CHICAGO TODAY

The University of Chicago Chicago, Illinois 60637 SUMMER 1965 Volume 2, Number 2

179 - 250

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Cover: Ralph Shapey conducting the Contemporary Chamber Players in a performance at Mandel Hall of compositions by Edgard Varèse.

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After Hiroshima

If more individual scientists were not stricken in the weeks following Hiroshima with an overwhelming sense of personal remorse it was in part because there developed a prompt, widespread, and intensely earnest collective preoccupation with two closely related subjects: the impact of the new weapon on world peace and the effect of continued secrecy upon international relations and upon the healthy growth of science and technology. The practical expression given to this preoccupation during August and September, 1945, was the organization of groups at Manhattan Project laboratories with the initial purpose of providing the American people and their leaders with the information needed for intelligent decisions.

At the Met Lab two cardinal documents of the scientists' movement, the Franck Report and Eugene Rabinowitch's July 12 memorandum on a scientists' organization, had already outlined principles and practice. There the news of Hiroshima did not precipitate, it merely lent new vigor to earlier discussions which the Committee on Social and Political Implications now extended by calling an open meeting of laboratory staff on Tuesday evening, August 7, to consider a statement about the bomb. Some 20 scientists joined the committee members and Eugene Rabinowitch was made chairman of a committee to summarize the group's thinking.

At a second meeting on August 13, Farrington Daniels, as Met Lab director, reviewed the substance of the still secret Franck Report, including its suggestions for control of fissionable materials and its plea that the world be informed of the new weapon by some means other than military use. Daniels' summary stressed those points which would become the scientists' principal stock in trade in the coming campaign: the likelihood of speedy imitation by other nations, the dangers of an atomic arms race and the need for controls, the advantage enjoyed by an aggressor, and the inadequacy of any conceivable defense.

With these ideas as the central theme Leo Szilard prepared a draft statement for a meeting on August 15 and Rabinowitch another for August 21. The arguments of the Franck Report, intended for the perusal of statesmen, were transformed into simpler phrases that might capture the attention of a less sophisticated audience.

Rabinowitch's contribution was the one selected as a basis for discussion. As considered on August 21 it was divided into three parts: (I) Responsibility of Science in the Postwar World; (II) Analysis of Unsatisfactory Solutions of the Atomic Power Problem; (III) Scattering of Cities, International Controls, and World Government. Section II listed certain slogans that might be used to mislead the public—do not reveal the secret; let's corner the raw materials; let's retain the leadership; a defense is sure to be found; if you smash our cities, we'll smash yours; let's scatter our cities and dig underground; let's prohibit atomic warfare—and then proceeded to refute them. The third section proposed measures more likely to succeed: dispersion, international control of atomic energy, and world government.

The evolution of this document proclaims the care with which scientists were preparing their case. The criticisms directed at Rabinowitch's draft on the 21st were reflected in a mimeographed version, dated August 31, with the title "Alternate Draft for Report of Committee on Social and Political Implications—to be considered at meeting of scientists, Tuesday, Septem-

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The article is taken from Mrs. Smith's book, A Peril and a Hope, *soon to be published by The University of Chicago Press. Mrs. Smith was assistant editor of the* Bulletin of the Atomic Scientists, *1946–48, and now is director of the Radcliffe Seminars. Her husband, Dr. Cyril Stanley Smith, served at The University of Chicago as Director of the Institute for the Study of Metals, 1946–56, and as Professor of Metallurgy until 1961.*

ber 4, 1945." It contained the same basic arguments against the unsatisfactory solutions but in a less journalistic style. The section on valid solutions was greatly modified. Dispersal of cities and population was regarded less hopefully, and world government was omitted entirely; instead, people were urged to think seriously about means of achieving international control as the only alternative not leading to world suicide.

The emphasis upon world government did not, however, disappear without protest. A September 1 memorandum from Robert Maurer maintained that international control involved the relinquishment of "a little sovereignty" and was therefore unsatisfactory as a permanent solution. The conclusion of the final revision (the work of Bernard Weissbourd, J. J. Nickson, Austin Brues, and Eugene Rabinowitch) was a compromise: "Since world government is unlikely to be achieved within the short time available before the atomic armament race will lead to an acute danger of armed conflict, the establishment of international controls must be considered as a problem of immediate urgency."

