

THE SPACE RACE AND PRE-SPUTNIK ERA

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INTRODUCTION

The human race since time immemorial has always been fascinated by the night sky and space in general. The desire to venture into space and reach out to stars and planets has been there in all civilisations. That's why it is said 'Sky is the limit'. People in general have admired birds because they could fly in the skies and defy gravity to an extent; mankind has always wanted to take a similar giant leap. With the launch of Sputnik 1¹ on October 4, 1957, humanity did take a giant leap as for the first time a man-made object was placed into the earth's orbit. This event made news headlines across the globe and as a result it was hailed as the 'dawn of the space age'.

The Soviet Union which launched this satellite (Sputnik 1) showed its potential and capability as one of the two superpowers present in the international system then. The other superpower, USA, was meanwhile trying hard to build its space capabilities and outdo its rival, the Soviet Union, in the domination of Outer Space. This attitude of outdoing each other turned first into a 'race' and subsequently transformed into a 'rivalry'. To understand the difference between the two, a race can be understood as a process in which two or more than two competitors try to reach a goal

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1. Sputnik 1 was the first ever artificial satellite ever to be launched. The launch of Sputnik 1 was a landmark moment in history that marked the start of space age.

The space rivalry started to become political when leaders of these states got personally interested in the matter. More than that, both the Superpowers were trying to 'woo' the newly independent states to join their bloc as 'ally' and those nations who were already 'allies' felt a sense of security.

by focusing on their own abilities. On the other hand a rivalry starts within a race when a competitor is setting his strategies in opposition to a specific opponent. In this case, these opponents were the USA and USSR.

The space rivalry was not just seen as a feat in the field of science, technology and engineering but it was seen more as an issue of *prestige* and *national* honour by both the superpowers. Other countries who were not participants in the Space Race watched the rapid unfolding of events in the field of outer space activities with awe and a sense of admiration towards the Superpowers. Both the American and Soviet systems were being judged on the basis of their technological prowess especially in areas like outer space. Socialism² inside the Soviet Union was pitted against Capitalism³ in the United States. The space rivalry started to become political when leaders of these states got personally interested in the matter. More than that, both the Superpowers were trying to 'woo' the newly independent states to join their bloc as 'ally' and those nations who were already 'allies' felt a sense of security. Countries like India, which were part of neither of the two blocs, i.e., NATO⁴ or Warsaw Pact,⁵ were also looking at the activities in outer

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2. Socialism is an economic and political system based on public or collective ownership of the means of production, which emphasises equality. The Soviet Union throughout its existence was a socialist state till its dissolution in 1991.
 3. Capitalism is an economic and political system in which a country's trade and industry are controlled by private owners for profit, rather than by the state.
 4. North Atlantic Treaty Organization (NATO), military alliance established by the North Atlantic Treaty (also called the Washington Treaty) of April 4, 1949, which sought to create a counterweight to Soviet armies stationed in central and eastern Europe after World War II.
 5. The Warsaw Treaty Organization (also known as the Warsaw Pact) was a political and military alliance established on May 14, 1955 between the Soviet Union and several Eastern European countries. The Soviet Union formed this alliance as a counterbalance to the North Atlantic Treaty Organization (NATO).

space by these Superpowers with much interest. India began contemplating whether it could develop its own space programme sometime in the future. This was the situation prevalent globally in the second half of the decade of the 1950s.

This article looks primarily into the genesis of the Cold War space rivalry and how outer space became a strategic domain by the end of the 1950s. The focus of the article is to analyse the history before the Sputnik 1 was launched by the erstwhile USSR on October 4, 1957 which gave birth to a Space Race between the then two superpowers, i.e., the United States and USSR. The decade of the 1940s and 1950s therefore becomes crucial to understand how the early space programmes in both US and USSR came into being.

BEFORE 1950s

The dawn of Space Age with the launch of Sputnik 1 was not an event which happened out of the blue. It took place within a context. The context was the Cold War rivalry between the US and USSR and if one goes further beyond, one could find the traces of technological innovations in the field of space related technology even before the Second World War. Space came to be seen as a strategic arena with the advent of V-2 rockets in Nazi Germany, when Adolf Hitler used these rockets to attack London during the Second World War for the first time on September 8, 1944 killing and injuring civilians. Each of these V-2 rockets were 14 metres in height and carried a ton (900 kg) of explosives.

