

THE EARLY DAYS OF PUGWASH

Soon after the outbreak of World War II, the UK began research into the atom bomb, motivated by the fear that German scientists would develop the bomb and thereby enable Adolf Hitler to win the war. The work soon shifted to the US and the Manhattan Project. The scientists used the rationale of nuclear deterrence: The threat of immediate retaliation was the only way to prevent Hitler from using his bomb against us.¹

As it turned out, this fear was unfounded. The German atom bomb project never got off the ground and was practically abandoned as early as 1942. But even after Hitler was defeated, the tempo of the Manhattan Project continued undiminished (see the article by Stanley Goldberg in *PHYSICS TODAY*, August 1995, page 38). To a large extent this was due to inertia: Having gone so far, the scientists were eager to see the conclusion of their efforts. In addition, the brutality of the war continuing in the Far East drove some of them to look at the bomb as a means to bring the war to a rapid end.

On the other hand, many scientists became worried about the moral aspects of the use of the weapon against civilian populations. The Chicago branch of the Manhattan Project was the most vocal in this respect. Under the chairmanship of James Franck, they formed a committee to consider the consequences of such use. The leading members of the committee were Leo Szilard and Eugene Rabinowitch. Rabinowitch was mainly responsible for the text of *The Franck Report*, which was submitted to Secretary of War Henry L. Stimson in June 1945.² Apart from appealing to the US government not to use nuclear weapons against civilian populations, the report called for the international control of nuclear energy in all its aspects. This was the first time that scientists had expressed a collective opinion about the awesome political and ethical repercussions of the discovery they had made.

When this (and a subsequent petition by Szilard) remained unheeded, and the bombs were dropped on Japanese cities with devastating results, many scientists decided to take action to ensure that such a deed would not occur again. They organized themselves into various groups, which eventually amalgamated into the Federa-

During the height of the cold war, how did prominent Western and Soviet scientists end up in Canada discussing nuclear weapons?

Joseph Rotblat

an effective system based on full cooperation among all nations. This initiative was vigorously debated in the columns of the *Bulletin of the Atomic Scientists*, with Eugene Rabinowitch as its editor from the establishment of the *Bulletin* in December 1945 until Rabinowitch's death in 1973. He wrote more than 100 leading articles in which he strongly pleaded for the active involvement of scientists in the vital issues arising from the progress of science and technology that were confronting the human community.

An important outcome of these debates among US scientists was the Acheson-Lilienthal Report,⁴ which recommended the creation of an International Atomic Development Authority for the peaceful application of nuclear energy and the disposal of all existing bombs after an adequate control system had been agreed on.

Activities somewhat analogous to those of the FAS, but on a much smaller scale, were carried out in the UK by the Atomic Scientist Association (ASA), set up in March 1946. The ASA's first task was to issue a memorandum on the international control of nuclear energy, very much along the lines of the Acheson-Lilienthal Report.⁵ However, when the British government decided to manufacture its own bomb, the ASA's vice presidents who were close to the "establishment" put a virtual veto on any antinuclear statements. That made the organization ineffective in influencing policy and eventually led to its formal dissolution in 1959.

With the start of the arms race, following the failure of the UN to agree on international control, it became clear to FAS and ASA members that, in order to be effective in preventing a catastrophe, it was essential that they initiate a dialogue with scientists on the other side of the Iron Curtain. Such communication was impossible under the Stalin regime, during which relations between Soviet and Western scientists hardly existed. But soon after Stalin's death in March 1953, preparations began for a conference that would include Soviet scientists. Rabinowitch, on behalf of the FAS, and I, in my capacity as ASA executive

tion of American Scientists (FAS). The FAS continues to this day.³

After the war

From its beginnings, the FAS was involved in the formulation and promotion of a US initiative on the international control of nuclear energy, advocating the setting up of

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EUGENE RABINOWITCH in middle age.

vice president, met several times for this purpose; by 1955, we had in fact worked out an agenda for the conference, which at that time was still merely a glint in our eyes.

As it happened, however, the initiative for convening the conference came from another quarter. The credit for starting the Pugwash movement must go to British philosopher Bertrand Russell.

