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Moon rocks and mediations: Cooperation and competition in space race diplomacy

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MOON ROCKS AND MEDIATIONS:
COOPERATION AND COMPETITION
IN SPACE RACE DIPLOMACY

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ABSTRACT

While the Space Race is often discussed in terms of international competition and Cold War tension, the fact that both Soviet and American forays into space remained peaceful and scientifically driven throughout the 1950s and 1960s points to a more complicated reality that indicates a significant amount of international cooperation during the Space Race. The International Geophysical Year (IGY), which was a collaborative effort among scientists from around the world, served as a catalyst for beginning the Space Race in the late 1950s, and the importance of scientific cooperation emphasized by the IGY remained central to space exploration throughout the Space Race. Efforts within the United Nations (UN) also served to direct the Space Race away from potential war and toward peaceful collaboration. While Cold War tensions remained a major factor in the Space Race, cooperation between the United States and the Soviet Union were a vital part in directing the Space Race toward peaceful ends.

This paper examines the role that the IGY, the UN, and Cold War tensions played in the progression of the Space Race during the 1950s and 1960s. In the process it challenges the Historiographical assumption that the Space Race was solely competitive in nature as well as the traditional understandings about the nature of the Cold War.

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LIST OF ABBREVIATIONS

ABMA	Army Ballistic Missile Agency
COPUOS	Committee on the Peaceful Uses of Outer Space
CSAGI	*Comité Spécial de l'Année Géophysique Internationale*
FPY	First Polar Year
IAU	International Astronomical Union
ICBM	Intercontinental Ballistic Missile
ICSU	International Council of Scientific Unions
IGC-59	International Geophysical Cooperation 1959
IGY	International Geophysical Year
IRC	International Research Council
IUGG	International Union of Geodesy and Geophysics
MAD	Mutually Assured Destruction
NASA	National Aeronautics and Space Administration
SPY	Second Polar Year
UN	United Nations
URSI	International Scientific Radio Union
WMO	World Meteorological Organization

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INTRODUCTION

"That's one small step for man; one giant leap for mankind."[1] Neil Armstrong spoke these memorable words as he took his first step onto the surface of the Moon in July 1969. Fulfilling President John F. Kennedy's promise that the United States would land a man on the moon by the end of the decade, Armstrong and the crew of *Apollo 11* finally achieved the goal that had driven the Space Race between the United States and the Soviet Union for over a decade. As Armstrong and Edwin "Buzz" Aldrin made their way onto the surface of the Moon, the United States celebrated a victory twelve years in the making, yet Armstrong's comment was completely devoid of the nationalist tone that one would expect at the end of such a monumental race. Even the plaque attached to the ladder of the Lunar Module seems oddly anticlimactic considering the circumstances. Rather than a message of triumph, the plaque reads simply "HERE MEN FROM THE PLANET EARTH FIRST SET FOOT UPON THE MOON JULY 1969, A.D. WE CAME IN PEACE FOR ALL MANKIND."[2] While the peaceful rhetoric of both Armstrong's statement and the message on the plaque might seem out of place given the context of the Space Race, the ensuing pages of this study explain that both messages reflect the work of hundreds of diplomats in the United Nations and elsewhere who sought to direct the exploration of space toward peaceful, cooperative ends.

In his introductory essay for the collaborative book, *Cold War as Cooperation*, political science professor Edward A Kolodziej posits that the Cold War, from its earliest

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[1] William E. Burrows, *This New Ocean: The Story of the First Space Age* (New York: Random House, 1998), 29.

[2] Ibid., 426.

beginnings during World War II, is a grand example of game theory cooperation at work in global politics.[3] According to Kolodziej, the careful dance of the Cold War would never have been possible without a considerable level of cooperation between the United States and the Soviet Union. Cooperation, in Kolodziej"s terms, "does not imply congruent values or similar strategies," but rather serves as "a precondition for sustaining their rivalry at tolerable levels, short of mutually catastrophic war."[4] Crises like the Cuban Missile Crisis and conflicts such as the Korean or Vietnam Wars illustrate the ways in which both superpowers had to cooperate on some level to avoid total war. Even when faced with points of major conflict, the Soviet Union and the United States sought ways to resolve the issues without going to war.

The cooperation between the United States and the Soviet Union was somewhat forced by the advancement of several new technologies, most notably nuclear power and its associated weaponry and rocketry. When the United States dropped the first two atomic bombs on Hiroshima and Nagasaki in 1945, the realities of modern warfare came into sharp relief. The technological advances that accompanied both World War I and World War II took warfare to a new level. In less than a century warfare had gone from muskets, swords, and horse-mounted cavalry to machine guns, hand-grenades, and armored divisions. Further, airplanes allowed bombs and troops to be dropped deep behind enemy lines. Atomic and nuclear technology pushed warfare to an even higher

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[3] Edward A. Kolodziej, "The Cold War as Cooperation," in *The Cold War as Cooperation: Superpower Cooperation in Regional Conflict Management*, ed. Roger E. Kanet and Edward A. Kolodziej (London: MacMillan, 1991).

[4] Ibid., 6-7.

level of destruction that made total war unthinkable. Without the development of nuclear technology, the Cold War might have resulted in a large scale military conflict, but with the advent of the Nuclear Age and with the development of sophisticated rocket technology came the necessity to maintain civil relations internationally to prevent total destruction. Mutually Assured Destruction (MAD) became the catch-phrase used to describe the reality in which the United States and the Soviet Union operated for many years.[5] The nations cooperated because conflict would result in the total destruction of both entities. While the political cooperation between the Soviet Union and the United States was forced into being by the threat of nuclear war, voluntary cooperative efforts in the sciences took advantage of the technological advances of the world wars in major attempts to understand the earth and the forces that act on it.

In the early 1950s, a group of scientists proposed an international cooperative effort to gather data that sought to help scientists to understand the earth, the atmosphere, and the solar system. This effort became the International Geophysical Year (IGY), which took place from July 1, 1957 to December 31, 1958 and was a major factor in sparking the Space Race.[6] Created, planned, and executed under the authority of the International Council of Scientific Unions (ICSU), the IGY was an international collaborative effort that included nearly sixty thousand scientists from over sixty nations who worked together in observing a number of natural phenomena. The scientific

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[5] Howard Jones, *Crucible of Power: A History of American Foreign Relations from 1897* (New York: Rowman & Littlefield Publishers, Inc., 2008), 491-92.

[6] Ronald Fraser, *Once Round the Sun: The Story of the International Geophysical Year* (New York: MacMillan, 1958), 97-98.

contributions of the IGY were tremendous, but its impact on global politics is perhaps even more notable since it spawned the Space Race.

As part of the IGY program, capable nations were asked to attempt to orbit satellites to aid in the observation of the upper atmosphere and other cosmic phenomena. As the world leaders in rocketry, both the United States and the Soviet Union committed to orbit satellites as part of the IGY program. On October 4, 1957, the Soviet Union became the first nation to place an artificial satellite in orbit. Immediately and to the surprise of both the Soviet Union and the United States, *Sputnik I*, a simple metal ball with a radio transmitter and batteries, became an international spectacle. The United States rushed to orbit its first satellites and to catch up with the Soviet Union in its space programs as it reeled from the realization that the Soviets had beaten them in a major technological feat. What began as a collaborative program for scientific observation developed into one of the most expensive technological contests of the period as both the Soviet Union and the United States started on programs to understand the world, to explore space, and to land men on the moon.

As the Space Race began speeding up, the potential for cosmic war became an immediate threat. The rocket technology that was carrying men and equipment into space was the same technology that had been designed to carry nuclear warheads around the globe, and as an extension of the arms race, the Space Race could easily turn militaristic. Many feared that within a few years of *Sputnik 1*‟s first orbits, both nations would have orbital military platforms armed with missiles and perhaps even troops. Space also presented the potential of new colonial opportunities, and if the United States

and the Soviet Union both decided to colonize a particular celestial body, colonial wars might follow. The potential gains of expanding into space were entirely unknown at the beginning of the Space Race, and as American diplomat Craig Eisendrath explains in his introduction to his co-authored book *War in Heaven*, the potential for colonial conflict seemed unavoidable. Comparing humanity‟s expansion into space with Columbus‟ discovery of the New World, Eisendrath describes the questions facing the world in 1957 by asking, "What would follow? Would the nations of the world do what they did after 1492: arm themselves to the teeth, and carve up this new world into colonies and empires? Would we see the Americans and Soviets in a mad rush to claim their very own planets and various sections of space; and would other powers make similar claims? Would the great powers begin to fight wars in outer space?"[7] These were real possibilities given the political climate in the 1950s, and in 1958 these questions prompted the United Nations to act.

To address these potential conflicts and in response to requests from both the United States and the Soviet Union, the United Nations created the Committee on the Peaceful Uses of Outer Space (COPUOS) in 1958 to guide the race toward peaceful rather than militaristic ends. Despite the fact that the Space Race was inherently competitive, the committee called for cooperation in the exploration of outer space and the extension of programs such as the IGY to encourage international cooperation in the place of competition. While the COPUOS was unable to relieve the tensions created by

[7] Hellen Caldicott and Craig Eisendrath, *War in Heaven: The Arms Race in Outer Space* (New York: The New Press, 2007), viii.

the Space Race completely, it was successful in guiding the competition toward peaceful ends through a number of resolutions, suggestions, and ultimately the Outer Space Treaty of 1967, which declared outer space and any cosmic body to be international territory, thus reducing the threat of colonial war in space.

At its foundation, the Space Race was born of a cooperative international effort to explore the earth and the cosmos around it, and while international politics still came into play, efforts like the IGY created an atmosphere of peaceful cooperation in scientific enterprises that disregarded the rivalries present in the world of global politics. Official entities such as the United Nations and specifically the COPUOS helped to shape and direct the Space Race as it moved forward and assured that the rivalry between the United States and the Soviet Union would not result in cosmic warfare. Without the IGY calling for satellites there likely would have been no Space Race, and without the COPUOS guiding its progression, the space race would have undoubtedly developed into an extension of the already raging nuclear arms race. While humanity"s excursion into space was the product of international competition, it progressed successfully and peacefully through efforts made by the United States and the Soviet Union to cooperate in the field. As Kolodziej argues, cooperation between two nations does not require that those nations be friendly with each other. On the contrary, two nations can be almost entirely opposed to one another and still cooperate by continuing to participate in diplomatic talks and by recognizing the need to prevent conflict. While Kolodziej and his colleagues in the edited volume use this idea to examine regional conflicts that emerged during the Cold War, this paper uses Kolodziej"s theory to examine the Space

Race while arguing that cooperation fostered within the United Nations and the international scientific community was responsible for directing the Space Race toward its peaceful conclusion with the *Apollo 11* Moon landing in July 1969.

CHAPTER 1

CREATING THE SPACE RACE: THE IGY AND THE DEVELOPMENT OF INTERNATIONAL SCIENCE

On April 5, 1950 a group of American scientists gathered at the invitation of James A. van Allen, the scientist most responsible for the discovery of the radiation belts surrounding the earth that bear his name, to listen to an evening talk by Sydney Chapman, one of the predominant geophysicists of the 1940s and 50s. As the night progressed, the discussion turned to technological advances that could lead to major discoveries in various geosciences. The knowledge of the earth as a whole was rather limited in the early 1950s, and per the suggestion of another leading geophysicist of the time named Lloyd V. Berkner, the group decided to propose the creation of a third "polar year" to the International Council of Scientific Unions (ICSU), which Berkner and Chapman did within the year.[1] Since it came to encompass much more than just polar exploration, the scientific effort that these scientists envisioned in van Allen"s living room in April 1950 eventually became the International Geophysical Year (IGY). The IGY was meant to foster international cooperation in the physical sciences through major collaborative efforts that would take place from July 1957 through December 1958. The IGY produced numerous noteworthy discoveries in the physical sciences; however, it also spawned one of the most dangerous and costly technological races of the century—the space race between the Soviet Union and the United States.

[1] Ronald Fraser, *Once Round the Sun: The Story of the International Geophysical Year* (New York: MacMillan, 1958), 97-98.

