It's Laboratory or Goodbye

Gerold Yonas, PhD and Jill Gibson

STEPS: SCIENCE, TECHNOLOGY, ENGINEERING, AND POLICY STUDIES

STEPS Issue 3 (2016): 12-23.

STEPS (Print) ISSN 2158-3854
STEPS (Online) ISSN 2153-3679

Cite this article: Gerold Yonas and Jill Gibson, "It's Laboratory or Goodbye," STEPS 3 (2016): 12-23. Available from: http://www.potomacinstitute.org/steps/featured-articles/65-it-s-laboratory-or-goodbye

POTOMAC INSTITUTE PRESS

STEPS: Science, Technology, Engineering, and Policy Studies
is published by Potomac Institute Press of the
Potomac Institute for Policy Studies.

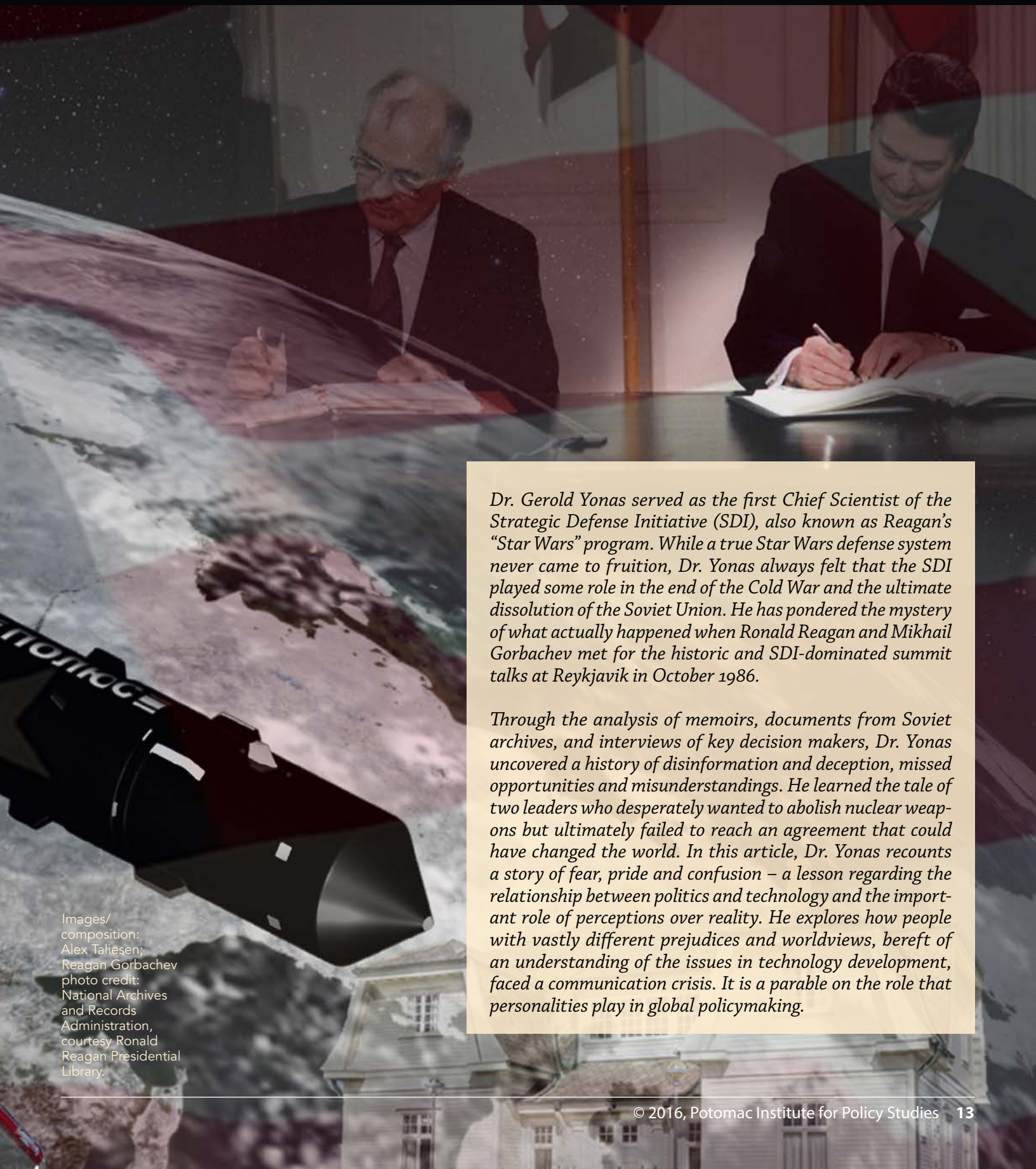
Access to *STEPS* is available free online at: www.potomacinstitute.org/steps.

ARTICLES

FEATURE ARTICLE

It's Laboratory or Goodbye

Gerold Yonas, PhD and Jill Gibson



Dr. Gerold Yonas served as the first Chief Scientist of the Strategic Defense Initiative (SDI), also known as Reagan's "Star Wars" program. While a true Star Wars defense system never came to fruition, Dr. Yonas always felt that the SDI played some role in the end of the Cold War and the ultimate dissolution of the Soviet Union. He has pondered the mystery of what actually happened when Ronald Reagan and Mikhail Gorbachev met for the historic and SDI-dominated summit talks at Reykjavik in October 1986.

