Lunar Colonies and Nuking the Moon: Motivational Factors behind the American Conquest of the Moon

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In the 1950s and 1960s, the United States and the Soviet Union embarked on the greatest technological race the world has ever seen. Sparked by the advent of nuclear weapons, the Space Race pitted American and Soviet scientists against each other in a struggle to achieve superiority in outer space. However, when the Soviets expanded their lead with the launch of several lunar probes, American officials feared their counterparts were planning a militarization of the moon. As this was considered, officials began to believe that the nation which controlled the moon would have an invaluable advantage in the Cold War. In light of this, this essay first analyzes newspaper responses to early satellite launches to demonstrate how the Soviet lead in space technology fostered serious security concerns in the United States. It then investigates declassified official documents to show how U.S. officials perceived the moon as a Cold War arena in which they could prove their nation's technological and military superiority. Even though the moon bases and lunar nuclear detonations as suggested by these documents never occurred, the perception of the moon as the ultimate proving grounds for U.S. technological and military superiority remained, which continually fuelled support for the Apollo program.

On the morning of 5 October 1957, the American public awoke to shocking newspaper headlines announcing "Reds Fire 'Moon' into Sky!"[1] The day before, the Soviet Union had successfully launched the first artificial satellite into space, using the newly developed R-7 booster rocket. Officially named Sputnik I by the Soviets, the satellite was little more than a metal sphere that emitted a radio signal which could be listened to by

[1] "Reds Fire 'Moon' into Sky!" *Chicago Tribune*, 5 October 1957, 1.

anyone with a radio when it flew overhead. While this "red moon" posed no direct military threat, Americans who had their radios tuned to Sputnik I's frequency could be reminded every ninety-six minutes that the Russians were, indeed, ahead of the United States in ballistic missile technology. What ensued would become known as the Space Race, an international competition in which the United States and the Soviet Union would constantly try to outperform each other through spatial endeavours. For most Americans, the Space Race created an era of ambition, particularly after President John F. Kennedy's challenge to place a man on the moon before the end of the 1960s. Some U.S. military officials, however, took this ambition farther than most citizens could have imagined. To them, manned lunar colonies and nuclear detonations on the moon were entirely feasible operations by which the U.S. could win the Space Race, and ultimately the Cold War.

Shortly after Kennedy's challenge to place a man on the moon, Cold War tensions came to a peak during the Cuban Missile Crisis. To the relief of countless American and Soviet citizens, the period following the Cuban Missile Crisis (1962-1979) became an era of relative peace and stability between the United States and the Soviet Union. This can be demonstrated by the establishment of direct communication between the United States and Soviet leaders, and the signing of the Limited Test Ban Treaty in 1963. Although direct confrontation decreased and nuclear tensions eased, the Space Race continued unabated. The Soviet Union achieved several new space exploration milestones during this time period, including the first multi man space mission and the first extra vehicular space-walk. The United States was also able to achieve several notable accomplishments, by setting several space flight duration records. Although these achievements were significant for their time, the Space Race would not end in Earth's orbit. To both the Americans and the

Soviets, technological superiority could only be proven by placing a man on the moon. For the Americans, this led to the creation of the National Aeronautics and Space Administration's (NASA) Apollo program which sent nine manned missions to the moon; six of which would land on the surface.

Most of the Apollo program's development took place during the period of low Cold War tensions following the Cuban Missile Crisis. Furthermore, by the end of the Apollo program, the entire project had cost the United States well over the twenty billion dollars that NASA had predicted.[2] Since the American government continued to fund the Apollo program even after it went over its estimated budget, it is clear that there were several key motivating factors that continued to drive the missions to the moon. In light of the contradictory decision to send men to the moon during a Cold War lull, this essay will examine the factors that led the United States to pursue a conquest of the moon no matter what the cost.