The letter 'V' in V-2 stood for 'vergeltungswaffen', or 'retaliatory weapon.' They were called retaliatory weapons because it was the last hope for Hitler to somehow try and reverse the outcome of the war which the Germans were losing. V-2 rockets⁶ were a giant leap in terms of technological advancement in the field of rocketry. These rockets had an approximate range of 200 miles. The man who designed the V-2 rocket was Wernher von Braun who later became one of the pioneers of the Cold War Space rivalry. V-2 rockets were

6. Richard Hollingham, "V2: The Nazi rocket that launched the space age". BBC News, <https://www.bbc.com/future/article/20140905-the-nazis-space-age-rocket>. Accessed on March 10, 2020.

built on automatic guidance systems which meant that they could operate independently of controllers on the ground. The target destination was programmed into the analogue computers on board which helped the rocket to adjust and keep itself in the trajectory for hitting the target.

The 'potency' and 'capability' of these V-2 rockets made them a strategic asset to the Nazis. Major powers like the USA and USSR were eyeing the V-2 rockets to develop a similar technology in their own countries. This is because they realised that having a weapon like the V-2 in the arsenal could give them both 'absolute' as well as 'relative' advantage over their adversaries. This became more evident after the end of the Second World War when Americans and Soviets tried their best to get hold of V-2 rockets from Nazi Germany who had lost the war. In fact, Wernher von Braun, the man behind the V-2, surrendered himself to the allied forces of USA in order to escape being captured by the Soviet forces which were also looking for him.

Not only von Braun but all his associates in Nazi Germany were of great "strategic value" to both the Soviets and Americans as these trained and experienced team of engineers and scientists possessed the potential to take forward the space programmes of the country they surrendered to or were captured by. Though the Soviets and Americans were allies during the Second World War and fought the war together, both were also in competition with one another to become the biggest power of the planet at the end of the war. To ensure its supremacy in general—and over the USSR in particular—an operation was launched by the USA to capture the scientists involved in the V-2 programme.

OPERATION PAPERCLIP

'Operation Paperclip' was the code name of the US intelligence and military services that extricated scientists from Germany, during the final stages of and after World War II. The project was initially called *Operation Overcast* but later came to be known as *Operation Paperclip*. Many of these scientists were Nazi 'War Criminals' who had done horrendous things like carrying out scientific experiments on humans under the

Hitler regime. Most of them were in high positions in their respective fields and supported the Nazi ideology. Once the Second World War was over, both Americans and Soviets wanted to get hold of the technological prowess of the Nazi regime, including the sophisticated technological equipment built in Germany.

Once they got hold of the instruments, equipment, weapons and machines, the question was what to do with the highly skilled and trained people who designed all these things? The question was of morality because on the one hand, the world knew about their Nazi past, while on the other hand, these scientists were too skilled to be just left behind and punished for the war crimes they had committed.

Writing on the issue, journalist Annie Jacobson in her book *Operation Paperclip: The Secret Intelligence program that brought Nazi Scientists to America* wrote, "The U.S. government secretly decided that the value of these former Nazis' knowledge outweighed their crimes and began a covert operation code-named Paperclip to allow them to work in the U.S. without the public's full knowledge."⁷

The NASA history series under the *Selected Documents in the History of US Civil Space Program* revealed how the rocket scientists from Nazi Germany were transferred to the USA. In the book *Exploring the Unknown*, it is clearly stated that, "On May 2, 1945, Wernher von Braun, Dornberger and 116 other rocket specialists surrendered to American officials in the Austrian Tyrol town of Reutte, just south of Bavaria. A few months later, they were taken to the United States, along with about 100 V-2 rockets, many rocket components, and truckloads of scientific documents. This "rocket team" formed the foundation of the US progress in the missile and rocket development for several decades to come."⁸

7. Annie Jacobsen, *Operation Paperclip: The Secret Intelligence Program that Brought Nazi Scientists to America*, <http://93.174.95.29/main/A4477CD74C76858B73683D3FB19A5BFA>. Accessed on March 11, 2020.