Through the analysis of memoirs, documents from Soviet archives, and interviews of key decision makers, Dr. Yonas uncovered a history of disinformation and deception, missed opportunities and misunderstandings. He learned the tale of two leaders who desperately wanted to abolish nuclear weapons but ultimately failed to reach an agreement that could have changed the world. In this article, Dr. Yonas recounts a story of fear, pride and confusion – a lesson regarding the relationship between politics and technology and the important role of perceptions over reality. He explores how people with vastly different prejudices and worldviews, bereft of an understanding of the issues in technology development, faced a communication crisis. It is a parable on the role that personalities play in global policymaking.

Images/ composition: Alex Taliesen; Reagan Gorbachev photo credit: National Archives and Records Administration, courtesy Ronald Reagan Presidential Library.

INTRODUCTION

At Reykjavik in October 1986, Reagan and Gorbachev almost agreed to abolish all nuclear weapons, but Gorbachev's fear of initiating a space race with the US, and Reagan's misguided commitment to SDI prevented what might have changed the course of history. The mystery of why they failed at a historic agreement has haunted me for decades.

The mystery I pondered for many years was focused on something Mikhail Gorbachev said to President Reagan at the Reykjavik summit meeting. He said four words that abruptly changed the course of history: "It's laboratory or goodbye." And now I think I understand.

So what really happened at Reykjavik? What role did the SDI play in the end of the Cold War and the collapse of the Soviet Union? Many historians and analysts have considered this question over the decades. None other than the "preeminent historian of the Cold War," Yale history professor, John Lewis Gaddis wrote that the SDI "may have been the most effective in ... promoting internal reform in the Soviet Union…the SDI may well have pushed them over the edge."[1] He was not alone in this theory and many well informed scholars have agreed with Gaddis that "…SDI was the straw that broke the camel's back."

Having served as the first chief scientist of the program, and from my vantage point of the SDI program that existed in 1986, I understood that we had few if any technical accomplishments to prompt a giant arms race, let alone the collapse of the Soviet Union. It seemed to me to be like trying to knock over a Sumo wrestler with a feather. When Nigel Hey interviewed me for his book, *The Star Wars Enigma* about the SDI'S role in the collapse of the Soviet Union, I was unable to clarify or substantiate Gaddis' claim. I told Hey "the real SDI story is about human behavior, bluff, fear, confusion and hope." When Hey asked me about the reported description by Robert McFarlane, Reagan's national security advisor, that SDI was "the greatest sting operation in history," I replied, "there was no sting, there was no plan, but the story unfolded anyway. It happened because the role of people – crazy, thoughtful, selfish, drunk, stupid, clever people – is to contribute unpredictably."[2]

So why did Reagan and Gorbachev consider the future of SDI so important that they could not come to an agreement? This, to me, was an enigma, particularly given what I knew about the state of the program at the time. I was not satisfied with just leaving an important part of my life as a mystery, so I set out to uncover the reasoning behind the decisions that took the world to the edge of abolishing nuclear weapons and then backed away.

I now think that Oleg Baklanov, the leader of the Soviet military industrial complex, and the fate of Polyus, the Soviet's first space based laser experiment, hold part of the key to unraveling the mystery of Reykjavik. At the same time, a clash of ideologies, not between the US and the Soviet Union, but rather between the political and technical leaders within each country, created unresolvable conflicts that led to strategic errors. But before I explore the pivotal role these factors played, I want to take a look at the events that led up to the summit.

WHAT WAS THE SDI?

Reagan's March 23, 1983 Star Wars challenge was to "make nuclear weapons impotent and obsolete." Exactly how the SDI program would protect America depended on whom you asked. The very conservative side of American politics saw SDI as a leak-proof defense, and the liberal side saw it as a dangerous but mostly rhetorical attempt to gain an upper hand in the continuing geopolitical struggle. Even the right side of the political spectrum saw the limitations of any defense. Ken Adelman, the US chief of arms control, wrote that Reagan "vastly exaggerated SDI's promise by claiming, 'our scientists are convinced [it] is practical, so much so that within a very few years we can have such a system ready to deploy.'"[3] The middle of the road was represented by James Schlesinger, former US defense secretary, who said, "The best use of SDI lies in that much maligned role of bargaining chips…the quintessential bargain chip."[4] The left could be characterized by Jimmy Carter's Secretary of Defense, Harold Brown, who published an excellent review of the SDI technical challenges, and wrote about doubts "about the vision of protecting populations from a nuclear attack by means other than deterrence."[5]

I had helped to prepare the plan for SDI. During the summer of 1983, I led the directed energy weapon panel of the Defense Technology Study Team (also known as the Fletcher Study). The study prepared a five year, $25 billion Research and Development (R&D) plan that would provide the basis for a deployment decision. In the fall of 1983, I briefed Reagan's Scowcroft

Commission on Nuclear Weapons, and Harold Brown, one of the most knowledgeable members of the panel, stated that the only credible deterrent was the belief that both societies would be destroyed in a nuclear exchange. The Scowcroft Commission's charter was to define a strategic weapon deployment that would provide a survivable retaliation against a Soviet first strike. They had doubts about the proposed silo-based MX missile, which they saw as an attractive target for the Soviet SS-18 intercontinental ballistic missile. This commission on strategic forces, which reported to the President, was critical of the President's initiative, and dead set against any sort of missile defense. They made it clear that the right approach to survivability would be to deploy many small single warhead missiles. Not only were the strategic military implications of the SDI controversial within the administration, the reality of the underlying science and technology was widely debated by both advocates and detractors.

Many directed energy weapons concepts; such as space-based chemical lasers, neutral particle beams, and ground-based electrically pumped lasers; were considered in the Fletcher Study, but they all had deficiencies needing many advances in science and technology. Much has been written about the importance – or lack of importance – of so-called "scientific breakthroughs" for ballistic missile defense, but none were as controversial as the x-ray laser. Noted physicist Edward Teller championed the argument that the key to any effective ballistic missile defense would be an effective x-ray laser.