Historian Roger Launius outlines several of the current theories that seek to explain the American moon program. According to Launius, many have interpreted Kennedy's decision to pursue the moon landings as a rational choice that reflected a need to raise "international prestige in the height of the Cold War."[3] Launius also offers that the moon landings could have been a result of Kennedy's competitive and aggressive personality, and that Kennedy's insistence on the moon landings could have been a reflection of his desire to further human space exploration. Finally, Launius concludes that the potential propaganda value of an American moon landing was the ultimate motivating factor behind Kennedy's support for the Apollo

[2] Andreas Reichstein, "Space-The Last Cold War Frontier?" *Amerikastudien / American Studies* 44, no. 1 (2012): 123.

[3] Robert D. Launius, "Kennedy's Space Policy Reconsidered: A Post-Cold War Perspective," *Air Power History* 50, no. 4 (Winter 2003): 18.

missions.[4] While the propaganda value of American moon landings cannot be disregarded, this essay will demonstrate that there were several other key factors that propelled American astronauts to the moon.

Other historians attribute the moon landings to different key factors of the 1950s and 1960s. In Andrew Reichstein's article "Space-The Last Cold War Frontier?" the reader is provided with an outline of Lyndon B. Johnson's contributions to the Apollo program. Reichstein claims that Johnson supported the moon landings primarily because he saw an opportunity to make space exploration a Democratic Party issue and ultimately strengthen his career as a politician. Reichstein's article then demonstrates how Johnson continually put pressure on NASA administrator James Webb and President Kennedy to pursue moon landings all for the purpose of gaining support from American voters.[5] Although Reichstein provides several convincing examples of Johnson's influence in the Apollo program, it is difficult to attribute such a massive program to one individual alone.

While some historians observe the role of key political figures in the development of the Apollo program, others focus on other circumstances that drove the moon missions. David Bruggeman completely denounces the role played by politicians, and states that individuals such as President Kennedy only "influenced the nature of the mission."[6] Instead, Bruggeman suggests that the Apollo missions reflected a need for both political victories and American heroes, who would be a "powerful symbol of American strength" in the atmosphere of

[4] Launius, "Kennedy's Space Policy Reconsidered: A Post-Cold War Perspective," 20, 22.

[5] Reichstein, "Space-The Last Cold War Frontier?" 115, 121, 122.

[6] David Bruggeman, "NASA: A Path Dependent Organization," *Technology in Society* 24, no. 4 (Fall 2002): 420.

the Cold War.[7] However, while the moon landings did create inspiring American heroes, it is doubtful that the United States would have spent over twenty billion dollars for the sole purpose of winning a political victory and creating a handful of idolized astronauts.

While the question of motivation behind the American moon landings has been given a substantial amount of attention by historians, recently declassified U.S. government documents have provided new perspectives on American interest in the moon. It is now evident that there were legitimate security concerns caused by the initial Soviet lead in the Space Race. This can be demonstrated by American newspapers that reacted fearfully to early Soviet space achievements, and by declassified United States government documents that address the issue of potential Soviet moon landings. Furthermore, as demonstrated by declassified official U.S. proposals and study reports, there were numerous military objectives that continued to fuel American interest in lunar missions. In light of these revelations, this essay will argue that the United States' continued support for the Apollo missions was a result of security concerns surrounding the American space technology deficit, and the perception of the moon as the ultimate proving ground for American military superiority.

The Space Race was not the first technological race between the United States and the Soviet Union. As the Cold War began to unfold in the late 1940s and early 1950s, both the Americans and the Soviets began to place increasing importance on the quantity and capability of their nuclear weapons. While the nuclear arms race continued throughout the 1950s and 1960s, the Space Race developed shortly after as the United States and the Soviet Union began to develop booster rockets for delivering

[7] Bruggeman, "NASA: A Path Dependent Organization," 422.