A combination of circumstances and personalities was to make the Chicago group one of the most influential elements in the scientists' movement, and it is therefore worth noting what its initial policy statement did and did not say. Its general theme was that the introduction of a new dimension of power into international relations demanded some truly radical countermeasure and that the only one with a chance of success was international control. It stressed the responsibility of scientists to explain the significance of the bomb. It said a great deal about the futility of atomic secrecy, but it did not talk about freedom of science in general, an omission later mentioned by "non-atomic" scientists with a certain asperity and hints that Project scientists wanted to maintain their monopoly of atomic information. But Chicago attributed the omission solely to a wish to avoid the charge that scientists objected to secrecy because it interfered with their work. Its lead in this de-emphasis was followed by other Project site groups.

The statement noted that all scientists did not share in reservations about the bomb's use or feel responsible for its future employment, but the first press release of the Atomic Scientists of Chicago on October 4 claimed the support of 95 per cent of the scientists working on the atomic bomb project at Chicago. Cautious revision a week later to "over 90 per cent"—a figure no one challenged—still left the new organization with impressive support, but as John Simpson later remarked, "that five or ten per cent included people we respected, and that always bothered us."

But it was more than a meticulous desire to reconcile slight variants in opinion that led the Chicago scientists to postpone for two months the publication of their statement. "For some four to six weeks after Hiroshima," Szilard told an audience assembled by the editors of *The Nation* on December 3, "atomic scientists expressed no opinion on the political implications of the bomb, having been requested by the War Department to exercise the greatest possible reserve. Our response to this request does not mean that we were intimidated by the War Department. We kept silent because we all believed that Hiroshima was immediately followed by discussions between the United States, Great Britain, and Russia, as indeed it should have been, and we did not want to embarrass the President or the Secretary of State." We are never explicitly told through what channel this request reached the scientists, but as we shall see, the substance of it was well understood at all laboratories.

Because of this prohibition, what turned out to be the opening salvo in the scientists' campaign was fired not by the memo writers or the committee of worried young men but by a senior physicist and Manhattan Project administrator, Samuel K. Allison. The occasion

of what came to be known as "Sam's butterfly speech" was a luncheon at the Shoreland Hotel on Chicago's South Side on Saturday, September 1, 1945, at which The University of Chicago announced to an audience of newsmen the formation of its new research institutes. Allison, as the newly appointed director of the Institute for Nuclear Studies, with such luminaries as Enrico Fermi and Harold C. Urey already enlisted as members, had come from Los Alamos (where he would continue as associate director until the new year) to be the principal speaker. Fermi, Urey, and some 15 other present and future Chicago scientists were also there. To his army supervisors, Allison had proved a reliable administrator, a source of sound advice and a soothing influence on the young men when they got excited. Six weeks earlier his voice had sounded across the New Mexico desert in that memorable dawn, counting off the minutes to zero for his tense and anxious colleagues. At 44 Allison was a tall, stocky figure with a reputation for slumbering through a lively party, then rousing himself suddenly to recite a hilarious tale of human foible or misadventure at the expense of himself or his friends. His usual air of imperturbable calm made doubly effective the occasions when he blurted out some piece of sound common sense in vigorous and quotable language. This was what he did at the Shoreland lunch on September 1, and his speech got black headlines in next day's *Chicago Tribune*: "Scientist Drops A-Bomb: Blasts Army Shackles."

"We are determined to return to free research, as before the war," the *Tribune* quoted Allison as saying. After a semifacetious description of Los Alamos as virtual imprisonment in a luxurious concentration camp where freedom of speech and communion with fellow scientists were denied him, he warned that if the exchange of scientific information was prohibited by military regulation, research workers in America would leave the field of atomic energy and devote themselves to studying the colors of butterfly wings.

The pedagogic calm of the meeting was shattered with the force of an atomic bomb, related the *Tribune* reporter. When Allison referred to the "tragedy" of the second bomb on Nagasaki, newsmen wanted to know whether scientists would work on the bomb if they had the decision to make over again. Only if we were as angry at the dictators as we were in 1942, said Allison. But Urey, who had seconded Allison's remarks about secrecy with characteristic vehemence, objected at this point; he did not wish to be associated with any statement that implied reservations about helping the government in time of need.

