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Project Vanguard and Ike's "Space for Peace"

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Introduction

On December 20, 2019, U.S. President Donald Trump founded the U.S. Space Force, the newest military branch since the creation of the U.S. Air Force in 1947. He was apparently responding to the rising threats from Russia and China, who are rumored to be developing their own space capabilities. Three decades after the error of Ronald Reagan's Strategic Defense Initiative, Star Wars is now a distinct possibility. The formation of the Space Force symbolized a departure from a principle the United States had upheld for decades—that space should be free from all weapons and open to all nations. This principle, commonly called "space for peace," now seems to be falling into oblivion.[1]

This article traces the origins of "space for peace" to Dwight D. Eisenhower's presidency. In February 1955, the Technological Capabilities Panel (TCP) at the Science Advisory Committee (SAC) submitted a report, which proclaimed that "a satellite would constitute no active military offensive threat" and that "space, outside our atmosphere, is open to all [nations] ('freedom of space')."[2] This

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1. "Space dominance" is now an important point of discussion regarding the Space Force. Trump said that space is "the world's newest warfighting domain" in December 2019 at a ceremony at Joint Base Andrews. Valerie Insinna, "May the Space Force be with you. Here's what we know about the U.S. military's newest service." *Defense News,* December 20, 2019, https://www.defensenews.com/breaking-news/2019/12/21/may-the-space-force-be-with-you-heres-what-we-know-about-the-us-militarys-newest-service/ (accessed June 3, 2020).

2. Eisenhower established the TCP in 1954, under the SAC (Science Advisory Committee) in the Office of Defense Mobilization. Forty-two scientists and engineers on the TCP investigated the chance of surprise attack by the Soviets using a hydrogen bomb. It warned of U.S. vulnerability and recommended accelerated development of ICBM (intercontinental ballistic missile) and IRBM (intermediate-range ballistic missile), as well as improved capability in information gathering. See James R. Killian Jr., *Sputnik, Scientists, and Eisenhower: A Memoir of the First Special Assistant to the President for Science and Technology* (Cambridge: The MIT Press, 1977); "Meeting the Threat of Surprise Attack

report marked the beginning of "space for peace." The two key concepts articulated by the TCP report became an official policy that May in NSC (National Security Council) 5520 and was titled "U.S. Scientific Satellite Program."[3] The term "space for peace," the mantra of Eisenhower's space policy, first appeared in a 1956 policy paper prepared by Richard Leghorn, a consultant to Eisenhower's Assistant for Disarmament Affairs, Harold Stassen.[4] This paper championed such broad ideas as non-militarization/weaponization of space, space open for all mankind, and United Nations control to use space for peaceful purposes.[5] Underlying these developments was a military necessity in the late 1950s: Washington had to keep the Soviet missile program in check by flying reconnaissance satellites collecting Soviet military intelligence. The "freedom of space" meant the freedom of spying.

"Space for peace" was more than a discursive fig leaf. With NSC 5520, the United States decided to participate in the satellite program by the International Geophysical Year (IGY), an international scientific cooperation scheme that lasted between July 1957 and December 1958. The IGY was intended to encourage scientists worldwide to jointly study the Earth's geophysical properties. Among thirteen or more programs, the IGY in particular focused on the Antarctic and space projects.[6] First espoused by American scientists as an international scientific endeavor, the U.S. participation in the IGY came under the jurisdiction of the Department of Defense (DOD), in cooperation with the National Science

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Technological Capabilities Panel," February 14, 1955, "NSC 5520 TCP (3)" Folder, Box 16, NSC Series, Policy Papers Subseries, White House Office (hereafter: WHO), Office of the Special Assistant for National Security Affairs (hereafter: OSANSA), Dwight D. Eisenhower Library (hereafter: DDEL), Abilene, Kansas, 146–48.

3. NSC 5520, "U.S. Scientific Satellite Program," May 20, 1955, "Outer Space (1)" Folder, Box 38, NSC Series, Policy Papers Subseries, WHO, OSANSA, DDEL, 6.

4. This paper showed that the "space for peace" campaign involved a scientific satellite program and international arms control measures using reconnaissance satellites. It suggested that a "space for peace" policy would serve the purposes that "enhance world opinion of U.S. technological strength," "better identify the U.S. as the pursuit of peace," and "insure the reconnaissance satellite will not be vulnerable to Soviet political counter measures." "The Reconnaissance Satellite and 'space-for-peace' Political Action," undated, "Space Satellite July 1956–February 1960" Folder, Box 3, WHO, Office of the Special Assistant for Science and Technology, DDEL.

5. Sean N. Kalic defines Eisenhower's "space for peace" as the non-militarization/weaponization of space and civilian space programs led by the National Aeronautics and Space Administration (NASA). Sean N. Kalic, *US Presidents and the Militarization of Space, 1946–1967* (Collage Station: Texas A&M University Press, 2012), 59.

6. Rip Bulkeley, *The Sputniks Crisis and Early United States Space Policy: A Critique of the Historiography of Space* (Bloomington: Indiana University Press, 1991), 3. See also Yanek Mieczkowski, *Eisenhower's Sputnik Moment: The Race for Space and World Prestige* (Ithaca, NY: Cornell University Press, 2013), 36.

Foundation (NSF), an independent government agency supporting fundamental research and education. The DOD viewed the IGY as a Trojan horse, aimed at establishing the "freedom of space" under the disguise of peaceful scientific cooperation. U.S. involvement in the IGY satellite project was codenamed Project Vanguard. As it turned out, Project Vanguard provided a scholarly platform to catapult "space for peace" into the lexicon of international space development.[7] The phrase changed from a national security pretext into a universal norm.

"Space for peace" had duel purposes diametrically different from each other—one military, the other scientific—and the contradiction between the two surged after October 4, 1957, the day when the Russians took the world by surprise with the launch of Sputnik 1. The U.S. Air Force tried to use the event as leverage to wrest control of U.S. space policy and become the nation's space force.[8] Eisenhower did not budge, however. He maintained "space for peace" as the core principle of U.S. space policy, with the same dual purposes. Since then, "space for peace," with the National Aeronautics and Space Administration (NASA)-led civilian space programs at its core, had endured as the cornerstone of U.S. space policy until the Trump administration trashed it sixty years later.

