

Protecting the Environment and Preventing Nuclear War

Remarks at Western Reserve Academy

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Before I start, let me recognize that I stand between you and a sunny spring afternoon out of doors. I will be brief, but not as brief as I once was in this chapel. When I was here we had at some point to give an Assembly talk to the student body, at 8 am and classes started at 8:50, I think. So I prepared my talk. I don't recall anyone suggesting that I rehearse my presentation.

So suddenly, here I stood. I looked up and saw several hundred faces: waiting, suspicious, expectant faces. I grabbed my paper, looked down, and read the whole talk at top speed without pause or punctuation, one continuous sentence. No one understood a word. It was over in seven minutes. I looked up and saw a sea of smiling faces. A standing ovation and assembly was over, thirty minutes of free time. For several hours I was a campus hero.

Morley

It is a very special honor to be recognized by the Academy community, particularly with an award in the name of the famous American scientist, Edward Williams Morley. Morley was a professor of Chemistry and Natural Philosophy here in the 1870's when this campus was Western Reserve College. His former home is still at 73 Hudson Street. Some of his early work was done on the first floor of the Athenaeum where I lived as a freshman in 1948.

Morley was a scientist. He pursued his own interests and satisfied his own curiosity by doing ingenious experiments with simple instruments. His work with his colleague Michaelson nearly won him a Nobel Prize. By suggesting that the speed of light is constant, the Michaelson-Morely interferometer experiments laid the basis for Einstein's theories of relativity.

Two Ideas

Today I want to share some thoughts that possibly connect us with Edward Morely, thoughts about protecting the environment and about preventing nuclear war. Let me start by suggesting two ideas.

First idea: Advanced societies have a tendency to develop technologies which they cannot properly control. For example, we have created an energy system based on fossil fuels which produce emissions that threaten the earth's climate and its regulation. We haven't yet figured out the nature of a sustainable energy system. We have invented

thousands of useful chemicals but allow some of them to pollute our air, water and food. We have produced nuclear weapons; and it seems just a matter of time before some are used. One is not a Luddite to observe that technologies can have unexpected and adverse outcomes.

Second idea: Science, policy and activism are a continuum, more closely related than we often think. In stereotype, scientists are white coated, geekish and isolated in their laboratories. Policy-makers are legislators or bureaucrats, or more likely today, lobbyists. And activists march, chant and chain themselves to fences. But in fact the scientist, the policy maker and the activist may be the same person. All three are concerned with social problem solving. Morley was an activist. He was a busy public speaker on the difficult science topics of his day including the relationship of science and religion, a topic that is still contentious. Think of the stem cell research controversy.

My Work

I am a public health physician and work in environmental health at Mount Sinai School of Medicine in New York. For a long time I have been preoccupied with two problems: protecting the environment and preventing the use of nuclear weapons. I think the Academy got me started. In the Academy debating society, the Mugwumps, we argued issues of the atom bomb and world government. We were very aware of atomic weapons. Recall that 1948 was just three years after the first and only use of what we now call nuclear weapons in Hiroshima and Nagasaki. We formed a chapter of the United World Federalists, the first national advocacy organization I had joined

These problems hold my attention today as a physician because they are threats to human health and because they are preventable. I teach preventive medicine. The medical profession has given me some specific expertise to work on these problems and perhaps a special responsibility as well. By the way, I love the practice of medicine. It offers such remarkable opportunities for service and for social action. I recommend it to you.

Toxic Chemicals and Body Burden

My own research is about the health effects of industrial chemicals in our environment: chemicals like lead, mercury, pesticides, solvents, air pollutants, and the huge array of industrial chemicals used to make plastics, cosmetics, kitchen cleaners, flame retardants and water repellants, you name it. There are some 75,000 chemicals in commercial use today. Some are made in huge amounts. Some are toxic. Industry reports releasing over 7.0 billion pounds of hazardous chemicals into our air and water each year

Most citizens reasonably believe that the government tests chemicals for safety before they are put into consumer products. But most of the 75,000 chemicals in use have never been evaluated for their effects on human health. Current regulations assume chemicals are safe until they are shown to be toxic. Chemical companies are not required to conduct human health or safety studies before chemicals are marketed or to monitor chemical

safety once they are in use. I believe that this is poor public policy and ought to be changed.