Repercussions were prompt. That evening long-distance calls from Colonel Kenneth D. Nichols at Oak Ridge, made at General Leslie Groves' request, invited Allison, Fermi, Urey, and Hogness to lunch next day, again at the Shoreland. In the early September heat Allison arrived without a coat and had to borrow the jacket that the hotel kept for University of Chicago professors. His explanation that lunch the previous day had been late and that sheer hunger had made him fractious did not placate Colonel Nichols who viewed the speech as the opening gun in a scientists' campaign against the Army and as inaugurating a nation-wide speaking tour. Allison was astonished at this interpretation of his spontaneous outburst. Although not quite as isolated at Los Alamos as his words suggested, he had had no part in the Met Lab discussions of the past year; and besides, he was not cut out to be anybody's mouthpiece. As for the others, Allison recalls that Fermi "squirmed" and Urey "sort of flopped around," as Colonel Nichols made clear that he wished no more said about butterflies. A bill dealing with atomic energy was to be introduced when Congress reconvened and such talk might hurt its chance of passage.

Hogness' reaction was chiefly one of shock, for this was the first that he, and he thinks the others, too, had

Manhattan Project scientists on the steps of Eckhart Hall, December 2, 1946. From left, back row: N. Hilberry, Samuel Allison, Thomas Brill, Robert Nobles, Warren Nyer and Marvin Wilkening; middle: Harold Agnew, William Sturm, Harold Lichtenberger, Leona W. Marshall and Leo Szilard; front: Enrico Fermi, Walter Zinn, Albert Wattenberg and Herbert Anderson.

heard of an actual bill. Talk of War Department legislation was already causing uneasiness at Oak Ridge, and it would be surprising if similar rumors had not reached Allison at Los Alamos, Urey at Columbia, or Hogness at Chicago, or if Fermi, as a member of the scientific panel of the Interim Committee, did not have some inkling of what was afoot. Be that as it may, Nichols' statement indicated that the framing of legislation was proceeding apace without opportunity for general discussion among those who had a firsthand working knowledge of nuclear technology.

Nichols could tell them little about the still secret bill, but he assured them that Conant, Bush, and Oppenheimer approved of it. Far from allaying their suspicions, as Nichols expected, this merely provoked further protest. The men to whom Nichols spoke were on friendly terms with the scientist members of the Interim Committee and panel. But scientists tend to recognize authority on an *ad hoc* basis, and the fact that men like Conant, Bush, and Oppenheimer had done a good job during the war was not adequate reason for accepting their opinions about what should happen next. Science and technology have their pecking order, but it applies to fields rather than to individuals; to a remarkable degree a man is judged by the evidence with which he backs up his statements rather than by age or status. Even in the minds of the high-level group Nichols had assembled, there lurked a suspicion of "the brass."

Urey was especially incensed and, according to Hogness' recollection, went to Washington next day and "raised hell," although Urey himself, whose restless mind is more concerned with the present and future than the past, cannot now recall where he went or whom he saw at this point. Certainly he is remembered by others as one of the few who effectively raised the alarm about continued military control of atomic energy and hasty legislation.

Leo Szilard, apparently not present at the Shoreland lunch, also viewed the situation with alarm. Like Urey, he could not recollect in detail what he did at this time, but he later identified as his an unsigned four-page memorandum of September 7, 1945, entitled "An Attempt to Define the Platform for Our Conversations with Members of the Senate and House of Representatives." Much of the contents would reappear both in the platform of the atomic scientists and in atomic energy policy as finally adopted. Any domestic control system, said Szilard, should avoid creating vested interests that might make international agreements more difficult. Those who influenced the decisions of an atomic power commission should be connected with atomic energy work on a full-time basis. "Unpaid advisers whose attentions are largely occupied with subjects not connected with the field of atomic power are an evil and must be considered unacceptable." A permanent congressional committee might supervise the management of the atomic power commission; but "the scientists ought to be free, irrespective of any law or administrative order issued by the Atomic Power Commission to communicate to members of that Committee such information as they consider relevant."

Szilard feared that a new espionage act might be attached to domestic legislation on atomic secrecy. As already noted, his attitude about secrecy had provided one of the minor administrative headaches of the Manhattan Project. Szilard never denied his wartime disregard of rules of compartmentation; in fact he later made rather a point of it in congressional testimony and in public speeches. In this private memorandum of September 7, he asked what would happen if an atomic armaments race developed and if scientists, under a reinforced espionage act, again had to choose "between obeying the rules and thereby slowing down the work, or violating the rules and thereby offending the law."

"I think most of us would, in such circumstances, choose to violate the law. Such violation . . . would, of course, not be prosecuted by the Atomic Power Commission. But it would create an intolerable situation in which the scientists involved could be intimidated and could not openly raise their voices in criticism of the Atomic Power Commission without incurring the risk of being prosecuted for violation of the new espionage act."