nuclear weapons and ultimately carrying payloads into space. Discourse on space operations had already begun by the early 1950s, when the United States began seeking reliable ways to spy on the Soviet Union. However, the development of rockets capable of carrying payloads into space did not begin until the International Geophysical Year (IGY) challenged the Americans and Soviets to place an artificial satellite into low-earth orbit. At the time, there were two rockets in the early stages of development that were capable of putting a satellite into space. These included the Naval Research Laboratory's Vanguard rocket, and Wernher Von Braun and the Army's Jupiter missile. According to Walter McDougal, Eisenhower's decision to consign the satellite project to the Navy significantly hindered the United States' first successful satellite launch, as the Vanguard program was underfunded and the rocket had to be made from scratch.[8] Consequently, it was the Soviets who won the first leg of the Space Race with the successful launch Sputnik I on 4 October 1957. To the Eisenhower Administration, the widespread shock and panic caused by Sputnik I meant that the United States had to seriously re-evaluate its space program.

Unfortunately for Americans, the string of Soviet space accomplishments continued. Only one month after the launch of Sputnik I, the Soviets triumphed yet again over the successful launch of Laika the dog, the first live animal in space. American confidence then took another blow with the catastrophic failure of several Vanguard rockets, which were supposed to deliver the first U.S. satellite into space.[9] In light of the highly publicized Vanguard failures and increasing rivalry between the Navy and Army over control of the space program, Eisenhower began

[8] Walter A. McDougal, "Sputnik, the Space Race, and the Cold War," *Atomic Scientists, Bulletin* 41, no. 5 (Spring 1985): 20-22.

[9] Reichstein, "Space-The Last Cold War Frontier?," 116.

searching outside the military for a new organization to lead the American space effort. The group he selected was the National Advisory Committee for Aeronautics (NACA), which was little more than "an obscure group of part-time scientific consultants" at the time.[10] Nevertheless, on 29 July 1958, Eisenhower signed the National Aeronautics and Space Act, which transformed NACA into a space exploration oriented organization called the National Aeronautics and Space Administration (NASA). Although its first mission, Project Mercury, was to place humans into earth orbit by the early 1960s, by 1959 NASA's Research Steering Committee on Manned Space Flight had already decided that NASA's next mission should be a manned lunar landing. A meeting on 9 July 1960, officially named the project Apollo, and the new mission began to take shape directly after.[11]

The American space program spent its first years playing catch up with the Soviet Union. The initial Soviet lead in the Space Race can be attributed to its capture of German V-2 rocket development and testing centres in the late stages of World War II, along with several key German rocket scientists.[12] At the end of World War II, the United States was in possession of a large bomber fleet and several overseas military bases that were in striking distance from the Soviet Union. As a result of this disadvantage, the Soviet Union began using their captured V-2 information and German rocket scientists to develop intercontinental ballistic missiles (ICBMs).[13] The first ICBM developed by the Soviet Union was the R-7 rocket, which was intended to deliver the newly created hydrogen bomb. When the

[10] Joan Johnson-Freese and Roger Handberg, "Realigning NASA's Destiny," *Technology in Society* 13, no. 4 (1991): 435.
[11] Reichstein, "Space-The Last Cold War Frontier?" 117.
[12] Roadl Sagdeev, "Sputnik and the Soviets," *Science* 318, no. 5847 (Fall 2007): 51.
[13] Trevor Brown, "The American and Soviet Cold War Space Programs," *Comparative Strategy* 30, no. 2 (Summer 2011): 177.

IGY challenged the United States and the Soviet Union to launch an artificial satellite into space, the R-7 was already in development and easily modified into a satellite booster.[14] While the United States held clear air superiority over the Soviets, the Soviet Union's rocket technology was far superior at the outset of the Space Race.