The Russell-Einstein Manifesto

With prophetic insight, Russell very early assessed the dangers inherent in the discovery of nuclear energy; in a speech to the House of Lords on 28 November 1945—only a few months after the Hiroshima bomb—Russell had forecast the tremendous destructive power of the H-bomb and the resulting threat to civilization.⁶

In April 1954, I became involved with Russell during the live broadcast of a BBC television program in which we discussed the impact of the first US explosion of a deliverable H-bomb on Bikini Atoll. My subsequent analysis of the radioactivity in the fallout that showered a Japanese fishing boat and its 23-member crew led me to the deduction⁷ that the bomb had three stages—fission, fusion, and fission—and thus a huge radioactive fallout, a feature that the US authorities tried to conceal at the time. I shared my findings with Russell. He became increasingly agitated about the danger of a thermonuclear war and its horrifying consequences, and decided to express his fears in a

BBC radio broadcast on 23 December 1954.⁶

The radio broadcast made a deep and widespread impression on the public, and Russell received many letters supporting the ideas expressed during the program. Encouraged by this response, Russell decided on a new initiative: to persuade a number of eminent scientists from all over the world to join him in issuing a statement warning governments and the general public about the danger of a thermonuclear war, and calling on the scientific community to convene a conference on steps to avert that danger.

The most eminent scientist alive at that time was Albert Einstein, and Russell wrote to him, seeking his advice about the statement. Einstein responded immediately and enthusiastically. He asked Russell to draft the statement and send it to him for his signature. Russell did this promptly.

On 18 April 1955, Russell was flying from Rome to Paris and had yet to hear back from Einstein, when the captain conveyed to the passengers the news he had just received: Einstein had died. Russell was shattered; he feared that without Einstein's sponsorship, the whole project would collapse. But when he arrived at his hotel in Paris, there was a letter—forwarded from London—awaiting him, with Einstein's signature. Signing the statement was one of the last acts of Einstein's life, giving the statement—which became known as the Russell-Einstein Manifesto—extra poignancy: The last message from the man who symbolizes the acme of human intellect implored us not to allow our civilization to be destroyed by human folly.



BERTRAND RUSSELL READING the proclamation of the Russell-Einstein Manifesto in Caxton Hall, London, on 9 July 1955.

PUGWASH ARCHIVES

After receiving Einstein's endorsement, Russell began the task of procuring other signatures to the statement. Although he was seeking Nobel laureates, more important to him was that the signatories to the manifesto should be politically balanced, coming from both the left and the right of the political spectrum. However, the only signatory from a communist country (but not a Nobel laureate) was Leopold Infeld from Poland, and the only Nobel laureate from the West who was a declared member of the communist party was Frédéric Joliot-Curie. In the end, there were 11 signatories: Max Born, Percy Bridgman, Einstein, Infeld, Joliot-Curie, Hermann Muller, Linus Pauling, Cecil Powell, Russell, Hideki Yukawa, and me.

For the proclamation of the manifesto, Russell decided to call a press conference in Caxton Hall, London. This famous building contains many differently sized rooms for such conferences. Initially, a small room was booked because Russell feared that not many of the media would be interested. But somehow the word got out that there would be an important statement, and a larger room was reserved. Eventually, by Saturday, 9 July 1955, the largest hall was booked, and it was packed with representatives of newspapers, radio, and television from many countries.

I spent the preceding week with friends in Bray, a small village in Ireland. One evening, after returning from a visit to Dublin, I found a message that I should report immediately to the police station. With some trepidation—I couldn't think of any misdemeanor I had committed that called for action by the Irish police—I hurried to the station, only to find a message from Russell asking me to ring him urgently. The telephone at the police station was the only one in the village!

Russell's request was that I should take the chair at the press conference. He was worried that there might be technical questions about the H-bomb that he would be unable to answer, and I was the only one among the signatories to have worked on the Manhattan Project.

At the press conference, after Russell had read the manifesto, there were questions—plenty of them. Russell handled them masterfully and soon won over the audience with his witty replies. It became quite evident that the media realized the manifesto's far-reaching significance. Indeed, the media worldwide gave it excellent coverage; as a result, hundreds of letters and cables, from individuals and groups, came pouring in from many countries expressing approval and offering support. The manifesto clearly touched a sensitive cord in the minds of the general public and the scientific community.

