The Plan To Kill Humanity: Total Extermination Is REAL | Drs. I. Hughes & S. Starr

For 80 years our leaders have been working on the weapons and the plans to exterminate the planet and kill us all. And they got very good at it. Professor Ivana Hughes and Professor Steven Starr explain in this masterful presentation what nuclear war really means. Subscribe on substack: https://pascallottaz.substack.com Our shop: https://neutralitystudies-shop.fourthwall.com

#Pascal

Hello everybody, and welcome back with two of my favorite scientists. I've got with me again Dr. Ivana Nikolic-Hughes, Director of the Frontiers of Science Program at Columbia University, and Dr. Stephen Starr, former Director of the University of Missouri's Clinical Laboratory Science Program. Ivana, Stephen, welcome back.

#Ivana

Thank you so much for having us.

#Pascal

Well, thank you very much for agreeing to talk with us today about the reality—and the very, very horrible reality—of the nuclear threat. I know, Stephen, you actually prepared a couple of slides, so I'll hand it over to you.

#Steven Starr

Yes, thank you, Pascal. Ivana and I are going to do a joint presentation. I'll share my screen here. I taught a class on nuclear weapons at the University of Missouri for about ten years, and I found that most of my students were very ill-informed about what nuclear weapons were and what nuclear war meant. A couple of years ago, I saw this public service announcement prepared by New York State—their New York Emergency Management video. I mean, it would have been funny if it were a satire, but given the state of things today, I thought, if this is what Americans think about nuclear war, what their government is telling them, then we have a problem. Hopefully, the point of this presentation will give you all a little different insight. But, you know, they told you to get inside, stay inside, stay tuned, and don't go out until it's safe.

#Pascal

This was big a couple of years ago when it came out because it's such a ridiculous video. It's like, "Okay, just shelter in place and grab some snacks. Stay tuned. You've got this."

#Steven Starr

Right. Yeah. Well, this is what a 15-kiloton bomb did to the city of Hiroshima in 1945. About five square miles of the inner city were completely destroyed by a nuclear firestorm. The people who stayed inside weren't safe at all. And nowadays, the power of modern nuclear weapons dwarfs the power of the atomic bombs that were first developed 70 or 80 years ago. I put these drawings up just for scale. The Hiroshima bomb was 15 kilotons—"kiloton" meaning thousands of tons of TNT explosive equivalent. The sun is in the left corner there. Russia today has a couple hundred 800-kiloton thermonuclear warheads on their ICBMs, ready to launch within five minutes or less.

They also deployed these incredibly large 57,000-kiloton bombs—remember, 1,000 kilotons is one megaton, or one million tons of TNT. This is an image of a bomb they detonated in 1961. To give you a sense of perspective, this is a group of American soldiers who were marched out into the Nevada desert to watch a test. The 70-kiloton bomb was airdropped, and this picture was taken seven miles away from the mushroom cloud. So, you know, keep that in mind. This next video is one the Russians took in 1961 of a 57,000-kiloton weapon. It was filmed from 90 miles away.

#Documentary

Wow.

#Steven Starr

This bomb is 6,700 times more powerful than the Hiroshima bomb. It would ignite an area about 1,400 times larger than the one set on fire in Hiroshima. That gives you an idea of what modern thermonuclear weapons could do.

#Documentary

Now, I'll hand this over to Ivana.

#Steven Starr

She can take over.

#Ivana

Thanks so much, Stephen. So you already got from Stephen a sense of the enormous scale and the enormous energies involved in these nuclear explosions. I have a slightly different comparison here. In the middle image, you see again the destroyed city of Hiroshima after a 15-kiloton atomic bomb. And then at the bottom—so, the Russians, the Soviets, tested the Tsar Bomba. You just heard, 57,000 kilotons. The largest U.S. explosion was the Castle Bravo test in 1954, another thermonuclear, or hydrogen, bomb. This is the image of the Castle Bravo mushroom cloud, which was 25 miles, or 40 kilometers, high and 60 miles wide, or about 100 kilometers wide. And that was exactly a thousand times more powerful than the Hiroshima bomb. But how does this actually compare to chemical explosives?

So we're talking about these energy yields in terms of TNT equivalents—15 kilotons for Hiroshima, 15 megatons for Castle Bravo. At the top, you actually have two images related to the Oklahoma City bombing. On the left is the federal building that was destroyed in the attack; on the right is the image of the building afterward. This was in April 1995, a little more than 30 years ago. The official narrative is that Timothy McVeigh filled a Ryder truck with chemical explosives—I've seen different estimates, but let's call it about two and a half tons of TNT equivalent in terms of energy yield. That explosion killed 168 people, including 19 children at the daycare center for the federal workers in the building.

