a sudden attack on them could not substantially reduce their ability to strike a major counter-blow, then these forces may be looked upon as protection against the possibility that America might be attacked with bombs.

A clear policy decision to the effect that America is going to maintain an invulnerable second strike, but would not adopt a "first strike if necessary" policy would leave open the door to an agreement on arms control. This is important, because an agreement on arms control (providing for far-reaching disarmament) is a necessary first step towards abolishing war.

An agreement on arms control would have to involve, however, not only Russia but also China, and it is not likely that negotiations including China may get under way within the next twelve months. It might very well be, therefore, that in the immediate future America would have to take unilateral steps in order to reduce the present danger of an all-out war.

Such unilateral steps are not adequate substitutes for negotiated agreements, and they can carry us only part of the way, but still there are some unilateral steps which need to be taken at the present time. I propose to discuss with you at this point what unilateral steps America could and should take at the present time.

(1). I believe that America could and should make unilaterally two crucially important policy decisions and that she should proclaim these decisions.

First of all, America should proclaim that she would not resort to any strategic bombing of cities or bases (either by means of atomic bombs or conventional explosives), except if American cities or bases are attacked with bombs, or if there is an unprovoked attack with bombs on cities or bases of one of America's allies.

Further, America should make a second policy decision and should proclaim this decision. In order to understand the meaning and importance of this second decision, it is necessary to consider the following:

Soon after the war, the Soviet Union proposed that the atomic bomb be outlawed. This could take the form of a unilateral pledge, given by each atomic power, that it would not resort to the use of atomic bombs either for the purpose of attacking cities or bases or as a tactical weapon to be used against troops in combat.

Recently Sulzberger discussed with Khrushchev the possibility of unilateral pledges, renouncing the use of the bomb. Khrushchev said on this occasion that if there were a war, and if at first only conventional weapons were used, subsequently the side which is about the lose the war would find it impossible to abide by its pledge and would resort to the use of the bomb.

This brings out, what I believe to be the crux of the issue, that today it might still be possible to resist force with force, but the objective of the use of force can no longer be victory. The objective can only be to exact a price.

As long as force is used at all, an all-out war which neither side wants, can be avoided only if both sides recognize that the use of force must not be aimed at victory, or anything approaching victory.

Keeping this point in mind, America could and should proclaim that if, in case of war, she were to use atomic bombs against troops in combat, she would do so only on her own side of the pre-war boundary. America would be bound by this pledge in case of war, as long as Russia imposes a similar restraint on her conduct of the war. Manifestly, this type of use of atomic bombs would be a defensive operation.

Such a pledge would be no less clear than the simple pledge renouncing the use of the bomb, but it would be much easier to keep and therefore it would be a more believable pledge. And if neither side aims at anything approaching victory, then the pledge would greatly reduce the danger of an all-out war.

When I discussed this issue in Germany three years ago, the people there said that if the ground forces of the allies were pushed back to the Rhine, and America used atomic bombs against troops in combat between the Rhine and the Oder Neisse line, many West German cities might be destroyed by American bombs. I do not know to what extent West German cities could be spared by a judicious tactical use of atomic bombs by American forces, but I do know that if America were to use bombs beyond the pre-war boundary, West German cities would be destroyed by Russian bombs.

(2). America could and should resolve that atomic bombs and the means suitable for their delivery, which are supplied by her and which are stationed in Europe, shall remain in the hands of American military units which are under American command, rather than be placed under the control of NATO. As long as we are committed to defend Western Europe, there is no valid argument for turning over bombs to the control of other Western European nations.

Germany is going to put increasingly strong pressure on the United States Government to turn over such equipment to NATO control, and I would be in favor of counterbalancing any pressure by bringing political pressure to bear on the Government.

(3). Nothing is gained by America winning meaningless battles in the cold war and a change of attitude in this regard is urgently needed. Take the International Atomic Energy Agency in Vienna, for instance. This organization has at present no function whatsoever, and if it is maintained in existence at all, it should be maintained as an exercise in cooperation among the nations.

The first director of this Agency, Sterling Cole, is an American, and his term expired recently. Since next to America, the Soviet Union is the most important atomic power, we could have proposed that the next director of the Agency be a Russian. Instead, we proposed a Swede, who was not acceptable to the Russians, and since we had the votes we were able to win a victory in a meaningless battle in the cold war.

This "victory" has reduced the chances of finding some useful function for this Agency, because the Russians resent being pushed around and there is no way for us to force them to play ball in this Agency.

I believe that it would be important for the Government to reach a major policy decision, and for the President to issue an Executive Order against fighting meaningless battles in the Cold War. Some political action in support of such an Executive Order might be necessary.