In ringing phrases and in beautiful and moving prose from the pen of Russell (after all, he was a Nobel laureate in literature), the manifesto called on governments and the general public to take heed of the dangerous situation that had arisen from the progress of science in a world engaged in a titanic struggle between communism and anticommunism.⁸

We are speaking on this occasion, not as members of this or that nation, continent or creed, but as human beings, members of the species Man, whose continued existence is in doubt. . . . Almost everybody who is politically conscious has strong feelings about one or more of these issues; but we want you, if you can, to set aside such feelings and consider yourselves only as members of a biological species which has had a remarkable history, and whose disappearance none of us can desire.



PUGWASH ARCHIVES

LEO SZILARD ENGAGED in an animated discussion with Cyrus Eaton (with Brock Chisholm looking on) at the first Pugwash conference in Nova Scotia, Canada, in 1957.

We shall try to say no single word which should appeal to one group rather than to another. All, equally, are in peril, and, if the peril is understood, there is hope that they may collectively avert it.

We have to learn to think in a new way.

East meets West

The manifesto called on scientists to assemble in a conference to discuss ways to avert the peril. Within a few days, a letter was received from a Cyrus Eaton in Ohio.⁹ Addressed to Russell it began:

My Lord: Your brilliant statement on nuclear warfare has made a dramatic world-wide impact. . . .

and continued with a specific offer:

Could I help toward the realization of your proposal by anonymously financing a meeting of the scientists in your group at Pugwash, Nova Scotia? I have dedicated a comfortably equipped residence there by the sea to scholarly groups.

Initially we did not pay serious attention to this offer because plans had already been laid to hold the conference in India, where Prime Minister Jawaharlal Nehru was very keen on a meeting in New Delhi, and had offered hospitality for it. Indeed, letters of invitation had been sent out for the conference to be held in December 1956 in New Delhi. However, two international events—the Suez Canal crisis and the Hungarian uprising—made the political situation unstable, and Russell decided to cancel the meeting.

After the situation calmed down, we resumed the plans for the conference. The support from India was no



GROUP PHOTO OF PARTICIPANTS in the first Pugwash conference. From left to right: Iwao Ogawa, Chou Pei-Yuan, Vladimir P. Pavlichenko, Shinichiro Tomonaga, Cecil F. Powell, Antoine M. B. Lacassagne, Alexander V. Topchiev, Alexander M. Kuzin, Eugene Rabinowitch, George Brock Chisholm, Dmitri V. Skobelzyn, John S. Foster, Cyrus S. Eaton, Hermann J. Muller, Joseph Rotblat, Hans Thirring, Leo Szilard, Walter Selove, Eric H. S. Burhop, Mark L. E. Oliphant, and Marian Danysz. David F. Cavers, Paul Doty, Victor F. Weisskopf and Hideki Yukawa were absent when this photograph was taken.

longer available and we turned to Eaton and his offer to finance the meeting in Pugwash, his birthplace. A cable inquiring whether his offer still stood brought an immediate positive response, and so we began preparations for the conference, which eventually took place in the Nova Scotia village in July 1957.⁸

The agenda for the meeting was the one that Rabinowitch and I had worked out earlier. It consisted of three items: nuclear energy hazards in war and peace, problems relating to international control of nuclear energy, and the responsibility of scientists and international collaboration (see the box below).

It was a historic encounter, the first time that eminent scientists from East and West met to discuss what essentially were highly sensitive issues, on which there was a wide divergence of views even within the scientific community in the West. Indeed, we were worried that disagreements over viewpoints would be exacerbated in a confrontation with Soviet scientists because of the high political tensions generated by the cold war. When the 22 scientists and their assistants from 10 countries, embracing both sides of the political divide and neutrals (Australia, Austria, Canada, China, France, Japan, Poland,

USA, USSR, and UK), met in Pugwash, we had no perception that this was the start of a new world movement. We thought of it as a one-shot event, because we believed there was a more than even chance that the meeting would break up in disagreement.