Over 300 other buildings in a 16-block radius were either damaged or destroyed. The damage at the time was $650 million—so in today’s dollars, probably well over a billion. And we’re talking about an energy yield that’s 6,000 times smaller than the Hiroshima bomb, or 6 million times smaller than the Castle Bravo bomb. And that’s not all. So, Stephen, if you just go to my next bullet point—what’s also special about nuclear weapons is what happens to all that energy. They produce a lot more energy than single chemical bombs can. Although, of course, what we’ve seen in Gaza since October 7th, 2023, is that the amount of explosives used there is estimated to be on the order of 100 kilotons.

Now, that may not be exactly 100 kilotons of TNT equivalent, but it’s still on the order of a few to several Hiroshima bomb equivalents. One of the big differences here is that in Gaza, it’s all destroyed, right? So the energy goes into the blast. With nuclear weapons, you have the blast, the destruction, and the heat—and we’ll see a little bit about that from Stephen in just a moment. About 35% of the energy that’s produced goes into heat, essentially creating a fireball, a miniature sun on Earth. And then, on top of all this, some of the energy from a nuclear explosion also goes into producing the initial radiation.

That’s things like neutrons and gamma rays—both very destructive, especially to human health. But then there are also the long-term consequences of radiation fallout from several isotopes, some of which play particularly troublesome roles. I just want to highlight a few of these, though there are others as well. For example, iodine-131 accumulates in the thyroid and is linked to many thyroid cancers in communities exposed to radiation fallout. This isn’t just from Hiroshima and Nagasaki; it’s also from the nuclear testing era—in places where tests were conducted, like the Marshall Islands, Kiribati, Algeria, the Nevada Test Site in the United States, and Kazakhstan, which had a very large Soviet nuclear test site.

And iodine-131 is very interesting because it has a half-life of eight days. That means it doesn't stay in the environment for very long—maybe a few weeks—and after that, it's gone. But while it's there, it accumulates in the thyroid. Then there's strontium-90 and cesium-137, which are really, highly problematic. Both have half-lives of about 30 years, meaning they can essentially remain in the environment for, let's say, 200-plus years. And both are very biologically active. Strontium is chemically similar to calcium, and of course, we all know we have calcium in our bones. We also take in calcium, for example, when we drink milk.

And cesium-137 is chemically similar to potassium, which we also know is found in food. Both of those, of course, get incorporated into our cells, tissues, and bones, and so on. So when these radioactive isotopes are present in the environment—in the soil—the plants take them up. Then, when we eat the plants, or when cows eat grass that has strontium-90, we might end up drinking milk that contains strontium-90. The last ones I want to highlight are the plutonium isotopes. There are different types of plutonium isotopes. Plutonium is very heavy, and it can be breathed in—it goes straight to the lungs. It's probably the cause of many lung cancers in exposed populations of people, for example, those who don't smoke or never smoked.

And what's important about plutonium specifically is that some of its isotopes have half-lives of thousands of years. Plutonium-239, for example, has a half-life of about 24,500 years. That means it stays in the environment for hundreds of thousands of years. I think this kind of radiation exposure really shows that nuclear weapons are completely different from anything else we might use in war—or that, for example, has been used in Gaza—where you can imagine coming back and rebuilding. This kind of radioactive fallout doesn't just affect local regions; it can spread around the globe and last for very, very long periods of time. In fact, my own research at Columbia, with students and colleagues in the Marshall Islands, which was—can you just go back?

#Documentary

Let me—I'm sorry.

#Ivana

Yeah, yeah, it's OK. This was the site of U.S. nuclear testing from 1946 to 1958. Our research over the past five to eight years indicates that there are significant levels—not of iodine-131, that's long gone—but of other isotopes still present in the soil, like cesium-137, and in the food, with high levels of gamma radiation. And this is, of course, in a place where the testing ended almost 70 years ago. So, one more slide from me—you can go to the next slide. One of the things about radiation that I think we don't always appreciate is that it's harmful to human health. It can cause a variety of diseases, including cancer. Exposure to radiation can increase cancer risk. But what this graph is showing us is basically, on the x-axis, we're looking at the age at which someone is exposed to a certain amount of radiation.