This subject was well documented by Bill Broad, who wrote in his book *Teller's War: The Top Secret Story Behind the Star Wars Deception*, "The disintegration of the Communist bloc showed that much of its economic and military might have been a ruse. So too, the x-ray laser in many respects was a lie."[6] The most ironic aspect of this development was the Soviet view expressed in 1998 by M.A. Gareev, deputy head of the Soviet General Staff, who wrote that they were way ahead of us in the race to develop this weapon. Gareev spoke of the USSR's successful x-ray laser test during the 1970s at Semipalatinsk saying, "In this field we surpassed the Americans in many areas. However, we spent tens of times more resources on all the programs than the Americans."[7] The Soviet programs included a giant ground based laser driven by explosives as well as space based gas dynamic lasers.[8] The Soviet Polyus spacecraft, launched in 1987, would have tested components of a carbon-dioxide laser in space with an eventual goal of one million watts of power; however, this spacecraft failed to reach orbit. This was a pivotal development that I will discuss later in detail.

In the US, many had doubts about the x-ray laser, including Reagan's scientific advisor, Jay Keyworth, who in an interview in 1998 called the nuclear driven ray laser, "a pack of lies, unadulterated lies."[9] The scientific community in the labs, academia, and industry were very critical of the exaggerations and overselling from the start. Don Kerr, who was Los Alamos National Lab director at the time, described Teller's enthusiasm as being a result of his technical optimism, but warned that, "It's dangerous because in part, there are very few people in the government who can objectively participate in or observe and learn from a technical debate."[10]

As it turned out, no one was less able to understand and deal with the technical issues than Reagan and Gorbachev, but other decision-makers had a hard time grasping the technical issues. George Shultz, Reagan's secretary of state had problems early on in the program in trying to understand what was real and what was fantasy. At a briefing I gave to Shultz in 1985, I emphasized that that the program would require a long-term R&D effort, and that the outcome of the R&D program was uncertain. I left him quite unsatisfied because I was unable to offer him the technological silver bullet I think he and many others were seeking.

WHAT WERE THEY THINKING

But what were the Soviets thinking and how much did they actually know about what was happening in the US?

In 1993, two of the most highly regarded Soviet scientists who were directly involved in advising Gorbachev gave interviews about their views on the implications of the SDI on Soviet decision making concerning the Cold War, and they could not have been more clear. They claimed that SDI was of no importance in the collapse of the Soviet Union. Evgeny Velikhov, the leading scientific arms control adviser in the Soviet Union who accompanied Gorbachev to all meetings with Reagan, said, "any importance of the SDI on the collapse of the Soviet Union is a kind of a historic injustice." Roald Sagdeev, Soviet and Russian expert in plasma physics and a former director of the Space Research Institute of the USSR Academy of Sciences, simply called such

a hypothesis explaining the fall of the Soviet Union, "nonsense."[11] But if the SDI was of little importance, why did Gorbachev take it so seriously? In his memoir, Sagdeev indicated that the explanation might lie within the vast Soviet defense investments, and the competition for funds within the Soviet defense ministries, and not directly dependent on our actions.[12] V. Shlykov, the department head of the Soviet military intelligence, GRU, said, "Nobody cared and nobody considered a practical response to the Star Wars program."[13]

Clearly the Soviet scientific perspective greatly influenced the decisions their leaders made. Throughout my work with the SDI, I sought to understand their viewpoint. In 1983, I concluded that the outcome of the five-year program would depend not just on our technology advances, but how the Soviets responded based on their perceptions of reality.[14]

George Shultz explained in his memoir that he really appreciated the limitations of our technology and was prepared to trade our non-existent accomplishments for some meaningful agreement. In his instructions to Reagan in preparation for the Reykjavik summit, Shultz suggested a compromise, stating that SDI could be a bargaining chip to gain cooperation on arms reductions. Shultz recognized the power the SDI held in the negotiations and advised Reagan to "give them the sleeves from our vest on SDI and make them think they got our overcoat."[15]

I was determined to understand why we did not achieve an agreement and give up "the sleeves of our vest." George Schultz not only understood the status of technology development and had a strategy for the negotiation, but also had stood by the president's side during the Reykjavik summit. In 2014, I made arrangements to meet with Shultz, and, when I asked him why we did not trade, he made it clear that Gorbachev was convinced America had already developed a successful SDI technology that could become extremely effective against their ballistic missiles.

What was driving Gorbachev to walk away from a deal that would satisfy his dreams of eliminating nuclear weapons and preventing a space arms race? I knew that the Soviet scientific community had provided substantial evidence to Gorbachev that the technical foundation of SDI was inadequate to justify the initiative, but I am not sure that scientific advice amounted to much when confronted with other more powerful goals and beliefs from the Soviet military.

The information that Gorbachev had received from his political and military advisors contradicted that of the key Soviet scientists. Instead, the information he received before the summit painted a frightening picture of American superiority.[16] Gorbachev was convinced that he had to stop not only the American SDI program, but also had to stop the arms race driven by his own military industrial complex. M.I. Gerasev, from the Soviet Institute for the USA and Canada, said, "We had plenty of zealots who greeted Reagan's SDI with open arms. They came running with comprehensive projects expecting to be showered with funds."[17] Before Gorbachev left for Reykjavik, he stated, "Our main goal now is to prevent another new stage in the arms race… drawn into an arms race that is beyond our strength. We will lose because now for us that race is already at the limit of our possibilities."[18]

"The Soviets were keenly aware that we were waging a psychological war that was just as serious as any aspect of the Cold War conflict."