On the contrary, we found ourselves in broad agreement on the main aspects of the agenda. In my opinion, this was due to several factors but especially because this was a meeting of scientists of international repute. Scientists are not a superior class of humans; rather they are trained in the scientific tradition of appraising a problem without prejudice but with respect for facts. It was not a coincidence that about 70% of the participants were physicists, a number of whom had worked on the Manhattan Project during World War II. We knew one another from our scientific work, either personally or from reading each other's research papers, and we had faith in each other's scientific integrity. We were able to build on this confidence by using rational analysis and objective inquiry to discuss problems that were, to a large extent, political in nature.

The first Pugwash conference ended with the unanimous agreement to continue the effort by setting up a new organization: The Pugwash Conferences on Science and

The Pugwash Agenda

In a general sense, Pugwash has had three agendas throughout its history: technical, political and ethical. As part of the technical agenda, we use our specialized knowledge to assess the consequences of modern warfare, primarily the effects of nuclear, chemical, and biological weapons.

The political agenda, the one that occupies most of our time, involves debates on disarmament and arms control in the nuclear field and discussions of the terms of conventions banning chemical and biological weapons. It also includes a multi-

tude of other issues relating to overcoming war and strife and securing peace and stability on both national and international scales.

As part of the ethical agenda, Pugwash, as a movement of scientists, deals with the social and ethical aspects of science. This is a problem of increasing importance today at a time when fast advances in some areas of science and technology are increasingly impinging not only on the material, but also on the cultural, moral, and spiritual values of the community.

World Affairs, a name that we have kept despite the criticism that it is too comical to be taken seriously. This criticism refers to a popular children's cartoon character in the UK, Captain Pugwash, the pirate.

The task of organizing further conferences was entrusted to a continuing committee of five persons who attended the first meeting: Rabinowitch from the US, Dmitri Skobel'tzyn from the Soviet Union, and three from the UK—Russell, Powell, and me.

Because we had no guidelines about the type of future activities Pugwash should undertake, Rabinowitch and I contemplated three possible types of meetings:

▷ Type A: a large meeting to deal with general problems in which we would issue resolutions aimed at the world at large

▷ Type B: a smaller meeting to clarify the thinking of scientists themselves and to study the social implications of scientific progress

▷ Type C: a still smaller meeting to discuss immediate political problems, directed primarily at influencing national governments

Rabinowitch and I solicited the opinion of US and UK scientists by means of a questionnaire. Although the sample polled was small, the response was quite clear. The great majority were in favor, in about equal numbers, of type B and C meetings; only a few respondents were in favor of type A meetings.

This response was the main point of discussion at the first meeting of the continuing committee, chaired by Russell, which was held in London in December 1957. Szilard was also present, and although not a member of the committee, he made his views unmistakably known, namely, his preference for type C meetings. On the other hand, Rabinowitch favored type B meetings. After two days of heated debate, the committee agreed that both types, B and C, should be pursued, though not at the same time. Type A meetings, large public meetings, were not excluded but were to be convened only rarely. Indeed, during the next few years, the conferences (approximately two per year) were alternately of types B and C. Later, a format of activities was established by which type B meetings became annual Pugwash conferences and type C became the small workshops, up to 10 per year, each concerned with a specific topic.

Occasionally, type A meetings were held in which



RUTH ADAMS and Joseph Rotblat at the first Pugwash conference. Adams was Rabinowitch's assistant and took an active part both in the organization of the conference and in the discussions during it. Subsequently, she became editor of the *Bulletin of Atomic Scientists* and played an increasing role in Pugwash, participating in 30 meetings.

Pugwash presented itself to the public, for example, in September 1958, after the end of the annual conference in Kitzbühel, Austria. On that occasion, nearly 10 000 people gathered in Vienna Municipal Hall to listen to speeches by 10 scientists, including Russell. At the meeting, the "Vienna Declaration" was issued. This document set out the main principles and objectives of the Pugwash movement. The Vienna Declaration was subsequently circulated to scientists in many countries and was endorsed by thousands of them.

Pugwash is a unique organization in the sense that it has no written constitution, but participants from the beginning have adhered to certain characteristics governing its activities. For example, participants are invited in their personal capacity and represent no one but themselves. In addition, the meetings, especially the type C ones, are held private, without the presence of the media. These features are conducive to an

uninhibited exchange of ideas, not usually given to delegates at official negotiations.