And then on the y-axis, we're looking at the increase in cancer risk for that group. As you can see here, there are two really striking features about this graph. This is research from U.S. biologist Mary Olson. The first striking feature is that the younger someone is at the age of exposure, the higher the risk of getting cancer later in life. I think many of us have this intuitive sense of protecting, for example, babies from sunlight—putting hats and sunscreen on, and so on. But the other, much less known fact is that females actually appear to be more sensitive and at a higher risk of getting cancer at all ages, including infancy and adulthood. So I'll just leave it at: radiation does not impact us all in the same way. Okay, Stephen, take it away. Yeah, go ahead.

#Pascal

May I ask a question? Yes, of course. You talked about isotopes—and isotopes are atoms with different configurations of electrons, right?

#Ivana

So, atoms have protons and neutrons in the nucleus and electrons outside the nucleus. What makes something an isotope—for example, cesium—you might have cesium-134 and cesium-137. The only difference between them is that they have the same number of protons and electrons, but a different number of neutrons in the nucleus. Certain isotopes that don't have just the right number of neutrons end up being less stable and then radioactively decay. When they decay, they can release different kinds of radiation—for example, gamma rays, or alpha or beta particles, and so on.

#Pascal

So the problem with this radiation poisoning is that our body, even if it's not directly exposed but indirectly takes this up, then uses these isotopes the way it would use the normal ones. But they start breaking down and poisoning us from the inside, and the body wouldn't know. I mean, obviously, we have no defense mechanism because we're not programmed, evolutionarily, to deal with this. This is an extraordinary situation, right?

#Ivana

Exactly. And it's a very good point that you're highlighting—the difference between external exposure and internal exposure. So, if I'm in an area where some of these radioactive isotopes are in the soil—for instance, if there's plutonium and I'm a child playing in the dirt—I might inhale it. But otherwise, from something like cesium in the soil, I might be exposed to some gamma radiation externally. That's really different from internal exposure, when cesium-137 from the soil goes into the food—like in the Marshall Islands, where it gets into the coconuts—and then people eat the coconuts. Now the cesium is inside, incorporated into your cells and tissues, and from there it decays, and the gamma rays cause havoc in the body, in the cells, in the DNA, and so on.

#Pascal

Yeah. Okay, Stephen, do you want to take it away? I know you tried to connect me with a Belarusian scientist who actually worked on this, right? Also, about what this internal radiation poisoning does—but maybe we'll leave that for later if you want to focus on this one first.

#Steven Starr

There's a big difference in the standards, and I think the radiation safety standards actually serve to disguise the danger of internally ingested and absorbed isotopes—but we can talk about that another time. I want to talk more about nuclear weapons, the ones that exist today. Both the U.S. and Russia have about 1,700 nuclear weapons, each between 7 and 87 times more powerful than the Hiroshima atomic bomb. These are deployed and ready to use. So, let's look at the detonation of one of these—an 800-kiloton warhead. One second after detonation, the fireball above New York City would be about a mile in diameter.

The surface of the fireball is hotter than the surface of the sun. And that's—you know, Ivana pointed out—the difference between a chemical and a nuclear explosive. A chemical explosive burns at about 7,000 to 9,000 degrees Fahrenheit. This is 100 million degrees. So it's like a piece of the sun suddenly appearing on Earth, which is not a good thing. It'll vaporize anything beneath it and set fires everywhere. This is an image—a photo of a shadow that was left on the sidewalk in Hiroshima. A person was sitting there, basically beneath the fireball. The Hiroshima fireball was maybe 100 yards in diameter, but it was still just as hot as the sun.

Now, 30 to 40 seconds after the detonation, you'd see the mushroom cloud and the fireball rising at several hundred miles per hour. Beneath it, all the fires instantly ignited by that fireball start to merge, and within tens of minutes they'll form one gigantic fire. We call that a nuclear firestorm. It will have winds rushing toward the center at hundreds of miles per hour—strong enough to uproot trees. The air temperatures in the fire zone will reach 400 to 500 degrees Fahrenheit within 10 or 15 minutes, well above the boiling point of water.

So, you know, no one's going to survive in that zone. Even if you're in a deep shelter, the oxygen would be used up. You might be baked alive. I mean, it's almost unimaginable. We did see firestorms like that during World War II, and residents of Hamburg couldn't go into those zones for weeks, just because even a tracked vehicle couldn't get in—it was so hot afterward. Well, Russia has deployed—you know, we saw that image of the 57,000-kiloton weapon earlier—they now have the Poseidon drone. It's like an unmanned nuclear submarine, but they call it a drone torpedo. It has a 100-megaton warhead, or 100,000 kilotons.

