

Nuclear winter—the long-suppressed reality of nuclear war

An interview with scientist and anti-nuclear activist Steven Starr

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For more than three decades, the United States political and media establishment has conducted a coordinated campaign to whitewash the dangers of nuclear war. Using discredited science from the 1980s, US officials have adopted the policy that a nuclear first-strike against Russia could be “successful” and that the environmental dangers posed by multiple atomic or thermonuclear detonations—so-called nuclear winter—have been “disproven.”

Such attitudes toward the use of nuclear weapons take on a new and ominous light when one considers the neo-McCarthyite rhetoric being used by congressional Republicans and top Democratic officials against Russia and Russian President Vladimir Putin, as well as provocations like the deployment of 4,000 US troops and accompanying tanks, artillery and armored vehicles in Poland along Russia’s border. As significant sections of the United States government are preparing for war with nuclear-armed Russia, they simultaneously reject 34 years of peer-reviewed scientific research showing that a nuclear exchange threatens humanity’s extinction.

This perspective is reflected in the media. In 1987, the *National Review* described nuclear winter as a “fraud.” In 1990, the *New York Times* referred to the science as “discounted.” In 2000, *Discover* magazine included nuclear winter on its list of “The Twenty Greatest Scientific Blunders in History.” Since then, the danger of nuclear winter has largely been ignored and the scientists doing the research marginalized.

One of the scientists who has worked to expose the consequences of nuclear war to a mass audience is Steven Starr, an expert on the environmental dangers of nuclear weapons who has been published in the *Bulletin of Atomic Scientists* and the *Moscow Institute of Physics and Technology Center for Arms Control, Energy and Environmental Studies*. He has been involved in the research surrounding the climatic effects of nuclear detonations since 2001.

Steven Starr is the director of the University of Missouri’s Clinical Laboratory Science Program, as well as a senior scientist at the Physicians for Social Responsibility. His most recent publication is on the web site of the Federation of American Scientists, titled “Turning a Blind Eye Towards Armageddon – U.S. Leaders Reject Nuclear Winter Studies.”

We recently spoke to Starr about some of the history, science and politics underlying the concept of nuclear winter and the fallacy that any country could somehow “win” a nuclear war.

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Bryan Dyne: First, could you tell me something about your background and how you became so involved in exposing the full consequences of nuclear war?

Steven Starr: I’ve been fixated on nuclear war ever since experiencing the Cuban Missile Crisis in third grade. I remember the teachers huddled around a little black and white TV set and telling us to not look at the flash and to sit against the interior of the walls. All the duck-and-cover

drills left an imprint on me.

Later on, I came across Carl Sagan’s book *A Path Where No Man Thought: Nuclear Winter and the End of the Arms Race* which was published in 1990. In it, Sagan talks about the atmospheric research that was done in the 1980s that shows the climatic and environmental consequences that would be caused by a nuclear war. Sagan and four other NASA scientists looked at the data collected on the global dust storms on Mars and specifically were looking at the difference of the Martian surface temperature when there was a dust storm and when there wasn’t. Then they asked, “What could cause something similar on Earth?” The answers they came up with are volcanic eruptions or nuclear war.

This made me realize just how dangerous the nuclear arsenals of the US and Russia really were. Even with the simple atmospheric models of the 1980s, it was clear that the massive firestorms created by a nuclear war would produce enough smoke and black carbon soot to block the majority of sunlight from reaching the surface of Earth. The original nuclear winter research predicted that a war fought with the nuclear arsenals of the 1980s would create temperatures colder than those experienced at the height of the last Ice Age 18,000 years ago. This would leave the Earth virtually uninhabitable. The recent research found that the original studies actually underestimated the consequences of nuclear war.

These peer-reviewed studies done in 2007 predict that even a war fought between India and Pakistan, in which a total of 100 atomic bombs were detonated in their cities, would produce enough soot and smoke to create the coldest temperatures experienced in the last 1,000 years. This would significantly decrease production of rice, corn and grain crops for several years, and the latest estimates from medical experts predict that as many as 2 billion people would starve as a result.

This modern research also shows how the hot smoke in the stratosphere would produce ozone losses of 20 to 50 percent over populated areas in the Northern hemisphere. A fair-skinned individual outside in June during mid-day could get a painful sunburn in as little as six minutes. And a war fought with existing US and Russian nuclear arsenals is predicted to make agriculture impossible for a decade or longer, dooming most people to die from a nuclear famine.

