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THE ABOLITION OF NUCLEAR WEAPONS AND WAR: THE RESPONSIBILITY OF SCIENTISTS

By David Krieger

The abolition of nuclear weapons and war requires a leap in our thinking. How do we get from the world we live in to one without nuclear weapons and war? How do we even muster the optimism to believe that such a world is possible? How do we contribute to making a difference in achieving such a world? And what is the responsibility of scientists in this endeavor, I would say, this noble endeavor?

Perhaps there are more questions than answers. But the starting point in our thinking should be the necessity of change. The fact that nuclear weapons have not been used in warfare since Hiroshima and Nagasaki is not predictive that they will not be used again.

The survivors of Hiroshima and Nagasaki have long said, "Human beings and nuclear weapons cannot co-exist." Over time, certain consequences are inevitable if nuclear weapons are relied upon for security: first, more countries will desire these weapons, and they will proliferate; second, these weapons or the materials to make them will find their way into the hands of terrorists; third, the weapons will be used again, by accident or design; fourth, cities will be destroyed, causing untold suffering and harm; and fifth, there will be no winners in a nuclear war.

Scientists can play an important role in preventing nuclear war, because they have the training to comprehend the magnitude of the resulting destruction. Scientists, and especially those that brought nuclear weapons into the world or who have worked on developing or improving them, have particular responsibilities to awaken the public to the dangers of the continuing nuclear threat to humanity and all life. Scientists possess voices of authority and can be influential by taking a strong moral stance, speaking out publicly and condemning their colleagues who continue to work on the development and improvement of nuclear arms.

Scientists have played a pivotal role in every aspect of the initiation and development of nuclear weapons, and as advocates or opponents of their use. It was scientists who proposed the atomic bomb project to President Roosevelt. Leo Szilard went to Albert Einstein in 1939 and expressed his justified fears that the Germans might develop an atomic bomb and use it to prevail in World War II. Einstein, who hated war and militarism, signed a letter to Roosevelt warning of this danger. Roosevelt then set up a small uranium research project that would eventually become a full-scale bomb project involving thousands of scientific and technical workers.

The onset of the Nuclear Age makes clear that scientists cannot maintain control of their destructive creations. The scientists on the US atomic bomb project, the Manhattan Project, worked hard to create a nuclear weapon in order to deter a potential German nuclear weapon. But by the time the US project succeeded, the Germans had already been defeated by the Allies. Thus, the original purpose of creating the weapons

no longer existed when the first nuclear device was exploded. Nonetheless, the weapon was used just three weeks after its first test at Alamogordo, New Mexico on the Japanese city of Hiroshima, and then three days later on Nagasaki.

Only one scientist on the Manhattan Project left when he became aware that the Germans would not succeed in creating an atomic weapon and, therefore, in his mind the justification for developing a such a weapon no longer existed. His name was Joseph Rotblat, and he was a moral giant in the field of science. He resigned from Los Alamos and returned to London, never to work again on a weapons project. Ten years later, he became the youngest signatory of the mid-twentieth century warning to humanity, the Russell-Einstein Manifesto, as well as a founder and leader of the Pugwash Conferences on Science and World Affairs. Rotblat would spend the rest of his life working to abolish nuclear weapons.

A second scientist, Leo Szilard, an important figure in the creation of the atomic bomb, stayed in the Manhattan Project, but tried by all means available to him to convince the US President not to use atomic weapons on Japan. Szilard urged US policymakers to demonstrate the power of these weapons to leaders of the world by exploding an atomic device in an uninhabited area. To this end, Szilard drafted another letter to President Roosevelt and had his friend Albert Einstein draft a cover letter for him. Unfortunately, Roosevelt died before Szilard could meet with him and argue his case.