8. John M. Longsdon, "Exploring the Unknown: Accessing space", <https://history.nasa.gov/SP-4407/ETUv1.pdf>. Accessed on March 9, 2020.

The United States not only took these scientists but used their potential by giving them a platform to build the US capabilities as a superpower in the arena of outer space along with other areas in science. Dr. Kurt H. Debus, who was a German V-2 Rocket Scientist under Nazi rule, was made the first director of NASA's John F. Kennedy Space Center. He remained there from 1962 till 1974. Similar was the case with many other Nazi scientists who later gained prominent positions in highly reputable institutions in the United States. While this was the case with the US, the Soviets did not allow captured Nazi Scientists to take part in their space programme or any other institution. All the information that these captured scientists possessed about rocketry and missile technology was elicited from them. Once this was achieved, these scientists were deported back to West Germany.

THE SOVIET RESPONSE: 'SOVIET ALSOS'

The Soviet version of Operation Paperclip was 'Soviet Alsos'. Under this, the Soviets tried to take control of the German technological and scientific materials, equipment, instruments as well as scientists and engineers who were the brain behind it. The Soviets were particularly interested in getting hold of atomic technology of the defeated Germans. The idea was to ensure that firstly, they secure these technologies with them and second, to prevent these from falling into the hands of the Americans, who also had a similar objective. Under the Soviet Alsos, the German scientists were captured to work on defence and space related programmes that the Soviets were focusing on during the days of Second World War. The atomic and the space programmes were actually going in tandem with one another in the USA and USSR. The dawn of the Space Age, which was still a distant reality owed its development to programmes like Operation Paperclip and Soviet Alsos.

Thus, both the USA and USSR, in a way, used the Nazi space technology in order to advance their own space programmes. Germany was clearly one of the pioneers in space technology; its defeat in the Second World War halted its forward momentum towards becoming one of the major space powers in the world. One thing which is noteworthy is that, during this time, the real

potential of the space sector had not even been envisaged. The technology related to rocketry was primarily for military purposes. Historical events like Operation Paperclip and Soviet Alsos give us a fair idea of the interest shown by Superpowers in strategic weapons.

THE POST-SECOND WORLD WAR SCENARIO

The end of Second World War led to the rise of two Superpowers, i.e., the USA and USSR. Despite being allies in WWII, both turned antagonistic towards each other in order to establish their individual supremacy over the world. The fight was mostly ideological as both tried to portray to the world that their ideas, their political system, their morality, their culture was better than that of the other. It was in this backdrop that both the US and the Soviet Union started working seriously towards advancing their endeavours in the arena of outer space. It was at this time that 'Space Militarisation' started and gained greater and greater currency.

The term militarisation of space could signify the usage of space assets in order to increase military effectiveness of ground-based forces. Various developments in the field of information and communication satellites have made the global positioning system (GPS) an undeniable part of militaries across the world.⁹ Space militarisation could also be understood as the use of assets based in space to enhance the military effectiveness of conventional forces or the use of space assets for military purposes.¹⁰ Militarisation of space enables a greater 'strategic advantage' over the opponent. Before the launch of Sputnik 1, outer space was unexplored but the 'near space' was very much a 'strategic arena' as the world got to know its potential when nuclear bombs were dropped on Hiroshima and Nagasaki in the Second World War by the US, effectively ending the war decisively.

9. Richard L. Garwin, "Proceedings of the American Philosophical Society", vol. 145, no. 3 (September 2001), pp. 243-59, https://www-jstororg.ezproxy.jnu.ac.in/stable/pdf/1558107.pdf?ab_segments=0%252Fbasic_search%252Fcontrol&refreqid=excelsior%3A02b48b00df173927c9b35231035a63b2. Accessed on March 12, 2020.

10. Mathew Mowthorpe, "The Militarization and Weaponization of Space" (Lexington Books, 1st edition, December 17, 2003), <https://www.goodreads.com/book/show/9924084-militarization-and-weaponization-of-space>. Accessed on March 14, 2020.

In the year 1957, the first successful test of an Intercontinental Ballistic Missile (ICBM) was conducted by the Soviet Union. Although the United States had tried to conduct the first launch of an ICBM before the Soviets, but the test launch had failed.