(4). We have a cultural exchange program with the Russians but their State Department and our State Department are playing a game of "if you hit our scientists, we shall hit your scientists." Accordingly, our State Department imposes senseless travel restrictions on our Russian colleagues who visit this country. These travel restrictions are not aimed at the safeguarding of any secrets, but are merely one way of hitting back at travel restrictions which the Soviet Government occasionally imposes on American scientists who travel about in Russia.

The Russians have opened up their country to tourist travel to a considerable extent, and if we wish to encourage this development, as we probably ought to, then American tourists should not be given spying assignments. Tourists make poor spies, and we are losing more than we are gaining by trying to use them as spies.

I believe that representations ought to be made, at as high a level of the Administration as is necessary:

(a) for the Secretary of State to find some other assignment in the State Department for those who have, up till now, handled the East-West Cultural Exchange Program;

(b) for the President to issue an Executive Order to the CIA directing it to refrain from approaching those who go to Russia as tourists.

(5). Not every issue can be solved by Congress passing a law, and there are borderline issues where political action alone can bring no solution because the specific knowledge is lacking of how to go about a solution. The issue of general disarmament seems to be such a borderline issue.

I believe that, at the present time, little could be gained by bringing pressure on the Administration to enter into formal negotiations with Russia on the issue of General Disarmament, because--as they say, "You can lead a horse to the water, but you can't make him drink."

I believe that no substantial progress will be made towards disarmament until Americans and Russians first reach a meeting of the minds on the issue of how the peace may be secured in a disarmed world.

American reluctance to seriously contemplate general disarmament is largely due to uncertainty about this point. If it became clear that a satisfactory solution of this issue is possible, many Americans may come to regard general disarmament as a highly desirable goal.

On the issue of how to secure the peace in a disarmed world, progress could probably be made reasonably fast through non-governmental discussions among Americans and Russians. I believe that such discussions ought to be arranged through private initiative, but with the blessing of the Administration.

It does not seem likely that the newly created Disarmament Agency will be in a position to mobilize the imagination and resourcefulness which is required, and I believe that it may be necessary for a major private group to help them out or to prod them along--as the case may be. This may or may not require political action of one sort or another.

The Russians know very well that America is not ready seriously to contemplate general disarmament and this, to my mind, explains why, in spite of being strongly motivated for disarmament, the Russian Government displays in its negotiations on this issue much the same attitude as does the American Government. As far as negotiations on disarmament are concerned, hitherto both governments have been mainly guided by the public relations aspect rather than by the substantive aspect of the issue.

The Soviet Union's attitude might change overnight, however, if it became apparent that America was becoming seriously interested in disarmament.

The Russians are very much aware of the great economic benefits they would derive from disarmament, and I believe that the Soviet Union would be willing to pay a commensurate price for obtaining it. It stands to reason that this should be so. The Soviet Union spends on defense a much larger fraction of her industrial output than America does.

America is at present committed to protect certain territories which are located in the geographical proximity of Russia. In the case of general disarmament, America would not be able to live up to any such commitment. Disarmament will, therefore, be politically acceptable to America only if it is possible for her to liquidate her present commitments--without too much loss of prestige and without seriously endangering the interest of the other nations involved.

Khrushchev seems to be very much aware of this. Therefore, it is possible that if it came to serious negotiations on the issue of disarmament, and if it became manifestly necessary to reach a political settlement in order to permit America to liquidate her military commitments, then the Soviet Union would go a long way towards seeking an accommodation.

The so-called Berlin Crises, which centers around the commitments which America made to West Berlin, might very well be a case in point.

(6). General disarmament will, if we are lucky, eliminate war, but it will not end the rivalry between America and Russia.

It is a foregone conclusion that American efforts towards creating an orderly and livable world will be frustrated in Southeast Asia and Africa because of our failure to devise forms of democracy which would be viable in these regions of the world. The task of devising forms of democracy which would be suitable to the needs of such areas is not a task that the Government can handle. Various forms of democracy may have to be devised which are tailor-made to fit the various areas. A major private group could tackle and ought to tackle this problem. If it is not solved, more and more underdeveloped nations will become dictatorships; some of them may have a rapid succession of dictator after dictator and, in the end, the people may have to choose between Chaos and Communism.

It is a foregone conclusion that America's efforts to raise the standard of living of underdeveloped nations may be frustrated in those areas where the birth rate is high, infant mortality is high, and there is little arable land left. Improvement in the standard of living will initially lead to a fall in infant mortality, and if the birth rate remains high, the population will shoot up so rapidly, that economic improvements will not be able to catch up.