How did Eisenhower pull it off? How did "space for peace," such a euphoric concept, survive the Sputnik Shock and the Cold War arms race? This article answers these questions by focusing on the agency of scientists—those at the NSF and the Office of Naval Research (ONR), who informed the IGY. They made bottom-up contributions to Project Vanguard, a peace-oriented scientific satellite program, distinct from what was envisioned in NSC 5520, which focused on the "freedom of space" to legitimize reconnaissance satellites. By focusing on the leap in U.S. space strategy from NSC 5520 to Project Vanguard, this article explains how Eisenhower kept "space for peace" alive even after Sputnik.

This article is comprised of five parts as follows. The first section briefly surveys the literature on early U.S. space policy, with an emphasis on the impact of the 1957 Sputnik Shock. The second section discusses the decision-making process for NSC 5520 and the objectives pursued by American IGY scientists, in variance with those of high-level policymakers like Eisenhower and DOD officials. The third section describes the process by which Project Vanguard was voted on by the Stewart Committee's selection of the rocket. The fourth section examines the expanding role of the scientists, who set scientific achievements as

7. In a 1959 memo, Eisenhower said that the American IGY project had acquired real scientific value (the Van Allen radiation belts, solar "hot spots," and the Argus effects) and that "we are establishing an excellent record" in terms of the peaceful use of outer space. "Memorandum for national space program," October 12, 1959, "NASA [September 1958–January 1961] (7)" Folder, Box 18, WHO, Office of the Staff Secretary, Subject Series, Alphabetical Subseries, DDEL.

8. Kalic, *US Presidents and the Militarization of Space*, 40.

the primary objective in Project Vanguard. This article concludes that this bottom-up decision-making process, in which scientists almost possessed a veto over Eisenhower, ensured that U.S. space policy be insulated from the influence of the military even after the Sputnik Shock.

I: Existing Scholarship

The literature on Eisenhower's foreign policy dates back to the 1980s, when "Eisenhower revisionists" began to positively reappraise his leadership and achievements.[9] In contrast to Eisenhower's previous public image as a golf-playing president who heavily depended on Secretary of State John Foster Dulles, revisionists acknowledged the president's self-restraint and crisis-control capability in avoiding nuclear war with the Soviets, although he could not rein in the nuclear arms race. More recent studies have analyzed Eisenhower's wisdom in a more cautious light. While acknowledging his leadership, the post-revisionists focused on concrete issues in his foreign policy.[10] Kenneth Osgood, for example, examined many aspects of Eisenhower's psychological warfare with the Soviets, from Radio Free Europe to atoms for peace to cultural exchanges.[11]

The Sputnik Shock of 1957 was one of the themes that preoccupied both revisionist and post-revisionist scholars. They have now reached a broad consensus that Eisenhower's space policy did not aim to make the United States the first nation to launch and orbit a satellite, hence no "defeat" in the space race. To be sure, the Sputnik Shock shook America by raising public concern that it might be lagging behind the Soviets in space science (the "space gap") and missile development (the "missile gap"). The latter, in particular, had a serious impact not only on domestic politics, but also on the U.S. credibility with its allies, because the ability to launch a satellite was directly linked to the ability to launch a nuclear missile.[12] In fact, the Soviets had already succeeded in their first ICBM (intercontinental ballistic missile) test in August 1957, two months before Sputnik 1.

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9. Robert A. Divine, *Eisenhower and the Cold War* (Oxford: Oxford University Press, 1981); Fred I. Greenstein, *The Hidden-Hand Presidency: Eisenhower as Leader* (Baltimore: Johns Hopkins University Press, 1982); Robert R. Bowie and Richard H. Immerman, *Waging Peace: How Eisenhower Shaped an Enduring Cold War Strategy* (Oxford: Oxford University Press, 1998).

10. Robert J. McMahon, "Eisenhower and Third World Nationalism: A Critique of the Revisionists," *Political Science Quarterly* 101, no. 3 (1986), 453−73.

11. Kenneth Osgood, *Total Cold War: Eisenhower's Secret Propaganda Battle at Home and Abroad* (Lawrence: University Press of Kansas, 2006).

12. "Missile gap syndrome" steadily increased defense spending despite Eisenhower wanting to balance the budget. It also drove him into a corner in the 1958 election because Senator John F. Kennedy criticized the president as prioritizing economic strength over military strength. See Mieczkowski, *Eisenhower's Sputnik Moment*, 178.

Sputnik seemed to debunk the U.S. image as a leader in science and technology, military or non-military. The United States was "defeated." This false impression, argued post-revisionists, derived from Eisenhower's failure to reassure the public that there was no such thing as a "space race."[13] Misleading as it was, the "defeat" overshadowed U.S. space policy and fueled the nuclear arms race, as well as the prestige race.

No firm consensus exists, however, on the purpose of Eisenhower's satellite project. According to the conventional perspective, Washington intended the space program to be a crucial part of the missile race with Moscow, while highlighting its peaceful nature to conceal the real intention.[14] Surveying Eisenhower's early space policy, Walter McDougall and Cargill Hall argued that the most important U.S. goal in the IGY satellite program was to establish "freedom of space" to legitimize reconnaissance satellites. The U.S. satellite program "lost" to Sputnik because high-level U.S. policymakers, aware of the legal and political delicacy of satellite overflight, tried to achieve "freedom of space," not to launch the satellite sooner than the Soviets. Had Washington hoped to outcompete Moscow in the race to space, it would not have invested in a civilian-led, technologically-uncertain rocket project by the Naval Research Laboratory (NRL), since the army's missile-oriented rocket project would have taken American satellites out of the Earth much faster.[15]

Taken for granted in McDougall and Hall's analysis was a top-down decision-making process, in which Eisenhower and DOD officials mobilized scientists to serve the U.S. national interest as they perceived it. Recent studies have put this into perspective. Historians Matthew Bille, Erika Lishock, and Michael Neufeld emphasized the role of scientists in Eisenhower's key decisions, including the selection of the navy's proposal for Project Vanguard. In preparing for the IGY, scientists in the Eisenhower administration concerned themselves with maximizing the technological accomplishments for scientific progress, not with solving the "freedom of space" problem for reconnaissance satellites. Bille, Lishock, and Neufeld concurred with McDougall and Hall that "freedom of

13. Ibid.

14. Sasaki Takuya, *Aizenhawa seiken no huujikome seisaku* [The Eisenhower Administration's Containment Policy: The Soviet Threat, the Missile Gap Controversy, and East-West Exchanges] (Tokyo: Yuhikaku, 2008); Nagai Yuichiro, "Aizenhawa seiken to Amerika no uchukaihatsu seisaku," ["The Eisenhower Administration and U.S. Space Policy: Focusing on NSC 5520"], *Daigakuin Ron Shu* (Shizuoka: The Bulletin of Nihon University College of International Relations), 17 (2007), 16–31.