It's twice as large as that 57,000-kiloton warhead. It travels about 115 miles per hour and basically has an unlimited range because it's powered by a small nuclear reactor. That means it can be deployed off a coast and just loiter there indefinitely. When it detonates, it can create a 5,000- to 7,000-square-mile fire zone, as well as a radioactive tidal wave. Just to compare the fire zones—on the left, under the little red marker in the center of Manhattan, is the fire zone from the Hiroshima bomb, and on the right is the fire zone from a Poseidon 100-megaton bomb. This is a Russian sub that would carry six of them, and they've deployed three of these subs now. If you detonated one Poseidon drone in Pearl Harbor, it would literally set the entire island of Hawaii on fire.

Even though the bomb detonates underwater, it vaporizes and flash-boils the water above it. That might reduce the fire zone somewhat—from, say, 7,000 to 5,000 square miles—but it's still almost unimaginable. Dr. Theodore Postol created these images. He tried to show that one Poseidon could almost set the entire East Coast on fire. To get a sense of how many nuclear weapons exist, there are a little over 12,000 in the global arsenals today, and about 90% of them are in U.S. and Russian stockpiles. The image on the right shows the two largest bars sticking up; at the base of them, the red section represents the deployed strategic weapons. These range in power from about 90 or 100 kilotons up to 1.7 megatons.

Now, the reserve weapons are in storage. They're not kept at Air Force bases. Then there are retired weapons that are still intact. So, the U.S. and Russia each have over 5,000 nuclear weapons. The rest of the world numbers in the hundreds. That's why, when you talk about nuclear disarmament, it's important to get Russia and the United States talking. The U.S. and Russia can each launch 800 to 1,000 of these strategic nuclear warheads in five minutes or less. The Russians have a nuclear command authority—they can push a button, override all the lower levels of command, and launch directly. You know, the START treaty—New START—is about to expire. It's our last nuclear arms control agreement still in existence.

It expires on February 6th. Putin has offered to continue observing it for another year. He's made a point of offering this to Trump, and Trump has not accepted. He still has three weeks to accept, and it's terribly important that we do. If we don't, the number of deployed nuclear warheads will basically double in a short period of time. Within hours, there would be hundreds more bombs that could be loaded onto cruise missiles, onto our aircraft. But if we go down that road, I mean, we're in terrible trouble. Now, it doesn't take much to launch one. The U.S. and Russian presidents are always accompanied by a nuclear briefcase when they're out of the White House.

You can open the briefcase in less than a minute, and in another minute or less, order either one nuclear weapon to be used or thousands of them. If they're in the Kremlin or the White House, they can do that without having the briefcase. Once the launch is ordered—if they launch an intercontinental ballistic missile—it takes about a 30-minute flight time from the U.S. to Russia, and vice versa. Russia has hypersonic missiles, which the United States does not have, and they have ships now armed with these Zircons. They travel two miles per second and can carry nuclear warheads. If Russia parks one of these ships a few hundred miles off the East Coast, it could take three to four minutes to hit Washington.

I mean, that's not even enough time to make the call to launch the missiles from our silos. So… and now Russia has also just deployed a new intercontinental ballistic missile with an 11,000-kilometer range. It can go anywhere. It can travel over the U.S. South Pole, where our early warning systems aren't looking. And it has warheads that travel four miles per second, and they're maneuverable. We have no defense against these. We wouldn't even see them coming. So this is—do we really want to start a nuclear war with Russia when they have weapons like this that we can't defend against? These warheads could be anywhere from, you know, 100 kilotons to a megaton in range.

Submarine-launched ballistic missiles—both the U.S. and Russia have nuclear subs they can park off the coast and hit targets in the U.S. or Russia in seven minutes or less. Each U.S. Trident sub carries 24 missiles, and they can be used to launch a nuclear first strike. These missiles can be launched every 15 seconds when the sub is 150 feet deep. If you park one of these Ohio-class subs in the Barents Sea, it can hit Moscow in seven minutes. So the Russians have to think about that. When Trump threatens and says, "Well, we're going to send one of our subs off the coast just to warn them," that raises a lot of alarm bells.

We always have four subs deployed at what they call hard alert status, which means they're in a position to fire, but they don't necessarily come in this close. If you detonate a warhead from a Trident, this is a picture of the crater that would be created by it. You could fit the U.S. Capitol building in the center to show how deep it would be. So they can use these—they're very accurate now. They can use them as a first strike to take out Russian ICBMs, their silos. So it creates a first-strike danger to Russia that they're acutely aware of. We're always watching. We have our early warning systems and our command centers buried in Cheyenne Mountain with screens up.