Gorbachev seems to have been most strongly influenced by outrageous claims from his own military industrial complex. Evgeny Velikhov, wrote in his memoir, "Our negotiators and military experts were convinced that by 1990, the Americans would deploy space weaponry."[19] Gorbachev's military advisors misled him to believe that the US had developments including "kinetic energy nuclear weapons…creates a stream of metallic fragments of small mass …and are capable of striking targets in space, including warheads, [with] a direct hit."[20] If this were true, it would be a fantastic space weapon. Gorbachev had also been told that full-scale development of "x-ray laser weapons, directed electro-magnetic radiation weapons, and kinetic energy weapons is expected to occur in the second half of the 1990s."[21] Regardless of reality, Reagan's outrageous statement that the SDI was nearing deployment, according to Adelman, "must have caused heartburn for Gorbachev, and confirmed his worst fears."[22]

Not only had Gorbachev been told that the Soviet military industrial complex had proven that a space-based missile killer was possible, but "the US has achieved results in this area which surpass those of our country."[23] The Soviet leader had been warned "overall the Soviet Union lags approximately 4-5 years behind the US in research on creating the elements of a space-based missile defense echelon,"[24] and "Americans think that a multi-echelon missile defense system should allow at most 0.1% of the attacking missiles to get through."[25]

What was behind such wildly exaggerated claims? Was it the marketers of the Soviet military industrial complex taking advantage of the technically incompetent decision maker? Or maybe we had some hand in creating this perception?

WHAT INFLUENCED THEIR THINKING?

The Soviets were keenly aware that we were waging a psychological war that was just as serious as any aspect of the Cold War conflict. M.A. Gareev described his perception of our approach to the "non-war" mind war as including, "hostile indirect activity [that] was the extraordinary effort to undermine the Soviet Union… measures aimed at preventing the inflow of modern technologies."[26]

Project Farewell was the name of another aspect of the United States' attempt to undermine the Soviet Union. The Soviet military had been fed bogus technical intelligence from Project Farewell, a technical disinformation program engineered by Gus Weiss of the CIA.[27] There probably were many other instances of the technology-thirsty Soviets accepting our nonsense. This may have been the source of the panicky advice Gorbachev received.

Gorbachev's military advisors warned him of the need to delay the US space weapons program "to gain the time to conduct analogous work in our own country."[28] They told Gorbachev over and over again, that the US must not be allowed to test "apart from laboratory research."[29] His instructions were clear, emphatic, and repeated over and over again; the US must not test "outside of the laboratory." Gorbachev was not at all educated in science and technology, but he certainly understood and believed that it was absolutely necessary to keep the US from testing SDI technology in space.

Many in the Soviet military industrial complex saw SDI as an opportunity for funding, and Gorbachev must have been acutely aware of the rising tide of pressure to invest in space weapons. He was also aware that his own military industrial complex, led by Oleg Baklanov, was prepared to accelerate the race toward the development of space weapons.

Baklanov, born in 1932, rose from an engineer, then factory manager in the Ukraine, and received many awards including the Lenin Prize in 1982. He became leader of the Soviet space industry in the '80s and then the head of the military industrial complex under Gorbachev. Baklanov seems to have been dedicated to saving the Soviet Union from Gorbachev's well-intentioned but mismanaged Soviet reforms, and he appears to have approached this problem as a sober and linear thinking engineer would. Baklanov also had little respect for Gorbachev or his understanding of technology. He later wrote, Gorbachev "had a poor grasp of

USSR, MOSCOW. Central Committee of the CPSU Secretary Oleg Baklanov. (© ITAR-TASS Photo Agency / Alamy Stock Photo, Valentin Cheredintsev).

the subject matter …no understanding of it, no definite ideas about the issues of defense."[30]

That belief in Gorbachev's technical incompetence was seconded many years later by Victor Mikhailov who became the head of all Soviet things nuclear as the leader of the Russian Federation of Nuclear Energy. He believed in the potential of nuclear directed energy weapons that he called the "Evil Jinn."[31] Mikhailov wrote in his memoirs that Gorbachev was in no mood to listen to his technical advisors. Instead, he wrote, "Gorbachev has to take the blame for the attempts to demolish the military industrial complex. He almost ordered that the directors of our enterprises be squashed, treating the talented scientists and organizers like bedbugs."[32]

Baklanov not only lacked respect for Gorbachev, he also viewed America's leader with contempt. He was just as convinced of Reagan's lack of technical understanding and capabilities to deal with these issues, writing, "Reagan was completely illiterate when it came to talking about problems of a scientific and technical nature. He didn't understand anything he said about SDI…a bluff and a myth." Baklanov recognized that Gorbachev used Reagan's mythical SDI to advance his own objectives, noting, "Gorbachev wanted to use the myth about the capabilities of SDI…as a pretext for getting us to surrender."[33]

Baklanov was not alone in his opinion of Reagan's scientific illiteracy. The nominal leader of the left wing, Alexander Yakovlev, Gorbachev's minister of propaganda, was in close agreement on the view of Reagan: "In Reykjavik, Reagan missed his chance to go down in history not as a clown, but as a statesman…not intelligent enough and too limited in his freedom of choice…."[34]