15. Walter A. McDougall, *The Heavens and the Earth: A Political History of the Space Age* (New York: Basic Books, 1985); R. Cargill Hall, "The Origins of U.S. Space Policy: Eisenhower, Open Skies, and Freedom of Space," in *Exploring the Unknown: Selected Documents in the History of the U.S. Civil Space Program*, ed. John M. Logsdon, vol. 1 (Washington: NASA, 1995), 225–33.

space" was the highest priority for Eisenhower, but they attributed the scholarly nature of the IGY project to the scientists' strong desire for a more sophisticated satellite. In the course of the IGY, scientists swayed policymakers, and scientific sophistication trumped propaganda effect. And this precipitated the Sputnik Shock.[16]

For Bille, Lishock, and Neufeld, Project Vanguard was a failure. The growing influence of scientists caused delays and increased the cost, allowing the Russians to beat the Americans in the race to space. On the whole, the existing literature, whether focusing on policymakers or scientists, explains the making of the Sputnik Shock, while missing the crucial link between Project Vanguard and "space for peace," a link constructed by scientists. The IGY program failed to launch a satellite as quickly as U.S. officials hoped, but it laid a foundation for the principle that space remained a sanctuary for peaceful scientific development, free from the Cold War arms race—a principle that would define U.S. space policy in the decades to come. Using documents from the *Foreign Relations of the United States* volumes and the Eisenhower Presidential Library, this article explains the complex conception of this principle.

II: NSC 5520 and the IGY Scientific Satellite Program

1. IGY and Scientific Internationalism

The TCP report, submitted to the NSC in February 1955, provided a foundation for nascent U.S. space policy. Eisenhower had established the TCP in 1954, with MIT President James Killian as chairman. This group of about two-score scientists were tasked with assessing and analyzing the threat of a surprise attack by the Soviets using a hydrogen bomb. Recognizing U.S. vulnerability, the TCP recommended a series of research and development programs, including the accelerated development and deployment of IRBMs (intermediate-range ballistic missiles) and ICBMs. With regards to space policy, the TCP proposed launching a small scientific satellite. It was intended to address the urgent need to improve U.S. intelligence capabilities in the face of the Soviet missile programs. The scientific nature of this project, reasoned the TCP, would make the satellite look innocuous and help to establish a legal precedent for satellite overflights.[17] To establish "freedom of space," the TCP emphasized that the satellite was aimed at

16. Matthew A. Bille and Erika Lishock, *The First Space Race: Launching the World's First Satellites* (Collage Station: Texas A&M University Press, 2004); Michael J. Neufeld, "Orbiter, Overflight, and the First Satellite: New Light on the Vanguard Decision," in *Reconsidering Sputnik: Forty Years Since the Soviet Satellite*, eds. Roger D. Launius, John M. Logsdon, and Robert W. Smith (London: Harwood Academic, 2000), 231−57.

17. Bulkeley, *The Sputniks Crisis*, 126.

"no active military offensive," but "peaceful use of space," a principle that garnered DOD's support.[18]

Around the same time, the American scientific community proposed a scientific satellite project for the IGY.[19] The IGY was an international cooperation project for geophysical sciences, sponsored by the International Council of Scientific Unions (ICSU) and staffed by scientists from sixty-seven nations, the United States and the Soviet Union included. Among thirteen or more programs that investigated "physical properties and process of the Earth as a complete planet," the IGY paid particular attention to the Antarctic and space projects.[20]

The NSF and the National Academy of Science (NAS) proposed a purely scientific satellite program for the upcoming IGY.[21] While the NSF was a government-controlled agency, the NAS, on the other hand, was a nongovernmental organization instituted in 1863, which conducted research for the government. The NSF and the NAS were both comprised of distinguished scientists independent from the government, although they advised the government on all matters related to science and technology. These organizations played key roles in American involvement in the IGY and requested the government's support for the IGY, stressing the scholarly importance of this scientific endeavor.[22]

The idea of an IGY satellite program was first conceived at a dinner party at American physicist Van Allen's home in April 1950. After Allen obtained a doctorate in 1939, he and his colleague S. Fred Singer launched a rocket research project in 1951, supported by the ONR. At that dinner party, Allen and Singer were discussing international cooperation in scientific research, and then came across the idea of launching a small satellite into space. This idea led to the IGY satellite program, in which Allen played a major role.[23]

The ICSU approved the launch of the IGY in 1952 and established the Special Committee for the IGY (French abbreviation CSAGI).[24] The first serious discussion on the satellite program took place at an ICSU meeting in Italy in October 1954. At this meeting, attended by American and Russian scientists, participants adopted a resolution, which stipulated: "In view of the advanced state

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18. "Meeting Threat of Surprise Attack Technological Capabilities Panel," DDEL, 146–48.

19. Bulkeley, *The Sputniks Crisis*, 126.

20. Ibid. Quotes are from page 3. See also Mieczkowski, *Eisenhower's Sputnik Moment*, 36.

21. Eisenhower publicized the plans for construction of the Earth satellites on July 29, 1955, for the first time. "Press Release by James C. Hagerty," July 29, 1955, "OF 146–E International Geophysical Year (1)" Folder, Box 624, Records as President, Official File, DDEL.

22. NSC 5520, "U.S. Scientific Satellite Program," DDEL, 4.

23. Bille and Lishock, *First Space Race*, 50.

24. Ibid.

of present rocket techniques [. . .] that thought be given to the launching of small satellite vehicles."[25] This meeting also birthed the U.S. National Committee (USNC) for the IGY appointed by the NAS, and a technical panel on rocketry under the USNC conducted special studies on a long-range rocket. This technical subcommittee consisted of three experts: William Pickering of Jet Propulsion Laboratory (JPL), and Milton Rosen and John Townsend from the NRL. The three ideas about the satellite vehicle raised by this panel prompted Assistant Secretary of Defense Donald A. Quarles to create the Homer J. Stewart Committee, charged with selecting the rocket prototype for the IGY satellite program.[26]

Funding was paramount for this project. Joseph Kaplan, the atmospheric physicist who chaired the USNC, succeeded in persuading the White House into boosting the NSF funding for FY1955 to $13 million, but this was not enough to launch a satellite.[27] President of the NAS Detlev Bronk and president of the NSF Alan Warterman had to acquire additional funding from such government agencies as the DOD, the CIA, and the State Department.[28] These agencies, especially the DOD, apparently saw strategic value in the IGY satellite.