Recently scientists have been able to document the industrial pollution of our own bodies. That is, with advances in the technology of chemical analysis, we can now measure the actual levels of industrial chemicals absorbed into our bodies, in all of us, you and me, infants and old people.

We are all in a sense personally polluted and carry in our tissues small amounts of many of the industrial chemicals I just mentioned. Most of these chemicals did not exist 50 years ago, let alone in human bodies. Some of these chemicals are reproductive toxins. For example, a group of chemicals called phthalates, used as softeners in vinyl plastic, are known to damage cells in the human male testis. At the same time sperm counts are decreasing in a number of well studied male populations around the world. One hypothesis is that this sperm count decline is due to toxic environmental chemicals, like phthalates.

My colleagues and I at Mt Sinai Medical Center in New York recently finished a survey of this human body burden of industrial chemicals. We measured the levels of 210 chemicals in the blood and urine of 9 normal people. The number of persons was small as ours was a preliminary study and the laboratory analyses are very expensive. We created a chemical profile for each person. No one person had all 210 chemicals. One person did have a total of 95 of the 210. We named each of the specific consumer products that contained the chemicals we found. For example we found traces of Dursban, a popular insecticide. And we named the companies that manufactured these consumer products, companies including Shell, Dow and Monsanto.

Our activism in this case was public education. The subjects had various reactions to the information about their body burden. Many were shocked at the breadth and variety of potentially toxic chemicals in their bodies. One of the subjects in our study was Bill Moyers, the television journalist and former Presidential press secretary. He asked to be included in the research and incorporated his experience in a television documentary on the chemical industry called Trade Secrets. Some of you may have seen it. This kind of environmental health activism has been successful. Chemical body burden is now being studied in laboratories across the country and the regulation of industrial chemicals is being improved.

Nuclear Weapons

Let me illustrate our two ideas with a second example: nuclear weapons. Remember the two ideas: poorly controlled technology can have dangerous consequences; and science and activism are closely linked.

I have just stepped down as President of a medical organization called Physicians for Social Responsibility or PSR. PSR was founded to educate the public and policy makers about the dangers of nuclear weapons. In the 60's schoolchildren were trained to

"survive" a nuclear attack by hiding under their desks in "duck and cover" exercises. Above ground nuclear weapons explosions were a spectator activity in Las Vegas, Nevada, near the nuclear weapons test site. In the early 1980's the cold war raged and a nuclear arms race had produced a situation of mutual assured destruction or MAD with 30,000 or more nuclear bombs on each side, on missiles, aircraft and submarines, enough to destroy all the major cities of the US and the Soviet Union many times over.

It was an impossible situation with nuclear technology truly escalating out of control. Nuclear weapons were on hair trigger alert. There were several close calls in which nuclear weapons were almost launched by accident. The public was thoroughly frightened. Alternative nuclear policies like the nuclear weapons freeze were proposed and in 1985 a million people gathered in Central Park in New York City to oppose the arms race and to support the Nuclear Freeze. A national and international peace movement arose. PSR's work grew into an international physician's movement that exists today. The organization International Physicians for the Prevention of Nuclear War (IPPNW) is a federation of environmental and antinuclear organizations like PSR. The Nobel Peace Prize was awarded to IPPNW in 1985 for educating the public about the dangers of nuclear war.

For physicians the relevant science in this case is the medical consequences of nuclear war. This science is based on careful analysis of the physical effects of nuclear weapons explosions and the translation of these huge energies into human injury. In articles in prominent medical journals and lectures, we described in gruesome detail for individual cities the terrible injury and death from the blast and the burning heat and the ionizing radiation of a nuclear weapon, all in terrible, physically determined detail.

The talk we give we call "the medical consequences of nuclear war." It starts like this: "Let me describe for you the explosion of a 5 megaton nuclear weapon in Cleveland on the ground, near the Terminal Tower on a sunny day, this afternoon, just now." The talk goes on to describe in technical detail a fireball a mile in diameter, temperatures of millions of degrees, the instant vaporization of buildings, cars, people. A half a million people could die instantly. Gruesome burns, terrible blast injuries and silent but lethal radiation would expand out to Severance Hall and to the medical school; radioactive fallout would likely reach Hudson, Ohio. The medical response would be minimal. Burned persons would quickly overwhelm surviving hospitals. There are probably fewer than 100 burn beds in the city of Cleveland. You get the point.