About the secrets relating directly to the atomic bomb, said Szilard, we must explain to congressmen that the first secret was given away when we dropped the bomb on Hiroshima and the second when the War Department released the Smyth report. There are still undisclosed secrets, Szilard admitted, but they affect further development of atomic bombs rather than the present stage. Congressmen should also be informed that the atomic bomb creates the additional danger of a preventive war arising from the race in the production of bombs, a danger which can be removed only if nations accept close supervision of many of their activities by foreign agents.

The relevance of what Szilard had to say to the bill on which War Department employees were then at work is very marked, but whether this resulted from actual or intuitive knowledge on Szilard's part is hard to say. Either would have been in character. It is virtually the only evidence that the atomic scientists were thinking concretely about domestic control at this time, confirming what all the participants now recollect, that international control and the related problem of secrecy completely dominated their thinking until early October when the terms of the May-Johnson bill became known.

Meanwhile in Chicago, an organization began to take form along the lines suggested by Rabinowitch in his memorandum of July 12. The three-part policy statement of nearly 20 single-spaced pages was somewhat long for enlisting members, and by September 14 an organization committee was circulating a more concise proposal of action for signatures. The "General Purpose" of what shortly became the Atomic Scientists of Chicago was conceived as follows:

1. To explore, clarify and consolidate the opinion of the scientists on the problems of the role and responsibility of science, particularly as far as the implications of atomic power are concerned.

2. To present this opinion before the National Administration and to influence the decisions which this country will have to make in the field of atomic power research and applications and international problems resulting from it.

3. To educate public opinion to the full understanding of the scientific, technological and political implications of the new scientific development, particularly those resulting from atomic power.

Two "Immediate Objectives" were proposed:

1. To support the immediate establishment of international controls over atomic power developments, and to work towards a permanent solution of the atomic problem on the basis of effective world government.

2. To study and make recommendations as to the national policy on atomic power research and development, the relation between free and secret research, the respective roles of government, universities and industries in the atomic field and similar problems. These recommendations must be correlated with the solution of the main problem under 1.

And finally five "Modes of Action" were offered:

1. Study and discussion within the organization.

2. Preparation of reports to the people and Congress, releases to the press and other publications.

3. Establishment of a "lobby."

4. Coordination of efforts with similar organizations in this country, Great Britain, Canada and other countries.

5. Organization and encouragement of discussion in groups in colleges, universities, etc.

A general meeting on September 25 considered the draft of a constitution and elected a temporary executive committee. Of its seven members, Leo Szilard, J. J. Nickson, Glenn Seaborg, and Eugene Rabinowitch had been on the Franck committee, and John Simpson had led the continuing Committee on Social and Political Implications; other members were Austin M. Brues, a medical biologist, and a young physicist, David Hill.

An important factor in the early and continuing strength of the Atomic Scientists of Chicago was the proximity and support of The University of Chicago, where parts of the Metallurgical Laboratory continued for some months to occupy their wartime quarters in Eckhart, Ryerson, New Chem, and at "Site B" across the Midway. During the fall and winter of 1945, a number of ASC members returned to posts in the University or took up new appointments there; after 1946

the government laboratories were gradually moved to the new Argonne establishment southwest of Chicago, but until 1947 the association between Met Lab and University personnel remained close.

Chancellor Robert M. Hutchins felt both pride and responsibility for the University's share in the development of atomic energy, and he, as well as members of the political and social science faculties, entered promptly into discussions with the scientists of problems related to the bomb. On September 9, 64 University faculty members and Met Lab scientists sent a petition to President Truman, asking that the United States share the secret of the bomb with the United Nations as a gesture of confidence of which time would show the wisdom, magnanimity and daring. The signers included theologians, political scientists, doctors, as well as scientists.

Hutchins took steps to extend the formulation of opinion beyond the campus by calling a conference on atomic energy at The University of Chicago on September 19 and 20, 1945—the first of many such meetings of troubled scholars and men of affairs. This one was confidential, though no classified material was discussed. Of the 50 conferees over half were laymen, most of them exposed for the first time to atomic energy problems. Distinguished economists and political scientists came from Princeton, Yale, and Columbia. William Benton and Beardsley Ruml offered advice on public relations. Secretary of Commerce Henry A. Wallace and Philip Hauser, director of the Census, unofficially represented government. David Lilienthal, head of TVA, and Chester Barnard, president of the New Jersey Bell Telephone Company, would later help draw up the State Department plan for international control. Here, in all probability, Urey, Szilard, and E. U. Condon shared their fears about the domestic atomic energy program that the War Department was framing.