Most of the top DOD officials were far from enthusiastic about the IGY. As historian Rip Bulkeley demonstrated, Defense Secretary Charles E. Wilson, when asked by reporters about the possibility that the Soviets might get to space earlier, famously responded, "I wouldn't care if they did."[29] Assistant Air Force Secretary Trevor Gardner feared that the top-priority air force missile project he was in charge of would be hampered by the IGY program.[30]

Quarles favored the IGY program administered by scientists, although there is no clear evidence as to why Quarles took a different position to Wilson and Gardner. By the end of March 1955, when the IGY proposal arrived on Quarles's desk, he had already been briefed on the satellite project by the army and the NRL, because military services had long been interested in collecting data of the

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25. "Memorandum to the President, Subject: Earth Satellite," October 7, 1957, "Earth Satellite (1) 1955–1958" Folder, Box 7, NSC Series, Briefing Notes Subseries, WHO, OSANSA, DDEL.

26. The subcommittee proposed three possible launch designs: First, the plan to use a large rocket like the army's "Redstone" fitted with upper stages. Second, a method to adopt a new launching vehicle based on the idea of NRL's "Viking" rocket. Third, the way to build a new, more powerful rocket. See Bille and Lishock, *First Space Race*, 53.

27. McDougall, *Heavens and the Earth*, 118.

28. NSC 5520, "U.S. Scientific Satellite Program," DDEL.

29. Bulkeley, *The Sputniks Crisis*, 129. Quotes are from *New York Times*, 17 December, 1954.

30. "Memorandum from Bowie to the Acting Secretary of State," September 7, 1955, *Foreign Relations of the United States* (hereafter: *FRUS*), *1955–1957*, National Security Policy, Volume XIX, Document 33.

upper atmosphere since before Eisenhower's inauguration.[31] Also, Quarles knew that the air force was soliciting the DOD's support for its reconnaissance satellites.[32] Under pressure from several services, he was looking for a way to establish "freedom of space" and justify reconnaissance satellites.[33] Quarles thus took the IGY project seriously, while his boss Wilson was skeptical about it.

2. The Intentions of DOD and NSC 5520

While responsible for the American participation in the IGY, DOD officials pursued goals quite different from scientists. The White House and DOD predominantly saw a national security value in the IGY satellite, which, unlike an American satellite, would require no prior consent from any nation over which the satellite might pass in its orbit. As Quarles believed, the legal framework of the IGY could be applied to future American satellite programs and inoculate them from a Soviet allegation of violating territorial airspace.[34] The dovish cause of international scientific cooperation masked the hawkish purpose of "freedom of space."

Based on the TCP report, NSC 5520 was drafted on May 20, 1955, at the request of the DOD. The May 25 NSC meeting pointed out that "considerable prestige and psychological benefits will accrue to the first nation which is successful in launching a satellite." The Americans understood the dual merit of a satellite—the scientific merit of an "observation of the characteristics of upper atmosphere" and the military merit of taking "a technological step for a large surveillance satellite." The Joint Chiefs of Staff (JCS) vocally stressed the latter. The discussion on NSC 5520 also stated that Washington should stress the satellite's peaceful purpose to secure international support and divert Soviet criticism. "The satellite itself and much information as to its orbit would be public information; the means of launching would be classified," the policymakers argued.[35] The "freedom of space" principle rested on a precarious balance between publicity and secrecy.

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31. The military had been conducting satellite feasibility studies since the end of World War II by utilizing the German V2 rocket, with captive German scientists and engineers, including Werhner von Braun, who later worked for the Army Ballistic Missile Agency. David N. Spires, *Beyond Horizons: A Half Century of Air Force Space Leadership* (Honolulu: University Press of the Pacific, 2002), 13–49. See also Bille and Lishock, *First Space Race*, 53–54.

32. Bulkeley, *The Sputniks Crisis*, 128.

33. NSC 5520, "U.S. Scientific Satellite Program," DDEL.

34. NSC 5520, "U.S. Scientific Satellite Program," DDEL; Philip Taubman, *Secret Empire: Eisenhower, the CIA, and the Hidden Story of America's Space Espionage* (New York: Simon & Schuster, 2003), 202–5.

35. "Scientific Satellite Program (NSC 5520)," May 25, 1955, "Outer Space (1)" Folder, Box 38, NSC Series, Policy Papers Subseries, WHO, OSANSA, DDEL.

Approved by Eisenhower on May 27, NSC 5520 put "space for peace," an idea laid out by the TCP report, into a policy. Following the TCP report, NSC 5520 stated, "A satellite would constitute no active military offensive threat to any country over which it might pass [. . .]. A bomb could not be dropped from a satellite on a target below."[36] Meanwhile, NSC 5520 demanded that the IGY satellite should not interfere with the U.S. military priority, namely the missile programs. On July 29, 1955, the White House announced the U.S. participation in the IGY satellite program. Four days later, the Soviets followed suit.[37]

Under the jurisdiction of DOD, the responsibility for the IGY endeavor fell on various agencies on an ad hoc basis. The NAS, for instance, was in charge of the scientific aspects of the satellite, while the NSF was responsible for fundraising as well as collaboration with other agencies.[38] The military provided technical advice and logistical support, including the boosters and launch facilities.[39] The IGY projects were broken down into unclassified and classified realms. The NSF worked in the unclassified realm in cooperation with the USNC, including scientific experiments, while the DOD operated in the classified realm, particularly technical development of the satellite vehicle.[40] Quarles had the final say over how to launch the satellite, or which booster to use.[41]

The U.S. satellite program first proposed by the TCP made rapid headway thanks to the IGY. Whether American scientists involved in the IGY satellite program knew of the secret military objective of establishing the "freedom of space," as outlined by NSC 5520, remains unclear. Historians disagree on this point, with no one presenting conclusive evidence.[42] Bulkeley speculates that key IGY scientists, including the vice president of CSAGI, Lloyd Berkner, and Warterman, both members of the Science Advisory Committee of the Office of Defense Mobilization (SAC-ODM), could have known what was happening on the TCP, which was instituted under the SAC-ODM, although they probably took no direct part in the TCP report.[43] "[T]he intelligence potential of satellites had

36. "Meeting the Threat of Surprise Attack Technological Capabilities Panel," DDEL, 147.

37. "Press Release by James C. Hagerty," DDEL.

38. The NSF worked with the USNC under the NAS to formulate plans for the satellite and its implementation, as well as for the preparation and deployment of the ground observer equipment required for the program. Bille and Lishock, *First Space Race*, 77; "Memorandum to the President, Subject: Earth Satellite," DDEL, 2–3.