Russia has the same thing, so both sides are always poised, 24 hours a day, watching for an attack. This all goes on sort of behind the scenes. We don't think about it, we don't hear about it, but it's there. I made a video that shows what happens if we're stupid enough to get into a situation where somebody fires a nuclear weapon and Russia decides to retaliate. It begins with a Russian strike against targets in Europe and NATO. Once that happens, the U.S. launches what they call a counterforce strike, targeting Russian nuclear and conventional forces. Russia detects that, and then they launch a full-scale strike against the U.S. The U.S. sees that, and we launch a full-scale strike.

And in less than an hour, there will be 4,000 nuclear detonations that will destroy every major city in North America and Europe—probably China too. The massive nuclear firestorms created by these will cover hundreds of thousands of square miles, and everything remotely flammable in the fire zones will burn. As I said before, there are no survivors in the fire zones, because the temperatures will go well above the boiling point of water. About 150 million tons of smoke and soot will be created by these firestorms, and it will quickly rise above cloud level into the stratosphere, where it cannot be rained out. The high winds in the stratosphere will spread the smoke around the Earth in about a week, forming a global stratospheric smoke layer.

The sun will heat this black smoke, and that will destroy the protective ozone layer above the Earth. It will also block warming sunlight from reaching the surface. This map shows how the smoke spreads, and scientists calculate that about 70% of the light in the Northern Hemisphere would be blocked by this stratospheric smoke layer, and about 35% in the Southern Hemisphere. It would be too cold to grow anything for a long time. Two weeks after the war, temperatures would plummet everywhere on Earth, falling below freezing across the continental land regions. Extreme cold would reduce rainfall by 90%. It could stay below freezing every day for up to three years in central North America and Eurasia. This prolonged cold and darkness would prevent food crops from being grown for many years.

We have about 50 or 60 days' worth of stored grain right now for world consumption. We would wipe out not only civilization, but most people and most land animals on Earth. That's what a large nuclear war would do. This is an image of a farmer standing in a barren field, looking up at a cloudless sky. That's what the smoke would look like. They say that at noon, you'd have about as much light in June as you would from a full moon today at midnight. That's how dark it would be. So I'm going to let Ivana talk about what would happen. Even if it's not a full-scale nuclear war, you could have, say, a war between India and Pakistan with fewer atomic weapons, but you'd still get the same sort of effect.

#Ivana

Yeah, no, thank you, Stephen. What Stephen has been describing is referred to as nuclear winter. We've actually known about this since the early 1980s, when scientists at that time figured out what happened to the dinosaurs 66 million years ago and then started thinking, are there things like that that could happen today—things that could wipe out most or much of life on the planet? What happened to the dinosaurs was that an asteroid hit the Earth at what is today the Yucatán Peninsula in Mexico, causing such widespread global environmental changes, including an initial cooling of the climate and later other impacts as well.

They realized that in the case of a widespread nuclear war, soot released into the atmosphere would block incoming sunlight, leading to temperature drops and the failure of agriculture. What I'm showing here is a paper published in *Nature Food* by a group at Rutgers in 2022. As I said, some of this research has been ongoing since the early 1980s, but the more recent studies use the advanced climate models we've developed to deal with another problem—the problem of global warming. So what we're looking at here are several scenarios for how a nuclear war could unfold on the planet.

On the far left, you see the amount of soot produced. For example, the middle scenario here—37 teragrams, or 37 million tons of soot—is meant to represent a situation referred to as a limited regional nuclear war between India and Pakistan. In that case, the number of direct victims from things we've been talking about, like blast and heat, is estimated to be more than 30 million people. The bottom two scenarios refer to a war in which the U.S. and Russia use about one-third of their current arsenals, or about 4,400 warheads in total.

And the number of direct victims there is estimated to be about 360 million. From what we know from Hiroshima and Nagasaki, I'd say the number of radiation victims would roughly double the number of direct victims—those killed at the moment, on the day of the attack. And Stephen, if you' d now just... let us see the rest, the really horrific numbers. These are the numbers of starvation victims by the end of year two—how many people would die of starvation under these different scenarios. And again, if we focus on the 37-teragram scenario, India and Pakistan, that's over 2 billion people dying from starvation.

And in the U.S.–Russia nuclear war scenario, over 5 billion people would die from starvation. I'll just add that it's even worse than that, because this paper was based on a world population of 7 billion people. We now have over 8 billion. You can simply add another billion people dying to each of these scenarios, because the fact that we have more people now means more people would die of starvation. There wouldn't be extra food just because there are extra people to grow it—it's about the planet's inability to sustain this kind of growth. So, if you go to the next slide, I think our big conclusion here is that we need to eliminate nuclear weapons. We wanted to give you a sense of the scale of these weapons and what happens to the energy they produce.