The Apollo program was, in large part, a reaction to the American space technology deficit that became apparent in the late 1950s. Security concerns surrounding the lag in space technology can be demonstrated by American newspapers that were published directly after major Soviet and American space achievements. On 5 October 1957, the day after the launch of Sputnik I, the *Chicago Daily Tribune* began reporting on the Soviet's ground breaking accomplishment. Interestingly, most of the articles in this volume dedicated to the launch of Sputnik I appear to be unconcerned with the new potential security threat. Instead, the articles focused on American scientists who extended their congratulations to Russian scientists. Dr. Joseph Kaplan, chairman of the United States National Committee for the IGY, was reported to have said the Soviet launch was a "remarkable achievement on their part," while chairman of the Technical Panel on United States Satellites, Dr. Richard Porter claimed the launch was a "magnificent step forward in science."[15] It is important to note the entire newspaper contained solely U.S. scientist responses. This is most likely because U.S. officials had not prepared an adequate response to Sputnik I at this time, thus explaining the lack of negative responses.

Although the *Chicago Daily Tribune* newspaper published on 5 October 1957, did not portray any security threats, this

[14] Sagdeev, "Sputnik and the Soviets," 51.

[15] "Russians Congratulated by American Scientists," *Chicago Tribune*, 5 October 1957, 6.

began to change in the editions published in the days that followed. On 6 October 1957, the *Chicago Daily Tribune* reported that the White House had deemed the launch of Sputnik I "a great propaganda victory" for the Russians.[16] It also appears U.S. officials wanted to downplay the panic caused by Sputnik I, demonstrated by their statement that the Russian accomplishment would have no effect on the planned launch of the American's first satellite, which was to take place in the spring of 1958. Later in the article, Sputnik I was directly linked with Soviet ICBMs when U.S. Satellite Chief John Hagen claimed the launch of Sputnik I had represented a victory in "the race for the ultimate weapon-the ICBM."[17] Now that there had been time for U.S. officials to respond, newfound security concerns began to surface.

By the next day's edition, the *Chicago Daily Tribune* had completely stopped reporting on the scientific achievements of Sputnik I, and focused solely on security concerns as highlighted by U.S. military officials. According to Major General John Homer, the same rocket used to propel Sputnik I into space "could be used to hurl deadly transoceanic missiles."[18] In addition to new long range strike capabilities, Homer warned that the Soviet Union could use their satellite technology to spy on the entire world and locate western defence systems and nuclear stockpiles. In his conclusion, Homer warned that the Soviet accomplishment had revealed "new dangers and the accompanying need for heightened vigilance on the home front."[19] Foy Kohler and Dodd Harvey have accurately

[16] "Won't Rush 'Moon' Plans- White house," *Chicago Tribune*, 6 October 1957, 3.
[17] "Won't Rush 'Moon' Plans- White house," 6.
[18] "Sees Red Moon Baring West's Arms Secrets," *Chicago Tribune*, 7 October 1957, 2.
[19] "Sees Red Moon Baring West's Arms Secrets," 2.

characterized American reactions to Sputnik I, which they refer to as "an orgy of self-denigration."[20] While the White House had tried to depict itself as unfazed by Sputnik I, it is clear that the Soviet lead in space technology had thrown the United States into a state of panic.

When the United States launched its first satellite, Explorer I, on 1 February 1958, it became very clear that it was a direct response to concerns surrounding the Soviet Union's lead in space technology. Although the White House had declared that the United States' first satellite launch would take place in spring 1958, the launch of Explorer I actually took place in the middle of winter. This early launch shows that the Explorer I program was rushed after the success of Sputnik I, most likely to close the gap between U.S. and Soviet space technology. To add to this competitiveness, a substantial amount of effort was also put in to promoting the superiority of Explorer I over Sputnik I. The *Chicago Daily Tribune*'s newspaper published on 1 February 1958, reported that Explorer I "should prove much more valuable than the Russian Sputniks."[21] In the following day's edition, an entire full page column was dedicated to reporting praise received from around the world. Italy's foreign affairs office was reported to have said the United States "held supremacy in the scientific race with the Soviet Union," while the president of the German Rocket Society claimed the American satellite was "fabulous- far better than the Russian Sputniks."[22] Evidently, as a result of the launch of Sputnik I and other early Soviet space

[20] Foy D. Kohler and Dodd L. Harvey, "Administering and Managing the U.S. and Soviet Space Programs," *Science* 169, no. 3950 (Summer 1970): 1051.