At the same time, as Reykjavik negotiations proceeded, in October of 1986, the Soviet Union's military industrial complex was preparing to launch the world's biggest booster, Energia from the Baikonur Cosmodrone Site in the desert of Kazakhstan. Energia would be carrying the Polyus payload, a demonstration of bits and pieces of the Soviet's first space based laser. It is ironic that our own shuttle launcher had blown up on launch in January 1986, just 10 months earlier, and the US shuttle fleet was grounded for three years. What we didn't know at the time was that the Soviets were ahead of America in the development and space deployment of a crude space weapon, which would have been the key to their ability to destroy our space assets. I am sure that they would have gone ahead with some sort of minimally effective laser weapon program, which would have in turn energized our own program, if their tests had proven successful. Ashton Carter, now the secretary of defense but then a prominent critic of SDI, speculated on a hypothetical Soviet effort. He pointed out correctly that an "ASAT attack on crucial sensors based in space is probably the cheapest and most effective offensive countermeasure."[35] A comprehensive history of their giant Terra laser program was published in the '90s that convinced me that they had the experience and desire to commit to very large investments in laser weapons had they had the political will to do so.[36]

> ***"The world was on the edge of a fundamental change in military capabilities and nuclear weapon deployment.."***

Fear of, or maybe hope for, the American SDI program was driving the ambitions of the Soviet military industrial decisions. Baklanov was expecting that SDI would compel his country to compete in an expensive arms race, and he was confident that the outcome would be favorable to the Soviet Union. He said, "Creating SDI system in space would have required enormous and ultimately worthless expenditures."[37] He wanted us to waste our money while they raced ahead with countermeasures, and he expected the most effective countermeasure would be his own anti-satellite weapons, such as those under development and to be tested on Polyus.

WHAT HAPPENED AT REYKJAVIK AND BAIKONUR?

In the midst of this conflict and confusion, in October of 1986, Gorbachev and Reagan met together at Reykjavik, struggling with decisions that could save the planet from nuclear destruction. After almost three days of back and forth arguing about SDI and arms control, the leaders had arrived at a dramatic point in the

conversation that might have changed the world. The meeting was drawing to an exhausting and frustrating close and it was either make or break when Gorbachev demanded dozens of times that the SDI "be confined to research and testing to the laboratories."[38] According to Ken Adelman, "Gorbachev's insistence that SDI be confined to laboratories…was repeated constantly …and then a stunning twenty times on Sunday afternoon. Mentioned every five minutes."[39] Gorbachev and Reagan had made it clear that they both desperately wanted to abolish nuclear weapons, but they were stuck on the issue of testing SDI outside of the laboratory.

During the last moments of the summit, Reagan stated "it would be fine with me if we eliminate all nuclear weapons," and Gorbachev enthusiastically followed with "let's eliminate them. We can eliminate them."[40] The world was on the edge of a fundamental change in military capabilities and nuclear weapon deployment. Then Reagan demanded to "continue research, testing, and development which is permitted by the treaty." Gorbachev objected. The Soviet leader said, "if development can go on outside the laboratory, and the system can go ahead in ten years…. It's laboratory or goodbye…ten years of research in the laboratories within the limits of the treaty ought to be enough for the President."[41] Apparently he was not against SDI research, but the research had to be conducted in the laboratories.

It is possible he was more worried about his own military industrial complex and their imminent breakout from their laboratory confines. This connection between the negotiations at Reykjavik and the upcoming events at Baikonur, explains the mystery of Reykjavik.

Gorbachev was at the end of his patience and desperate to clinch the deal, but he knew he could not walk away and leave the door open for Baklanov to launch an ultimately dangerous and probably ruinous space arms race, and he must have been focused on the upcoming launch of the world's biggest booster, Energia. This achievement, if successful, would create momentum in the space arms race from which there could be no turning back. This world changing agreement between the super powers was hanging on one word: LABORATORY, and Gorbachev hoped to thwart the launch and the ruinous arms race by committing to "staying in the laboratory". While Gorbachev argued with Reagan about future US space weapons, what he feared most was what was about to take place at Baikonur Cosmodrome in Kazakstan.

Shortly after the Reykjavik summit, Gorbachev and members of the Politburo flew from Moscow to Baikonur to witness the first launch of Energia. Baklanov, not to be undone, brought his team of scientists and engineers to the historic event. Ironically, they were not just there to view the historic launch of the world's biggest rocket, but to persuade Gorbachev to allow the launch to take place.

When they arrived, Energia, was ready for launch. It was fitted with the 100-ton Polyus space based laser demonstration. "This was a full scale mockup of what they called the Skif-DM orbital combat laser platform – 37 meters long and over four meters in diameter. The Energia/Buran program had been under way for 18 years at a cost of 16.5 billion rubles, and involving 1200 industrial sites."[42] Gorbachev, immediately upon his arrival, made a startling announcement. He declared to the already exhausted and frustrated launch crew that had dedicated months to preparation and then delayed for the arrival of the dignitaries, that there would be no launch. He ordered them, in classic bureaucratic style, to do more analysis and write comprehensive reports. Then to make matters worse, he preached to them about the evils of space-based weapons.[43]

Baklanov was well aware of Gorbachev's attitude, and he was prepared for this move. That evening he and his team gave Gorbachev a comprehensive briefing on the subject of rockets, space, and Energia. He undoubtedly emphasized the glory of Energia and Soviet space technology. "We created close to eighty five new materials of a higher caliber than anything else in industry and engineering… we introduced something on the order of six hundred innovations."[44] I can imagine how a technically educated person might be persuaded by such argument, but none of this should have been convincing to a social/economics expert or a diplomat who could did not care about any technical innovations. After his insistence at Reykjavik about the need to stop development and deployment of any weapons in space, how could Gorbachev then relent?