39. Bille and Lishock, *First Space Race*, 77.

40. "Memorandum to the President from Alan Waterman," July 27, 1955, "Earth Satellite (3)" Folder, Box 7, NSC Series, Briefing Notes Subseries, WHO, OSANSA, DDEL.

41. Bille and Lishock, *First Space Race*, 76.

42. Spires, *Beyond Horizons*, 41.

43. The SAC-ODM, created by Harry S. Truman at the height of the Korean War, was the highest-ranking group of scientists in the government mobilized for national security work. See Zouyue Wang, *In Sputnik's Shadow: The President's Science Advisory Committee and*

been realized in such circles," wrote Bulkeley.[44] There is a chance, indeed, that some IGY scientists with ties to the TCP were briefed of the national security goal of the IGY. Even for these scientists, however, the IGY satellite program remained "a program for science by scientists" from beginning to end.[45]

III: Project Vanguard and the Stewart Committee

The crucial question for the IGY satellite concerned the booster design. In July 1955, Homer Stewart of the JPL chaired the special committee of eight scientists, organized by Quarles to review the rocket options, submitted by the navy, the army, and the air force.[46] The navy's proposal, made by the NRL, recommended its sounding rocket Viking to orbit a thirty-four-pound satellite. The army, on its part, urged the Stewart Committee to select their own Project Orbiter, which would use the rocket of the Redstone missile for a smaller satellite. The air force suggested using the rocket of the Atlas ICBM, but it soon withdrew the proposal out of fear that the IGY project might interfere with their ICBM development.

On August 3, the Stewart Committee selected the navy's proposal in a five-to-two vote.[47] It surprised both the navy and the army, for while the army's Project Orbiter only needed to improve its existing Redstone missile, the navy's proposal, codenamed Vanguard, had to develop a new rocket that did not yet exist.[48] The army's Project Orbiter had a better booster, but the Stewart Committee concluded that Project Vanguard would, on the whole, have better satellite instruments, including the tracking and telemetry systems.[49] On August 15, Major General Leslie Simon, the army's assistant chief of ordnance for research and development, protested the Stewart Committee's selection. Warning of the rapidly improving Soviet satellite capabilities, he wrote, "The first orbital flight for this [army] configuration can be scheduled for January 1957 if an immediate approval is granted."[50] As Bille and Lishock explained, "Quarles was impressed [by Simon's letter] enough to ask the Stewart Committee to look at the army's proposal again,"[51] but not enough to overturn the committee's decision. Project Vanguard was reapproved that September.

Cold War (New Brunswick: Rutgers University Press, 2008).

44. Bulkeley, *The Sputniks Crisis*, 96–97.

45. "Memorandum to the President from Alan Waterman," DDEL.

46. Bille and Lishock, *First Space Race*, 77.

47. Mieczkowski, *Eisenhower's Sputnik Moment*, 45.

48. McDougall, *Heavens and the Earth*, 122.

49. The Stewart Committee felt that the army was the better choice when it came to boosters, but Project Orbiter utilized a smaller booster than Project Vanguard and therefore could not carry elaborate science equipment. Bille and Lishock, *First Space Race*, 81–82.

50. Bulkeley, *The Sputniks Crisis*, 153.

51. Bille and Lishock, *First Space Race*, 81.

Historians are divided over why the Stewart Committee chose Project Vanguard for the IGY satellite program, when Project Orbiter had a more mature and reliable booster. The point of contention was whether Project Vanguard was selected because it was a "non-military" project. Walter McDougall is one of the scholars who argued that the Stewart Committee "was instructed [by Quarles] to keep in mind the importance of a nonmilitary, scientific image for the enterprise," since the pursuit of the "freedom of space" was the IGY's primary objective for high-ranking officials.[52] While the Redstone used a militarily-oriented booster, Viking was a scientific rocket.[53] The selection, argued McDougall, was made based on not technical but political considerations, namely to deflect Soviet criticism, as articulated by NSC 5520. The White House and the DOD presented a different view that the navy's proposal was accepted because the development of a scientific rocket without military purposes would not compete with the ballistic missile program Eisenhower prioritized throughout his presidency. As Bulkeley explained, this statement is technically accurate, yet cannot provide a full account to the question at hand.[54]

Historians Bille and Lishock derived a clearer answer, based on recently declassified documents, that the preference of high-level policymakers had limited influence on the selection of the Stewart Committee. There is no record, including in the Stewart Committee report, that demonstrates that Project Vanguard was selected because it appeared less of a "military" project. Bille and Lishock also maintained that although NSC 5520 did highlight the importance of the rhetoric of peace in launching a scientific satellite, it did not mention that the satellite should be explicitly "nonmilitary." They explained, moreover, that if the army proposal had been rejected for political reasons, the Stewart Committee would not have had to reexamine the army's proposal.[55] Citing the Stewart Committee's report, Bille and Lishock concluded that although the members of the Stewart Committee recognized the national security element in the IGY satellite, their decision was affected not so much by the overflight issue as by the purely scientific and technological concerns. The contrasting accounts by McDougall on one hand and Bille and Lishock on the other derive from a question of agency: Did policymakers control scientists, as McDougall implied, or did scientists trump policymakers, as Bille and Lishock explained? The answer shown in this article is

52. McDougall, *Heavens and the Earth*, 122–23. Quotes are from page 122.

53. Redstone was under development by the army while Viking was constructed by private industry for high-altitude research. Although both of them were developed based on the German V2, which had struck terror into Europe during World War II, the former was planned for weapons systems while the latter was designed for scientific research, such as gathering meteorological data. McDougall, *Heavens and the Earth*, 122–23.

54. "Memorandum to the President, Subject: Earth Satellite," DDEL, 2; Bulkeley, *The Sputniks Crisis*, 179.

55. Bille and Lishock, *First Space Race*, 81–83.

that bottom-up decision-making predominated, which is explained in the next section.

