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The Prometheus Bomb

Neil J. Sullivan

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THE PROMETHEUS BOMB

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THE PROMETHEUS BOMB

The Manhattan Project and Government in the Dark

NEIL J. SULLIVAN

Potomac Books

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Set in Minion Pro by John Klopping.

For Joyce, Kate, Tim and Olivia, and Mo

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Understanding government power has been a lifetime interest. How do communities organize themselves so that they can solve problems and promote common interests? How do we balance the interests of the community and the individual? What processes do we use to make decisions so that we can act efficiently while also giving proper consideration to people who may not have the wherewithal to participate in civic life? I am grateful to all the people who have helped me appreciate the complexity of those questions, beginning with my parents, who kept the spirit of Franklin Roosevelt alive in our home.

At Baruch College–City University of New York, Diane Gibson, Rita Ormsby, Steve Savas, and Jerry Mitchell are friends and colleagues who set the standard for teaching, scholarship, and service. Thousands of students over thirty-eight years have inspired my curiosity and reflection about public affairs. Students and faculty are served by a staff that is a privilege to know.

Jane Dystel and Miriam Goderich are my friends and agents who took an inchoate sentiment and helped me turn it into an idea. Their contribution to seeing the essential political issues in the curious world of the atom was especially welcome.

Other companions have been enormously helpful through their thoughts about government, science, writing, and other subjects germane to this book. Jean Huff is a fellow writer and attorney who has been encouraging through her own example. Kenny Greehan serves the City of Yonkers with distinction and has had intriguing observations about the wonderful city where my family and I live. Joe Cianciulli is our chairman of the Yonkers Zoning Board of Appeals, a post from which he has paid particular attention to the interests of the people who so often are ignored in their struggles.

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James Jond is my friend and teacher who is not responsible for my failure to master his lessons on the golf swing. Deborah Roche has given me some clarity about why I struggle with James's wisdom, and, whatever happens with par, her friendship is a great gift.

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Kristen Rowley at the University of Nebraska Press was an early champion of the book. Tom Swanson and Emily Wendell are the editors who have guided the manuscript through the publication process. Jeremy Hall has provided the haircut the manuscript needed, through superb copyediting.

The Prometheus Bomb is a book about World War II, and that conflict is as close as some of the people dearest to me. Dan Fenn left Harvard for the Army Air Corps in 1943 to serve in the European theater. He returned to Cambridge, was appointed to the White House staff by President John F. Kennedy, became the founding director of the Kennedy Presidential Library, and continues teaching at Harvard and elsewhere, still the youngest person in whatever room he's in.

Tim Ireland served our country through the "long, twilight struggle" of the Cold War and the current challenges. He and his sister Kathleen have been treasured friends since our college days. Their father, Dr. Robert Ireland, served in the Pacific during World War II as a surgeon before returning home to marry the wonderful Joan and to extend kindness to those who knew him.

Colin Cooke was a friend, writer, and neighbor who sang as the sole chorister at the coronation of King George VI, served as an engine machanic in the RAF during the war, and whose first born, another Colin, can boast of being the founder of our neighborhood's Sunday Cigar Seminar.

Al Nocella is the son of Staff Sergeant Nocella, another Al, who was drafted in 1940 with the expectation that he would be serving until 1942. Pearl Harbor extended his service for the duration, and he was sent to Europe in March of 1945. He returned to America after the war, married the marvelous Eleanor, and raised three splendid children.

Ron Yoshida has been a friend since our days at Loyola High School in Los Angeles, where we took classes from Mr. Bill Lenihan that put the questions about government, history, and writing in a permanent place in our lives. Ron serves the country by helping people in the Middle East work on education reform. His parents, Robert and Yoshiye Yoshida, both born in the United States, were sent to internment camps during World War II because of the country where their forebears were born, a distinctly un-American act. They returned from the camps to raise a wonderful family and contribute to their friends and neighbors.

Emile Vaessen, born and raised in Belgium during the war, is the son of Leonie, who smuggled small arms for the Resistance and raised her six children while the Gestapo occupied their home. Emile's cousin, Ivan Hotchamp, died a hero's death, executed during the war for his Resistance efforts. Emile himself was saved by U.S. Army doctors after a gasoline explosion. He has been a devoted husband, father, and grandfather and has built a successful business of his own—that success is especially reflected in the regard and affection that his friends have for him.