But surprisingly Gorbachev gave the go ahead for the next day. Somehow Baklanov had convinced the Soviet leader to change his mind, and abruptly reverse his conviction to stop the launch of Energia. It is possible that Gorbachev's behavior was subsequently explained by the very revealing book *Ten Years That Shook the World* by V. Boldin, Gorbachev's chief of staff, and one of his closest associates. Undoubtedly Boldin's comments, particularly his book, which he wrote behind bars after he participated in the 1991 failed coup to overthrow

Gorbachev, were driven by intense dislike or worse, but I don't think his words can be entirely ignored. In his memoir, Boldin described how Gorbachev, "for whom maneuvering had become a habit, was really taking two steps forward, three to the side, and one backward, and everyone found such conduct disconcerting… he had everybody confused." In another blistering comment Boldin said, "Gorbachev is a coward by nature."[45] Strong words from a bitter man who had turned against his boss of ten years.

But similar comments were made by Baklanov who described Gorbachev as a manipulator and schemer, writing, "Perhaps Gorbachev wanted to use the myth about the capabilities of SDI for certain purposes, such as foil for his later actions."[46] Very sour grapes, but not contradicted by the comprehensive and well-documented historical analysis of Vladislav Zubok, who wrote a most comprehensive description of the period. He quoted William Odom, who was the Director of the National Security Agency: "Gorbachev was an inveterate schemer, loquacious obfuscator, unable to anticipate the likely consequences of policy."[47] Zubok also quotes Anatoly Dobrynin, Soviet Ambassador to the US, that Gorbachev "had the emotional makeup of a gambler… was visible even in 1986 at the Reykjavik summit."[48]

So I surmise that Gorbachev could easily have changed his mind. He had the ad hoc optimism of the moment to hope things would work out, and it seems he lacked the inhibitions to be consistent with the position he had taken so forcefully at Reykjavik.

But why was Reagan so insistent that SDI was more important than his dream of abolishing nuclear weapons?

Reagan may have been acting out his part as the savior of his country and he had to fulfill his obligation to the American people to deliver the ultimate defense, like an umbrella in a rainstorm that would stop incoming nuclear warheads. Unfortunately, the reality was that even in the most optimistic outcome, that umbrella would be useless in the torrential downfall of an all-out nuclear missile attack.

Maybe Reagan's belief in fate and luck that he had demonstrated throughout his acting career[49] was not misplaced, since the start of a real Star Wars never occurred. Circumstance, incompetence, or luck played the key role in the outcome of the Energia launch, which suffered, ironically, a software glitch that probably saved both countries from a ruinous arms race.[50] Polyus went unceremoniously into the Pacific and was never seen again, and Gorbachev was saved from the inevitable US reaction and Soviet counter action.

WHAT ENDED THE COLD WAR?

The historian Pavel Podvig, after an extensive study of the comprehensive Soviet archives that appeared after the Cold War, argued convincingly that the vigorous attempt by Gorbachev to curtail SDI was really a fear of unleashing the powerful Soviet military industry complex on an uncontrolled Star Wars spending spree.[51] But if all of that is true, then what could Gorbachev have been thinking at the closing moments of the Reykjavik meeting that prevented him from realizing his goals to abolish nuclear weapons, and keep SDI within the bounds of the existing agreements? We will never know, but it could have been no more than the emotions of the moment and his sense of self-confidence. In Gorbachev's memoir, he did not admit making a single mistake. He barely mentioned strategic defense, or Reagan, although he certainly deeply believed in abolishing nuclear weapons. He said in his arms control proposal in January 1986 that to do away with all nuclear weapons was "not utopian after all … this noble and salutary goal is reachable, given the good will of all members of the international community."[52] He never indicated that the SDI had any impact on ending the Cold War, but instead wrote, "The Cold War was brought to an end thanks to Perestroika and the new thinking." He also made it clear that the "totalitarian system had run its course morally and politically, and a prolonged and potentially deadly period in world history, in which the human race had lived under the constant threat of nuclear disaster had come to an end."[53]

Zubock described the collapse as a failure of will to save "the empire they did not believe in, and for the empire they did not profit from. Instead of fighting back, the Soviet socialist empire, perhaps the strangest empire in modern history, committed suicide."[54] Maybe this self-inflicted wound was not that dramatic, but was just a compounding of very bad management. Boldin wrote, "By 1987, virtually the entire membership of the Poliburo had been changed, only to undergo another overhaul in 1990…utterly incapable of deciding or uniting anything at all – a sure sign that the collapse of the organs of government and of the entire party was imminent."[55]

Baklanov's role in the history of the Soviet Union reached a climax on August 18, 1991, when he and three of his right wing colleagues, including Boldin, as members of the "Gang of Eight" coup plotters, showed up at Gorbachev's dacha in the Crimea, and "nicely" but forcefully asked him to step aside so they could straighten out the mess that had become the Soviet Union. The August coup collapsed in a few days and the Soviet Union soon was to see its last days. This confrontation with Gorbachev was the culmination of a conflict with Baklanov, and indeed the entire Soviet military industrial complex.

The concept that one of the largest and most powerful countries in the world committed suicide because of its moral decay and mismanaged political institutions, rather than economic collapse or even a scientific and technology competition, as many claim, is profound. It is a warning about protecting and unifying the national social and political fabric as well as its military-based national security.

All Reagan had to do was agree to keep SDI "in the laboratory" for maybe ten years, or even less. There were plenty of technical challenges to keep all of us scientists and engineers very busy. There was plenty of wiggle room in the definition of the "laboratory" and the program could have proceeded for many years in the "laboratory," without disruption. The Soviets and Americans could have worked together in a shared environment that would have been accepted by the scientists and engineers on both sides. The problem of the trusted computer hardware and software to manage a shared system of early warning and response would likely have been one of the most difficult challenges, but would also pay enormous spin-off benefits for commercial applications. Getting the diplomats and military experts to go along would have required a level of trust that in itself would have constituted a revolution in international affairs.