Szilard then sought a meeting with President Truman, but Truman sent him to see his Senate mentor, Jimmy Byrnes, who Truman would soon appoint to be Secretary of State. Szilard argued that the use of the atomic weapons against Japan was likely to start a dangerous nuclear arms race between the US and Soviet Union. Byrnes was dismissive of him. Szilard then organized a petition of Manhattan Project scientists to President Truman, but the petition didn't reach Truman until after the bombs were used. Szilard would work for the rest of his life for the elimination of nuclear weapons, founding several organizations for this purpose, including the Council for a Livable World.

J. Robert Oppenheimer was one of four key scientists that advised the Interim Committee that recommended to Truman the use of the weapons against Japan. The other three were Enrico Fermi, Arthur Compton and Ernest Lawrence. Oppenheimer, who had led the scientific team that created the bomb, wanted to use it against Japan, as did the other three, believing that its use might improve "international prospects." A few years later, when Oppenheimer would oppose developing thermonuclear weapons, his loyalty to the United States was attacked, and the government held hearings and took away his security clearance.

Albert Einstein, the greatest scientist of his era, hated war. He once said, "That a man can take pleasure in marching in fours to the strains of a band is enough to make me despise him. He has only been given his big brain by mistake; unprotected spinal marrow was all he needed. This plague-spot of civilization ought to be abolished with all possible speed. Heroism on command, senseless violence, and all the loathsome nonsense that goes by the name of patriotism – how passionately I hate them! How vile and despicable seems war to me! I would rather be hacked to pieces than take part in such an

abominable business." Yet, despite these strongly held views, when in 1939 his friend Leo Szilard urged him to write to President Roosevelt warning about the potential German atomic threat, Einstein complied.

Einstein never worked on the Manhattan Project, and was deeply dismayed when he learned of the first bomb being used against Hiroshima. He would work for the rest of his life for the elimination of these omnicidal weapons. One of his most famous and important comments on the subject of nuclear weapons is: "The splitting of the atom has changed everything save our modes of thinking, and thus we drift toward unparalleled catastrophe."

The most important and famous statement of scientists was the Russell-Einstein Manifesto, released on July 9, 1955. The Manifesto, authored by Bertrand Russell with assistance from Joseph Rotblat, and containing many of Einstein's publicly stated views, was the last public document signed by Einstein before his death. It was additionally signed by nine other leading scientists, including Joseph Rotblat. The Manifesto was a warning to all humanity that nuclear weapons placed before us the risk of "universal death." The Manifesto called not only for the abolition of nuclear weapons, but of war itself. It stated:

"No doubt in an H-bomb war great cities would be obliterated. But this is one of the minor disasters that would have to be faced. If everybody in London, New York, and Moscow were exterminated, the world might, in the course of a few centuries, recover from the blow. But we now know, especially since the Bikini test, that nuclear bombs can gradually spread destruction over a very much wider area than had been supposed.

"It is stated on very good authority that a bomb can now be manufactured which will be 2,500 times as powerful as that which destroyed Hiroshima. Such a bomb, if exploded near the ground or under water, sends radio-active particles into the upper air. They sink gradually and reach the surface of the earth in the form of a deadly dust or rain. It was this dust which infected the Japanese fishermen and their catch of fish.

"No one knows how widely such lethal radio-active particles might be diffused, but the best authorities are unanimous in saying that a war with H-bombs might possibly put an end to the human race. It is feared that if many H-bombs are used there will be universal death, sudden only for a minority, but for the majority a slow torture of disease and disintegration."

The Manifesto concluded: "There lies before us, if we choose, continual progress in happiness, knowledge, and wisdom. Shall we, instead, choose death, because we cannot forget our quarrels? We appeal, as human beings, to human beings: Remember your humanity, and forget the rest. If you can do so, the way lies open to a new Paradise; if you cannot, there lies before you the risk of universal death."