Closer to home, Joyce is the daughter of Thomas H. Murray, who went to the Pacific at the age of seventeen. He returned; married the delightful Carolyn; raised six children, including the extraordinary Joyce; and brought particular joy to family, friends, and neighbors through his participation in community theater and a town garden.

I have been blessed beyond measure by sharing life with Joyce. Kate and Tim showed up and visited for about twenty years, staying

connected now with the adventures of their marvelous and admirable lives. Kate has taken the family back to the West Coast, where she is forging a career in animation. Tim is also west of the Hudson, in New Jersey. He gave our family a Brazilian branch through his marriage to Olivia, our third child, who is developing an online presence in the art of cooking while Tim pursues Information Technology. Through much of the time researching and writing the book, our beloved cat Mo was a center of attention as he battled the illness that took him from us. He taught the great lesson that what matters most in life is doing the next act of kindness. I dedicate this book to my wonderful family.

THE PROMETHEUS BOMB

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Introduction

$E=mc^2$ in the hands of Adolph Hitler. In the summer of 1939, that nightmare was on the minds of two Martians as they drove through the North Fork of Long Island hoping to get the signature of the one man who might forestall catastrophe.

Leo Szilard and Edward Teller were fellow Hungarians, fellow physicists, and fellow Jews who fled Germany after they received PhDs and before the Nazi vise tightened. Both delighted in the tale that so many geniuses hailed from their native Budapest because they were descendants of visitors from the neighboring Red Planet passing among us as Magyars.¹

As they raced along Route 25, Szilard and Teller knew that German scientists were among the pioneers of quantum physics, that ample quantities of fissile uranium had come under the control of the Reich, and that the combination of knowledge and material could produce a bomb that would lead to swastikas flying over the capitals of Europe.

Making a right turn onto Skunk Lane in Cutchogue, Szilard and Teller were a couple of miles from the summer residence of Albert Einstein. The drive was a return trip for Szilard, who had visited Einstein a few weeks before with Eugene Wigner, another Hungarian physicist. Szilard's familiarity with the area meant that he and Teller would find the house on Old Grove Road without getting lost on Nassau Point, the custom for first-time visitors looking for the great man.

The purpose of the trip was to try to wrap up a letter that Szilard needed to send to somebody in authority to sound the alarm about a Nazi bomb. He realized that, if he contacted a public official directly, the reaction he could expect would be, "Who the hell is Leo Szilard?"

Not only was Einstein the most famous scientist in the world, but he also knew everybody. And somewhere in his collection of admirers was the person to whom the letter should be sent.

The queen of Belgium was a possibility. Her country had colonized the Congo, where vast supplies of the crucial element uranium-235 were held, a relatively easy target for Nazi extraction. Einstein had met her, but he thought a minister in the Belgian government was a more sensible choice. Learning of that idea, Wigner countered that, with Europe on the brink of war, immigrants contacting a foreign official without going through the State Department could be hard to explain to a congressional committee.

Showing that genius has its limits, Einstein and company prepared to ask Charles Lindbergh to carry the message to Franklin Roosevelt. They soon realized that the Lone Eagle was busy crafting a national address that trumpeted the wisdom of isolationism and, unable to repress his antisemitism, hinted at the patriotic duty of the barons who controlled American media to refrain from luring the nation into war.

Alexander Sachs turned out to be their man. He knew FDR personally, having written speeches on economics for him in the 1932 campaign. Sachs determined that the letter was too important for him to limit himself to being its postman. He told Einstein and Szilard that he not only would deliver the letter himself but would explain its contents to the president, lest its message die a common bureaucratic death.

Weeks passed with no word from Sachs. What could possibly be holding up a matter of such urgency? Sachs was looking for the right moment when the president would have the time and focus to absorb the ominous news. The opportunity came finally in the middle of October. After hearing Sachs, FDR commanded, "This requires action," setting in motion what would become the Manhattan Project.

None too soon. Six weeks before, the German army had rolled into Poland, turning a question of theoretical physics into a race for the decisive weapon of the war.