IV: Project Vanguard in Motion

Project Vanguard was a large inter-service endeavor. The Office of the Secretary of Defense (OSD) gave the navy overall responsibility and appointed John Hagen, superintendent of NRL Astronomy, as director.[56] Some one hundred and eighty people supported Project Vanguard, including the representatives from the army and the air force, although the Army Ballistic Missile Agency (ABMA), which had proposed Project Orbiter, never joined the project.[57] Nongovernmental actors also contributed to Project Vanguard, as the NRL contracted with the Glenn L. Martin Company, an aircraft and aerospace manufacturer, to build the Viking rocket. The NRL itself took charge of the satellite design and other instruments needed to operate the vehicle. By misfortune, however, Project Vanguard could get only "second-string" assistance from the Martin Company, because it won a new lucrative contract with the air force to build the Atlas ICBM and redirected its main resources to it soon after they signed on with the navy. The Viking development suffered as a result.[58]

The shortage of human resources aside, Project Vanguard faced technical problems with the booster since no one had ever built such a large-scale, three-staged rocket.[59] The Viking and Aerobee rockets would be used for the first and second stages, but the third stage was the bottleneck.[60] Modifying Aerobee was not a simple task, but designing the unproven solid fuel third stage and finding a contractor to design a suitable motor was much more difficult.[61] The complicated design of the satellite and the booster caused a price hike and a chain of delays.[62]

The number of satellites became a focal point against this backdrop. Clifford Furnas, a member of the Stewart Committee, wrote NSF Director Alan Waterman on January 20, 1956, that he endorsed planning for additional satellites beyond the originally planned six, citing scientific merits.[63] Waterman proposed twelve to

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56. McDougall, *Heavens and the Earth*, 129–31.

57. Bille and Lishock, *First Space Race*, 86–88.

58. McDougall, *Heavens and the Earth*, 130.

59. Bille and Lishock, *First Space Race*, 91.

60. Aerobee was a pure-sounding rocket designed and developed by U.S. aerospace manufacturer Aerojet, instead of an improvement of the German V2. "Memorandum by Charles A. Haskins," April 19, 1956, "Outer Space (1)" Folder, Box 38, NSC Series, Policy Papers Subseries, WHO, OSANSA. DDEL, 3.

61. Bille and Lishock, *First Space Race*, 95–97.

62. Mieczkowski, *Eisenhower's Sputnik Moment*, 48.

63. Scientists were convinced that six attempts were the minimum needed to ensure at least one success. They urged an expansion of the program to increase the experimental possibilities

Eisenhower as recommended by Furnas, while the DOD insisted on only six.[64] At the May 3 NSC meeting, Eisenhower expressed his objection to Waterman, proclaiming that if the first two shots failed, they should abandon the entire project, including the remaining four shots. Waterman responded by articulating the scientists' view that they needed twelve satellites to guarantee the full scientific potential of the project. In the meeting, "the president then said that he surrendered, and certainly would not engage in a fight with all the scientists of the nation."[65] Defense Secretary Wilson also opposed the NSF's plan and stated that a six-vehicle program was preferable, while admitting that six attempts would be the base minimum for a reasonable chance of success. The DOD seemed to be of the opinion that "the satellite was without direct military value."[66] Bulkeley observed that the DOD's unforthcoming attitude derived from the failure of IGY scientists to explain the benefits the satellite experiments could bring to the missile program.[67]

Eisenhower approved the NSF's supplemental budget plan at the May 1956 NSC meeting. He was nonetheless increasingly annoyed by Project Vanguard's skyrocketing cost and the scientists' ambition to maximize scientific achievements. At another NSC meeting a year later, the president alarmed the scientists by stating that the estimated additional funds should be reduced "by restricting the program in ways which will not jeopardize the current objectives under NSC 5520."[68] Eisenhower stressed that the priority was not to "gold plate" the satellite, but to launch a satellite into orbit for the "element of national prestige."[69] He anticipated Sputnik 1.

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which could obtain scientific outputs. "Memorandum by Charles A. Haskins," DDEL, 3.

64. "Memorandum: U.S. Earth Satellite Program (NSC 5520)," May 1, 1956, "Outer Space (1)" Folder, Box 38, NSC Series, Policy Papers Subseries, WHO, OSANSA. DDEL.

65. As Eisenhower asked Waterman at this meeting about "what assurance we would get from the attempt to launch six satellites," his attitude towards scientific advice was driven by his desire to be convinced of the success of the scientific satellite launch. "Memorandum of Discussion at the 283d Meeting of the NSC," May 3, 1956, *FRUS, 1955–1957*, United Nations and General International Matters, Volume XI, Document 343; Bulkeley, *The Sputniks Crisis*, 129–30.

66. "Memorandum by Charles A. Haskins," DDEL, 3.

67. Bulkeley, *The Sputniks Crisis*, 140.

68. "Memorandum by James S. Lay, Jr.," May 14, 1957, "Outer Space (1)" Folder, Box 38, NSC Series, Policy Papers Subseries, WHO, OSANSA. DDEL.

69. "Memorandum of Discussion at the 322d Meeting of the NSC," May 10, 1957, *FRUS, 1955–1957*, United Nations and General International Matters, Volume XI, Document 345; Mieczkowski, *Eisenhower's Sputnik Moment*, 48; Bulkeley, *The Sputniks Crisis*, 136–37.

The funding issue was a ticking time bomb.[70] While the NSF conflicted with Eisenhower and the DOD over the number of satellites, the Stewart Committee avoided clarifying which government agency should finance Project Vanguard. As Bille and Lishock wrote, "there was no funding mechanism or a reliable budget projection" for Project Vanguard from start to finish. It sought funding from several sources, including congressional appropriations, IGY funds, NAS funds, and several funds within the DOD.[71] Bulkelely noted another aspect of the financial problem: since "back-door lobbying leaders of the scientific elite" spearheaded the U.S. participation in the IGY, no funds were officially budgeted for the DOD to supply the "logistics" required for the project.[72] When NSC 5520 was approved in May 1955, it was estimated that the cost of the satellite project would run $15 to $20 million.[73] A couple of years later, the NSC re-estimated the cost of Project Vanguard at $110 million.[74]

The spike aggravated the dispute between the NSF and the DOD, and the cancellation of Project Vanguard loomed as a possibility.[75] National Security Advisor Robert Cutler dissented from the DOD on this subject, insisting on the merit of the substantial scientific advancement the satellite would beget. He also warned against the potential pushback from the international scientific community should the United States withdraw from the program. "A final decision on the satellite program should be made by the President on an integrated presentation of the view of all concerned in this matter," argued Cutler.[76] CIA Director Allen Dulles seconded Cutler's view, because the cancellation would deal a major blow to the U.S. reputation, now under attack by the Soviet peace offensive.[77] Cutler and Dulles helped to persuade Eisenhower to keep Project Vanguard alive after the May 1957 NSC meeting.[78]

As discussed in the previous section, a closer look at Project Vanguard reveals the predominance of the bottom-up decision-making. The NSF was the key agency, with influence on the Stewart Committee, as well as Project Vanguard.