The historiography on the IGY is almost non-existent. From the beginning of the event in 1957 until about 1961, commentators published a number of books on the topic, but since the early 1960s, little to nothing has been written on the IGY.[2] Walter Sullivan's *Assault on the Unknown: the International Geophysical Year*, which was published in 1961, provides what he calls a "layman's approach" to the IGY "in the hope that the general reader will share the thrills of its discoveries and the promise that it holds for a peaceful future."[3] Sullivan offers a considerable amount of information on both the IGY and the polar years in much more detail than the typical layman's account, but he does so in an accessible and even exciting way. Another helpful study of the IGY is Sydney Chapman's *IGY: Year of Discovery, the story of the International Geophysical Year*.[4] Chapman was largely responsible for the creation of the IGY and worked as the head of the committee charged with its organization. His discussion of the undertaking is helpful in understanding the breadth of knowledge gained from the IGY and in gaining a first hand perspective on the undertaking. Ronald Fraser's *Once Round the Sun: the Story of the International Geophysical Year* discusses some of the major events and potential discoveries of the IGY, but being written in the midst of the IGY, which ran

[2] Roger D. Launius, James Roger Fleming, and David H. DeVorkin have recently written a book examining both polar years and the IGY, but it is not due from the publisher until November of this year. Roger D. Launius, James Roger Fleming, and David H. DeVorkin, eds., *Globalizing Polar Science: Reconsidering the International Polar and Geophysical Years*, Palgrave Studies in the History of Science and Technology (New York: Palgrave MacMillan, 2010).

[3] Walter Sullivan, *Assault on the Unknown: The International Geophysical Year* (New York: McGray-Hill Book Company, Inc., 1961), vii.

[4] Sydney Chapman, *IGY: Year of Discovery, the Story of the International Geophysical Year* (Ann Arbor: The University of Michigan Press, 1959).

from July 1, 1957 to December 31, 1958, his discussion of the science tends to be incomplete and conjectural.[5] Still, Fraser provides a fascinating and enthusiastic window into what these scientists hoped to accomplish through the IGY. Beyond these initial commentators there has been little to nothing written on the IGY, which is probably due to the fact that IGY has become so overshadowed by the Space Race that developed out of IGY efforts to explore the upper atmosphere.

Lloyd Berkner initially proposed the IGY as the Third Polar Year. The first two polar years had been largely successful, and Berkner hoped, as did the other scientists involved in the project, that recent technological advances would make a third polar year even more successful than its predecessors. While the name was changed to the International Geophysical Year during the planning stages to encourage exploration taking place beyond the Arctic and Antarctic Circles, the concept was much the same as the preceding efforts.

Austrian explorer Karl Weyprecht proposed the First Polar Year (FPY) in 1875.[6] His plan consisted of the construction of a ring of stations around both the Arctic and Antarctic circles that would make synchronized observations of magnetic fluctuation, aurora, weather, and polar ice. He hoped that through such cooperative observations, patterns would emerge that could be helpful in understanding the earth‟s magnetic field and would aid in understanding weather patterns worldwide. While he proposed the idea in 1875, the project did not happen until 1882. The FPY was primarily an effort of

[5] Fraser, *Once Round the Sun*.

[6] Sullivan, *Assault on the Unknown*, 8.

observation, although it was not without risk. Several teams were stranded as ice broke up their ships or moved them off course, and an American team led by Adolphus Greely spent three winters stranded as supply ships were unable to make it through to their position. Only six of the original twenty-five men survived the ordeal, but they preserved their records, and their observations were entered into the pool of data retrieved from the other teams around the world. Ultimately, eleven nations contributed to the venture, and the year of observation resulted in advances in meteorology and magnetic theory.[7]

The Second Polar Year (SPY) was a bit more broad in its scope. A significant portion of the observations were still concerned with understanding the earth‟s magnetic field, but by 1932, when the second polar year was to begin, new discoveries in radio transmission and advances in rocketry allowed for serious attempts at understanding the upper atmosphere, specifically the ionosphere.[8] In the 1920s, scientists had discovered how to bounce radio waves off the upper atmosphere and had begun a series of experiments to determine the height and makeup of this reflective layer. One of the planned experiments of the second polar year was to make synchronized observations of this reflective layer to try to understand how it worked.[9]

Plans to send rockets with meteorological instruments into the upper atmosphere were also part of the original plans being considered in the late 1920s. Robert Goddard, the American rocket scientist often considered to be one of the fathers of modern

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[7] Chapman, *IGY: Year of Discovery*, 95.

[8] Ibid., 99.

[9] Sullivan, *Assault on the Unknown*, 16.

rocketry, had greatly improved his liquid-fueled rocket designs, and polar year planners intended to send weather instruments up on several of these rockets to gather information about the upper atmosphere. Plans were also in the works to fire a number of sounding rockets, which were designed to explode at a particular altitude, giving observers on the ground readings on the density and temperature of the air through which the shock-wave passed.[10] However, before any of these plans came to fruition, the Great Depression struck.

The onset of the Great Depression made funding a major problem for the planners of the SPY, and budget cuts forced the planners to cancel several projects, including Goddard‟s rocket experiments. Thanks to a generous grant from the Rockefeller Foundation, the main portions of the initiative moved forward as planned, and by August 1933, the SPY was complete. The outbreak of World War II further complicated the task of compiling and publishing the data collected over the year and a half period. Unfortunately much of the data disappeared, but as author Walter Sullivan points out, the applied knowledge gained in the realm of radio communications alone "was worth hundreds of millions of dollars."[11] The SPY also made use of information gathered during the FPY as a basis for comparison. Both Polar Years provided similar foundations for the IGY in the 1950s.

A resurgence in international cooperation in the sciences followed the end of World War II. Organizations that had become politically entangled following the First

[10] Ibid., 16-18.

[11] Ibid., 19.

World War, such as the International Research Council, fell by the wayside, and new organizations emerged. Designed to organize but not control the thirteen major scientific unions worldwide, the International Council of Scientific Unions (ICSU) emerged as the guiding force in the effort to unite global scientific research. These unions were meant to ensure that projects were not being double researched and that major areas of study were not being missed, and by 1945 all thirteen of these scientific unions were significant entities.

Scientific unions stem from the original scientific societies such as the Royal Society of London and the *Académie des sciences* in France. Just as these early scientific societies functioned as a meeting of the minds within France or England, the scientific unions of the nineteenth and twentieth centuries existed to bring scientists together in major efforts to understand the natural world and to help fund and direct research in specialized areas. As the scientific knowledge of the natural world became more and more advanced, these societies became more and more specialized. Whereas the Royal Society of London during the 1800s featured numerous scientists exploring a plethora of subjects, unions such as the International Union of Geodesy and Geophysics (IUGG), which still meets today, is concerned specifically with understanding the earth‟s gravitational field and other phenomena concerning earth sciences, and the International Scientific Radio Union (URSI) is concerned with understanding how radio waves function and how to make radio technology function better.

When Berkner first proposed his idea to hold the IGY, he did so before the Mixed Commission on the Ionosphere, which was a cooperative effort among the International

Scientific Radio Union (URSI), International Astronomical Union (IAU), and the International Union of Geodesy and Geophysics (IUGG).[12] While each scientific union is primarily concerned with a particular branch of the natural sciences, when the interests of two or more unions can be served by a particular program, the ICSU helps organize cooperative efforts among the unions. For instance, the Mixed Commission on the Ionosphere was a cooperative effort among the IUGG, the IAU, and the URSI, and the IGY itself became a grand effort including all of the scientific unions represented in the ICSU. After Berkner presented his idea to the Mixed Commission on the Ionosphere, the participating unions then passed the idea up to the ICSU General Assembly, who decided to begin planning for the event.[13]

In response to Berkner and Chapman's request, ICSU created a special committee to plan the IGY. The *Comité Spécial de l'Année Géophysique Internationale* (CSAGI) first met in October 1952 and was responsible for the planning and execution of the IGY. Invitations went out to all members of the ICSU, and by 1954 the CSAGI began outlining a specific program of study for the IGY and requirements for potential projects to take part in the IGY. All told, sixty-seven nations and over sixty thousand scientists participated in the program. Oceanographers discovered new deep sea currents flowing around the world. Seismologists were able to triple the number of seismographic observations points around the world, and huge advances were made in understanding the

[12] The acronyms for these unions were based on the French titles. Some, such as the IAU, line up with the English title, but others are more anomalous.

[13] Fraser, *Once Round the Sun*, 100-101.

way the earth"s atmosphere filters and absorbs radiation from the sun. While tremendous advances were made in a number of areas, as Sullivan points out, it most notably expanded study into two fields "that mid-twentieth-century technology had brought within the reach of man: the Antarctic and outer space."[14]

Antarctica had been part of the programs of both Polar Years, but little had actually been done. Given its remote location in relation to most interested nations, exploration of Antarctica was much more difficult than similar efforts in the Arctic. Several nations controlled territory that extended into the Arctic Circle, such as Alaska for the United States, the Northwest and Yukon Territories for Canada, and Siberia for Russia/the Soviet Union. Antarctica, however, exists as a continent of its own, surrounded by turbulent seas and shifty ice shelves, making it a difficult place to reach. Ships trying to land observers on stable ground were often caught in the ice shelves, which were thick enough to trap a ship but not stable enough to hold heavy machinery. Another problem that faced Antarctic explorers was the fact that it is even colder than the Arctic region. As Chapman points out, the North Pole remains as much at thirty degrees warmer than the South Pole "because it is in the midst of a sea where the ice thickness averages less than 15 feet, so that heat can be conducted to the air from the deep and relatively warm sea water below."[15] When temperatures are reaching –50ºF, thirty fewer degrees does not make much difference to the human body, but it does present new

[14] Sullivan, *Assault on the Unknown*, 30.

[15] Chapman, *IGY: Year of Discovery*, 54. Chapman also states that the wind is incredibly harsh in Antarctica as well. At one point the Soviet team encountered winds in excess of one hundred and thirty mph, and over the entire period of IGY observation on the continent, the wind was calm for only twenty-five cumulative hours.

challenges in keeping equipment running. Thus, it is not surprising that prior to the IGY, Antarctica was almost entirely unexplored.

Explorers had reached the South Pole in 1911, and several nations had stations on Antarctica prior to 1957, but no serious attempts to explore the region had taken place. As Sullivan points out, scientists were not even sure if Antarctica was a single land mass, two distinct land masses, or a group of islands covered in ice.[16] Scientists concluded that Antarctica is in fact one land mass through a technique called "sounding," which consisted of setting off explosions in the ice and measuring the amount if time it took the shockwave to travel through the ice, reflect off the rock beneath it, and return to sensors on the surface. It was a painstaking process, as Sullivan describes: "each shot took the better part of a day, since thirty-six-foot holes had to be dug so that the jolt would be administered within hard ice."[17] Through this process, scientists were able to map a considerable portion of Antarctica"s land mass and roughly calculate the amount of ice covering the continent. The IGY efforts greatly expanded scientific knowledge of the continent and also laid the groundwork for later international cooperation in the region.

Of all the activities that were part of the IGY, the best known are the American and Soviet excursions into space, which have almost entirely eclipsed the IGY in the public eye in subsequent years. When the CSAGI met in Rome in 1954 to discuss possible projects, American physicist Fred Singer, one of the scientists present when Berkner first proposed the IGY at van Allen"s house, proposed a resolution requesting

[16] Sullivan, *Assault on the Unknown*, 307-09.

[17] Ibid., 324.

capable nations to work toward launching scientific satellites into orbit as part of the IGY. Passed almost immediately, the resolution noted the "advanced state of present rocket techniques" as empowering the attempt, and it outlined the hope that such a venture would provide invaluable "observations during extended periods of time of extraterrestrial radiations and geophysical phenomena in the upper atmosphere."[18] Following the call, both the United States and the Soviet Union committed to space programs, and by the end of the IGY both had satellites in orbit.