[21] "U.S. Satellite Termed Vital Aid to Science," *Chicago Tribune,* 1 February 1958, 3.

[22] "Western Europe Happy over U.S. Satellite," *Chicago Tribune,* 2 February 1958, 3.

accomplishments, the United States made superiority over the Soviet space program an issue of national priority.

On 12 April 1961, the Soviet Union proved their space technology superiority yet again with the launch of Yuri Gagarin, the first man in space. However, perhaps even more concerning to U.S. officials was the successful launch of the Soviet moon probes Lunik I, II and III in the late 1950s. Between January and October of 1959, the Lunik probes sent back valuable lunar information, the most notable being T.V. pictures of the previously unseen far side of the moon.[23] While these probes obviously posed no direct threats to U.S. national security, an examination of recently a declassified U.S. official report will show that Soviet lunar probes were taken extremely seriously.

U.S. official concerns about the Lunik probes can be observed in Sydney Finer's report on a CIA covert operation that hijacked a Lunik probe from a touring Soviet exhibition. According to Finer, U.S. analysts had reason to believe the touring probe was not a mock up, which resulted in an operation to extract vital information on Lunik's design and configuration. When Lunik was carried away in a truck at the end of its most recent exhibit, the truck was stopped and the driver escorted to a hotel room. Meanwhile, the truck was driven to a rented out salvage yard, where the probe was unpacked and examined by CIA agents. After Lunik had been disassembled and extensively photographed, it was quickly put back together and sealed in its original container. The original truck driver then took the probe to its original destination, and the Soviets never discovered that their probe had been "borrowed for a night."[24] Given the risk involved with such a difficult operation, it is clear U.S. officials

[23] Gerard P. Kuiper, "The Apollo Program and Lunar Science," *Atomic Scientists, Bulletin* 29, no. 10 (Winter 1973): 20.

[24] Sydney Wesley Finer, "The Kidnaping of the Lunik," *Studies in Intelligence* 11, no. 3 (Winter 1967): 33-39.

considered matching and surpassing Soviet lunar capabilities essential to future American space endeavours.

Shortly after the launch of Lunik I, the U.S. Army and Air Force began drawing up their own plans for the moon. While many Americans followed the adventures of Buck Rogers and fantasized about moon colonies and other extraordinary space endeavours, recently declassified U.S. Army and Air Force studies and proposals show that extraordinary U.S. lunar goals were not exclusive to the world of science fiction. In line with classic early Cold War optimism and boundless confidence in technology, evidence will show that U.S. officials and scientists believed that manned lunar military outposts and lunar nuclear tests were very real possibilities that could be achieved well before the 1970s. To them, a militarization of the moon would be the ultimate display of both U.S. military and technological strength and superiority.

On 20 March 1959, the United States Army submitted a two part study titled Project Horizon. The goal of the study was to examine the feasibility of a manned military lunar outpost, including the procedures required to achieve the objective of a lunar outpost and the purposes to which such a project would serve.[25] From the outset, one of the primary motivating factors for Project Horizon was a militarization of the moon. In its list of military objectives for the lunar outpost, the study acknowledged that the ability to observe both earth and space vehicle movement from the moon would be "highly advantageous."[26] In addition to surveillance, the study also asserted that moon based weapons systems for use against both earth and space targets could be extremely effective. Aside from individual military objectives,

[25] United States Army, *Project Horizon, Volume I: Summary and Supporting Considerations*, 20 March 1959, 14.

[26] United States Army, *Project Horizon, Volume I: Summary and Supporting Considerations*, 4.