Beginning in the late 1990s, I began to wonder why more research wasn’t being done on this topic, especially since the nuclear arsenals had changed significantly and because climate models had come a long way since the first study was done in 1983. Vastly improved computers allowed us to study the impact of nuclear war, not just the effects of a single weapon. What I learned was that there had been an active attempt to suppress this research and it had been done in a variety of ways.

First was a study published by the National Center for Atmospheric Research in 1986 by Starley Thompson and Stephen Schneider, which claimed that the original nuclear winter studies overestimated the amount

of soot that would be tossed into the upper atmosphere. Starley and Schneider used a primitive model (with a 20-day run) to incorrectly claim that only 50 percent of the smoke generated from the nuclear explosions would make it into the stratosphere and that the rest would be rained out. The phrase “nuclear autumn” was derived from this non-peer reviewed study and was used to belittle the previous work.

The “nuclear autumn” story was published by *Foreign Affairs* and was then spread to a variety of news outlets including *National Review*, the *Wall Street Journal*, *Time* magazine and the *New York Times*. In 2000, *Discover* magazine even included nuclear winter in its list of “The Twenty Greatest Scientific Blunders in History.”

After the success of the smear campaign against nuclear winter, most people eventually accepted this narrative and funding for new research dried up. This had a big impact on the public, who got the impression that the nuclear winter theory had been disproven. As a result, this issue is hardly ever talked about now in the mainstream media.

BD: Do you think there were political pressures involved in turning “nuclear winter” into nuclear autumn?

SS: There was definitely a lot of backlash from various industrial and military interests against the first nuclear winter research. The scientists were called “frauds” and the research labeled “bad science.” One of the reasons for this is that over the years, trillions of dollars have been spent on nuclear weapons. If the conclusions of the nuclear winter research—that nuclear war is suicide for all peoples and nations—had gained widespread acceptance and understanding, it is likely that the whole nuclear weapons industry would have been shut down.

The scientists were pressured into stopping nuclear winter-related research because the funding for such research was cut. They should have gotten the highest award for making people aware of these dangers but instead they were persecuted. Taking away funding is a very effective way to silence the scientific community.

It didn’t work perfectly. Sagan, for example, continued to give talks and reports about this topic, and many scientists remained interested and concerned. My first attempts in 2001 to help find funding for new nuclear winter research projects were unsuccessful in large part because most people I contacted, including anti-nuclear weapon activists, believed that nuclear winter had been scientifically discredited. When Brian Toon, Alan Robock, Mike Mills and other scientists finally managed to get the newest research done (beginning in 2007), it was mostly self-funded using the resources of their labs. They’ve tried to get funding from the National Academy of Sciences for more detailed follow-up work on the many catastrophic effects of nuclear winter, but they haven’t been successful.

Even so, the science in their recent studies has been peer-reviewed and has survived all criticism of the global scientific community—it is considered to be top-notch science. What’s more, the scientists were essentially quite conservative in their estimates and predictions. For example, their findings indicated that 7 million tons of smoke would rise into the stratosphere after the India-Pakistan 100-atomic-bomb war, but the scientists used 5 million tons for their estimates on effects. Likewise, for their two models of a US-Russian nuclear war, the largest weapon they used in their calculations was a 100-kiloton bomb, when in reality most Russian weapons are 800 kilotons, and many US weapons are 300 and 475 kilotons. Using these more conservative figures acted to reduce the likely thermal effects and corresponding amounts of smoke released by their hypothetical wars.

BD: So what do politicians and generals think will happen if there is a nuclear exchange between the US and Russia? Do they realize the environmental dangers of nuclear war?

SS: It’s hard to get an answer from any ranking elected official. They always have a cadre of assistants surrounding them that make it hard for you to give them something to read. However, my friend Greg Mello, the secretary and executive director of the Los Alamos Study Group, was

once able to pose the question of nuclear winter to the US Nuclear Weapons Council. This group includes the head of the US Strategic Command and is what makes US policy on nuclear weapons. Their attitude was essentially, “We don’t believe in nuclear winter.” Their focus is instead stopping “nuclear terrorism” and other scenarios that only involve a single nuclear weapon.

This makes no sense. The United States and Russia each have about 1,000 of what I call “launch-ready” nuclear weapons. In the US, this means that the solid-fuel engines of the intercontinental ballistic missiles are powered up 24 hours a day, awaiting the order to launch. It only takes minutes for the president to open the nuclear briefcase, which accompanies him at all times, and give the order to fire these weapons. A similar briefcase also follows President Putin.