The capacity for both the United States and the Soviet Union to put a satellite into orbit was still theoretical when they committed to doing it in 1954 and 1955, respectively, but German rocketry programs during World War II had advanced rocket science considerably, and by 1950, both the United States and the Soviet Union were utilizing knowledge gained from German scientists, schematics, and abandoned German rockets to make bigger, faster, and more powerful rockets.[19] Prior to the IGY both nations had been pushing toward developing Intercontinental Ballistic Missiles (ICBM), but the IGY turned rocketry toward peaceful purposes. As N. C. Gerson, the secretary for the American IGY committee, wrote, "man was at the verge of the space era; a whetted interest could induce the attempt."[20] Just as the Second Polar Year in the 1930s had pushed radio technology to new levels, "the IGY spurred the launching of satellite

[18] UN General Assembly, 14th Session, Official Record, Annexes, *Report of the ad hoc Committee on the Peaceful Uses of Outer Space*, 1959, 4.

[19] James Schefter, *The Race: The Uncensored Story of How America Beat Russia to the Moon* (New York: Doubleday, 1999), 10.

[20] N. C. Gerson, "From Polar Years to IGY," in *Advances in Geophysics*, ed. H. E. Landsberg (New York: Academic Press Inc., 1958), 25.

vehicles."[21] While the first rockets to carry satellites into space were in fact ICBMs, by redirecting the technology CSAGI was able to utilize the competition already going on between the United States and the Soviet Union to advance its own agenda—peaceful and cooperative exploration.

The primary objective of these orbital flights was to gather information about the upper reaches of the atmosphere and magnetic field, and several major discoveries came out of these efforts, but not all rocketry in the IGY was focused on putting satellites in orbit. As Chapman explains, "no less than 116 rockets were launched" in an effort to understand the "structural properties of the upper atmosphere."[22] Several of these rockets carried meteorological equipment in them to make temperature, wind-speed, and barometric measurements, while others were sounding rockets that set off detonations in the upper atmosphere to measure air density and temperature. Only a small number of rockets were designed to carry objects into space (fewer than a dozen, in fact), but these were the rockets that caught the world's attention.

While the IGY brought the United States and the Soviet Union together in pursuit of a common purpose, it failed to bring the two super-powers together in a joint effort. The program that had been designed to foster cooperation in scientific ventures ended up initiating one of the most intense technological races of the Cold War. Despite all of CSAGI's efforts to avoid political problems during the IGY, the United States and the Soviet Union still ended up competing, and while the space race was the most famous of

[21] Ibid.

[22] Chapman, *IGY: Year of Discovery*, 57.

these instances, it was not the only political problem of the IGY. In fact, even with the efforts of all the planners, several serious situations arose during the planning process and throughout its execution.

As a rule, the CSAGI tried to avoid playing politics at all costs. Former scientific organizations had waned and failed once they had entered the political realm, and both the CSAGI and the ICSU made every effort to avoid political ties and entanglements. The ICSU‟s immediate predecessor, the International Research Council (IRC), provides one of the best examples for this in the way it tried to limit German participation in international science after World War I. As Europe emerged from the shambles of World War I, the American National Academy of Sciences, the Royal Society of London, and the Académie des Sciences founded the International Research Council (IRC) to help guide research among member scientific unions. In keeping with efforts to punish Germany for its role in starting World War I, German scientists were specifically excluded from IRC efforts. As Sullivan explains, "as the years passed the exclusion of scientists from the defeated countries was relaxed, but such was the heritage of bitterness that some of the academies refused to join when told they could do so."[23] The bitterness continued until the IRC was finally replaced with the ICSU, which made every attempt to avoid the political entanglements of its predecessor.

The ICSU and its member unions were deliberately nongovernmental to avoid the political traps that had ensnared the IRC. As Chapman points out, the United Nations had developed or adopted a number of scientific organizations such as the World

[23] Sullivan, *Assault on the Unknown*, 24-25.

Meteorological Organization (WMO) and the United Nations Educational, Scientific and Cultural Organization (UNESCO), but these organizations are intergovernmental.[24] Each depends on national membership and is generally concerned with political issues. "By contrast," writes Chapman, "the International Scientific Unions and their sponsoring body—the International Council of Scientific Unions—are nongovernmental. They are based on the national scientific academies. In many countries these are self-governing societies, and their members support the academies by their personal subscriptions."[25] This is an important difference in that Chapman, Berkner, and the various other individuals involved in planning and executing the IGY wanted to avoid political issues as much as possible. The ICSU, CSAGI, and IGY were all to be purely scientific ventures meant to better humankind as a whole. Politics was to play no part. However, in light of political rivalries and unrest in the 1950s, it is not surprising that politics ended up playing a significant role in the planning and execution of the IGY. Even less surprising is the fact that one of the first conflicts arose between the United States and the Soviet Union.

At one of the final conferences held prior to the beginning of the IGY, the United States proposed an effort to develop a composite image of the polar ice-cap by compiling a number of surveillance photographs taken of the region. The Soviet Union agreed to the effort and proposed that surveillance planes from both countries shuttle back and forth between Murmansk, USSR, and Fairbanks, Alaska. As Sullivan observes, "this

[24] Chapman, *IGY: Year of Discovery*, 99.

[25] Ibid.

would have set an important precedent for a disarmament program which, like President Eisenhower‟s „open skies‟ proposal, depended on aerial inspection.”[26] However, the United States had just built two Air Force bases in the area surrounding Fairbanks and balked at the idea of allowing Soviet spy planes to operate in the area. The United States, then, proposed that Soviet planes land in Nome, Alaska rather than in Fairbanks. Whereas Fairbanks lies almost directly across the North Pole from Murmansk, Nome lies hardly fifty miles from the eastern coast of Russia, making it a less than ideal location to land. Timing was also a problem since the proposal coincided with the escalation of the Suez Crisis in Egypt as well as the nationalist uprising in Soviet-controlled Hungary.[27] As tensions mounted between the two superpowers, the Soviet Union withdrew the offer for American planes to use Murmansk, claiming that no American help was needed to photograph the Soviet side of the pole. Thus a potential project of the IGY broke down as a result of international political tension.[28]

Perhaps the biggest political crisis of the IGY came on the eve of its beginning when Nationalist China (Taiwan) requested admittance to the IGY despite Communist

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[26] Sullivan, *Assault on the Unknown*, 33. Eisenhower‟s “open skies” proposal consisted of both the United States and the Soviet Union providing each other with maps of their military bases and facilities to allow for aerial reconnaissance. It would also allow military reconnaissance planes to utilize the airspace of both powers. As diplomatic historian Howard Jones points out, this was more of a political stunt to test the Soviet‟s commitment to disarmament than an actual proposal. Howard Jones, *Crucible of Power: A History of American Foreign Relations from 1897* (New York: Rowman & Littlefield Publishers, Inc., 2008), 320.

[27] While the Soviet Union and the United States cooperated in their call for France, Great Britain, and Israel to halt their invasion of Egypt, the extremely aggressive rhetoric that the Soviet Union used against the United States‟ traditional allies, coupled with the idealistic fury in the United States against the Soviet crushing of the nationalist movement in Hungary, added to the tensions already present.

[28] Sullivan, *Assault on the Unknown*.

China‟s (China) insistence that Taiwan be excluded from the project. In 1955, the Academia Sinica in Peking, China‟s national scientific academy, approached Chapman about participating in the IGY. Given the expansive land mass of the Chinese mainland, CSAGI was excited at the prospect of including Chinese projects in the IGY. However, Chinese participation, as outlined by the earliest communications between Chapman and the Academia in Peking, could only be promised if Taiwan did not take part in the program. Since Taiwan, a member of the ICSU, had never responded to the initial invitation sent to members in 1952, CSAGI moved forward with Chinese plans and neglected the potential political problems created by China‟s ultimatum.[29] However, in late 1956 the Academia Sinica in Taipei, Taiwan requested an invitation to the IGY.

Despite efforts to avoid politics, the contention between the two competing Chinese governments threw CSAGI into a political conflict beyond its control. As Chapman reminisced:

> Questions of politics were almost excluded. There was only one major exception. This was the refusal of the Chinese People‟s Republic to adhere to the program if participation of Taiwan (Formosa) was also accepted. The co-operation of Taiwan was offered late in 1956 and accepted in 1957, two years after the Chinese People‟s Republic had adhered. The central IGY committee (CSAGI) felt unable in principle to refuse co-operation of any scientific academy organized under a government in control of a particular territory. Such acceptance involved no political implications. It was with extreme regret that on the eve of the beginning of the Year the central organization received word from the Academia Sinica, Peking, that its IGY committee had withdrawn from the program. Obviously the loss to the program was great. Participation in the program was not a matter for bargaining, but one of willing offering, by each academy according to its capacity and resources.[30]

[29] Ibid., 36-37.

[30] Chapman, *IGY: Year of Discovery*, 107-08.

The loss of the Chinese delegation was a major blow to the IGY effort, but its withdrawal was not as troublesome as many feared it would be. As Sullivan notes, the CSAGI feared that the rivalry between Communist China and Nationalist Taiwan would ignite further conflict between Eastern and Western powers, but fortunately, only Communist China withdrew, and the IGY proceeded as planned.

The best known achievement of the IGY was the Soviet launching of *Sputnik 1* in October 1957, and while it is almost always discussed in terms of the space race between the United States and the Soviet Union, the satellite had much humbler beginnings. The Soviet space program was originally just an offshoot of their ICBM program, an effort that Soviet Premier Nikita Khrushchev was willing to allow as long as it did not slow the ballistic missile program. As journalist and space race historian James Schefter explains, when Sergei Korolev, the mysterious Soviet Chief Designer, first proposed a space program to Khrushchev, the Soviet leader"s only question was "will it hurt the ballistic missile program?"[31] When he was assured that it would not, he signed off on the idea. Despite his later enthusiasm for the space program, Khrushchev"s personal reaction to the news of the successful launching of *Sputnik 1* was, as historian James Oberg describes, "almost casual."[32] Until Khrushchev realized the value of a space program in terms of propaganda, the Soviet satellite program was little more than an afterthought. However, this did not prevent the Soviet leader from taking advantage of it whenever he could.

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[31] Schefter, *The Race*, 8.

[32] James E. Oberg, *Red Star in Orbit* (New York: Random House, 1981), 33.

Sputnik 1 did almost nothing in terms of data collection or observation of outer space beyond proving that orbit could be achieved, although its radio broadcast gave scientists information on how radio waves pass through the ionosphere.[33] However, *Sputnik* served as motivation for the United States to push its space program forward, and by the end of the IGY, *Explorers 1*, *3*, and *4* had achieved orbit along with *Vanguard 1*. The Explorer satellites confirmed the existence of radiation belts surrounding the earth, which were later named the Van Allen Belts after American scientist James van Allen, and consist of massive amounts of particle radiation trapped in the earth‟s magnetic field. Alongside providing scientists with data concerning orbital drag and upper atmospheric density, *Vanguard 1* aided scientists in discovering that the earth is not perfectly spherical but is slightly compressed at the poles. The Soviet Union also sent several other satellites into orbit as part of the IGY. *Sputnik 2* carried Laika the dog, the first animal to orbit the earth, and *Sputnik 3* carried a huge array of scientific instruments that gathered further information on the Van Allen Belts and upper atmospheric pressure, temperature, and chemical constitution.[34]

For most commentators, the orbiting of the first few manmade satellites was the prime achievement of the IGY. They felt that the event had served as a catalyst for pushing humanity into the Space Age, and for the scientists involved in the proceedings of the year, nothing could have been more exciting. As the Soviet Union and the United

[33] Gerson, "From Polar Years to IGY," 42.

[34] For an excellent account of the development of the various satellites used during the IGY see Sullivan, *Assault on the Unknown*, 77-135.

States raced to reach the moon, it seemed that at such a rate humans would be exploring the rest of the solar system within years. In his 1964 contribution to the *Life Science Library*, Arthur C. Clarke, the renowned physicist and science fiction author, explained that NASA had "already prepared flight plans" for manned fly-by missions around and past Mars, and he also described plans for nuclear powered spacecraft and massive orbital structures that could spin to create artificial gravity.[35] While none of these projects have advanced beyond preliminary stages even in the fifty years since *Sputnik*'s first orbits, it is clear that to commentators during the late 1950s and early 1960s, the Space Age seemed an irrefutable reality and that humanity would soon be spreading beyond the bounds of earth. Through the cooperative efforts of the CSAGI, the IGY had, it seemed, ushered in the Space Age. What was not apparent in 1958 was that rather than bringing about the dawning of a new Space Age, the launch of *Sputnik 1* had actually sparked a Space Race.