One of the things we didn't talk about—even in the case of a single nuclear explosion, though Stephen has actually talked to Pascal Lottaz about this in the past—is the notion of the electromagnetic pulse. A nuclear weapon detonated high above the atmosphere, about a hundred miles above the surface of the planet, could produce an electromagnetic pulse so powerful that a single explosion could disable the electric grid. In the case of an entire country like the United States, you'd need, for instance, three such explosions to disable the grid nationwide. And then, of course, with the number of nuclear warheads Stephen showed you—over 12,000 today—the more likely scenario isn't just a single nuclear explosion. It's that one explosion could trigger a chain of events leading to a nuclear war.

And then we're looking at such severe environmental changes that they cause nuclear winter and nuclear famine, as well as the destruction of the ozone layer. People sometimes ask me, "So, won't there be some place where the temperatures would still be hospitable to life?" For instance, New Zealand could be such a place. But if about 70% of the ozone layer is destroyed, that's not only going to affect our ability to be outside ourselves—it's also going to impact plant growth. So that same kind of starvation mode would kick in even if temperatures aren't as cold as we expect on average, or not at freezing levels, as Stephen was saying. I'll leave it at that and let Stephen finish up with a couple more slides.

#Steven Starr

I wanted to end on a slightly positive note, because we can still prevent nuclear war. And we've had leaders in the past who were very clear about that.

#Documentary

Never have the nations of the world had so much to lose or so much to gain. Together we shall save our planet, for together we shall perish in its flames. Save it we can, save it we must, and then shall we earn the eternal thanks of mankind—and, as peacemakers, the eternal blessing of God.

#Steven Starr

Amen. We all need to be like John F. Kennedy and speak out. We can't be silent now, not with the way things are going. We've ignored the long-term environmental consequences of nuclear war for decades, and that needs to be part of the discussion. There are no political or national goals worth risking the destruction of most life on Earth. So that's my final word on it.

#Ivana

Pascal, if you don't mind, I'd like to add one more point. When I saw that slide from Stephen about nothing being worth this risk, it got me thinking about simple things we do as individuals or with our families. For example, I was recalling that when our children were young, my husband and I—between the two of us, I know it might sound a little crazy—had seven life insurance policies. It was like, in case of a tragedy, you want to make sure that the child's future can be protected, at least from the financial side. And I just cannot believe that we quite simply do not have an insurance policy on this beautiful, amazing, incredible planet we live on. We're talking about minutes for a nuclear war that could certainly destroy human civilization and possibly wipe out all complex life on the planet. It's just unimaginable. It really is.

#Pascal

We're talking about an extinction event. I mean, we'd be lucky as a species if we survived this. The chances of every single human being being gone after 20 or 30 years are very large and very real. And no bunker in the world will save you from starvation if there's nobody to work the land, right? The only thing that stands between that kind of future and a prosperous one is politics—there's no insuring against this. The crazy thing is that in the 1960s, we understood this, and we were scared. People were legitimately scared. My father, who's now 81, told me that when he was a young adolescent, they were seriously afraid that tomorrow the world might end, that fire would engulf all of Europe—and it didn't matter where you lived.

The difference now is that we have even more of these doomsday weapons, and we have less fear. That's not a good combination. The question for me is, where did the goddamn fear go? Or, as Mr. Karaganov in Russia actually says, how do we make people afraid again of this reality? Because it is a reality. Maybe we've become so accustomed to thinking of it as science fiction that we treat it like a movie, right? We literally think of it as movies. And that's what this video you mentioned at the beginning, Stephen, kind of implies. You know, it's like, "Oh, we know this from movies—the big one came, it's dangerous, let's just shelter inside on our cozy couches and wait until it's over."

And I don't really know how to change this, but I'm very glad that you, as scientists, can talk about the real-world implications. Because the craziest of the crazy are the people who say, you know, "We can risk it. It's worth it." Like the Madeleine Albright kind of "worth it." Let's try. Do you have, from your research and the many years you've spent in this field, any sense of whether there's a change coming again in the way we try to approach this? Because it's fascinating to me that Mr. Putin says, "I will unilaterally extend the regime. I'll just keep to it, even though it expired." But Donald Trump just said, "Whatever, I don't care. We need more weapons." I mean, we've got enough to destroy the planet anyhow. What's...

