**Opening speech for Student Movement for the Culture of Peace Symposium**

by Bryan Penprase, Dean of Faculty, Soka University of America, March 10, 2018

I am delighted to be here - and thank the Student Movement for the Culture of Peace for organizing the First Annual Symposium on the Culture of Peace. Congratulations to our student leaders - Hayato, Mila, Grace and the others - for making such an amazing event possible.

Many of you younger people may not be as familiar with nuclear weapons or their threat than those of us who came of age during the Cold War. During my college education, at Stanford University, I was studying physics in the height of the cold war and Soviet nuclear armed submarines were lurking off shore. Our campus regularly experienced overflights of the submarine chasing planes based at the nearby Moffet Airfield. Every few hours one of those large propeller driven planes would fly over, bristling with radars, and we would be reminded of the imminent threat of nuclear destruction at any moment which we lived in during the Cold War. This visible and audible reminder of threat kept us worrying and thinking about the possibility of nuclear war. Today that threat is less visible - and audible - but remains and is as deadly, and it is very important for all of us to be reminded of the dangers that nuclear weapons pose for our civilization.

Our campus had a strong cadre of socially conscious physicists such as Sidney Drell, who was simultaneously on the board of directors of Los Alamos laboratory, director of the Stanford Linear Accelerator lab, and founder of the Center for International Security and Arms control. Sidney Drell offered a short course in nuclear weapons and their effects to us physics students at Stanford, and as an undergraduate I listed in rapt and horrified attention as he described what a MIRV-armed Soviet missile would do to the Bay Area. He described in meticulous detail the elaborate geometric patterns by which the warheads might be programmed to land, carefully destroying one part of the Bay area at a time, and avoiding the effects of fratricide, whereby one of the warheads might disrupt the workings of the others. In his talk he presented a visual of the Bay Area overlaid with large 10-mile wide circles that represented the destructive radius of small Soviet warheads, and noted that modern missiles were capable of delivering 5-10 of these weapons in a single MIRV warhead, and that modern submarines were armed with dozens of such missiles. The destructive power described, and the technical sophistication of both the weapons and the entire system of mass destructive was horrifying and fascinating at the same time. As a scientist, I shared what many physicists felt - a mix of morbid curiosity about the technical aspects of the devices, and a dread about the power and destruction that our field of physics and wrought upon the world.

One of my favorite books on this topic is *American Prometheus* which has the subtitle of "The Triumph and Tragedy of J. Robert Oppenheimer" by Kai Bird and Martin Sherwin. As you may recall Prometheus is the mythical Titan credited with the creation of man from clay and the one who also stole fire from the gods to hand it to mankind. Prometheus was punished for his crime by Zeus by being bound to a rock and attacked by an eagle, until freed by Hercules in the Greek legend.

Oppenheimer led the Manhattan Project, which transformed a dusty New Mexico town into the sprawling nuclear weapons laboratory of today. From Oppenheimer's past as a physicist, he had worked on deep questions of the physics of neutrons, the stability of neutron stars, and advanced

quantum theory. He presided over a band of devoted graduate students at Berkeley, until the war placed him at the top of the most urgent and well-funded effort of the war to build the first nuclear weapon. Oppenheimer's talents as a physicist were matched with gifts of skill in managing the diverse, eccentric and powerful minds gathered in the remote nuclear town. The band of physicists were a who's who of 20th century physics - Enrico Fermi, Richard Feynman, Edward Teller and dozens of the most brilliant minds in the world. They toiled day and night to create the first bomb known as "the gadget."

Their joy and excitement in this technical project filled the days and nights of these men, until the big day on July 12, 1945, when they detonated the world's first nuclear weapon in the remote Mexico desert site previously known as *Journada del Muerto*, chosen and renamed by Oppenheimer as the "Trinity" site, probably in reference to the three aspects of Hindu deities. The exuberance and excitement of the test detonation is described in the book *American Prometheus*. Richard Feynman, an irrepressible jokester, dispensed with safety goggles as he calculated that a windshield of a car would provide the necessary UV protection. He sat in the front seat of a car facing the explosion, playing his bongo drums with excitement before the test. Enrico Fermi and other physicists all had wagers on the yield of the device, and they all boyishly had joked about the experiment and concocted different ways of estimating the power. Oppenheimer himself was closer to the device in a bunker, where he laid face down; he was nervous about the experiment and his entire professional reputation rested on this device being successful.

Feynman described the explosion thusly: "A big ball of orange, the center that was so bright, becomes a ball of orange that starts to rise, and billow a little bit and get a little black around the edges, and then you see its a big ball of smoke with flashes on the inside of the fire going out, the heat. Ninety seconds later - at 20 miles away - Feynman finally heard the enormous explosion which was followed by the rumble of thunder which echoed around the various mountain ranges that surrounded the valley of the Trinity test site. Many commented on the beauty of the explosion - the first ever mushroom cloud on earth - and how the colors would change from white to orange to red to purple and then flicker around the horizon as the light bounced off the mountains. The team of physicists were exalted with their success - and most celebrated with sport-like cheers. A rousing party afterwards was held where Oppenheimer was lauded as a hero and thanked everyone for their work.

Within a day of the test however, the magnitude of this event began to settle in on many of the physicists including Oppenheimer. Oppenheimer realized that this device would be used on people - who would suffer terribly, and that also once unleashed, this device would render the US and all other nations vulnerable to destruction. Oppenheimer said in a report "it is our firm opinion that no military countermeasures will be found which will adequately be effective in preventing the delivery of nuclear weapons." "We are unable to assure that we can maintain hegemony of such weapons and "the safety of this nation - cannot lie wholly or even primarily in its scientific or technical prowess. It can be based only on making future wars impossible." Oppenheimer later wrote that "I feel I have blood on my hands" and "If atomic bombs are to be added as new weapons to the arsenals of a warring world, or to the arsenals of nations preparing for war, then the time will come when mankind will curse the names of Los Alamos and Hiroshima."

Oppenheimer, like Prometheus, had delivered fire, but also was tortured. Unlike Prometheus, Oppenheimer was not saved by an analogous Hercules. What can we learn from this?

Perhaps the quote from Daisaku Ikeda could be helpful from his definition of Global Citizenship which includes: "The wisdom to perceive the interconnectedness of all life and living," "The course not to fear or deny difference, but to respect and strive to understand people of different cultures and to grow from encounters with them," and "The compassion to maintain an imaginative empathy that reaches beyond one's immediate surroundings and extends to those suffering in distant places."

Oppenheimer was brilliant but not wise. He forgot about the interconnectedness of life; he lost his imaginative empathy. We need to learn from Oppenheimer and in our work at Soka University we need to cultivate this wisdom and imaginative empathy that will prevent wars and help scientists understand the social and environmental consequences of nuclear weapons and other advanced science and technology. This Symposium is a wonderful step in this direction, and I thank our students for organizing the meeting and look forward to the presentations we will hear today. Thanks for your attention and enjoy the Symposium.

**References**

Bird, K, and Sherwin, M., American Prometheus: The Triump and Tragedy of J. Robert Oppenheimer, New York: Vintage Books, 2006.

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