Behind the Iron Curtain there was no freedom of thought and movement, but the Soviet Academy of Sciences was very anxious that the stature of the Soviet Pugwash participants should not be less than that of their Western counterparts. So the academy used its considerable influence to ensure that its best scientists took part in Pugwash. They included Lev Artsimovich, Nikolai Bogolubov, Peter Kapitza, Nikolai Semenov, Skobel'tzyn, Igor Tamm, Alexander Tupolev, and Alexander Vinogradov, people who were not afraid to speak their mind whether or not it agreed with official policy; these scientists were also influential with Soviet decision-makers.

Caught in the middle

In those early days of the arms race, while the Soviet Union was hurriedly building up its nuclear arsenals to match those of the US, the Soviets simultaneously attempted to restore the balance by propagating nuclear disarmament in the rest of the world. Since nuclear disarmament was also Pugwash's aim—though for different reasons—the organization was portrayed in the West as being a tool of Soviet propaganda. In the political climate of McCarthyism, anyone in the West who was willing to sit down with Soviet scientists to talk about peace and dis-

armament was immediately branded as a communist or—at best—as a fellow traveler. Those to whom these adjectives could not possibly be applied were slated as being naïve, dupes, and easy prey to Soviet manipulation.

As a matter of fact, the Soviet government did attempt to use us for their purposes, but without success. For example, in 1960, the Soviet government planned a world congress on disarmament in Moscow, and Pugwash was invited to send delegates to it. Alexander Topchiev, the leader of the Soviet group, formally presented this request to Pugwash's continuing committee. The argument seemed plausible: Pugwash was pursuing the same aim, nuclear disarmament, as the proposed congress, so why not join forces? A few members of the Pugwash committee were inclined to accept the invitation, but I was strongly opposed to it. I knew that participation in the congress—an obvious propaganda exercise—would discredit us in the West. Eventually my view prevailed and we decided not to have anything to do with the congress. After the committee meeting was over, Topchiev took me aside and thanked me warmly for opposing his own proposal. He was a member of the communist party, but he realized the importance of Pugwash as a channel of communication between East and West and the overriding need for it not to lose credibility in the West.

A few years later, the governments in the West concluded that Pugwash was genuine and, realizing the importance of the channels that Pugwash provided, they in turn tried to use us for their purposes. We had to guard against this too. Independence is not easy to maintain, but I believe we have managed it throughout the years.

An important role of Pugwash during the cold war years was to provide a forum for discussion between scientists from both sides of the Iron Curtain, who attended as individuals and not as delegates of governments or any other body. This informal link was maintained even when official relations between the US and the Soviet Union were interrupted by the Vietnam and Afghanistan crises.

During the cold war, when there was a real danger of it turning into a "hot war," Pugwash's main effort went into tackling the immediate danger: Nuclear war had to be averted and the nuclear arms race had to be brought to a halt. This effort necessitated reaching agreement on treaties, such as the Partial Test Ban Treaty, that were of limited scope but acted as brakes on the arms race. We had to wait until the destruction of the Berlin Wall and the end of the ideological divide before resuming efforts toward the total elimination of nuclear arsenals. In 1993 we first published a study of the desirability and feasibility of a nuclear-weapon-free world.¹⁰ Later still, we began to tackle the long-term objective expressed in the statement from the first conference⁸:

In this age of atomic weapons, the objective of all nations must be the abolition of war and even the threat of war from the life of mankind. War must be eliminated, not merely regulated by limiting the weapons to be used.

Elimination of all war was of course the main call of the Russell–Einstein Manifesto¹¹:

Here, then, is the problem which we present to



EUGENE RABINOWITCH with Alexander Topchiev at the first Pugwash conference.

you, stark and dreadful and inescapable: Shall we put an end to the human race; or shall mankind renounce war?

[Editor's note: Joseph Rotblat and the Pugwash Conferences on Science and World Affairs jointly won the 1995 Nobel Peace Prize for their efforts to eliminate nuclear weapons.]

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11. Additional information on the Russell–Einstein Manifesto and a selection of historical documents can be found at <http://www.pugwash.org>. ■