Scientists in both the US and USSR were working in tandem on both nuclear and space programmes. The combination of these two capabilities coming together had the most 'destructive potential'; Intercontinental Ballistic Missiles (ICBMs) emerged as a result of this thinking. ICBMs were designed to carry nuclear warheads over large distances, across continents. These ICBMs started coming up during the 1950s. These were much more powerful than the previous long-range guided ballistic missiles like Nazi V-2 rockets. For years after the Second World

War, both the United States and the Soviet Union had been trying to perfect a long-range missile capable of carrying nuclear warheads. Building on the success of Nazi Germany in developing the V-1 and V-2 rockets that caused great damage to Great Britain during the last months of World War II, both American and Russian scientists raced to improve the range and accuracy of such missiles.

In the year 1957, the first successful test of an Intercontinental Ballistic Missile (ICBM) was conducted by the Soviet Union. Although the United States had tried to conduct the first launch of an ICBM before the Soviets, but the test launch had failed. To fully understand the competition between the US and Soviet Union in the arena of outer space—which ultimately led to a space race and further to a space rivalry between them—one has to understand the context of the global order in which these events were unfolding.

The context was the 'birth' of Cold War itself. The end of World War II actually left three Superpowers in the offing, i.e., the USA, UK and USSR. The United Kingdom could not continue to maintain its status of a Superpower because of the huge damages it incurred during the war. Second, the large decolonisation of the British empire, including independence of huge colonies

like India, which had served the British Empire's development, contributed to its downfall. With the empire gone, the United Kingdom remained a shadow of its glorious past, leaving only two Superpowers ultimately, i.e., the US and USSR.

THE ADVENT OF THE COLD WAR

The term 'Cold War' was coined on April 16, 1947 by Bernard Baruch, the multimillionaire financier and adviser to presidents from Woodrow Wilson to Harry S. Truman, in order to explain the increasingly adverse relations between the two World War II Allies: the United

States and the Soviet Union. The Cold War was a period of 'competition' and 'tension' between the two Superpowers through the second half of the twentieth century until the break up of the Soviet Union in 1991. The period 1945-1991 is generally seen as the period of Cold War. Though the US and USSR never fought a direct war in this period, there were many stand-offs between them which brought them dangerously close to a nuclear war.

The Cold War as a period in the history of international relations is understood as a period of 'bipolarity'. The world was divided into two poles, each with its own ideology, claiming supremacy over the other. The Cold War became a rallying point for countries with similar systems of governance and ideologies to come together as a group, as an alliance, and as security partners. NATO and Warsaw Pact are examples of such groupings, where NATO represented the Western Bloc, while Warsaw Pact represented the Eastern Bloc. The Western Bloc was led by the United States while the Soviet Union led the Eastern Bloc. Though the US and USSR had fought together as allies against the Axis powers—which included Nazi Germany—tensions started

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coming to light between the two from the time of the Potsdam Conference itself where the allies negotiated the joint occupation of Germany.

As per information provided by the JFK presidential library and museum on the Cold War, "During the 1940s, the United States reversed its traditional reluctance to become involved in European affairs. The Truman Doctrine (1947) pledged aid to governments threatened by communist subversion. The Marshall Plan (1947) provided billions of dollars in economic assistance to eliminate the political instability that could open the way for communist takeovers of democratically elected governments." The Cold War gave birth to realist issues like balance of power, deterrence, territorial integrity and sovereignty. Realism, an approach to the study and practice of international politics, emphasised the role of the nation-states, motivated by their national interests, which could sometimes be disguised as moral concerns.

The Cold War became a battleground of ideas clashing with each other constantly. The world was moving in the direction of binaries. Things like 'us' versus 'them', 'capitalism' versus 'communism', 'America' versus 'Soviet', 'East' versus 'West', 'First World' versus 'Second World' started to define the nature of the Cold War. It was within this context that both the US as well as USSR tried to assert their dominance over the other. The idea was that once a Superpower manages to defeat the other in an ideological battle of supremacy aided by physical military strength as well, one of the two would become a 'hegemon' in the system. The term 'hegemony' was brought into International Relations literature by Robert Keohane—derived from the Greek word *hegemonia*, which translates as dominance or leadership.