Ultimately, the two leaders were hobbled by their own personalities and emotions of the moment, as well as the disinformation they had been given by their advisors. The US hard liners argued with Reagan that the Congress would not support a constrained R&D program. But my experience with arms control agreements of nuclear testing is that Congress tends to increase funding for laboratory research in spite of any limitations because of internal politics. Scientists and engineers are adept at arguing that we always need a hedge of new knowledge "just in case" somebody cheats. This is the sort of a not-so-subtle yet persuasive approach that has given laboratories the leverage they need to go along with arms control agreements and continue to receive substantial funding.

"The key was then – and is still – the art of empathetic communication between two very different cultures, but might have been possible between two men who were both dreamers and ideologues."

WHAT COULD HAVE BEEN

When Reagan and Gorbachev met at Reykjavik, the two world leaders could have agreed to end the nuclear danger – or at least started on an admittedly long and arduous journey toward total nuclear abolition. Neither of them had the backing from their supporters and assistants. Both were really on their own in dealing with what had to become enormous resistance from all political persuasions. The path forward would have required a leap of creativity and vision, widespread disarmament, economic aid or possibly a jointly or multi-national operated defense R&D laboratory, and possibly even the invention and realization of a shared space-based missile defense as first envisioned by Reagan. As a minimum, they could have agreed to develop a shared early warning system that would prevent accidents or warn of rogue nation actions by requiring that any launch of a missile be reported before it occurred.

A LESSON FOR THE FUTURE

And so ends my tragic tale of two men who desperately wanted to abolish nuclear weapons but ultimately failed to reach an agreement that could have changed the

world. MacFarlane said the SDI was a sting;[56] Keyworth called the directed nuclear weapons "unadulterated lies;"[57] and Baklanov called SDI a "hoax,"[58] but I suggest that, although all of these perceptions were somewhat real, they don't tell the story.

This story is a complex lesson about not just technology, but about politics, psychology, leadership, competition and control. Instead of SDI ending the Cold War, which was on its final path on its own, it stood in the way of an agreement to abolish nuclear weapons. Had we learned this lesson back in the 1980s, perhaps we could have taken remedial steps to begin to abolish nuclear weapons, and create a relationship of mutual understanding and trust that has escaped us even now. The key was then – and is still – the art of empathetic communication between two very different cultures, but might have been possible between two men who were both dreamers and ideologues.

The fallout from the momentary agreement at Reykjavik to abolish nuclear weapons was similar to that from Reagan's 1983 announcement of the Star Wars initiative to "make nuclear weapons impotent and obsolete." Both Gorbachev and Reagan shared a vision but neither had a realistic idea how to implement it, and it caught everybody, particularly the US Congress, off guard. Sam Nunn, one of the most respected arms control experts in the Senate, said "it would have been the most painfully embarrassing example of American ineptitude in this century."[59] The fight between the left and the right in both societies would have been furious, but, in my opinion, the route to an agreement was emerging and should have been seriously pursued.

The academics would have had to walk back their predictions in 1986 that "SDI has seen its last good days."[60] They would have had to get on with solving the technical challenges in a jointly managed program. The military/industry leaders who were lusting after new military programs would have found non-military challenges for application of their facilities and capabilities. The diplomats would all have been given satisfaction in continuing negotiations, and they would have found many ways to argue endlessly about the nuances of verification of agreements.

It might have taken years or decades, but maybe we could have aided what Alexander Yakovlev, Gorbachev's minister of propaganda, said in his history of the evils of Bolshevism the need for the "Russian psyche healing" process.[61] We might have avoided the resurgence of the Russian militaristic strategies and investments. It is now most likely too late, and the possibility of changing the Russian culture might be just a totally foolish concept. Maybe it was just an unrealistic dream after all. We now see that the nuclear arms race is heating up again. The Soviets have improved their ICBM capabilities as evidenced in 2015 by their test firing of the ten-warhead payload, submarine-launched Bulava missile, which has advanced countermeasures against ballistic missile defense. They even developed a decoy to "mimic all features of warhead's signature"[62] This capability is even more worrisome when we take into consideration increasing Russian emphasis on nuclear weapon use, and that Gorbachev last year warned that the world is "on the brink of a new Cold War."[63] In addition we now are witnessing a continuing threat from nuclear weapons proliferation.

My conclusion is that Reagan had a vision to abolish nuclear weapons and share the as yet non-existent SDI with Russia and eventually the world. Gorbachev had a determination to stop the dominance of his own military industrial complex that stood in the path of fundamentally changing his society. Both were driven by their own ideologies that had little useful support from their political and military advisors. Scientific advice was realistic and credible to other scientists, but irrelevant to the decision makers. Gorbachev's dilemma was the legacy of totalitarian rule on domestic psychology and the economic/technological backwardness from the lack of economic competition. Reagan's problem was the lack of a national or global acceptance of a world without nuclear weapons. They were both visionaries who never bothered to think about the details. Any compromise would still have required that the two leaders convince their own societies that cooperation would be more beneficial than continued confrontation. They almost changed the world, but missed the opportunity in the fleeting moment at Reykjavik.

NOTES

1. John Lewis Gaddis, *U.S. and the End of the Cold War* (New York: Oxford University Press, 1992) p.43-44.
2. Nigel Hey, *Star Wars Enigma* (Herndon: Potomac Books, 2006) p. 225.
3. Ken Adelman, *Reagan at Reykjavik* (New York: Harper Collins Books, 2014) p.106.
4. James R. Schlesinger, National Security Issues Symposium, 1984.
5. Harold Brown, "Is SDI Technically Feasible," *Foreign Affairs*, 1985.
6. William J. Broad, *Teller's War* (New York: Simon & Schuster, 1992) p. 289.
7. M.A. Gareev, The USSR in the Mid-1980s: Structural Factors, in Ellman and Kontorovich *The Destruction of the Soviet Economic System an Insider's View* (Armonk, New York: M.E. Sharpe Inc, 1998) p.57.