Project Horizon argued that a militarization of the moon would be a key asset in deterring nuclear war because of the "extreme difficulty, from the enemy point of view, of eliminating our ability to retaliate."[27] These claims show that many U.S. officials considered military control of the moon the key to Cold War victory, and the decisive factor in the case of all out nuclear war.

Project Horizon also voiced concern about Soviet military activity on the moon. After listing the security benefits of an American military lunar outpost, the study recognized that these advantages could be reversed if a hostile country was to establish their own lunar base before the United States. In light of this, the study recommended that the establishment of a lunar outpost be given "priority similar to the Manhattan Project in World War II."[28] In addition to using the moon as a weapon against the United States, Project Horizon claimed that a Soviet lunar outpost could completely prohibit the United States from landing on the moon as it could be considered an act of hostility. As a result of these fears, the study proposed a strict timeline that would end with the completion of the manned lunar outpost. The initial cargo launches were to begin in January 1965, using the newly developed Saturn I and II booster rockets. In April 1965, the first two astronauts were supposed to arrive on the moon, and begin construction of the outpost using cargo that had already flown in prior to their arrival. By November 1966, the outpost was to be completely operational and able to sustain twelve astronauts at a time. In total, Project Horizon estimated it would need sixty-one Saturn I rockets and eighty-eight Saturn II rockets carrying 490,000 pounds of cargo for the build-up phase, and an additional sixty-four launchings carrying 266,000 pounds of

[27] United States Army, *Project Horizon, Volume I: Summary and Supporting Considerations,* 4.

[28] United States Army, *Project Horizon, Volume I: Summary and Supporting Considerations*, 4.

cargo between 1966 and 1967. The total cost of the project was estimated at six billion dollars, or roughly seven hundred million dollars per year.[29] Given the extensive detail and planning put into the Project Horizon study, along with its insistence on urgency, we can assume the project's developers were told the establishment of a lunar outpost was a matter of utmost priority.

The U.S. Army's Project Horizon was not the only study to explore the possibility of manned lunar outposts. On 20 April 1960, the U.S. Air Force also submitted a proposal for a U.S. lunar base, which took a different approach than Project Horizon. Like the Army study, the Air Force report acknowledged that military deterrent forces could be stationed on the moon. In particular, it asserted that a "lunar based bombardment system" could be developed, with an accuracy range of two to five nautical miles.[30] However, unlike Project Horizon, the Air Force study did not consider any of the available American booster rockets capable of bringing the required supplies to the moon. Instead, it suggested the development of a new five stage rocket that was capable of six million pounds of thrust in the first stage. The study also called for a later completion of the lunar base, with the first manned landing taking place in June 1967 and operational requirements of the base being completed in June 1969. Furthermore, the Air Force envisioned the establishment of a lunar base would require one million pounds of cargo and cost a total of 7.7 billion dollars.[31] Lunar base studies such as Project Horizon and the U.S. Air Force study show that lunar bases were

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[29] United States Army, *Project Horizon, Volume I: Summary and Supporting Considerations*, 20-22.

[30] Air Force Ballistic Missile Division, *Military Lunar Base Program or S.R. 183 Lunar Observatory Study Volume I: Study Summary and Program Plan*, 20 April 1960, 12.

[31] Air Force Ballistic Missile Division, *Military Lunar Base Program or S.R. 183 Lunar Observatory Study Volume I: Study Summary and Program Plan*, 8-13.

considered a viable way to gain an upper hand in the Space Race and ultimately the Cold War.

U.S. military goals for the moon did not end with the establishment of a manned lunar outpost. Completed on 19 June 1959, L. Rieffel's study for the Air Force Special Weapons Centre examined the possibility of detonating nuclear weapons on and within the vicinity of the moon. To Rieffel, the explosion of a nuclear bomb on the moon would provide the United States with valuable military information. In particular, Rieffel believed the United States would learn to detect nuclear space tests performed by other countries, and gain a better understanding about the "capability of nuclear weapons for space warfare."[32] Rieffel's study also asserted that a nation stood a lot to gain if they were the first to perform a nuclear detonation on the moon as "a demonstration of advanced technological capability."[33] Interestingly, the report gave no thought to the potential environmental disturbances that could result from detonating nuclear devices on the moon.[34] Rieffel's study provides another example of how the moon had been transformed into a Cold War arena for proving technological and military superiority.