The hegemonic ambitions of both Superpowers demanded an absolute edge with respect to military capabilities over the other. To achieve that, both the USA and USSR started building their military capability aided by nuclear, missile and space technologies. If the 17th, 18th and 19th centuries were about the mastery of seas to become great powers, the twentieth century was about getting mastery over air and space. The combination of air and nuclear power together provided quite a 'lethal combination', as was seen during the dropping of a nuclear bomb in World War II as well as in the use of V-2 rockets by Nazi

Germany (though nuclear weapons were not used at that time). Pioneers of space engineering—which included people like Wernher von Braun and Sergei Korolev—were therefore focusing on building and enhancing such capabilities which in their minds would become the future of warfare.

With the US already in the lead, having declared itself a nuclear power—in fact, the first nuclear power on the planet—the USSR followed soon thereafter and declared itself a nuclear power in 1949. One thing that needs to be kept in mind is that the nuclear arms race between the two superpowers was a precursor to the upcoming space race between them. Therefore, one cannot fully understand the nuances of ‘Space Race’ which intensified the Cold War in the 1960s. The space programmes in both the US and USSR were not conceived for ‘civilian purposes’ at the outset. Militarisation of outer space was at the heart of both these programmes. There was a great ‘mutual suspicion’ between Americans and Soviets and therefore a lot of spying and counter-spying was involved. In order to ‘outdo’ each other across all fields—especially trying to have a relative superiority in the military arena—both the countries started to invest heavily in their defence sector. Let’s have a brief look into both the US and Soviet involvement in the arena of Outer Space before the dawn of the Space Age.

AMERICAN EFFORTS IN OUTER SPACE AFTER WW II

The end of the Second World War was decisive in many ways. On the one hand, it ended the tyrannical Nazi regime in Germany which was the perpetrator of crimes against humanity at large, while on the other it threw up a new international order with two Superpowers. Also, the war ended with the ‘dawn of nuclear age’ with the US dropping the atomic bomb named ‘Little Boy’ over Hiroshima and another bomb named ‘Fat Man’ over Nagasaki. The Americans started working on their ballistic missile programme with the help of the German scientists who had been taken out of Germany by the US under Operation Paperclip. Wernher von Braun began working for the Americans along with hundreds of German—and US—scientists and engineers reporting to him.

Till then, the air power capabilities of the US or any other country in the world were limited to the earth's atmosphere. Reaching outer space was still a distant dream, although the advancement in rocketry and missile technology provided a real possibility of making manned forays into outer space soon. The only big question was when? The US administration at the very top level, including its President, was involved in the decision-making process regarding the kind of space policy that was to be made with respect to the usage of outer space. One thing which is noteworthy is that each of the US Presidents had a different approach with respect to the militarisation of space.

In the book, *US Presidents and the Militarization of Space: 1946-1967*, the author, Sean N. Kalic describes the stand taken by various US Presidents during the early Cold War. The book looks into the role played by three successive presidents of the USA after Second World War, i.e., Presidents Truman (1945-53), Eisenhower (1953-61) and Kennedy (1961-1963). Kalic states, "President Truman remained personally detached from the work on the early ideas about the use of satellites and space systems." The Truman era also saw the birth of the idea that eventually led his successors to push for an international ban on the stationing of weapons in space. Eisenhower recognised the significant national security contributions that non-aggressive military satellites could provide the United States. He also saw the importance of advancing the US civilian space programme as a demonstration of US commitment to the peaceful use of space.

These ideas were carried over to the administrations of Presidents Kennedy and Johnson. President Kennedy emphasised the role of NASA by embracing the capabilities of the civilian space programme to further the US agenda of the peaceful use of space. Despite strong criticism for his decision to emphasise NASA's programmes over those of the military, Kennedy advanced the use of non-aggressive military satellites as developed and authorised under Eisenhower. The decisions by these three presidents to use space for military as well as civilian purposes were not made in a vacuum. Rather all the three presidents embraced the use of

space for reasons of national security, international prestige, and scientific and technological research, all areas of heightened concerns during the Cold War.¹¹