[35] Arthur C. Clarke, *Man and Space*, ed. Norman P. Ross, Life Science Library (New York: Time Incorporated, 1964), 158, 161, 57.

CHAPTER 2

THE FIRST HEAT: ROCKET SCIENCE AND THE RACE FOR "FIRSTS"

The launch of *Sputnik 1* in October 1957 is often heralded as the official beginning of the Space Race, and while it was the first successful foray into space, the race for superiority in rocket technology had begun as early as 1945 as Soviet and American troops raced to capture the rocketry facilities around Peenemünde on the German Baltic coast. In various laboratories across the region German rocket scientists had been working on a number of projects throughout the war, most notably the V-1 and V-2 rockets, and as the Allies pushed into Germany, both the Soviets and the Americans wanted to secure as much of the technology and as many of the scientists as they could. The Americans arrived first and recruited the majority of the rocket scientists and captured some of the existing rockets and designs. The Soviets, who had rightful claim over the area, arrived later and captured the remaining rockets and technicians still in the region. These rockets and scientists became the foundation for both the American and Soviet rocket programs that would produce spaceflight within two decades.[1]

The first rocket programs in both the United States and the Soviet Union focused on military technology. While the German V-2 rocket had not been of any major strategic consequence during World War II, it had been moderately effective during the German bombardment of London. Its supersonic speed made it impossible to intercept, and advances in guidance systems made it increasingly accurate. Its strategic impact was limited by the fact that the explosives it carried were conventional explosives that could

[1] For more on the rocket programs at Peenemünde and the Soviet and American pushes into the area see Michael J. Neufeld, *The Rocket and the Reich: Peenemünde and the Coming of the Ballistic Missile Era* (New York: The Free Press, 1995).

be dropped at a much higher rate with more devastating effect from an airplane. However its potential in the nuclear age as a vehicle for delivering warheads was apparent to both the United States and the Soviet Union. As historian and journalist James Schefter writes, "big bombers carrying atomic or hydrogen bombs could be shot down. Incoming missiles couldn"t."[2] By the early 1950s both powers had begun stockpiling nuclear weapons, and while the United States had more long range bombers capable of reaching targets in the Soviet Union, neither side had a distinct advantage. Both superpowers began work on developing a technological edge through rocketry.[3]

Despite its early arrival at Peenemünde and its capture of the majority of the German rocket scientists and documentation, the United States was unable to maintain a significant edge in rocketry following World War II. Whereas the Soviet Union had one rocket program working toward developing long range missiles, the United States began with two and eventually had three separate teams working on parallel projects. The Army had recruited Wernher von Braun and his team from Germany, but the Navy had its own rocket program, and by 1955, the Air Force had its own program as well. Already weakened by the division of these various rocket programs, military budget cuts following the conclusion of World War II halted significant progress in the field.[4] Since, as Schefter points out, "any serious money the United States spent on rocketry

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[2] James Schefter, *The Race: The Uncensored Story of How America Beat Russia to the Moon* (New York: Doubleday, 1999), 11.

[3] Ibid.

[4] Arthur C. Clarke, *Man and Space*, ed. Norman P. Ross, Life Science Library (New York: Time Incorporated, 1964), 56.

immediately after World War II went into creating newer and better missiles for the military," military budget cuts virtually killed both the Navy and Air Force programs.[5] The Army program continued on a minimal budget with von Braun and the Army team continuing to test the captured V-2s at the White Sands Proving Grounds in New Mexico. With no significant budget, however, few advances were made until the outbreak of war in Korea convinced the United States government of the need for military rockets in 1950.[6]

Another reason that American rocketry received little funding during the late 1940s was the popular opinion among experts that atomic weapons were simply too heavy to be carried by "any conceivable rocket."[7] Nuclear warheads, prior to the development of the hydrogen bomb, generally weighed more than two tons. Such a payload seemed impossibly large in light of the current state of rocketry, therefore most American military projects were cut. Rather than worrying about warhead weight, the Soviet Union simply built bigger rockets. "They did not wait," writes Clarke, "as did the U.S., until lighter warheads were available."[8] Instead, they built gargantuan rockets, and by the time the United States was capable of putting the 24 pound Vanguard satellite in orbit, the Soviet Union had already orbited the 1,200 pound *Sputnik 2* and was preparing to launch the nearly 3,000 pound *Sputnik 3*.

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[5] Schefter, *The Race*, 10.

[6] Clarke, *Man and Space*, 55-57.

[7] Ibid., 56.

[8] Ibid., 61.

With the start of the Korean War came a resurgence of interest in military rockets. Werhner von Braun and his team were moved to the Army"s Redstone Arsenal in Alabama, and they began work on the larger Redstone missile and eventually the multistage Jupiter rocket.[9] With nuclear bombs getting lighter and rockets getting stronger, rocket programs in both the United States and the Soviet Union aimed at developing Intercontinental Ballistic Missiles (ICBM) capable of carrying warheads around the globe. However, in 1955, when both the United States and the Soviet Union committed to orbiting satellites as part of their participation in the IGY, these rocket programs gained a new objective — space.

While the Space Race became one of the biggest propaganda battles of the Cold War, neither nation had more than minimal interest in spaceflight prior to *Sputnik 1*. The major players in both the Soviet and American rocket programs, Sergey Korolev and Wernher von Braun respectively, had hoped for spaceflight early in their careers, but prior to the IGY commitments of both nations, none of the rocket scientists had been able to convince their sponsoring governments to fund space programs.[10] Sergey Korolev, the secretive Soviet "chief designer," had been rebuffed at least once by Communist Party Chief Nikita Khrushchev, and even when he garnered permission to go ahead with a satellite program it was under the condition that it would not slow progress on the ICBM

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[9] Schefter, *The Race*, 13.

[10] For detailed discussions of Korolev and von Braun respectively see James Hartford, *Korolev: How One Man Masterminded the Soviet Drive to Beat America to the Moon* (New York: John Wiley & Sons, Inc., 1997), and Dennis Piszkiewicz, *Wernher von Braun: The Man Who Sold the Moon* (Santa Barbara: Praeger Publishers, 1998).

projects.[11] Von Braun was similarly frustrated by President Dwight D. Eisenhower's refusal to allow the Army to launch its orbital program, which allowed the Soviet Union to beat the United States into orbit.

The idea of orbiting an artificial satellite was not original to the IGY proposal. Many people, especially the scientists intimately involved with the ongoing missile programs, felt that spaceflight was immediately possible and worthy of investment. In 1951 von Braun wrote a technical article detailing the feasibility of a manned mission to Mars that was read at the Second International Congress of Astronautics in London and created a significant stir worldwide.[12] In 1953 Dr. Fred Singer of Great Britain proposed a "Minimum Orbital Unmanned Satellite of Earth" (MOUSE), which was to carry several small scientific instruments, a tape recorder, and a radio transmitter into orbit. The MOUSE would weigh roughly one hundred pounds and with the technology available in 1953, Singer claimed, as Clarke recalls, that the "satellite could be orbited for one million dollars." Despite its potential, MOUSE never garnered enough support to become reality.[13]

When President Eisenhower officially supported and announced an American satellite program in July 1955, the United States had three distinct rocket programs working on separate, yet parallel, projects. The Army Ballistic Missile Agency, which consisted primarily of the German team recruited after World War II, was working on the

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[11] James E. Oberg, *Red Star in Orbit* (New York: Random House, 1981), 26-30.

[12] Von Braun did not attend personally as the memory of his V-2 rockets landing all over London was still too fresh for him to feel comfortable visiting the city. Schefter, *The Race*, 13.

[13] Clarke, *Man and Space*, 58-59.

Jupiter missile. This multi-stage liquid-fueled rocket was based on earlier V-2 designs and was the most advanced and tested program of the three. While the Jupiter rocket was designed to carry warheads, the Army team developed the modified Jupiter-C as part of Project Orbiter, their proposal for IGY participation. Air Force Ballistic Missile Division was working on the Atlas rocket, which was the largest and most ambitious of the three. The Atlas became the United States‟ first viable ICBM as it had a large enough lift capacity to carry a warhead around the globe. Finally the Naval Research Laboratory was working on Project Vanguard. The Vanguard rocket was the only one of the three that was designed specifically for space-flight and not as a military missile. Its projected payload capacity was around twenty pounds, so it had no viable use beyond putting a small satellite into orbit.

Ultimately, Project Vanguard was awarded the bid to be the official orbital program for the United States‟ IGY program, and the Army and Air Force projects were redirected toward other objectives.[14] As Clarke points out, "few technical decisions have ever been more momentous, or more bitterly criticized" than the Eisenhower administration‟s decision to support Project Vanguard over the Army‟s Project Orbiter.[15] It allowed the Soviet Union to gain the lead in the early stages of the Space Race, but as Clarke continues, "it is a gross oversimplification to say that the … verdict was wrong."[16]

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[14] Schefter, *The Race*, 15-16, and Clarke, *Man and Space*, 59-60.

[15] Clarke, *Man and Space*, 60.

[16] Ibid.

Nonetheless, it was a momentous decision given the theoretical capacity of the Army‟s rockets to reach orbit as early as September 1956.

As the Navy began preparations for the IGY and the Air Force continued with their Atlas rocket, the Army team began a series of high atmosphere tests to explore various options for reentry materials. One of the challenges of spaceflight is that anything that must be returned to the surface of the earth must be shielded against the intense heat caused by friction in the upper atmosphere. While this would become increasingly important as both nations pushed toward manned spaceflight, it was immediately important in 1956 as warheads were being designed to withstand the trauma of atmospheric reentry that would follow intercontinental flight. Since the Army had the most advanced long-range rockets at the time, the task of testing various types of heat shields fell to them, and in 1956 and 1957, von Braun and his team carried out a series of tests in which their Jupiter-C rocket carried nosecones of different material to the outer edges of the atmosphere and dropped them back to earth.

While the Army‟s assignment was for suborbital flights of all of the nosecones, von Braun and his team had originally designed their Jupiter-C rockets for orbital flight. The three liquid-fueled stages were designed to carry a payload just beyond the upper atmosphere and the fourth, solid-fueled stage, according to von Braun‟s calculations, could boost a small payload over the 17,500 mile per hour threshold and into orbit. As the Army team prepared for their first nosecone launch in September 1956, rumors reached the Pentagon that von Braun might “accidentally” orbit one of the Army‟s nosecones and apologize for the oversight after the fact.

One of the reasons the Eisenhower Administration had supported the Navy"s Project Vanguard over the Army"s Project Orbiter was the fact that the Vanguard rocket was designed specifically for spaceflight and had no militaristic overtones, while the Jupiter rocket was designed as an ICBM and modified for spaceflight. Since the Soviet Union had perpetually painted the United States as a militaristic, imperialist aggressor, Eisenhower sought to avoid the image of military aggression as much as possible, and orbiting an Army nosecone, which was essentially a prototype warhead, aboard an ICBM presented the wrong image. Therefore, von Braun was ordered to drain the fourth stage of fuel and to fill it with sand for ballast.[17] Whether the Jupiter rocket would have reached orbital speed with an active fourth stage is purely hypothetical, but considering that the same rocket with only minor design changes launched the United States" first successful response to *Sputnik* in January 1958, von Braun"s rocket was likely capable of orbital flight a full year before *Sputnik 1* dazzled the world.

Despite the fact that the American government lauded the Jupiter missions as great successes, Sergey Korolev, the Soviet Chief Designer, knew that von Braun"s design had included a fourth stage and that the fourth stage had not fired. As Schefter explains, "Korolev believed that von Braun"s Jupiter rocket *was* a satellite mission and that it had failed. The U.S. announcement about nose cones and reentry was simply a cover-up."[18] The R-7, which was the rocket that would carry *Sputnik 1* into orbit in October, was Korolev"s answer to the demand for both a viable ICBM and an orbital

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[17] Schefter, *The Race*, 17-18.