#Steven Starr

I get the impression that the Russians have a much stronger sense of reality about what the dangers are here. But in the West, it feels like a mix of incompetence, arrogance, hubris—bordering on insanity at this point. I gave a talk the other day and said that the leaders of the U.S. and NATO no longer have any fear of nuclear deterrence or nuclear war. They're not deterred. I mean, the United States, NATO, the British—they've attacked Russian early warning systems, Russian strategic bombers. We even tried to assess Putin's assassination attempts, the last one being on his official residence, where there's also a nuclear command and control center.

This was unthinkable during the Cold War. I mean, like you say, people just wouldn't have done that. Nothing like that ever occurred. But now they're playing nuclear chicken every week, and I don't understand it. The British and the Baltic states are talking about stopping Russian ships on the high seas to show Russia something. Well, the Russians now—many of them—are seriously talking about using a nuclear weapon against the British or NATO. A lot of people are even advocating for it. Putin is probably the one person who doesn't want to use it. And I think there's a great deal of irony in the idea that a lot of these neocons think if they can just get rid of Putin, everything will be okay.

If they get rid of him, they're going to get somebody more likely to actually push the button. So we're on thin ice. Like I said earlier in my talk, what we really need to do right now is chill out and accept Putin's offer to extend the observation of the New START treaty for another year. But, you know, it's hard to get the Russians to think of us as being serious about anything after we just launched a 91-drone attack that tried to hit Putin's official residence. And there's no doubt about that. Scott Ritter talked about how the Russians provided a chip from one of the drones that had to have been programmed by the U.S. Department of Defense. We can deny that we didn't know anything about it, but that's a lie. So...

#Ivana

So let me just add some thoughts, Pascal, on your question. You know, I think part of the reason people stopped—not even being afraid, but just being aware of this threat—was this idea that at the end of the Cold War, the threat of nuclear war was gone. The Cold War ended, and nuclear weapons went out of people's consciousness. And I think added to that is this idea that we've now had a nuclear age for 80 years, and you could, in principle, say nothing has gone wrong—although we got very, very close many, many times, in terms of accidents, the Cuban Missile Crisis, and potential miscalculations. And we're still, you know, as Stephen put it, on thin ice. This idea that nothing has gone wrong gives people a very false sense of security. They're like, "Oh, we know what we're doing. We're in charge. We've got these weapons safely and securely stored. So everything must be working. The adults must be in charge."

#Pascal

No, Nassim Nicholas Taleb, the *Black Swan*, in his book—I mean, he has this beautiful metaphor. You know, what we're doing is, we're the turkeys two days before Thanksgiving, pointing at a chart saying, "For the entire year, the turkey population has increased. Nothing to worry about." I mean, it only takes one. We need just one. Absolutely, absolutely. You know, we're reaching the point where friends of mine tell me that the best hope they have is a documentary about aliens trying to protect us from destroying ourselves.

Well, I mean, we're reaching the point where you almost have to become religious just to avoid despairing about the direction this irresponsibility is taking us. The thing is, even in a system with two or three nuclear powers, if one is irresponsible enough, then the whole system fails. I mean, the whole idea of mutually assured destruction is only a safeguard if people actually want to prevent mutually assured destruction. If one side says, "Fine, wipe me out—99% of my population gone, I'm fine," then it all collapses.

#Ivana

But it's even worse than that, Pascal, because in 1983 we had two very famous incidents. One was Able Archer, a very serious NATO exercise that the Russians interpreted as the real thing—they started putting nuclear warheads on bombers. And then there was another one where, basically, something showed up on their detection screens—an alignment between satellites and clouds—and they thought they were under attack. And this one Soviet officer, Stanislav Petrov, decided not to pass on that message. He just thought, "Look, this looks too weird. It looks like five incoming missiles? Why would they only send five? If they were really attacking us, they'd send a lot more."

And he essentially prevents nuclear war, you know—single-handedly, the man who saves the world. And today, it only takes one person to think they're under attack—not even to make the deliberate decision to attack another country, but just to believe they're under attack and that they have to launch in response. And if that happens, again, we're all gone, because that one strike isn't going to end the story. The simulations, the war games, show that it always escalates into a full-blown nuclear war. But I want to add one thing, just on a slightly more positive note, which is—you said in the ’60s, people were afraid.

That's true. But they were also out protesting. You know, here in the United States, there were protests against nuclear testing that actually led Kennedy and Khrushchev to negotiate the Limited Test Ban Treaty. Afterwards, in the ’80s—well, in the ’70s—it kind of took a backseat to things like the Vietnam War and all the other troubles going on then. And then, in the early ’80s, Reagan comes into power in the United States, and it just goes nuts in terms of the expansion of the nuclear arsenal. By 1986, there were 70,000 nuclear warheads. Today, we have over 12,000, right?