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70. "Memorandum of Discussion at the 310d Meeting of the NSC," January 24, 1957, *FRUS, 1955–1957*, United Nations and General International Matters, Volume XI, Document 344.

71. Bille and Lishock, *First Space Race*, 91.

72. Bulkeley, *The Sputniks Crisis*, 138.

73. "Memorandum by Charles A. Haskins," DDEL, 1.

74. "Memorandum by James S. Lay, Jr.," DDEL.

75. "Memorandum of Discussion at the 322d Meeting of the NSC."

76. "Bureau of the Budget Memorandum for the President Subject: Project Vanguard," April 30, 1957, "Missiles and Satellite Vol.1 (1) [January 1956–May 1957]" Folder, Box 6, Subject Series, DoD Subseries, WHO, Office of the Staff Secretary, DDEL, 4–5.

77. Kalic, *US Presidents and the Militarization of Space*, 34.

78. In this meeting, the president directed that Project Vanguard should be continued on "no more elaborate basis than at present." "Memorandum by James S. Lay, Jr.," DDEL.

There is no evidence that the NSF had an impact on the Stewart Committee's decision, but it might well have done, since the NSF not only managed the public scientific information about the satellite, but also sponsored the U.S. participation in the IGY.[79] On the other hand, as discussed so far, for Project Vanguard, NSF did insist on prioritizing scientific achievements.[80] All available evidence seems to point in one direction: scientists trumped policymakers in Project Vanguard.[81]

The ostensible continuity from NSC 5520 to Project Vanguard belies the divide, created through the Stewart Committee. NSC 5520 was a national security document, which shaped the first U.S. satellite project as a way of establishing the "freedom of space" and justified aerial reconnaissance against Soviet missiles. In putting NSC 5520 into practice, however, scientists transformed it into a scientific project. The Stewart Committee, as well as the NSF, prevailed over policymakers in determining the nature of the IGY satellite, manifest in the selection of the rocket. Whether the rocket had a "peaceful" or "military" character mattered for policymakers mindful of the propaganda war with the Russians, but not for scientists. They simply wished to maximize the rare opportunity for international scientific cooperation in the early Cold War.[82]

Meanwhile, the army did not give up on its own satellite. Hoping to overtake Project Vanguard, missile engineers at the ABMA had been busy making fast progress toward the Jupiter C rocket since 1956, when Project Orbiter was dropped, and the ABMA began its bid for the Jupiter IRBM. To improve the army's satellite capability, John Medaris, commander of the ABMA, and Werunher von Braun, director of the development operation division of the ABMA, planned to adopt "a modified Redstone missile with high-speed upper stages, capping the configuration with a scaled down Jupiter nose cone."[83]

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79. NSC 5520, "U.S. Scientific Satellite Program," DDEL; "Memorandum to the President, Subject: Earth Satellite," DDEL, 2−3.

80. "Memorandum by Charles A. Haskins," DDEL, 3; "Memorandum to the President from Alan Waterman," DDEL.

81. NSC 5520, "U.S. Scientific Satellite Program," DDEL; "Memorandum to the President, Subject: Earth Satellite," DDEL, 2−3; "Memorandum to the President from Alan Waterman," DDEL.

82. Under the policy that scientific outcome data would be shared at IGY, the fact that the Stewart Committee supported Project Vanguard, and that the NSF claimed prioritizing the pursuit of scientific results, indicates that scientists were truly committed to international scientific cooperation. In a 1958 memo, NSF's Waterman expressed the hope that the IGY might be a model for the international exploration of space in the future. "Memo for Cutler, Subject: Science for Peace," April 10, 1958, "Space, Satellite, Rocket etc. (2) [February-June 1958]" Folder, Box 8, OCB Series, Subject Subseries, WHO, OSANSA, DDEL.

83. "Years of Work Preceded Launching of Army's scientific Satellite," February 3, 1958, "Explorer [Jan 1958] (2)" Folder, Box 12, Subject Series, Alphabetical Subseries, WHO, Office of the Staff Secretary, DDEL, 1−2.

Medaris and von Braun sought to modify the Redstone missile into Jupiter C, while working for the Jupiter IRBM.[84] The Jupiter C test succeeded in August 1957, and the army was now technically capable of launching a satellite.[85]

As McDougall argued, Eisenhower probably regretted having not selected Project Orbiter, which would have taken Americans into space much faster.[86] Paradoxically, however, Eisenhower's decision enabled the president to establish "space for peace," despite the intensifying missile race after the Sputnik Shock.[87] This was exactly what he had wanted to achieve all along since the TCP report.[88] By allowing IGY scientists to pursue scientific achievements through Project Vanguard, Eisenhower garnered widespread support from the scholarly communities around the world and enshrined "space for peace," a pretext for reconnaissance at first, as an international norm. This is because the United States, unlike the Soviet Union, was willing to share the scientific data obtained by the satellites with the IGY participating countries.[89] NASA took over this seemingly honorable American approach to space exploration, and the agency established partnerships with other countries in the space field, including cooperation with the U.K. on its scientific satellite program.[90] These trends in

84. "Summary of a Conference on the Army Missile Program," August 12, 1957, *FRUS, 1955–1957*, National Security Policy, Volume XIX, Document 139.

85. "Years of Work Preceded Launching of Army's Scientific Satellite," DDEL, 1–2.

86. McDougall, *Heavens and the Earth*, 134.

87. The priority given to obtaining scientific results in Project Vanguard precluded a role for the military after sputnik. It led to a movement for arms control in space, rather than the military's push for the weaponization of space. In fact, Eisenhower proposed a ban on the deployment of weapons of mass destruction in outer space at the U.N. in September 1960. Dwight D. Eisenhower, "Address Before the 15th General Assembly of the United Nations," September 22, 1960, Public Papers of the Presidents of the United States, Dwight D. Eisenhower, 1960–1961 (Washington: GPO, 1961), 707–20. For a survey of the weaponization of space, see Paul B. Stares, *The Militarization of Space* (New York: Cornell University Press, 1985); Spires, *Beyond Horizons*.

88. The TCP report was the beginning of the "space for peace" policy because Eisenhower wanted to preserve the "freedom of space" by keeping space "peaceful" for future reconnaissance satellites. "Scientific Satellite Program (NSC 5520)," DDEL.