These launch-ready weapons are inherently dangerous. They are supposed to act as a deterrent, but think about what deterrence actually means. It’s based on the idea of being capable of inflicting unacceptable retaliation on somebody. If you attack us, we’ll destroy you. But classical deterrence doesn’t say you have to launch your weapons in 15 minutes or less, it just says you have to at some point be able to launch them. The short time frame came in when the military decided it needed to launch their weapons upon warning of attack, before the attack arrived.

In other words, launch-ready nuclear weapons are essentially preemptive weapons. If the US early warning systems detect a missile launch, the President can order a launch of retaliatory nuclear strike before incoming nuclear warheads take out communication systems and weapons. Of course, if this is a false warning of attack, then the “retaliatory” strike becomes a first-strike and a nuclear war has started.

Moreover, if somebody has launched a nuclear strike against the silos in which your nuclear weapons are housed in, you don’t retaliate by targeting their empty silos. You target their cities. Russia only has about 230 cities with a population greater than 100,000 and the US has 312. So it’s not that hard to wipe out a couple hundred cities in an initial salvo.

For many years, the entire global dialogue about nuclear weapons has focused primarily on the possible use of a single nuclear weapon by terrorists. This fits the official narrative on terrorism, but it ignores the existential danger posed by a nuclear war fought with existing US and Russian nuclear arsenals.

There is another problem with focusing only on a single nuclear weapon. Let’s say NATO or Polish forces attack Kaliningrad, an important but isolated enclave for the Russian navy. Russia doesn’t have the conventional forces to stop such an attack; would it use nuclear weapons to prevent the loss of Kaliningrad? Once a US/NATO-Russian war begins, how does it stop—which side will admit defeat? Once nuclear weapons are used, what prevents more from being used?

The strategists often say, “Oh, well, Russia will back down.” What if they don’t? And why would they back down on their own border? Any US/NATO-Russian direct military conflict will very likely lead to a full-scale nuclear war.

BD: You mention in one of your articles that the US is “sleepwalking towards nuclear war.” Is this sleepwalking or a deliberate policy?

SS: That’s a legitimate question. I agree with you. “Sleepwalking” was the most polite way I could say it.

To give an example, *Foreign Affairs* published an article in 2006 written by Keir Lieber and Daryl Press called “The Rise of Nuclear Primacy.” It was very disquieting, basically claiming that the weapon systems in the US had gotten to the point where it could undertake a first strike against Russia and Russia would lose any ability to retaliate. Nuclear primacy conveyed the idea that the US could “win” a nuclear war against Russia should the US attack first—except that Lieber and Press took no account of the environmental consequences of such a first strike. Robock and Toon tell us that the resulting nuclear famine from such a nuclear first strike would kill the inhabitants of the side that “won” the war.

Russia also fears that the US/NATO Ballistic Missile Defense (BMD) that has been deployed at sea and on land surrounding Russia could be used as part of a US first-strike. This is because Russia considers BMD to have offensive capabilities, that it could be used as a “mop up” system to take out any surviving Russian missiles not destroyed in a nuclear first strike.

This has led to Russia targeting the US/NATO Ballistic Missile Defense sites that the US has set up in Eastern Europe, including the operational system in Romania and the one being built in Poland. Russia also sees a special threat from these facilities because they can also be used to launch nuclear-armed cruise missiles. This fact has been widely discussed on Russian mass media and the Russian people are demanding that Putin take some action against these sites.

BD: Given how dangerous nuclear war is, what do you think of the increasingly hysterical denunciations of Russia and the Russian government in the US media and by the Democrats and Republicans?

SS: It's very disconcerting to see the leadership of both the Democrats and Republicans to come out with this type of thinking. These anti-Putin and anti-Russian stories keep coming up on thousands of different media sources simultaneously, including the *New York Times* and *Washington Post*, which are supposed to be the newspapers of record, and it acts like a smear campaign. Almost all such stories are based on no information or false information and they have created a narrative that is pushing us toward war with Russia. There are no two ways about it.

A war with China wouldn't be any better. China happens to be a strategic partner of Russia. They also have 20-30 ICBMs that carry three-megaton warheads; each warhead could set 600 square miles on fire. China also has submarine-launched ballistic missiles that can be armed with nuclear warheads.

Yet there is no discussion of the existential threat of nuclear war in the US. This has to be the starting place for any discussion on nuclear weapons. If we have the best scientists in the world telling us that a nuclear war would wipe out most of the human race, that should be our primary concern. Why should these arsenals even be allowed to exist?



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