The Prometheus Bomb reveals a vacuum of leadership in the research and development of nuclear weapons during World War II. Who

assessed the costs and risks of building the atomic bomb? Who chose the most effective strategy for building the weapon? Who decided how to pay for it? Personnel issues? Location? Security? Who balanced all those considerations against competing claims elsewhere in the war effort? The answer is many people, thus no individual. Franklin Roosevelt made the ultimate decisions in the Manhattan Project, but his inability to comprehend the science at the heart of the effort meant that his determinations consisted of best guesses and trust in subordinates rather than informed judgment.

The Manhattan Project was the first case of a new type of challenge for the American republic. Our government must now fashion public policy for issues where a small group of brilliant scientists affect the entire population with discoveries and inventions that could secure or threaten our existence and our future. Bioengineering can target the human brain, alter livestock beyond nature's constraints, and create artificial life. Economic development and convenience in one part of the planet may trigger environmental disasters elsewhere. Combinations of robotics and artificial intelligence (AI) may force us to consider the meaning of *human*. In these and related questions, who should make the critical decisions, and by what process? The question is especially urgent with the nation's survival at stake.

In the American community, public policy had been the realm of politicians and bureaucrats. Those officials supervised even great engineering projects. Without grasping all the details, they understood rail transportation within cities and across the nation. A ditch through Central America? Sure. Flying machines? You bet. The Manhattan Project introduced new actors in policy making because Franklin Roosevelt had no capacity to supervise Nobel Prize winners while they penetrated the essence of matter and energy. The president did have capable subordinates like Vannevar Bush, Leslie Groves, and Henry Stimson. Their backgrounds in engineering, warfare, and diplomacy prepared them to manage the alpha males in science, industry, academics, and the military who tackled perhaps the greatest engineering challenge in history. But not one of those aides alone had sufficient knowledge or authority to oversee every aspect of the Manhattan Project.

The collaboration of experts from different fields repeatedly faced

complications from contending personalities and professional cultures. It fell to American government to control the turmoil of those rivalries, to keep the talent and resources focused on a weapon that might be necessary to America's survival, and to do so without abandoning the values for which the nation fought.

In this case, "American government" means Franklin Roosevelt. We will see him set a tone for the people in his administration that facilitated a bristling exchange of ideas followed by confidence, win or lose, in the decision reached. Army brats worked with scions of the Eastern Establishment. Some Nobel physicists worked relentlessly on an atomic bomb that they later argued should not be used. Some military officers counseled against dropping the bomb on Japan and were countered by career politicians using a different calculus. Nobody won every bureaucratic battle, but strong egos had the humility to accept the decisions that they had opposed. Politics, even in the most urgent circumstances, was an art practiced energetically and gracefully, a reflection of FDR.

The story of the Manhattan Project is a story of war, so it is a tragedy. Heroes abound, and they can be celebrated without becoming depressed about our own times. The 1940s also included nature's usual share of deplorables and knuckleheads, so we can look back for inspiration and encouragement rather than despair that we fall short of our own heritage.

We find much to consider in that retrospective: Leslie Groves, the army engineer, returning from his initial meeting with Vannevar Bush, the MIT engineer, bewildered by Bush's own befuddlement. For his part, Bush was on the phone stopping just short of trying to get Groves fired. We find Henry Stimson, the patrician secretary of war, bristling when Dwight Eisenhower explained why we shouldn't drop atomic bombs on Japan, a position with which Stimson agreed. We read that Stimson and Groves contended for weeks over targets in Japan and then that Groves expressed gratitude to the secretary for arguments that reduced casualties. We puzzle that all but a handful of members of Congress were kept in ignorance about the Manhattan Project while Soviet spies strolled about Los Alamos. Not puzzling at all, we see Congress furiously reengage at the end of the war to battle the executive for control of policy and

programs. We discover the public implications of the great friendship between Franklin Roosevelt and Winston Churchill, especially poignant for being forged in war. We read as the story shifts from FDR pressing through rapidly declining health to secure the postwar world to Harry Truman picking up the mantle, carrying through to the war's conclusion, fighting a revived Congress, and laying the foundations for the Cold War.