The years 1945-1952 are not considered as a part of the Space Age and yet these very years provided the intellectual beginnings of the American space programme. The Americans were wary of Soviet progress in the arena of military technology. By the start of the 1950s, the US did not remain the only nuclear power. The USSR was the new entrant to the nuclear club. From 1945 to 1949, it seems that the US remained a bit relaxed vis-à-vis its progress in the arena of strategic military assets. The reason seems to be that firstly, the Second World War had just finished and most of the countries needed a breathing time after a long war to bring back things to normalcy. Secondly, during this period, the US had proved itself as the most powerful and the only force in the world possessing nuclear weapons and therefore had a big 'strategic advantage' over the USSR. With the Soviets bridging the nuclear gap between itself and the US, the Americans started to embrace the militarisation of Space. It was under the Eisenhower administration that the military space activities by the US increased dramatically. Eisenhower took a deep interest in space related issues; he was especially in favour of using satellites for military purposes.

President Dwight Eisenhower authorised preliminary research on Anti-satellite systems (ASAT) and Ballistic Missile Defences (BMDs). Eisenhower supported these programmes because he believed that they could be used to stop a Soviet attempt to control space. Though he was against the use of weapons in space, Eisenhower defended US interest in ASAT and BMD research as necessary to preserve global peace and stability. Eisenhower did not usher America into the space age. It was already there, and he expanded on principles set out in the Truman years. What was new in the Eisenhower presidency was the President's recognition of the need for a national space policy based upon the militarisation of space.

11. Sean Kalic, *US Presidents and the Militarization of Space: 1946-1967* (Texas A&M University Press, 2012), <http://93.174.95.29/main/378373758BA9D7F3743BDFB0B91C77B3>. Accessed on February 27, 2020.

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The concept of 'space superiority' is believed to have first been elaborated in the early 1950s by Wernher von Braun. In 1951 von Braun envisioned a space station that would give the United States 'military omnipresence'. He stated,

It appears to me that in the atomic age the nation which owns such a bomb-dropping space station might be in position virtually to control the earth. The political situation being what it is, with the earth divided into a western and an eastern camp, I am convinced that such a

station will be the inevitable result of the present race of armaments.

In the 1950s, Outer Space began to be seen as an arena of 'strategic stability' by the Americans. There is no particular or one definition of strategic stability as the word is used in many contexts and therefore one definition cannot do justice to all those contexts. But one definition which stands out among many is the one given by International Relations scholar Thomas Schelling. He defined 'strategic stability' as, "a particular balance between nuclear armed rivals that have credible retaliatory nuclear strike capabilities." He further added,

a situation is stable when either side can destroy the other when it strikes first or second—that is, when neither in striking first can destroy the other's ability to strike back. To maintain this equilibrium, it is not sufficient for all sides to simply have nuclear weapons. Strategic stability demands 'the maintenance of an effective second-strike capability'. (UNIDIR Report, "Space Security and Strategic Stability".)

Though this definition was written in 1958 but the debates on this issue had

started much before in the early 1950s which ultimately led to the formation of national space policy in the US post the launch of Sputnik 1.

SOVIET EFFORTS IN OUTER SPACE AFTER WORLD WAR II

Soviet efforts were no less than the US in the arena of outer space, although, unlike the US, the Soviets had a highly secretive and centralised set-up. The space programme, like other programmes in the USSR, was attached to its five-year plans which were very successful in taking Soviet Russia to

a dominant position on the global stage. After the Second World War, the Soviets realised that though they were one of the two Superpowers, they were lagging behind the US as it was the sole nuclear power by then. Despite being an ally of the US in WWII, the Soviets were never kept in the loop about the Manhattan Project by the US (at least not officially) nor were they informed by the US about its decision to drop the atom bomb on Hiroshima and Nagasaki.

The mutual suspicion between the two superpowers was running very high and it was in this context that the Soviets geared up to build their strategic and military arsenals, especially in the areas of ballistic missile technology and space technology. Sergei Korolev, a rocket engineer by profession, was put in charge of the Soviet Space programme. Considered as the Father of the Soviet Space programme, Sergei Korolev took the Soviet Space programme to great heights in his lifetime.