[18] Ibid., 18.

rocket, and in September 1956, it was hopelessly behind schedule. Believing that another orbital attempt from von Braun‟s team was forthcoming, he pushed forward with his plans at even greater speed. Several R-7s exploded on the launch-pad, and it was not until August 2, 1957 that the R-7 made its first successful launch. James Oberg, an expert on the Soviet space program, explains that "by July 1957 Korolev was facing serious criticism from rival rocket experts and from Moscow bureaucrats," and in response to criticism, Korolev is said to have responded, "You think only Atlas missiles can explode? We are building the most powerful machines in the world!"[19] Despite the pressure, Korolev‟s rocket finally worked. In August the R-7 became the world‟s first viable ICBM as it carried a nearly two ton payload the length of the Soviet Union.[20] By the middle of 1957, the only thing holding back Korolev‟s hopes of beating the United States into space was the satellite itself.

Since the R-7 was capable of lifting an incredibly large payload, the original satellite design was a 3,300 pound satellite called Object-D that consisted of 700 pounds of scientific instruments plus cameras, batteries, and radios.[21] The Soviets had designed Object-D to be the ultimate IGY satellite, measuring and observing everything imaginable. However, its complexity proved its downfall. By the time Korolev‟s rocket was ready to launch, Object-D was months from being finished. The various instruments continued to interfere with each other, and Korolev concluded that by the time Object-D

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[19] Oberg, *Red Star in Orbit*, 27-28.

[20] Schefter, *The Race*, 19.

[21] Ibid., 19-20.

was ready for launch, the United States would already have satellites in orbit.[22] His solution was PS-1, a simple aluminum ball equipped with a radio transmitter and batteries, and this one hundred and eighty-four pound, polished aluminum ball became the world‟s first artificial satellite when it soared into space atop Korolev‟s R-7 on October 4, 1957.

While it made no serious scientific contribution beyond proving that earth orbit was possible, *Sputnik 1* brought the international implications of a Space Race into focus. For the Soviet Union, the successful launch was a huge technological success and a tremendous boost for their national prestige. It set the Soviet Union securely in the lead in an extremely important technological race that the United States had yet to realize it was running. In the United States, the realization that the small aluminum ball that was beeping its way across the sky could have been a warhead sent shockwaves through the American public.[23] Fear and outrage drove the American programs forward, as the Eisenhower administration tried to make up for lost time. Internationally, the Soviet Union emerged as the world leader in space technology with the United States lagging behind.

Allowing the Soviet Union to be the first in space is often seen as one of the great failures of the Eisenhower Administration.[24] The Army had been capable of orbiting a

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[22] Object-D was eventually placed in orbit as *Sputnik 3* in May 1958. It seems Korolev was right in his estimation on the delay Object-D would cause. Ibid., 45-46.

[23] Mark Williamson, *Space: The Fragile Frontier* (Reston, VA: American Institute of Aeronautics and Astronautics, 2006), 3.

[24] Kenneth Osgood, *Total Cold War: Eisenhower's Secret Propaganda Battle at Home and Abroad* (Lawrence: University Press of Kansas, 2006), Schefter, *The Race*.

satellite for over a year by the time *Sputnik 1* was launched, yet Eisenhower had refused to give von Braun permission, a decision that allowed the Soviets to pull ahead. Even after *Sputnik 1* was in orbit, Eisenhower insisted that Project Vanguard push ahead with their still untested rocket, despite the fact that the Army had the capacity to put its own satellite into orbit. However, Eisenhower had his reasons, many of them viable.

As discussed above, one of the primary reasons why Eisenhower decided to support the Navy‟s Project Vanguard over the Army‟s Project Orbiter was the fact that the Vanguard rocket was designed specifically for spaceflight, whereas the Jupiter rocket involved in Project Orbiter was originally designed as an ICBM. Since the Soviet Union was already accusing the United States of being militaristic and imperialistic, launching the world‟s first artificial satellite aboard a rocket designed to transport warheads around the globe would play into the Soviets‟ propaganda campaign against the United States. While this is the most commonly cited reason for Eisenhower‟s hesitancy at allowing von Braun to launch his Jupiter rockets, a 1962 article by Robert Crane describes another problem facing the President — the Soviet Union‟s definition of airspace.[25]

The definition of airspace had been a point of contention between the United States and the Soviet Union for several years prior to the launching of *Sputnik 1* in 1957. As a military man, President Eisenhower knew the importance of reliable intelligence, and developing new, more effective ways of spying on the Soviet Union was one of Eisenhower‟s constant concerns. The U-2 spy plane became one of the president‟s most

[25] Robert D. Crane, "Soviet Attitude toward International Space Law," *The American Journal on International Law* 56, no. 3 (1962), 685-723.

reliable sources of information when it was first introduced in 1955. Its design as an ultra-high altitude flyer was supposed to allow it to fly above radar and beyond the range of surface to air missiles, and though it was effective at gathering information, it was also risky. According to most internationally accepted definitions of sovereignty concerning airspace, U-2 flights over the Soviet Union were an affront to Soviet sovereignty. When Eisenhower approved the satellite programs, he hoped that satellites would provide the intelligence that he desired without the risk of conflict that was inherent in the U-2 missions.[26] If satellite overflight were internationally acceptable, the United States could then orbit spy satellites with no risk of international condemnation or conflict with the Soviet Union. Eisenhower would have a reliable new source of photographic intelligence, and it would be entirely legal. However, all of this depended on positive international opinion of orbital overflight.

By the 1950s international law had become the weapon of choice in the war between the ideologies of Western Capitalism and Soviet Communism, and the United Nations (UN) had become the latest battleground between the United States and the Soviet Union.[27] The problem of defining the limits of any nations sovereignty over its airspace was a major issue in the 1950s, especially after the advent of U-2 flights in 1955. The Soviet leaders resented the presence of American planes in their sky, and in an effort

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[26] In a meeting with his advisors in which they were proposing to authorize another series of U2 flights, Eisenhower admitted that nothing would make him ask Congress to declare war faster than if the Soviet Union began violating American airspace. Evidence suggested that the Soviets had the capacity to track American U2s but were unable to attack them. Therefore Eisenhower was extremely uneasy about using the U2 more than was absolutely necessary.

[27] Ibid., 685.

to deny the United States access their airspace, Soviet experts in international law generally claimed that "Soviet sovereignty extended upwards *usque ad coelum*, *i.e.*, without limitation within the airspace or atmosphere."[28] Such a definition condemns any flight that passes through the atmosphere immediately above another nations" territory. The problem with such a definition is that the limits of the atmosphere were completely undefined.[29] This left orbital flight well within the realm of international condemnation. U-2 flights were secret and deniable. An orbiter was quite public and impossible to deny. Therefore, launching a satellite that would necessarily pass over Soviet territory risked garnering negative Soviet reactions and could compromise the legality of Eisenhower"s spy satellites.

While beating the United States into space proved to be a phenomenal propaganda victory for the Soviet Union, it is quite possible that the launching of an American satellite would have proved just as advantageous to the Soviets in terms of international law as *Sputnik* was in terms of public opinion. Soviet legal experts were almost obsessed with the issue of airspace sovereignty, and prior to *Sputnik 1*, the United States had no way of predicting the Soviet response to an American satellite passing over Soviet territory. Eisenhower"s fear was that the Soviet Union would, as Schefter points out, "accuse the United States of illegal overflight, [and] even challenge America as a warmonger flaunting or brandishing its intercontinental missile technology."[30] If the

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[28] Ibid., 688.

[29] This boundary remains undefined to the present.

[30] Schefter, *The Race*, 7.

Soviets succeeded in branding the United States as an aggressor in space, the United States would lose its capacity to shape international space law and would be hampered in its efforts in space.

As *Sputnik* was making its first orbits around the globe, Soviet legal experts began rapidly redefining their position to allow for orbital overflights. While the Soviets were willing to redefine airspace sovereignty to allow the overflight of their own satellites, it is probable that they would have resisted such a shift in definition if it were an American satellite in question. However, since the Soviet Union was readjusting its definitions of airspace to allow for its own satellites, the United States could launch satellites without fear of international condemnation, and Eisenhower could have his spy satellites.

While the launch of *Sputnik 1* relieved Eisenhower's fears concerning orbital overflight, it also served as a tremendous propaganda victory for the Soviet Union. As the president reflected after the fact, "the Soviet satellites were a genuine technological triumph, but this was exceeded by their propaganda value. To uninformed peoples in the world, Soviet success in one area led to the belief that Soviet Communism was surging ahead in all types of activity."[31] The launch of *Sputnik 1* was an embarrassment for the United States, and the Soviet Union knew it. As scholar Kenneth Osgood explains, "here was the Soviet Union — a country barely industrialized three decades earlier, supposedly shackled by totalitarian controls — overtaking the richest, strongest, and freest country on earth."[32] The Soviet advance into space represented a huge threat to American

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[31] Osgood, *Total Cold War: Eisenhower's Secret Propaganda Battle at Home and Abroad*, 323.

[32] Ibid.

interests world-wide, and while the Eisenhower administration had been hesitant about committing to a serious space program, the launch of *Sputnik 1* clarified the necessity of American efforts in space.

Since Eisenhower had decided to ground the Army‟s Jupiter rockets, the task of launching America‟s first satellite fell to the Navy‟s Vanguard project. The Vanguard project had not progressed as quickly as expected, and when *Sputnik* was launched in October 1957, Eisenhower insisted that the Navy push the timeline of a Vanguard launch forward. Despite the fact that only the first stages of the Vanguard rocket had been flight tested, the launch was set for December 1957. Given the level of development of the Vanguard rocket at that point, it is not surprising that it exploded on the launch pad, but the world was watching, and the failure of the Vanguard was an enormous blow to the American international image that had already been tarnished by the fact that the Soviet Union already had two satellites in orbit by this time.[33]

As became the trend, Khrushchev did not waste any chance to embarrass his American counterparts. As Schefter recounts, shortly after the Vanguard rocket exploded, "Russian delegates at the United Nations suggested that the Americans take advantage of a Soviet program offering technical assistance to backward nations."[34] When *Explorer 1* was successfully launched in January 1958 atop von Braun‟s Jupiter-C, the Russian premier mocked its size in comparison to the 1,200 pound *Sputnik 2* that was still in orbit. Khrushchev titled *Vanguard 1*, which was successfully launched in March,

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[33] Schefter, *The Race*, 26-28.

[34] Ibid., 28.

America‟s “grapefruit.”[35] The Soviet Union clearly had superior rocket power, but the race was only beginning.

With the launching of *Sputnik 1*, the quest for “firsts” began. The Soviet Union was the first into orbit. It was also the first to send an animal, the dog Laika, into orbit. The United States became the first to send an animal into space and return it to earth unharmed when a chimpanzee named Ham rode the Mercury-Redstone into space and back as a precursor to the first manned flights.[36] Yet while the United States made gains on the Soviet Union during the early stages of the Space Race, the Soviets were almost always one step ahead the majority of the race. They put the first man in space, the first woman in space, and performed the first spacewalk. Their probes were the first to escape earth‟s gravity and impact the moon. Still, the United States kept pushing to make up for lost time and by the mid-1960s, the two superpowers were heading toward the moon.[37]

By the end of 1958, both the United States and the Soviet Union had satellites in orbit, and the likelihood that the nuclear arms race would extend into this new field forced both sides to begin discussions within the United Nations. Both powers addressed the General Assembly of the UN in hopes that the organization would be able to direct the Space Race toward peaceful ends. With both nations engaged in a nuclear arms race, the possibility of that rivalry spreading into space was too real to be ignored. As is

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[35] Matthew Brzezinski, *Red Moon Rising: Sputnik and the Hidden Rivalries that Ignited the Space Age* (New York: Henry Holt & Company, LLC., 2007), 204.

[36] Clarke, *Man and Space*, 88.

[37] See Eugene M. Emme, *Aeronautics and Astronautics: An American Chronology of Science and Technology in the Exploration of Space 1915-1960* (Washington, D.C.: National Aeronautics and Space Administration, 1961).

discussed in the next chapter, UN involvement was not always smooth, but it kept the Space Race from becoming militaristic as both superpowers continued to make bigger, faster, and more accurate rockets.