Our failure to develop methods of birth control, suitable for the needs of such areas, is responsible for this state of affairs. The development of such methods is not a task which the Government can undertake. The Government could not create Research Institutes which would attract scientists who are ingenious and resourceful enough to come up with an adequate solution. The amount of money which would be involved is not much, and a major private group could and should tackle this problem.

If it should turn out that it is possible to formulate a set of political objectives on which reasonable people could generally agree, and if these objectives could count on the all-out support of a sizable minority--admittedly a very big "if"--then I should be inclined to go further, and I would go further along the following lines:

I would ask seven to twelve distinguished scientists to form a Council, which might be called Council for Abolishing War or perhaps better, Council for a Livable World. This Council would, first of all, assemble a panel of political advisors, whose identity would be public knowledge, and then it would formulate, in close consultation with

these advisors, two sets of objectives. To the first set belong those objectives which cannot be attained at the present time through political action because it would take further inquiry and research to know, in concrete terms, what needs to be done. To the second set belong those objectives which can be pursued through political action because it is clear what needs to be done.

The members of the Council would set up a research organization aimed at the pursuit of the first set of objectives, and they would serve as the Trustees of that organization. The members of the Council would also set up a political organization aimed at the pursuit of the second set of objectives, and they would serve as the Board of Directors for that organization. Because one of the functions of the second organization would be to lobby, we may refer to it for our purposes tonight as the Lobby.

The Board of the Lobby would, from time to time, revise the political objectives which it proposes to pursue and it would communicate these objectives--perhaps in the form of a series of pamphlets--to all those whom the Board believes to be seriously interested.

It seems to me that there is no need to enlist those who are interested as members of an organization. What one needs to create is not a membership organization, but a Movement.

Those who regularly receive the communications of the Board would be regarded as members of the Movement, provided that they spend, say, two percent of their income in support of the Movement. A small fraction of this amount would go to the Board for covering the operating expenses of the Lobby; the rest of it would go for political contributions made directly by each individual involved.

So that the members of the Movement may know where their political contributions would be most effective, they would have to keep in close touch with the Lobby. The Lobby would keep them informed about the key contests for seats in Congress, and the members should have no difficulty in figuring out where their contributions should go, even if the Lobby may not explicitly endorse anyone running for office.

The members of the Movement who are articulate would be expected to communicate not only with their own Congressmen and the Senators of their own states, but, also, each with at least one key member of the House or Senate. Above all, the articulate members of the Movement would be expected to discuss the relevant issues with the editors of their newspapers and various columnists, and other opinion makers, in their own community. They would be pledged to vote in the primaries, as well as in the elections. And they would be pledged to cast their vote--disregarding domestic issues--solely on the issue of war and peace.

The influence of the Lobby would be greatly enhanced if it were able to say not only how many votes it represents, in toto, but also how many votes it represents in each state and in each congressional district. So that the Lobby may not make false representations in this regard, all those concerned would be asked, from time to time, to inform the Board if they disagree with the political objectives proclaimed or if, for any other reason, they do not intend to perform as the members of the Movement are expected to perform.

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support of a sizeable minority - admittedly a very big "if" - then I should be inclined to go further and I would go further along the following lines:

I would ask seven to twelve distinguished scientists to form a Council, which might be called Council for Abolishing War or perhaps Council for a Liveable World. This Council would, first of all, assemble a panel of political advisers, whose identity would be public knowledge and formulate in close consultations with these advisors two sets of objectives. To the first set belong those objectives which cannot be attained, at the present time, through political action because it would take further inquiry, and perhaps research, to know, in concrete terms, what needs to be done. To the second set belong those objectives which can be pursued through political action, because it is clear what needs to be done.

The members of the Council would set up a Research Organization aimed at the pursuit of the first set of objectives, and they ~~wo~~ would serve as the Trustees of that organization.

The members of the Council would also set up a political organization aimed at the pursuit of the second set of objectives, and they would serve as the Board of Directors for that organization. Because one of the functions of the second organization would be to pursue political objectives we may refer to it for our purposes here as "The Lobby".

It seems to me that there is no need to enlist those who are interested as members of an organization. What one needs to create is not a membership organization, but a Movement.

The Board of the Lobby would hold hearings, once every four months, and would subsequently proclaim in detail the immediate political objectibes it proposes to support. It would communicate these objectives, perhaps in the form of a series of pamphlets, to all those who are believed to be seriously interested. Those who regularly receive the communications of the Board would be regarded as members of the Movement, if they are willing <u>actively</u> to support at least one of the several specific objectives proclaimed by the Board.

The articulate members of the Movement would be expected to discuss the relevant issues with editors of their newspaper and various columnists and other opinion makers in their own community. They would be expected to write to, and in other ways keep in touch with, their Congressman and the two Senators of their own State. Also each articulate member would be expected to keep in touch with at least one key member of the House or the Senate.