Among the nine signers of the Manifesto, in addition to Bertrand Russell and Albert Einstein, was the great chemist Linus Pauling. In the late 1950s, concerned about the health hazards of radiation from nuclear testing, Pauling and his wife, Ava Helen Pauling, organized a petition among scientists calling for an end to such testing. There

were 9,235 scientists from around the world who signed the petition, which Pauling presented to the United Nations. The petition stated, in part: "An international agreement to stop the testing of nuclear bombs now could serve as a first step toward a more general disarmament and the ultimate effective abolition of nuclear weapons, averting the possibility of a nuclear war that would be a catastrophe to all humanity."

Pauling concluded the petition with these words: "We have in common with our fellow men a deep concern for the welfare of all human beings. As scientists we have knowledge of the dangers involved and therefore a special responsibility to make those dangers known. We deem it imperative that immediate action be taken to effect an international agreement to stop the testing of all nuclear weapons." For his efforts, Pauling would receive a Nobel Peace Prize in addition to his Nobel Prize for Chemistry.

When Linus Pauling received a Lifetime Achievement Award from the Nuclear Age Peace Foundation in 1991, shortly after the onset of the Persian Gulf War, he offered this syllogism: "To kill and maim people is immoral. War kills and maims people. War is immoral."

In 1995, the 50th anniversary year of the bombing of Hiroshima, Hans Bethe, a Nobel Laureate physicist who had been a senior Manhattan Project scientist, called for all scientists to cease from aiding in efforts to develop, improve or manufacture weapons of mass destruction. He stated:

"Today we are rightly in an era of disarmament and dismantlement of nuclear weapons. But in some countries nuclear weapons development still continues. Whether and when the various Nations of the World can agree to stop this is uncertain. But individual scientists can still influence this process by withholding their skills.

"Accordingly, I call on all scientists in all countries to cease and desist from work creating, developing, improving and manufacturing further nuclear weapons – and, for that matter, other weapons of potential mass destruction such as chemical and biological weapons."

Later in that year, Joseph Rotblat received the 1995 Nobel Peace Prize. In his Nobel Lecture, he quoted Hans Bethe's plea, and also called for scientific guidelines in the form of a voluntary Hippocratic Oath:

"The time has come to formulate guidelines for the ethical conduct of scientists, perhaps in the form of a voluntary Hippocratic Oath. This would be particularly valuable for young scientists when they embark on a scientific career. The US Student Pugwash Group has taken up this idea – and that is very heartening.

"At a time when science plays such a powerful role in the life of society, when the destiny of the whole of mankind may hinge on the results of scientific research, it is incumbent on all scientists to be fully conscious of that role, and conduct themselves accordingly. I appeal to my fellow scientists to remember their responsibility to humanity."

Scientists today must follow the advice of Einstein, Szilard, Pauling, Rotblat and Bethe, and become more effective in working against weapons of mass destruction, particularly nuclear weapons. Scientists need to become more assertive in speaking out for peace and the need to eliminate nuclear weapons, and more effective in organizing. International organizations like the International Network of Engineers and Scientists for Global Responsibility, Pugwash and the Union of Concerned Scientists must grow in size and outreach and become a moral and political force for social change.

Scientists who give their talents to the military-industrial complex should be stigmatized, so that it becomes socially unacceptable for them among their peers to work on genocidal weaponry. The training of scientists should include moral, legal and ethical dimensions as these pertain to working on weapons of mass destruction.

The bubble of respectability surrounding scientists who work on such weapons needs to be pierced, not only within the scientific community, but with the public at large. In the end, the problems that we face are not questions of scientific responsibility so much as they are questions of human responsibility. Due to their knowledge, skills and intellect, scientists should be at the forefront of educating humanity about the dangers of nuclear and other weapons of mass destruction, and should lead by example. Scientists need to tell the public directly that our weapons have become too dangerous to any longer tolerate the institution of war.

It is time for all scientists to take the advice of Hans Bethe and other great scientists who led efforts for nuclear disarmament, and cease to work in any fashion on developing, improving or manufacturing nuclear and other weapons of mass destruction, while providing leadership and support toward their abolition.

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