If we struggle to assume honor, wisdom, and courage in America's public officials, we might at least assume sincerity. The questions remain: How did a president and a few members of Congress manage scientists whose work was incomprehensible? Could a public, whose taxes sustained that scientific work and whose lives were jeopardized in some of the experiments, know about the endeavor when secrecy was paramount? If they did know, how could they understand the issues before them? In short, how can we trust or control experts when we have no idea what they're talking about?

We live with the legacy of the Manhattan Project beyond even the thousands of nuclear warheads that are stockpiled about the planet or the efforts of turbulent regimes and terrorist groups to obtain those weapons. Building the bomb also established patterns of authority, models of organization, and a culture of secrecy that were harbingers for a type of public choice that has been with us since a shattered Japan surrendered on the deck of the USS *Missouri*.

Until the Manhattan Project, public works in America confined their potential catastrophes to folks in the neighborhood. If the dam burst, the train derailed, the schoolhouse caught fire, or the bridge collapsed, the immediate pain was local. If you didn't live below the lake or next to the tracks, if your kids weren't in that school, or your car on that bridge, your reaction would be relief and compassion: "Glad it wasn't us" and "Oh, those poor people." The Manhattan Project changed that calculus by introducing a new kind of disaster, one that removed the physical limits of tragedy.

Releasing the energy within the nuclei of atoms meant that the initial explosions and the subsequent radiation could conceivably reach every corner of the globe. Natural barriers such as oceans, mountains, and deserts once protected some people from the con-

flicts of others. Neutrality or a treaty with a powerful noncombatant state might keep a nation safe. But given enough countries at war and enough nuclear weapons at their disposal, nature would provide very few places to hide, and a treaty would likely be incinerated in the first exchange.

In the nuclear age, billions of people have been affected by the decisions of a very small band of officials. Just as significant, if the public did have access to the key issues, the opportunity would have been pointless. In a nuclear war, retail clerks, ballerinas, and Wall Street traders would not understand the weapon that killed them, but they would be every bit as dead as the geniuses who conceived the bomb. So, are we condemned to government in the dark where the most ominous decisions in science, ones of life and death significance for all of us, remain in the hands of a gifted few?

Two thousand years ago, Juvenal asked a question that James Madison would have appreciated: *Quis custodiat ipsos custodes?* Who guards the guardians? In our system of government, the answer is, “We do.” But how do we do so when the guardians’ work involves concepts and vocabulary that the rest of us are unable to understand?

Ask a financial adviser where to put your money. Talk to a guidance counselor about the middle school years. Call the Building Department about adding a deck to your house. Listen to a mechanic tell you whether your car is worth that repair. Entirely common experiences, but never mundane. Routine though these interactions are, we generally need experts to help us navigate them.

If we’re baffled by municipal bonds, the adolescent brain, rear yard setbacks, or power trains, more complexity is coming in the years ahead. Who will decide if we should be the objects of surveillance by satellites of the National Security Agency or by drones of the local police? Craig Venter’s labs have fashioned synthetic bacteria. How far into the animal kingdom can that technology penetrate? Robotics, artificial intelligence, and genetic engineering will force us to wonder about the meaning of *human* with more urgency than we do when considering hominid fossils from the Rift Valley.

As C. P. Snow famously put the matter, “It is dangerous to have two cultures which can’t or don’t communicate. In a time when sci-

ence is determining much of our destiny, that is, whether we live or die, it is dangerous in the most practical terms. Scientists can give bad advice and decision-makers can't know whether it is good or bad.”² He concluded that we were following the news from science, “as though listening to a foreign language in which one only knows a few words.”³ The danger to which Snow referred began with atomic fission.

The Manhattan Project was the first of a new type of public choice: life and death on a national scale. The effort began out of a fear that Germany would be the first combatant to develop an atomic bomb. Even after we saw that we would not be the target of an atomic attack, we pressed ahead as the bomb consumed resources, pushed aside other priorities, engendered secrecy, and likely ensured that we would never again disband our military after hostilities ceased.

Building the new type of bomb was an intriguing story with great significance for the outcome of World War II and for the future of life-altering science in our nation. The history of the Manhattan Project can be especially instructive as we again strike a balance in our government between authority and restraint in the face of scientific challenges the framers of the Constitution could not have imagined.