CHAPTER 3

DIRECTING THE SPACE RACE:

THE UNITED NATIONS' PUSH FOR COSMIC PEACE

For the scientists involved in the IGY and various space programs, the launch of *Sputnik 1* represented the beginning of a new era, a Space Age, but for the politicians and diplomats who were charged with maintaining peace in a world in which war could mean total annihilation, the Space Race represented a major and immediate threat to world peace. Neither the United States nor the Soviet Union sought direct conflict as both knew the devastating consequences that such an exchange would have, but the fear and paranoia that had come to characterize the Cold War era drove the rivalry between the two great powers ever onward. While many hoped that outer space would provide opportunities for international cooperation, the fact that humanity's expansion into space came at a time that Soviet diplomat Valerian Zorin described as being "characterized by mistrust, by an armaments race and by a division into military blocs" necessitated immediate action to prevent global war.[1]

While the Soviet Union's initial test of an ICBM in August 1957 met considerable skepticism worldwide, the successful launch of *Sputnik 1* sent the United States into a near panic.[2] As Cold War historian John Lewis Gaddis explains, Nikita Khrushchev, who was the active head of the Communist party at this point, added to the fear through "a gradually escalating series of carefully worded claims designed to imply, if not overtly

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[1] U.N. General Assembly, 13th Session, First Committee, [*Summary Records of Meetings*], *982nd Meeting*, 12 November 1958 (A/C.1/982), Official Record, New York, 1958, 193.

[2] John Lewis Gaddis, *Russia, the Soviet Union, and the United States* (New York: John Wiley and Sons, Inc., 1978), 226.

assert, the Soviet Union‟s ability to destroy the United States in any further war.”[3] The development of ICBM technology was a huge leap for the Soviet Union, which had thus far been considered inferior to its Western counterpart in the realm of military technology. By the late 1950s the United States had a considerable number of military bases near Soviet borders that were equipped with bombers and nuclear weapons capable of penetrating deep into Soviet territory. Eisenhower‟s threats of “massive retaliation” were backed by a considerable military machine, and from the earliest stages of the Cold War following World War II, the Soviet Union had been negotiating from a position of weakness. The development of ICBMs reversed this, at least in theory, as Khrushchev sought to convince the West that the Soviets “could hit a fly at any distance with [their] missiles” despite the fact that, as Gaddis points out, “problems of guidance and cost prevented the Soviet Union, at any point during [Khrushchev‟s] leadership, from deploying a sufficient number of launchers to obtain an assured first-strike capability against the United States.”[4] Regardless of strategic realities, the Soviet Union used its perceived position of power to seek concessions from the United States on a few key issues.[5]

On January 12, 1958 Eisenhower sent a letter to Soviet Premier Nikolai A. Bulganin proposing that the United States and Soviet Union “agree that outer space

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[3] Ibid., 227.

[4] Ibid., 225.

[5] Arnold L. Horelick and Myron Rush, *Strategic Power and Soviet Foreign Policy* (Chicago: University of Chicago Press, 1965), 42-57.

should be used only for peaceful purposes."[6] At this point the United States had yet to orbit its own satellite, giving the Soviet Union the distinct advantage of being the only power with ICBM capabilities. On February 3 Bulganin responded, saying that the Soviet Union was willing to consider the question if the "Western powers" were willing to ban all atomic and hydrogen weapons and to eliminate "all military bases on other nations" territories."[7] By linking ICBM technology to the ongoing discussion on disarmament, Bulganin confirmed American suspicions that the Soviet Union had developed its rocket program for militarily strategic purposes. Despite its efforts to "translate technological superiority into political benefits," the Soviet Union found Eisenhower unwilling to make concessions, and on February 17 Eisenhower repeated his request to Bulganin, insisting that the proposal was not meant to strengthen the American strategic position but was meant to direct the exploration of outer space toward peaceful ends "before its use for military purposes had, like nuclear weapons, advanced to the point where complete international control was almost impossible."[8] By this time U2 spy planes had already indicated that Soviet missile strength was not as significant as anticipated, and the United States had successfully launched its own satellites, thus stripping the Soviets of their advantage.

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[6] Eugene M. Emme, *Aeronautics and Astronautics: An American Chronology of Science and Technology in the Exploration of Space 1915-1960* (Washington, D.C.: National Aeronautics and Space Administration, 1961), 94-105.

[7] Ibid.

[8] Ibid.

The Soviets, especially Khrushchev, were not quick to relinquish their perceived advantage, however, and in March 1958 the Soviet Union took its diplomatic offensive to the United Nations by requesting consideration of a proposal to discuss "the banning of the use of cosmic space for military purposes, the elimination of foreign military bases on the territories of other countries and international cooperation in the study of cosmic space."[9] Having found Eisenhower unreceptive to their aggressive proposals, the Soviets tried to force the United States into concessions by involving the United Nations and by linking cosmic exploration with ongoing discussions on disarmament. In September of the same year, the United States sent a similar letter to the UN calling for a "programme for international cooperation in the field of outer space."[10] The American proposal notably omitted the military aspects of the discussion, since it had no interest in removing its military bases around the world and sought cooperation in outer space independent of the bogged down talks on disarmament.

The task of discussing the Soviet and American proposals fell to the First Committee. The First Committee, which reports directly to the General Assembly, is a permanent committee that has met to discuss issues concerning disarmament and related international security questions since the creation of the UN and continues to meet today. In the 1950s the First Committee played a considerable role in maintaining the tenuous peace between the United States and the Soviet Union by facilitating discussion on

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[9] U.N. General Assembly, 13th Session, [*Annexes*], *Agenda item 60: Question of the peaceful use of outer space*, (A/4074), Official Record, New York, 1958, 1.

[10] Ibid., 4.

disarmament and limiting military armaments worldwide. Since the Soviet Union had tied the questions concerning outer space to the ongoing discussions on disarmament and since international concern about space focused on keeping the Space Race from becoming a catalyst for conflict, the First Committee added the "question of the peaceful uses of outer space" as item sixty on its agenda for 1958.

By the time the First Committee met in November 1958, both the United States and the Soviet Union had launched a number of new satellites and space probes, making the committee"s task all the more urgent. In March the Navy finally got its Vanguard rocket to work, and *Vanguard 1* became the first satellite to detect the slight pear shape of the earth.[11] In May the Soviet Union launched the three thousand pound *Sputnik 3* into orbit, and in July the United States launched *Explorer 4*.[12] In October, just a year after *Sputnik 1* made its first orbits around the earth, the United States launched *Pioneer 1*, which was aimed at reaching the moon. While the rocket failed to escape earth"s gravity well, it set a new altitude record at 70,700 miles above the surface of the earth and reported on the outer limits of the van Allen radiation belts that had been discovered by the Explorer satellites.[13] *Pioneer 1* also set a new target for both the Soviet and American space programs — the moon. The rapid progression of rocket and satellite

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[11] Arthur C. Clarke, *Man and Space*, ed. Norman P. Ross, Life Science Library (New York: Time Incorporated, 1964), 116.

[12] Emme, *Aeronautics and Astronautics Chronology*, 94-105.

[13] James Schefter, *The Race: The Uncensored Story of How America Beat Russia to the Moon* (New York: Doubleday, 1999), 53-54.

technology emphasized the speed with which the United Nations needed to move if it were to direct the Space Race toward peaceful ends.

When the First Committee began discussion on the question of the peaceful use of outer space in November 1958, the committee sought unanimous agreement, especially between the United States and the Soviet Union. Given the volatile nature of the Space Race and the fact that total voluntary cooperation was needed from both superpowers, anything less than unanimous consent would make UN efforts to guide the Space Race useless. However, by the time the discussion grew to a close, it was apparent that no consensus was within reach given the fact that, as American delegate Henry Cabot Lodge explained, the American and Soviet "delegations had entirely different views concerning the nature of relations between States, the structure of the United Nations and the nature of the world."[14] These differences manifested themselves in two major points of contention. The first was the Soviet Union"s insistence that the discussion be placed within the context of disarmament, while the United States sought resolution of the space problem independent of the bogged down disarmament debates, and the second was the argument over which nations should be members of the proposed *ad hoc* committee.

The first issue, which the Soviet Union raised in its initial proposal, stemmed from the changing realities of world politics and military tactics in the 1940s and 1950s. Prior to World War II at least five major powers had maintained a more or less stable balance of power system. After World War II, however, the world was left with only two

[14] U.N. General Assembly, 13th Session, First Committee, [*Summary Records of Meetings*], *994th Meeting*, 24 November 1958 (A/C.1/994), Official Record, New York, 1958, 235.

viable world powers, or superpowers as they were eventually called. The United States and the Soviet Union stepped into opposing roles as the major players in global politics, and, as the only two superpowers, they were extremely wary of one another. Despite the fact that the two had been allies during World War II, ideological differences as well as dynamic personalities in leadership drove the Soviets and the Americans into opposing corners, and as ideological enemies neither trusted the other in the least.[15] Both had sizable militaries following the war, and the United States had recently dropped the world‟s first atomic bombs on Japan. As East and West met in Germany and across Europe, lines were drawn, spheres of influence established, and military bases were built.[16]

Since the end of World War II, the United States maintained a considerable military presence in countries around the world. Germany, Japan, and Turkey were just a few of the countries that housed American military bases along with all the personnel, equipment, and armaments that went along with such establishments. In countries like Germany and Japan, the American military presence was there initially to deal with post-

[15] The scholarship on the early years of the Cold War is extensive. Diplomatic historian Howard Jones provides an excellent overview of the development of the Cold War in Howard Jones, *Crucible of Power: A History of American Foreign Relations from 1897* (New York: Rowman & Littlefield Publishers, Inc., 2008). William Averell Harriman and George Kennan offer personal discussions of the issue in William Averell Harriman, *America and Russia in a Changing World: A Half Century of Personal Observation* (Garden City: Doubleday, 1971), and George F. Kennan, *Memoirs*, 2 vols. (Boston: Little, Brown and Company, 1967-1972).

[16] For more on the effects of nuclear technology on foreign affairs see William Sweet, *The Nuclear Age: Atomic Energy, Proliferation, and the Arms Race* (Washington: Congressional Quarterly Inc., 1988), George F. Kennan, *The Nuclear Delusion* (New York: Pantheon Books, 1982), and John Lewis Gaddis, *We Now Know: Rethinking Cold War History* (Oxford: Oxford University Press, 1997).

World War II reconstruction and to help stabilize the war-torn countries.[17] Countries like Turkey and Greece, however, were fortified after World War II in an effort to contain the Soviet Union"s attempts to spread communism throughout the world.[18] When the Soviet Union developed nuclear technology in 1949, these bases became crucial staging grounds for American air forces and missile batteries that were meant to hold the Soviet Union at bay. The proximity of these bases to the Soviet Union was essential to American security as they could easily reach key targets within the Soviet Union if the Soviets were to attack an American target. With the development of nuclear technology on both sides of the already cooling Cold War, military strategies changed as open war between the superpowers would likely result in the total destruction of both parties.

The majority of American military bases around the world were air bases. This reflected a change in American military strategy as nuclear weapons became the bulk of the American war machine. These bases, then, were built to keep American bombers and warheads within striking distance of the Soviet Union. As Melvyn P. Leffler explains, along with greatly increasing the number of warheads in the American arsenal, the "United States also increased its strategic air wings from 21 in June 1950 to 37 in June 1952. At the same time Air Force engineers constructed more than 100 additional

[17] Jones points out that the Marshall Plan for reconstructing Europe was initially economic in nature but by the early 1950s eighty percent of the aid being distributed was military in nature. Jones, *Crucible of Power: A History of American Foreign Relations from 1897*, 258-62.

[18] The United States" initial involvement in Turkey and Greece were part of the American effort to contain global communism which became known as the Truman Doctrine. Ibid., 251-57.

overseas installations from which American strategic bombers could fly."[19] The hope was to prevent the Soviet Union from striking out in any direction by encircling the entire nation with air bases capable of striking any target within the Soviet Union.