Though the rocketry and space programmes of the Soviet Union had their origins in the late 1800s with the farsighted and at times farfetched writings of a deaf, self-taught schoolteacher named Konstantin Eduardovich Tsiolkovskiy, it was Sergei Korolev who took the Soviet Space programme

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to the next level. Soviet efforts in outer space after the Second World War were formidable, given that the country had incurred tremendous loss of life and property. At that time, it was difficult for nations to think of spending large sums of money on outer space technology. But the young engineers of Soviet Russia—which included Korolev as the head of the operations—were in a ‘mission mode’. It was the combined fear of the country’s leaders and love for the country itself that provided the context within which the young aeronautical engineers of the Soviet Union started working towards their space programme. Their love for pursuing science and engineering was also one of the big motivating factors for the Soviet engineers to work under adverse conditions.

Stalin, who was then president of the Soviet Union, directed his forces to take control of the Nazi military technology which was quite advanced, but the Soviet forces did not have much success in getting the desired assets, i.e., German technology, or its scientists. US forces had already captured most of the Nazi military assets by the time Soviet forces reached those military facilities in Germany. Even Wernher von Braun, along with hundreds of engineers and scientists, had surrendered to US forces. Soviet leaders who had expectantly awaited capture of this most precious war booty were in some cases stunned by the efficiency and swiftness with which these ‘weapons’ were taken from under their noses. Stalin was reportedly quoted as saying: “This is absolutely intolerable. We defeated the Nazi armies: we occupied Berlin and Peenemunde but the Americans got the rocket engineers. What could be more revolting and more inexcusable? How and why was this allowed to happen?”¹²

Soviet efforts to take control of whatever was left were also disorganised. Among the Soviet team members for capturing the Nazi missile technology was a person named Boris Chertok, a guidance systems engineer who became one of the pioneers of the Soviet Space programme.

12. Asif Siddiqui, “Challenge to Apollo: The Soviet Union and the Space Race, 1945-1975”, <http://93.174.95.29/main/7C0CF0B1521459E67F7A52527EC10B26>. Accessed on February 24, 2020.

Chertok took a leading role in making impartial assessments of leftover German remains. The preliminary impressions resulting from the combined inspection of the artillery and Air Force groups at Peenemunde in May and June had repercussions not only on the perceived level of German missile technology, but they also reflected poorly on the accomplishments of the Soviets themselves.¹³

Soviet rocket scientists and engineers were as advanced, as inventive and as clever as their German counterparts but in putting these theories into practical technology they turned out to be behind the Germans. But soon that was about to change. The Soviets took back around 152 scientists to Moscow, all of whom were experts of rocketry. While the Soviet Alsos was going on, back at home the Soviet government was focusing to build up institutions. By the time the Germans arrived in Moscow, a vast network of institutions had been formed around the nerve centre of NII-88 at Kaliningrad, about 16 km north of Moscow.

The institute itself, headed by Maj General Gonor, was divided into three formal structural units:

- A specialised design bureau to design long-range ballistic missiles.
- A scientific branch with sub-departments for materials science, stress, aerodynamics, engines, fuels, control, testing and telemetry.
- An experimental plant to manufacture the missiles.

After getting their hands on whatever was necessary for the Soviets to exploit, the Nazi military assets (the scientists and engineers) were sent back to Germany.

CONCLUSION

The dawn of the space age is identified by the launch of Sputnik 1, but as is said 'Rome wasn't built in a day', similar was the case with the progress in the space arena. It took a lot of historical twists and turns, along with

13. Ibid.

the fast-changing global order, that eventually led to the era which is known as the space age. If one has to understand the nuances of the origins of the Cold War space race and then the space rivalry between the two superpowers, one needs to understand the context in which it happened and more importantly the historical background to this important landmark in international relations history. The pre-Sputnik era essentially built the ground for the 'space race'; it equipped the Superpowers to become much more powerful states in the decade that followed the end of the Second World War.

It was in this pre-Sputnik era that the international order and the system changed. The world was saved from the Nazi regime headed by Adolf Hitler who could have created much more havoc and could have threatened global security in a much more despotic manner had his regime been in possession of highly potent and destructive weapons like the atom bomb or ICBMs. The desire and zeal of the Superpowers to reach out to outer space gained currency in this period. The period of pre-Sputnik launch was a period of dreamers, achievers and pioneers who wanted to venture into a 'new world', a more 'scientific world'. To have supremacy over the planet was no longer the biggest dream; now mankind wanted to conquer Space. This need for gaining supremacy over the rest of world led to the intensification of the Cold War.