Nuclear warfare cannot be managed or its victims treated. The use of a nuclear weapon would be a terrible crime. It has to be prevented. So we argued, and continue to argue, for ending the nuclear arms race and for effective arms control agreements, particularly the Nuclear Weapons Test Ban and the Nuclear Non Proliferation (NPT) Treaties. On May 1st I will go to New York City to participate in the opening of the NPT Review Conference at the United Nations. We will join with activists from around the world and ask the delegates to strengthen and expand the treaty. We will conduct a rally in Central Park on that Sunday afternoon. Join us and watch to see if it is covered on television news. The goal of anti-nuclear activism is the abolition of nuclear weapons.

But the world is still awash in nuclear weapons. We are enjoying a world wide moratorium on nuclear testing, although the United States threatens to break out. Under the SALT and START treaties the US and Russia are building down their numbers of nuclear weapons and destroying warheads. In fact the highly enriched uranium we have purchased from decommissioned Russian nuclear weapons now fuels half the nuclear power produced in this country. But the Congress has cut funding for these efforts and the process is regrettably slowing down. And, the United States and Russia still have nuclear weapons on high alert, weapons that could fire by accident or false alarm. The de-alerting of nuclear weapons is an urgent priority.

Worse, the US plans to build new nuclear weapons. It is not widely appreciated and important to understand that our country has military policies that now include the use of nuclear weapons, weapons not used since Hiroshima and Nagasaki. The administration plans to build a family of small and more “useable” nuclear weapons or “mini-nukes”. A particular weapon is the robust nuclear earth penetrator, the so called bunker-buster. Congress this year, lobbied by groups like PSR, withheld funding for most but not all of this new nuclear weapon development.

Worse still, nuclear weapons technology is proliferating. The infamous Dr. AQ Kahn of Pakistan sold nuclear weapons technology and hardware to an unknown number of countries likely including Iran, North Korea and Libya. The US is in the untenable position of saying that it is going to build more nuclear weapons but other countries may not have them. Clearly Iran is not yet going along.

Preventing Nuclear Terrorism.

But at the moment the most frightening and in many minds the most likely nuclear prospect is nuclear terrorism. In their second presidential debate last summer President Bush and Senator Kerry agreed, and they agreed on almost nothing else, that the single most deadly danger facing the United States is the possibility that terrorists could obtain and use a nuclear weapon. Mr. Bush said he could fix the problem in 12 years, Mr. Kerry said he could do it in 8. What is this all about? First, experts agree that it is not whether terrorists could use a nuclear weapon, but rather when. Nuclear terrorism is judged a very real threat. But more hopefully, the presidential candidates and the experts agree that nuclear terrorism can be prevented, if we have the right policies and take the right actions.

Former Senator Sam Nunn chaired the Senate Armed Service Committee in the 80's and now directs the Nuclear Threat Reduction Initiative. The Initiative is a non-governmental activity funded in largest part by a well known activist, Ted Turner, the founder of CNN. Sen. Nunn recently said “At the dawn of a new century we find ourselves in a new arms race. Terrorists are racing to get weapons of mass destruction. We ought to be racing to stop them.” So what policies do we need?

It has been suggested we need a policy of three No's: No loose nuclear weapons, No new nuclear weapons, and No new nuclear weapon states. The three No's could very

significantly reduce if not eliminate the threat of nuclear terrorism; and the three No's are all achievable. With enough money and effort all the existing weapons and all the fissile material, enriched uranium and plutonium, could be put securely under lock and key. This is what the then presidential candidates said they could do in 8 to 12 years, that is, achieve no loose nukes. The US could lead the way in a freeze on new nuclear weapons development by the existing nuclear powers, and achieve no new nukes. And diplomacy by a united and cooperative world community can forestall nuclear proliferation that is no new nuclear states. But the policy of the three No's has not been adopted.

Conclusion

What can we say about protecting the environment and preventing the use of nuclear weapons? It is easy to name the problems. Solutions are difficult and are arrived at slowly in small steps. Environmental protection and arms control will move forward with sound science, effective policies and energetic activism.

Opportunities abound for efforts to make the world a better and safer place. I won't suppose to tell you what you might do in your own work or careers. Those opportunities for public service are for you to identify. But, just for practice, if you haven't already, try this: pick an issue, join an organization, learn to speak in public, and get involved in something you care about.

I deeply appreciate the honor of the Morley Prize. You have been a wonderful audience. Thank you.