While the United States had successfully formed lines of defense that were far from its home territory, the development of ICBMs made any point in the world vulnerable. Since the Soviet Union was the first to develop this technology, it hoped to use it to force the United States to withdraw its troops from around the world. Therefore, when the First Committee began discussion on the question of the peaceful use of outer space, the Soviet delegate Valerian Zorin sought to link the existence of American military bases abroad to ICBM technology in a discussion of disarmament.[20]

Since the first satellites in orbit were launched aboard military missiles, the Soviet Union and its allies approached the question of outer space as directly related to the disarmament debates already underway in the UN. As Kuzma Kiselev of the Byelorussian Soviet Socialist Republic pointed out, "international cooperation in the study of cosmic space, of the kind displayed in carrying out the International Geophysical Year programme, would not be fully effective until a solution was found to the question of banning the use of cosmic space for military purposes."[21] Such a ban would restrict the use of ICBMs for military usage because the ballistic flight path of an intercontinental

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[19] Melvyn P. Leffler, *The Specter of Communism: The United States and the Origins of the Cold War, 1917-1953* (New York: Hill and Wang, 1994), 118.

[20] U.N. General Assembly, 13th Session, First Committee, [*Summary Records of Meetings*], *982nd Meeting*, 12 November 1958 (A/C.1/982), Official Record, New York, 1958, 193.

[21] U.N. General Assembly, 13th Session, First Committee, [*Summary Records of Meetings*], *984th Meeting*, 13 November 1958 (A/C.1/982), Official Record, New York, 1958, 206.

missile, by definition parabolic, necessitates its passage into space. Furthermore, Zorin held that "supervision of intercontinental missiles without concurrent elimination of military bases on the territories of other countries" would be pointless.[22] According to Zorin, banning the use of outer space for military purposes without the concurrent elimination of American military bases around the world would hamper the Soviet strategic position without costing the United States anything. As L. F. Palamarchuk of the Ukrainian Soviet Socialist Republic insisted, "a solution which gave one party so great a military advantage could not be satisfactory. Yet the United States," he claimed, "was not prepared to accept an agreement covering both the use of cosmic space exclusively for peaceful purposes and the elimination of bases."[23] Still operating from its perceived position of power, the Soviet Union and its allies continued to direct the discussion back to disarmament.

The United States refused to acknowledge the link between the peaceful uses of outer space and disarmament for a number of reasons. First was the fact that the American military bases that the Soviet Union sought to eliminate diplomatically "were not," explained Ambassador Lodge, "„foreign" in the way the Soviet Union representative used the word, but mutual bases, to be used mutually for the common defense by common consent."[24] While the Soviet delegation tended to paint the American bases as

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[22] U.N. General Assembly, 13th Session, First Committee, [*Summary Records of Meetings*], *982nd Meeting*, 12 November 1958 (A/C.1/982), Official Record, New York, 1958, 193.

[23] U.N. General Assembly, 13th Session, First Committee, [*Summary Records of Meetings*], *990th Meeting*, 19 November 1958 (A/C.1/990), Official Record, New York, 1958, 226.

[24] U.N. General Assembly, 13th Session, First Committee, [*Summary Records of Meetings*], *982nd Meeting*, 12 November 1958 (A/C.1/982), Official Record, New York, 1958, 194.

occupation forces stationed in various countries, Lodge explained that the military bases in question were joint efforts between the host nation and the United States military. Several American allies echoed Lodge"s explanation just as Orhan Eralp of Turkey contested, "There were no „foreign military bases" in Turkey in the sense implied in the wording of the agenda item before the Committee. In the exercise of the right of collective defense proclaimed in the United Nations Charter, Turkey had freely joined a defensive alliance in order to provide for the security of its people." Further, "they would disappear as soon as the fear of external aggression had been dispelled."[25] Even if the United States decided to comply with the Soviet request, the smaller nations that depended on American support in their defense against the Soviet Union would have blocked the effort. This being the case, linking the discussion on outer space to the issue of eliminating such bases could end only in stalemate, and as Eralp explained, "the opportunity for genuine peaceful scientific cooperation in the field of outer space [would] be lost amid frustrating wrangling over general disarmament."[26]

Apart from the debate over disarmament, the members of the First Committee began compiling a number of questions that needed to be addressed if outer space were to be explored peacefully. UN delegate Oscar Pinochet of Chile indicated the need for the boundary between air space and outer space to be defined. As he pointed out, the United States and the Soviet Union had set a precedent for outer space being treated differently

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[25] U.N. General Assembly, 13th Session, First Committee, [*Summary Records of Meetings*], *990th Meeting*, 19 November 1958 (A/C.1/990), Official Record, New York, 1958, 226.

[26] Ibid.

than air space, but the problem of determining at what altitude national sovereignty ends and international territory begins remained unsolved.[27] Pinochet also alluded to the problem of whether a nation could claim celestial bodies such as the moon as national territory.[28] Francisco Delgado of the Philippines further pointed to the necessity of "establishing controls over" the uses of reconnaissance satellites, since they had military uses.[29] While several nations echoed the importance of each of these issue for directing outer space research toward peaceful purposes, the consensus within the committee was that more research was needed before a decision could be reached on any of the issues brought before the Committee.

Given the sensitive nature of the issue and the need for more specific information, the United States and nineteen other nations proposed a draft resolution to create an *ad hoc* committee to examine these questions in more depth than the First Committee was able to do.[30] The committee proposed in this twenty-Powers draft would consider these various challenges presented by space exploration and would report directly to the General Assembly on its findings. When the United States presented the twenty-Powers draft to the committee, the Soviet Union was still trying to push its original draft

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[27] U.N. General Assembly, 13th Session, First Committee, [*Summary Records of Meetings*], *982nd Meeting*, 12 November 1958 (A/C.1/982), Official Record, New York, 1958, 195-96.

[28] Ibid., 196.

[29] U.N. General Assembly, 13th Session, First Committee, [*Summary Records of Meetings*], *991st Meeting*, 19 November 1958 (A/C.1/982), Official Record, New York, 1958, 229.

[30] These twenty nations were Australia, Belgium, Bolivia, Canada, Denmark, France, Guatemala, Ireland, Italy, Japan, Nepal, Netherlands, New Zealand, Sweden, Turkey, Union of South Africa, United Kingdom of Great Britain and Northern Ireland, United States of America, Uruguay, and Venezuela. This draft is generally referred to as the twenty-Powers draft.

resolution through. By this point both resolutions were quite similar, but the differences between the two prevented consensus between the super-powers. At the request of several committee members wishing to continue with other issues on the schedule, the American and Soviet delegations conducted a series of private talks to resolve their issues and to discuss the potential membership of the *ad hoc* committee.[31] As Ambassador Lodge of the United States explained, the two delegations were able to reach an agreement on the content of the draft resolution. However, talks broke down when they came to the topic of membership.

While the United States and the Soviet Union were able to reach an agreement on the content of the draft resolution, their differences in approach made an agreement on membership virtually impossible. The United States sought to include a number of nations that were involved in space efforts from each continent regardless of political affiliation, but the Soviet Union interpreted this move as an effort to overpower the Soviet bloc by stacking the committee with American allies. The Soviet Union insisted that the committee be equally split among Soviet allies, American allies, and neutral nations, while the United States insisted that the exploration of outer space should not be treated as a polar contest between two distinct sides.[32]

Having reached an impasse, American Ambassador Lodge took the twenty-Power draft resolution, including the Soviet revisions, before the First Committee on November

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[31] U.N. General Assembly, 13th Session, First Committee, [*Summary Records of Meetings*], *992nd Meeting*, 20 November 1958 (A/C.1/992), Official Record, New York, 1958, 231-34.

[32] U.N. General Assembly, 13th Session, First Committee, [*Summary Records of Meetings*], *994th Meeting*, 24 November 1958 (A/C.1/994), Official Record, New York, 1958, 235.

24, 1958 requesting a vote despite the lack of consensus. The twenty-Power draft proposed a committee of eighteen nations, each of which the ICSU "considered to be most advanced in the study of outer space."[33] While Lodge acknowledged that the Soviet Union had threatened to boycott the committee if its demands were not met, Lodge and "the sponsors of the twenty-Power draft resolution hoped that the USSR would participate in the work of the committee, since its cooperation would be extremely valuable."[34]

Debate over the draft resolution continued throughout the day with the Soviet Union accusing the United States of trying to force its will upon the committee and the United States countering by accusing the Soviet Union of trying to divide the UN into two opposing camps. At the request of the Soviet delegation, the paragraph specifying the membership of the committee received a separate vote. The membership passed with a vote of 51-9, and the twenty-Power draft resolution passed 54-9.[35] Despite Lodge"s

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[33] Membership included Argentina, Australia, Belgium, Brazil, Canada, Czechoslovakia, France, India, Iran, Italy, Japan, Mexico, Poland, Sweden, the Union of Soviet Socialist Republics, the United Arab Republic, the United Kingdom of Great Britain and Northern Ireland, and the United States of America. Ibid., 236.

[34] Ibid., 236.

[35] The vote on membership was by roll-call with Iceland voting first. In favor: Iceland, Iran, Ireland, Italy, Japan, Laos, Liberia, Luxembourg, Mexico, Nepal, Netherlands, New Zealand, Nicaragua, Norway, Pakistan, Panama, Paraguay, Peru, Philippines, Portugal, Spain, Sweden, Thailand, Tunisia, Turkey, Union of South Africa, United Kingdom of Great Britain and Northern Ireland, United States of America, Uruguay, Venezuela, Argentina, Australia, Belgium, Bolivia, Brazil, Canada, Chile, China, Colombia, Costa Rica, Cuba, Denmark, Dominican Republic, Ecuador, El Salvador, Federation of Malaya, France, Greece, Guatemala, Haiti, Honduras. Against: Poland, Romania, Ukrainian Soviet Socialist Republic, Union of Soviet Socialist Republics, Albania, Bulgaria, Byelorussian Soviet Socialist Republic, Czechoslovakia, and Hungary. Abstaining: India, Indonesia, Iraq, Israel, Jordan, Lebanon, Libya, Morocco, Saudi Arabia, Sudan, United Arab Republic, Yemen, Yugoslavia, Afghanistan, Austria, Burma, Cambodia, Ceylon, Ethiopia, Finland, Ghana. The vote on the rest of the draft resolution was not done by roll-call. U.N. General Assembly, 13th Session, First Committee, [*Summary Records of Meetings*], *995th Meeting*, 24 November 1958 (A/C.1/995), Official Record, New York, 1958, 245.

request that the Soviet Union participate in the committee‟s work, Ambassador Zorin of the Soviet Union insisted that the draft resolution "represented an [American] attempt to impose on the Assembly and on various delegations a membership for the committee which would make fruitful cooperation impossible. For the same reasons," he continued, "the USSR would not participate in the committee‟s work."[36] Having passed the First Committee, the draft resolution moved on to the General Assembly where it was discussed on December 13, 1958.

When the twenty-Power draft resolution came up for discussion in the General Assembly, the Soviet delegation renewed its efforts to sway the opinion of the UN in its favor. After Franz Matsch of Austria presented the draft resolution to the General Assembly, Sobolev addressed the Assembly to explain that "the draft resolution submitted in that report for the Assembly‟s approval [was] not the product of agreement and [did] not reflect the general sentiment."[37] He went on to explain that "an overwhelming majority of the countries represented in the First Committee" sought to reach an agreement that would be "acceptable to all States," yet "the negative position adopted by the United States delegation" he claimed, "made it impossible to reach such an agreement." Sobolev further asserted that the American refusal to discuss "the military aspects of the problem of outer space" indicated its plans "to continue and

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[36] Ibid., 246.

[37] U.N. General Assembly, 13th Session, [*Verbatim Records of Meetings*], *792nd Plenary Meeting*, 13 December 1958, (A/PV.792), Official Record, New York, 1958, 615.

intensify the rocket and nuclear weapons race which constitutes a threat to peace."[38] Sobolev insisted that the membership of the proposed committee was skewed in favor of the United States and that the original membership proposed by the Soviet Union was the most balanced. He claimed that "the attempt by the United States to force through the membership it prefers by means of an automatic majority is one more example of the United States policy of dictatorial rule, a policy which never has been and never will be successful where the Soviet Union is concerned."[39] Sobolev further emphasized that any committee concerning space could not hope to succeed without Soviet participation, and that the current draft resolution would result in a Soviet boycott of its proceedings. Through this threat and his severely anti-American rhetoric, Sobolev hoped to turn the General Assembly against the draft resolution despite the failure of similar tactics used in the First Committee's meetings.