89. While the United States discovered the magnetic field, the Van Allen Belt, in 1958, the Soviet Union failed to produce any notable scientific results during the IGY. In addition, the Soviet Union did not separate its satellite program from its military program, as the U.S. did, so it shared very little data with the IGY. Historian Rip Bulkeley noted that American contributions to IGY of all kinds outweighed those from the Soviets by a ratio of about three to two. See Rip Bulkeley, "The Sputniks and the IGY," in *Reconsidering Sputnik*, eds. Roger D. Launius, John M. Logsdon, and Robert W. Smith, 148.

90. In 1959, with the help of NASA, the U.K. approached France about a joint European civilian satellite program using Britain's IRBM "Blue Steak." See John Krice, "Building a Third Space Power," in *Reconsidering Sputnik*, eds. Roger D. Launius, John M. Logsdon, and Robert W. Smith, 300.

space cooperation led to the establishment of the Ad Hoc Committee on the Peaceful Uses of Outer Space (COPUOS) at the United Nations in December 1959 to "govern the exploration and use of space for the benefit of all humanity."[91]

The Eisenhower administration lost the technological race to space but won the political race in the hearts and minds of scholars around the world. Project Vanguard enabled the Americans to cast an image upon themselves, an image of moral scientists who pursued "real" scientific achievements through international cooperation, quite contrary to the Russians, who were obsessed with launching a satellite as soon as possible, as part of their missile project.[92] The United States strengthened its leadership for the peaceful use of space after Sputnik. Eisenhower, a military strongman occasionally using belligerent rhetoric, would have far greater difficulty establishing such an image, if he had imposed the army's rocket on IGY scientists. Worse, U.S. space policy could have been hijacked by the air force, and "space for peace" little more than empty propaganda.

Conclusion

This article has analyzed the origins of "space for peace" in Eisenhower's presidency, focusing on the role of scientists in the progression of U.S. space strategy from NSC 5520 to Project Vanguard. It sheds new light on Project Vanguard, often depicted by the existing scholarship as the cause of the U.S. "defeat" in the space race with the Soviet Union. There was no doubt that it was a trouble-ridden project, with the command and decision structure complicated and the responsibility for funding blurred. Yet this article illuminated its positive, if unexpected, impact on the U.S. goal of establishing "space for peace." Indispensable in this success was the bottom-up decision-making process, in which scientists could sway high-ranking policymakers, including Eisenhower, in critical issues in satellite development.

Technically speaking, Project Vanguard was a stillborn project. The navy failed to launch the satellite in December 1957 as planned, and a month later, on January 31, 1958, the army successfully launched Explorer 1, the first U.S. satellite with a Jupiter C rocket, which orbited the Earth for 111 days. The

91. Twenty-four countries participated in COPUOS in 1959, including the Soviet Union. United Nations Office for Outer Space Affairs, and the Committee on the Peaceful Uses of Outer Space, https://www.unoosa.org/oosa/en/ourwork/copuos/index.html.

92. Quarles pointed out that "there was clear evidence" that the Soviet Union had the prime objective of being the first nation to orbit an Earth satellite. The Soviet satellite program "had always been integrated into the military ballistic programs," he stated. According to him, the scientific instrumentation of Project Vanguard was "better and more elaborate" than that of the Soviets. "Discussion at the 339th Meeting of the National Security Council," October 11, 1957, "339th meeting of NSC Oct10 1957" Folder, Box 9, Ann Whitman File, NSC Series, DDEL, 4.

conventional wisdom dismisses Project Vanguard as no more than a drag on Explorer 1. Explorer 1 was added to the IGY program after Sputnik 1, with its scientific nature highlighted to the fullest extent possible. The race to space was over with Vanguard's failure, and the Eisenhower administration had to find a different way of framing its own satellite. Explorer 1 made a significant scientific contribution to the IGY by discovering the magnetic field encircling the Earth, which was named the Van Allen Belts.[93] Project Vanguard was a disaster, but Explorer 1 was a triumph.

The existing scholarship tends to depict "space for peace" as a product of the Sputnik Shock, just as the creation of NASA was.[94] Scholars have pointed out that Eisenhower envisaged the creation of a civilian space agency committed to the peaceful use of space in order to enhance U.S. national prestige and a peaceful image, contrary to the alleged Soviet militarism. "Space for peace," according to the existing literature, was NASA's conceptual brother, both born in Sputnik's aftermath.

But this was not the case. This article has shown the pre-Sputnik conceptualization of "space for peace" in the hands of scientists associated with Project Vanguard. Project Vanguard, which established the relationship between Eisenhower and scientists as a leading authority in government and influential decision-makers against him, opened a policy avenue in which U.S. space policy could be insulated from the influence of the military. It follows from this that scientists could keep playing key roles in U.S. space policy after Sputnik, as shown in the creation of the PSAC (President's Science Advisory Committee), which was designated as a crusader for "space for peace" by Eisenhower, as well as the establishment of NASA as a civilian space agency based on the counsel of the PSAC.[95] Although the air force tried to use the Sputnik Shock as a bargaining

93. The von Braun group from the ABMA persuaded Van Allen to make Vanguard's scientific instruments compatible with Explorer 1's Jupiter C rocket. The naming was a tribute to him. James J. Harford, "Korolev's Triple Play," in *Reconsidering Sputnik*, eds. Roger D. Launius, John M. Logsdon, and Robert W. Smith, 88; Mieczkowski, *Eisenhower's Sputnik Moment*, 128.

94. McDougall, *Heavens and the Earth*.

95. By December 1957, Eisenhower reconstituted SAC-ODM as PSAC. The mission of the PSAC was to tackle the Sputnik Shock from a scientific and technological point of view. PSAC persuaded the president to establish an independent civilian agency, keeping the space program free of military involvement, in order to bring out the enterprising talent of scientists. Although not examined in this article, some reasons behind Eisenhower's decision can be pointed out. For one thing, Eisenhower wanted to restore the relationship with scientists that had been damaged by the Oppenheimer incident. What is more, Eisenhower sought a way to restrain the interservice rivalry caused by the missile development to avoid military control over satellites. See Richard V. Damms, "James Killian, the Technological Capabilities Panel, and the Emergence of President Eisenhower's 'Scientific-Technological Elite,'" *Diplomatic*

chip to extort control of U.S. space policy, scientists successfully maintained its position of influence due to Eisenhower's trust in their wisdom and his recognition of scientific aspects of the U.S. space programs as a core national interest. The expanded policy influence of scientists, facilitated by Project Vanguard, ensured the long afterlife of "space for peace" after the Sputnik Shock—until President Trump seriously compromised the relationship between science and policy.

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