One of the main functions of the Lobby would be to help the members of the Movement clarify their own minds on the political objectives they wish actively to support and to help arrange appointments for those members who come to Washington to see Congressmen, Senators and certain key members of the Administration.

The members of the Movement would be regarded as pledged to vote in the primaries as well as in the elections. As far as federal elections are concerned, they would be pledged to cast their vote, disregarding domestic issues, solely on the issue of war and peace. Further, the members of the Movement would be regarded as pledged annually to spend 2 per cent of their income on political contributions.

So that each member of the Movement may know where his contribution should go, in order to be most effective in furthering the political objectives which he has chosen to pursue, the Lobby will keep in touch with each member. The Lobby would keep the members informed not only in general about the particular contests for seats in Congress which are of interest to the Movement, but it may advise one member to take an interest in one of these contests and another member to take an interest in another of these contests.

This does not mean the Lobby would explicitely endorse anyone running for office. I may be assumed that if the importance of a given contest is brought to the attention of a member, the member will have no difficulty figuring out for himself which of the two candidates for office he would want to support.

For covering the operating expenses of the Lobby and the Research Organization (which would be maintained independently and operated parallel to the Lobby), one would look to the members of the Movement.

Each year a certain group of the members would be asked by the Board of the Lobby or the Trustees of the Research Organization to contribute 2 per cent of their income to them, rather that to spend it for political contributions. One year this group might be composed of those whose names start with the letter "C". Another year it might be composed of those whose names start with the letter "R", etc.

The influence of the Movement would be greatly enhanced if the Lobby were able to say not only how many votes it represents, in toto, but also how many votes it represents in each state and in each congressional district. So that the Lobby may not make false representations, concerning the votes it may be able to deliver, the Board shall from time to time ask all those who regularly receive its communications, to say which of the political objectives proclaimed by the Board they propose to support and if they intend to perform with respect to those objectives as members of the Movement are expected to perform.

The Movement must not wield the power that it may possess crudely. People in Washington want to be convinced, they do not want to be bribed or blackmailed. He, who gives consistently financial support to certain key members of Congress, may evoke their lasting friendship and may count on their willingness to listen to them as long as they talk sense. He, who talks to members of Congress, but does not talk sense, will not accomplish anything of lasting value, even if he temporarily sweeps some members of Congress off their feet

by making huge political contributions to them.

There are many intelligent men in Congress who have insight into what goes on; the Movement could help these men to have the courage of their convictions. There are others in Congress who are not capable of such insight; the only thing to do with them is not to return them to Congress, and to replace them with better men. This may make it necessary to persuade better men to run in the primaries and to stand for election. To find such better men, must be one of the tasks of the Movement, and the Lobby must be prepared to help the members of the Movement to perform this task.

I did not come here to enlist any of you in such a Movement or to launch such a Movement. I came here to invite you to participate in an experiment that ought to show whether such a movement could be successfully launched.

First of all, I ask each of you to look into your own heart and try to discover whether you yourself would want to participate in a political movement of the kind described, provided the objectives -- as formulated from time to time-appealed to you and you thought that the Movement could be effective.

Next, you may want to ask others -- within your University community-whether they might not wish to participate in the experiment also.

Those of you who wish to participate in the experiment are asked

to show a copy of this speech to people in your home community who might be interested and to determine which of these would be likely to be part of a dedicated minority that would give all-out support to a movement of the kind I have described.

I would appreciate your writing me, in about four to six weeks, how many people you have talked to and how many of these and who of these (name and address), you think, could be counted upon.

Those to whom you talk in your home community should not go and recruit still others. They may, however, put you into contact with others who might be interested, and you will be then in the position to evaluate their interest and to report back.

This experiment is meant to be based on the communities of Harvard University, Swarthmore College, Western Reserve University, and the University of Chicago.

If enough of you collaborate in this experiment, with luck we might be in a position to know within two months whether a movement of the kind I have described could get off the ground.

Those of you who participate in this experiment may need to have a copy of this speech, and we can discuss later just how I can get a copy to you.

If the result of this experiment indicates that such a movement could get off the ground, then perhaps one would want to start the Movement with talks, in front of large student audiences across the country, from coast to coast. If within the next 12 months one could find 20 thousand students who would go all-out in support of the

Movement, and if each student would, directly or indirectly, bring ten other people into the Movement, then the Movement could rapidly attain 200,000 members. This would represent about 20 million dollars per year in political contributions, or 80 million dollars over a four-year period, and this is probably as much as one would want to have.

Whether such a movement could grow further and could come to represent one or two million votes would then probably depend on the future course of world events.

THE END