The lunar base and nuclear detonation studies all strongly emphasise that the United States should be the first nation to complete their proposed projects. This is likely because there were significant concerns that the Soviet Union would attempt their own manned lunar landing and possibly a lunar militarization. Although this was suggested by Project Horizon, these concerns were more fully addressed by later CIA and NSA reports. A 1963 CIA report titled "Soviet Intentions Concerning

[32] L. Reiffel, Armour Research Foundation, Illinois Institute of Technology, *A Study of Lunar Research Flights, Volume I*, 19 June 1959, 10.

[33] Reiffel, *A Study of Lunar Research Flights, Volume I*, 10.

[34] Reiffel, *A Study of Lunar Research Flights, Volume I*, 7.

a Manned Lunar Landing" asserted that the most recent Soviet lunar probes represented significant technological progress, and that the role of the probes may have been to gather information on the lunar surface to prepare for a manned landing. The report also stated that the Soviets were in possession of a launching pad large enough to support moon capable boosters, and concluded that Soviet moon landings could potentially take place between 1967 and 1969.[35] While this report only considered the possibility of lunar module landings, others reports demonstrate there was a fear that the Soviets had more militaristic goals for the moon. According to John O'Hara's NSA report, many scientists thought that the Soviet Union's lunar probes were precursors to a Russian moon colonization attempt. O'Hara also claimed there was a legitimate concern that the Soviet Union would "place nuclear weapons on the moon and use it as a launching site."[36] While Soviet ICBMs were the initial security concern caused by Russian space supremacy, the continued American lag in space technology fostered a fear that the Soviets could use the moon as an instrument of war.

Despite fears of a Soviet militarization of the moon and the tremendous amount of effort and research put into reports such as Project Horizon and Rieffel's study, no U.S. lunar bases were ever developed and no nuclear weapons were exploded on the moon. This was most likely due to the immense costs involved in completing such projects, and because it soon became apparent that the Soviet Union was not capable of manned lunar expeditions. The estimated costs for Project Horizon and the U.S. Air Force project were six billion dollars and 7.7 billion dollars respectively. By the time the Apollo missions were completed, it

[35] Office of National Estimates, Central Intelligence Agency, *Soviet Intentions Concerning a Manned Lunar Landing*, 25 April 1963.

[36] John O'Hara, "Luna 9, the First Soft Landing on the Moon," *Cryptologic Almanac* (March 2003): 1.

had cost somewhere between 21.8 and twenty-five billion dollars.[37] Given there were only nine Apollo missions that spent very limited time on the moon, it is evident that lunar outposts which required dozens of launches and a million pounds of cargo to sustain astronauts for months at a time were soon calculated to be far too expensive. In addition to the massive underestimation of lunar outpost costs, it was also realized that the Soviet space program was not capable of placing men on the moon in the foreseeable future. This was due to the Soviet's inability to develop a heavy lift booster equivalent to the Apollo program's Saturn V. While the Soviet heavy booster attempts were overwhelmed by technical difficulties, demonstrated by one prototype that blew up on the launch pad, the ultimate reason the Soviets did not develop a heavy booster was their lack of private aerospace companies that could produce boosters relatively cheaply.[38] As threats of a Soviet militarization of the moon decreased, it is likely nuclear detonations on the moon and other experiments in space warfare were seen as unnecessary. As a result of overwhelming costs and decreasing Soviet space threats, the Apollo landings between 1968 and 1972 were but a shadow of initial American plans for the moon.