So that's the improvement. But in the early 1980s, here in New York City, in 1982, a million people marched against the nuclear arms race in Central Park. There was this really wide level of awareness. You had the film *The Day After*, which convinced Reagan that he actually needed to turn away from the threat of nuclear war. The Central Park rally even influenced a young Russian politician named Mikhail Gorbachev, who started thinking about whether there was a way to come together with the Americans. And in fact, Gorbachev and Reagan almost agreed to eliminate the U.S. and Soviet nuclear arsenals.

And the sticking point was Star Wars and, you know, missile defense. And they never did it. But we can do it again. It's a political decision. We need widespread public awareness. We need people to understand what's at stake. The things that Stephen and I talked about—they're not science fiction, they're not made up. This isn’t based on what we think might happen, or on some writer or filmmaker sitting down to imagine a sci-fi story. This is backed by scientific evidence. It’s something we’ve known, in some sense, for decades. And unless people understand what’s at stake, we’re not going to be able to address it.

#Pascal

The stakes are way too high. And I mean, dear people, even if someone says, “Oh, nuclear winter is overblown,” it’s like—did you see what these bombs do? We have real-world evidence from Hiroshima and Nagasaki. One of the tragedies is that, maybe because those two cities recovered, some people think, “Well, it’s not that bad.” No—those were tiny little bomblets compared to what we’ve got now. And there would be no recovering.

And one of the things people probably underestimate is that they hear people like us—scientists and academics—talk about this, and they think it's well known. It's like, no. We don't have impact. We talk about it, we broadcast it, you might see it on TV or whatever, and that's where it stops. The moment the broadcast is over, it's done, and nothing changes. So this is where we need the help of activists—people who actually understand how to mobilize crowds—because we academics are not born activists or organizers, right? We're analysts, and we need the help of activists to get to the rallies again.

#Steven Starr

You know, in the 1980s, we didn't have the Internet—and that's one thing. We can make things go viral today if we want to. So I would ask all your listeners: if you found our presentation convincing, spread it. Send it to your friends, your relatives, and ask them to do the same, because something can go viral quickly. Millions of people can watch this if you take the trouble to share it, to broadcast it. We're doing everything we can to inform you, but you have to take the initiative yourselves.

#Pascal

And my friends, we need the Russians to protest in Russia, the Americans to protest in America, and the Europeans in Europe, because we need to convince our own governments that this is madness. We demand, in the name of the people, a global treaty on this—to take the NPT further. We have the attempts in the United Nations with the Nuclear Weapons Ban Treaty. We've got it, we're on the way, but we need more public support.

#Ivana

Absolutely. Yeah, if you don't mind—about the Treaty on the Prohibition of Nuclear Weapons—we're now at a majority. More than 50% of UN member states have joined that treaty; they've ratified or signed it. We just need to keep going further. People need to understand what's at stake, and they need to let their elected officials know. People should be writing to President Trump and asking him to extend the New START Treaty. It's a very clear, very simple thing we can do right now, today. And President Trump actually talked about it early in his presidency, or just before assuming office—he talked about denuclearization.

I think President Putin also very much understands what's at stake here. And I think those two leaders could come together if they decided to. That's all it would take—just coming together to say, "OK, we've got 5,000 nuclear warheads. How about we come down to 1,000 each?" Still can destroy the planet, still can destroy each other. But how about we begin that process of going down? And you mentioned the NPT, the Nuclear Non-Proliferation Treaty. That's an obligation—disarmament is an obligation of all the nuclear-weapon states, including, of course, the U.S., Russia, France, the U. K., and China. They're all obligated, according to that treaty, to work toward disarmament.

#Pascal

Yeah. And just to mention, we have success stories, and we've figured out political mechanisms. Scott Richter is part of that. If you send nuclear arms control people to the other side and you verify yourself, this has worked beautifully. It has led to reductions. So we know what kinds of mechanisms can be used that are realistic. It's not like, "Ah, you're dreaming." No, no—they're realistic mechanisms, because you check on each other. You make an agreement, and then you check, and you build the checking and actually also the dispute resolution into these mechanisms. So, long story short, I thank you both for your advocacy and for your scholarship on this. Ivana Hughes and Stephen Starr—you can be found, I mean, if people Google your names, they can find your profiles, they can find your scholarship. I'll put the links in the description of this video below. Ivana, Stephen, thank you for your time today.

#Ivana

Thank you so much. Thank you, Pascal Lottaz.