8. Gerold Yonas and Jill Gibson, "Sword of Heat", *STEPS*. Issue 1.
9. Daniel S. Greenberg, *Science, Money, and Politics* (Chicago: University of Chicago Press, 2001) p. 292.
10. Willion J. Broad, p. 278.
11. Nigel Hey, p.219.
12. Roald Sagdeev, *The Making of a Soviet Scientist* (Toronto: John Wiley and Sons, 1994) p. 205-206.
13. V. V. Shlykov, The USSR in the Mid-1980s: Structural Factors, in Ellman and Kontorovich *The Destruction of the Soviet Economic System an Insider's View* (Armonk, New York: M.E. Sharpe Inc, 1998) p.57.
14. Gerry Yonas, "The Politics and Science of Weapons in Space", *Physics Today*, June, 1985; "Can Star Wars Make us Safe" *Science Digest*, Sept, 1985; "The Strategic Defense Initiative", *Daedalus*, 114:2.
15. George Shultz, *Turmoil and Triumph* (New York: Scribner's, 1993) p. 716.
16. Sidney D. Drell and George P. Shultz, "Implications of the Reykjavik Summit, 2007.p. 48.
17. M.A. Gerasev, in Ellman and Kontrovich, pp. 58-59.
18. Drell and Shultz, p. 48.
19. Evgeny P. Velikhov, ed. Shanti Blees, trans. Andrei Chakhovskoi, *Strawberries from Chernobyl* (CreateSpace Independent Publishing-Platform, 2012), p.265.
20. Drell and Shultz, p. 53.
21. Drell and Shultz, p. 53.
22. *Ibid*, p. 53.
23. *Ibid*, p.54.
24. *Ibid*, p. 58.
25. *Ibid*, p. 60.
26. M.A. Gareev, in Elman and Kontorovich, pp. 60-61.
27. Gus W. Weiss, "The Farewell Dosier, Duping the Soviets," CIA Library, 2007. Available at: https://www.cia.gov/library/center-for-the-study-of-intelligence/csi-publications/csi-studies/studies/96unclass/farewell.htm.
28. Drell and Shultz, p. 61.
29. *Ibid*, p. 64, 76, 77, 94.
30. Oleg Baklanov, Interview with Oleg Skvorsov, Oral History of the Cold War, Feb, 1999.
31. V. Mikhailov, *I am a Hawk* (Pentland Press, 1996), p. 84.
32. *Ibid*, p. 95.
33. Baklanov interview.
34. Alexander Yakovlev, memo to Gorbachev, Feb, 1987.
35. Ashton Carter, "The Relationship of ASAT and BMD Systems", *Weapons in Space*, 1986, p.183-185.
36. P.V. Zarubin, "History of High Energy Lasers and Laser Based Systems", 2004.
37. Baklanov interview.
38. US State Dept Memorandum of Conversations, Oct 11-12, 1986, Reykjavik.
39. Ken Adelman, *Reagan at Reykjavik, Forty Eight Hours that Ended the Cold War* (New York: Broadside Books, 2014), p.153.
40. US State Dept Memorandum of Conversations, Oct 11-12, Reykjavik.
41. *Ibid*.
42. Konstantin Lantratov, trans. Asif Siddiqi, The 'Star Wars' Which Never Happened," *Quest Magazine* 14, no 1 (2007), and Dwayne A. Day and Robert Kennedy III, "Soviet Star Wars," *Air and Space* Jan 2010).
43. *Ibid*.
44. V. Boldin Interview with Skortsov, Oral History of the Cold War, Feb. 1999.
45. Boldin Interview and *Ten Years That Shook the World* (New York: Basic Books, 1994), p.185.
46. Baklanov interview.
47. Vladimir M. Zubok, *A Failed Empire* (Chapel Hill: University of North Carolina Press, 2007), p. 314.
48. Vladimir M. Zubok, quotes Dobrynin, p. 328.
49. quote from Deaver, in: Francis Fitzgerald, *Way Out There in the Blue* (New York: Simon & Schuster), p. 370.
50. Konstantin Lantratov, trans. Asif Siddiqi; Dwayne A. Day and Robert Kennedy III.
51. Pavel Podvig, "Did Star Wars Help End the Cold War," *Russian Nuclear Forces Project*, March (2013).
52. Mikhail Gorbachev, *On My Country and the World* (New York: Columbia University Press, 2000), Kindle location: 3639.
53. *Ibid*, Kindle location: 3827.
54. Zubok, p. 344.
55. V. Boldin, Interview by Oleg I. Skvortsov, Oral History of the Cold War. Feb. 1999 and *Ten Years That Shook the World*.
56. Brock Brower, "Bud-McFarlane: Semper Fi" *The New York Times Magazine*, Jan 22, 1989.
57. Daniel S. Greenberg.
58. Oleg Baklanov, Interview with Oleg Skvorsov.
59. Francis Fitzgerald, p. 353.
60. Klaus Gottstein, *SDI and Stability* (Baden-Baden: Nomos Verlafsgesellschaft, 1988), p. 97.
61. Alexander Yakovlev, *A Century of Violence in Soviet Russia* (New Haven: Yale University Press, 2002), p.235.
62. Igor Sutyagin, "Ballistic Missile Defense, Russian Actions and Counteractions," RUSI BMD Conf, June, (2015).
63. Mikhail Gorbachev, Nov. 8, 2014.

Image credit: US Federal Government (Biography of Lt Gen James A. Abrahamson, USAF), PD.