Although the period between 1962 and 1979 is often considered a low point in the Cold War, it witnessed perhaps the greatest technological race the world has ever seen. For the United States, the Space Race culminated in the massively expensive Apollo program, which landed twelve Americans on the moon. Until recently, historians who have examined motivating factors behind the United States' decision to pursue

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[37] Monika Gisler and Didier Sornette, "Exuberant Innovations: The Apollo Program," *Society* 46, no. 1 (Winter 2009): 58.

[38] John B. West, "Historical Aspects of the Early Soviet/Russian Manned Space Program," *Journal of Applied Physiology* 91, no. 4 (Fall 2001): 1511.

manned lunar missions have offered two explanations for this commitment. Some argue that the Apollo programs were the result of one key political figure's influence, such as Lyndon B. Johnson or John F. Kennedy. Others argue that the Apollo programs were supported because of their propaganda value and to create American Cold War heroes. While these factors cannot be overlooked, they do not fully explain the United States' commitment to such an expensive and technologically demanding project.

Recently declassified U.S. government documents have generated a new, more convincing explanation for the United States' commitment to the moon. This explanation begins with the large-scale insecurity caused by the initial Soviet lead in the Space Race. As demonstrated by American newspapers published directly after major Soviet space achievements, there was immense fear that the Soviets could use their new space technology to spy on western allies from the vantage point of space. There were also significant concerns that the rockets being used to place satellites in space could also be used to deliver nuclear warheads across the ocean. However, as the Soviets took the next step in the Space Race with the successful launch of several lunar probes, U.S. officials became wary of a new, far more frightening Soviet threat. Many believed that the Soviet lunar probes were a precursor to Soviet moon colonies, from which they could launch earth bound nuclear weapons. Fears surrounding the Soviet lunar probes are evident in Sydney Finer's account of the CIA kidnapping of a Lunik probe, and by CIA and NSA reports that claim Soviet moon landings and lunar militarization attempts were very real possibilities.

In light of these new Soviet threats, U.S. officials came up with many extravagant plans for the moon. Both the U.S. Army's Project Horizon and the U.S. Air Force report stressed an urgent need for the construction of manned lunar outposts, and L.

Rieffel's study for the Air Force Special Weapons Centre shows that the United States seriously considered detonating nuclear devices on the moon. All three studies highlighted specific military goals that could be accomplished on the moon. Project Horizon noted that lunar outposts could be used for Earth surveillance, and both lunar base proposals acknowledged that the moon could be used as a launching pad for new U.S. weapons. In addition, Rieffel's study claimed that nuclear tests were an ideal way to test nuclear weapons for space warfare. As demonstrated by these reports, the moon was clearly perceived by many U.S. officials as the ideal area to prove their military and technological strength and superiority.

Ultimately, while the Apollo missions did not set up lunar outposts or detonate nuclear weapons, their motivation was grounded in security concerns caused by the American space technology deficit. As the Soviet lead in the Space Race grew, fears surrounding a Soviet militarization of the moon prompted U.S. officials to develop their own ambitious plans for the moon. Although these plans never progressed past the proposal stage, the perception of the moon as the ultimate proving ground for American capability remained. By sending men to the moon, the United States demonstrated that the years of fear caused by the Soviet lead in ICBM and space technology were over.

Forty years after the last Apollo mission landed on the moon, on 25 January 2012, Republican presidential candidate Newt Gingrich addressed a crowd of seven hundred people. In his speech, Gingrich announced that if he was elected, he would establish a moon colony by 2020. When criticized as being grandiose, Gingrich retorted that the people of America were naturally grandiose, as demonstrated by the Wright Brothers and John F. Kennedy. Gingrich then promised that his election would be "the second great launch of the adventure John F. Kennedy

started."[39] Although his campaign went poorly, Gingrich's platform and substantial amount of supporters shows that the era of Buck Rogers and belief in perpetual technological advancement still lives on in the hearts and minds of those who grew up during the Space Race.

[39] "Gingrich Promises US Moon Colony by 2020," *NBC News*, 25 January 2012.

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