Chicago scientists took an active part. Szilard was now able to recapitulate the international considerations that he had tried to impress upon government officials the previous spring. And James Franck, a willing and inspiring conversationalist but one whose remarks do not often receive public notice, dealt with that topic which scientists considered central to an understanding of atomic energy problems:

"Let us now discuss the damage which the perpetuation of full secrecy will create. It is said and will be said again and again that the great success achieved during the war is the best proof that scientists need to be guided by a rigid control; that they have to be prevented from being led astray by their so-called scientific curiosity; and that no patience should be wasted on the whims of impractical dreamers and prima donnas. While this looks funny to us, it has been said in earnest, in only slightly more polite words, by one of the best known science reporters in one of our very best newspapers. The high-ranking officers of the Army, who officially directed our work, were, of course, much too polite to tell us their opinion *expressis verbis,* and they learned in the years of cooperation a good deal about the ways and methods by which scientific progress is achieved. But so far as secrecy is concerned, they were unrelenting and, in all honesty, we have to admit that they had to be. Nevertheless, let there be no doubt that a stiff price had to be paid for secrecy, not only because of the necessity of building the factories in deserts, but also because of the wasting of talent and scientific manpower, and the loss of precious time by the compartmentalizing which was regarded as necessary. The flow of essential information from one site to another was slow, and, indeed, to a great extent, prevented. One obtained only that information which was regarded as absolutely necessary for his special task, and the decision of what was necessary was, let us put it mildly, not always a good one. If the success achieved by the scientists proves anything, it proves that good swimmers are even able to swim in a lake of molasses. But one cannot expect high efficiency and speed records under such conditions. . . . If the same kind of secrecy is to remain under Army regulations, enforced by the permanent threat of the espionage law,

if nuclear physics and nuclear chemistry are to remain secret sciences in their entirety, without competition, without the responsibility of attracting students by free and open teaching, and without scientific publications, the progress in nucleonics will soon be reduced to zero. Even financial support from private and government sources will not change this picture."

Statements were read from P. W. Bridgman and Albert Einstein, who could not be present. A Washington meeting prevented Fermi's attendance, but from Los Alamos, where he would remain until January, he sent his comments to Hutchins. Since Fermi's great affability in sharing his non-scientific views in private conversation, especially with younger associates, was matched by an extreme reserve in stating them publicly, it is instructive to see what they were at this point. Fermi wrote:

"There is general agreement, I believe, on the following points:

"That the new weapon has destructiveness that in case of a war between two powers both armed with atomic bombs both belligerents, even the victor, would have their cities destroyed.

"That the atomic bomb gives an unprecedented advantage to a sudden attacker.

"That the balance between defensive and offensive is strongly shifted in favor of the second. Perhaps the only effective defensive measure is a very extensive decentralization of our urban and production centers.

"I believe that also the following points are true although the agreement as to them is perhaps less general at least in the non-scientific public:

"That secrecy on the industrial aspects of the development would slow up a potential competing nation by only a few years.

"That secrecy on the scientific phases of the development not only would be of little effect but soon would hamper the progress of nuclear physics in this country to such an extent as to even make it exceedingly difficult to grasp the importance of new discoveries made elsewhere in the field.

"From these points one conclusion emerges. That it is imperative that this country not only should have but should put in operation in a very limited time a policy to face the new dangers. Inaction, hope that things may reach of themselves a satisfactory settlement or engaging in a halfhearted race of armaments would be in my opinion fatal mistakes.

"The possibility of an honest international agreement should be explored energetically and hopefully. That such agreement may prove possible is, I know, the most fervent hope of the men who have contributed to the development. In their optimistic moments they express the view that perhaps the new dangers may lead to an understanding between nations much greater than has been thought possible until now.

"One of the main reasons why I regret not to be able to attend the conference is that I lose the opportunity to hear the views of people more experienced than I am in international affairs on the practicability of an international agreement supplemented by effective control measures.

"A few remarks as to the peaceful possibilities of atomic energy. There is little doubt that the applications both to industry and to sciences other than physics will develop rapidly. One of the great advantages of an international agreement would be to permit the free growth of such application outside of the shadow of the war use of the new discoveries.

"Please accept the expression of my regret for not being able to come to the conference."

University sponsorship of interdisciplinary discussion continued, and research projects were undertaken by the Office of Enquiry into the Social Aspects of Atomic Energy, established by sociologist Edward Shils and Dean Robert Redfield of the Division of Social Sciences. A factor of no small significance in the success and influence of the Atomic Scientists of Chicago was the $10,000 that Chancellor Hutchins drew from special educational funds to support its initial efforts and those of a Washington office.