Following Sobolev's severe criticisms of the United States, Ambassador Lodge of the United States addressed the Assembly with regret that the current "session of the General Assembly [had] been characterized so prominently by the attempt of the Soviet Union to make every single subject before the Assembly a source of rivalry between the United States and the Soviet Union, leaving everyone else out." In a clever turn, Lodge shifted the discussion away from the rivalry between the United States and the Soviet Union and toward the incredibly diverse nature of the United Nations. "We believe in the small countries," Lodge exlained. "We believe in having a big General Assembly in

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[38] Ibid.

[39] Ibid., 616.

which every country has one vote, and we can never fall in with this Soviet plan to divide the world into two Power blocs where there are just the Soviet Union and the United States that do the talking. I regret that Mr. Sobolev's speech was very much in line with that way of thinking."[40] While Sobolev had focused on the unfairness of a committee that did not represent American and Soviet interests equally, Lodge emphasized that the American goal in proposing the eighteen nations mentioned in the draft resolution was to include nations of considerable "scientific advancement and technical activity in the field of outer space" and to provide for the "equitable geographical distribution" of its members. The United States hoped that the nations most involved in space exploration would be able to participate in the proceedings of the committee and that every continent would be adequately represented. However, the Soviet Union, explained Lodge, "insisted, with respect to this new venture in international cooperation, that the world be divided into two hostile camps, or two sides, as Mr. Zorin phrased it." The United States, according to Lodge, refused to take part in such a division, and as he explained, "if this effort succeeds in dividing the world into a group of satellites of the Soviet Union — which does exist — and a group of satellites of the United States — which does not exist, and which will never exist — then the rest of the delegations might as well go home. There would be nothing left here to do."[41]

Following Sobolev's rebuttal of Lodge's argument in which he attempted to amend what he considered to be Lodge's misrepresentation of facts, the president of the

[40] Ibid., 617.

[41] Ibid., 618.

General Assembly, Charles Malik of Lebanon, implored the two sides to reach an agreement saying, "I wish to say how deeply disappointed I am — and I am sure many of you feel the same way — that this deadlock has not been broken. If, even at this late hour there is someone in this Assembly who can break this deadlock and bring about agreement and a harmonious conclusion to this issue, he will be making a real contribution to the cause of peace. For my part, I can only voice this feeling, and hope that something can be done."[42] Malik was not alone in his desire to see the issue resolved, but the delegations from the Soviet Union and the United States were beyond negotiation on the matter.

While tensions were high during these proceedings, it is worth noting that both the United States and the Soviet Union maintained diplomatic ties throughout this process. With the accusations that were being flung back and forth by both parties, it is surprising that one side never walked out on the proceedings, but both sides recognized the importance of maintaining viable diplomatic relations with each other. Both continued to cooperate within the UN and in their private dealings despite having every opportunity to break off communication. Regardless of how tense the situation became, this willingness to talk and to cooperate at some level helped to keep the world from nuclear war during the Cold War.

After closing arguments by both Lodge and Sobolev, the twenty-Power draft resolution was put up for vote by roll-call. The resolution passed with a vote of 53-9,

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[42] Ibid., 619.

becoming General Assembly Resolution 1348 (XIII), and the *ad hoc* Committee on the Peaceful Uses of Outer Space was created.[43] It is important to realize that as these diplomatic proceedings were taking place, the Space Race continued to move forward. The COPUOS was created in December 1958, but its first meetings did not take place until May 1959, and its first report to the General Assembly was not until December 1959. This left another full year for the Space Race to develop haphazardly before the United Nations was in any position to influence its direction.

Given the tremendous success of the IGY both in collecting data and in promoting cooperation, the IGY was extended into 1959 as the International Geophysical Cooperation 1959 (IGC-59).[44] While both the United States and the Soviet Union extended their IGY programs with several more satellites and space probes, both powers began working on projects that were distinctly separate from the IGY. In 1958, in an effort to consolidate space efforts and to emphasize the peaceful nature of American space efforts, President Eisenhower created the National Aeronautics and Space Administration (NASA) to continue cosmic efforts apart from the military programs that were continuing to work on ICBM technology, and by 1959 most of the American

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[43] In favor: Iran, Ireland, Israel, Italy, Japan, Laos, Liberia, Luxembourg, Mexico, Nepal, Netherlands, Paraguay, Peru, Philippines, Portugal, Spain, Sweden, Thailand, Tunisia, Turkey, Union of South Africa, United Kingdom of Great Britain and Northern Ireland, United States of America, Uruguay, Venezuela, Argentina, Australia, Austria, Belgium, Bolivia, Brazil, Canada, Chile, China, Colombia, Costa Rica, Cuba, Denmark, Dominican Republic, Ecuador, El Salvador, Federation of Malaya, France, Greece, Guatemala, Haiti, Honduras, and Iceland. Against: Poland, Romania, Ukrainian Soviet Socialist Republic, Union of Soviet Socialist Republics, Albania, Bulgaria, Byelorussian Soviet Socialist Republic, Czechoslovakia, and Hungary. Abstaining: India, Indonesia, Iraq, Jordan, Lebanon, Libya, Morocco, Saudi Arabia, Sudan, United Arab Republic, Yugoslavia, Afghanistan, Burma, Cambodia, Ceylon, Ethiopia, Finland, Ghana, and Guinea. Ibid., 621.

[44] U.N. General Assembly, 14th Session, [*Annexes*], *Agenda item 25: Report of the ad hoc Committee on the Peaceful Uses of Outer Space*, (A/4346), Official Record, New York, 1959, 4.

scientific efforts were under the direction of NASA. Since the IGY had been extended to the end of 1959, NASA continued to launch satellites as part of an extended IGY program. However, not all the American satellites placed in orbit in 1959 were part of the IGY program or under the direction of NASA, and while the UN had yet to rule on whether orbiting reconnaissance satellites was a legal use of outer space, the first American spy satellite entered orbit in February 1959.

On February 28, the United States Air Force launched the first Discoverer satellite into a polar orbit. Most of the early satellites had been placed into orbit around the equator, which allowed for more constant observation of the satellite and also took advantage of the earth"s spin in reaching orbital speed. While such an orbit is useful for gathering scientific data and testing early flight systems, an equatorial orbit limits the amount of territory over which a satellite flies. However, a satellite in a polar orbit will eventually pass over every square mile of the earth"s surface as the earth rotates under the satellite"s orbit. When the Discoverer satellites were being developed, digital cameras were not capable of producing images of sufficient resolution to be useful, so the satellites carried film cameras that would photograph the earth"s surface over the course of a few days and would be dropped out of orbit to be recovered and processed.[45] The program had significant problems with stabilization and film canister recovery, but the Air Force eventually succeeded in achieving stable flight and canister recovery in

[45] Clarke, *Man and Space*, 80-81.

December 1960.[46] Despite the fact that it came at the end of his terms in office, President Eisenhower got his spy satellites.

While the Air Force was launching spy satellites, NASA continued to launch IGY satellites and smaller research rockets. According to NASA historian Eugene Emme, "approximately 300 U. S. research rockets were launched during the 30-month IGY/IGC-59 period. This compared with the some 400 U. S. research rockets fired during the entire preceding 12-year period from the beginning of high-altitude rocket research circa 1945-July 1, 1957."[47] These numbers illustrate the way the Space Race was gaining momentum. In the two and a half year period of the IGY and its extension into 1959, the United States alone had fired almost as many rockets as it had over the decade prior. With the increasing number of flights, the necessity for international oversight became more and more clear. Both the United States and the Soviet Union had refrained from launching blatantly military satellites or probes into space, but by the end of 1959, both nations had the rocket power to launch just about anything they wanted into orbit. Therefore, when the COPUOS began work in 1959, it was with a sense of urgency.

The *ad hoc* COPUOS first met in May 1959 and worked through June. In keeping with their threat to boycott the proceedings, the Soviet Union refused to take part in the work of the *ad hoc* COPUOS. While the original membership listed in Resolution 1348 (XIII) consisted of eighteen members, only thirteen nations participated in the work, Czechoslovakia, India, Poland, the Soviet Union, and the United Arab Republic being

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[46] Emme, *Aeronautics and Astronautics Chronology*, 134.

[47] Ibid., 117.

absent.[48] While the deliberations of the First Committee in 1958 had insisted that the cooperation of both major space powers was essential to the success of UN efforts to maintain peace in outer space, the absence of the Soviet Union had little effect on the work done by the *ad hoc* COPUOS, since the committee"s efforts focused on gathering information rather than setting policy.

The purpose of the *ad hoc* COPUOS was to collect information and to decide how the United Nations should respond to new threats to world peace created by developments in space exploration, and as such, the major accomplishment of the *ad hoc* Committee was the establishment of the permanent COPUOS, which it recommended as part of its report to the First Committee in 1959. Despite the heated debate that took place over the creation of the *ad hoc* COPUOS, its permanent counterpart passed through the First Committee, with the promise of Soviet participation, without any problem, and on December 12, 1959, the General Assembly created the permanent COPUOS by passing Resolution 1472 (XIV).

The creation of the COPUOS was an important step toward the peaceful exploration of outer space. When the First Committee opened debate on the issue in 1958, it appeared that outer space was destined to become another front of the Cold War, but by 1959 both the United States and the Soviet Union were willing to participate in programs that would ensure the peaceful progression of the Space Race. This was a

[48] The full membership was to be Argentina, Australia, Belgium, Brazil, Canada, Czechoslovakia, France, India, Iran, Italy, Japan, Mexico, Poland, Sweden, the Union of Soviet Socialist Republics, the United Arab Republic, the United Kingdom of Great Britain and Northern Ireland, and the United States of America.

major step in the right direction considering the fervor with which the two superpowers were condemning each other during the 1958 meetings. While the creation of the COPUOS was a good start, it was just a start. The Committee faced a number of serious challenges as each new landmark in the Space Race meant new challenges and potential conflicts for the COPUOS to solve, but perhaps the most significant accomplishment of the COPUOS in its first ten years of existence was the creation of the Outer Space Treaty of 1967.

CHAPTER 4

THE FINISH LINE: THE OUTER SPACE TREATY OF 1967 AND THE FIRST MEN ON THE MOON

It is difficult to describe the technological advances of the 1960s as anything but incredible. In light of the fact that both the Soviet Union and the United States had been pushing rocket power and navigational technology to their maximum capacity just to orbit a small satellite in 1957 and 1958, the rate at which advances were made was almost unbelievable. By 1966 both the United States and the Soviet Union had sent a number of probes to the moon and had orbited hundreds of satellites, but the most dramatic and best known achievement of the Space Race was the advent of manned spaceflight. Only four years after the launch of *Sputnik 1*, Soviet Cosmonaut Yuri Gagarin became the first man in space on April 12, 1961, followed in May by American Astronaut Alan Shepard.[1] As both space programs continued to push faster and harder, the moon became the ultimate goal and the final prize.

While the technological side of the Space Race advanced rapidly, the diplomatic side of it bogged down early. In 1959 the General Assembly passed a resolution making the Committee on the Peaceful Uses of Outer Space (COPUOS) a permanent committee. Many of the nations that had participated in the discussions expressed great hope that the COPUOS could guide outer space exploration in a positive direction despite international tensions surrounding the issue. Much to the dismay of many of the involved nations, the

[1] William E. Burrows, *This New Ocean: The Story of the First Space Age* (New York: Random House, 1998), 274-310.

Soviet Union had boycotted the proceedings of the *ad hoc* COPUOS.[2] When the committee was made permanent in 1959, the Soviets abandoned their boycott and joined the Committee. However, they did not abandon the political agenda that had led them to boycott the *ad hoc* Committee.

Despite overtones of hope and promises of progress, the Soviet Union still pushed to link the discussion of outer space to the larger debate on general disarmament, and they blocked American attempts to produce a binding document to ensure that outer space was not used for military purposes. The Soviets had insisted on this link during the early stages of the debate on the COPUOS, abandoning it only in an attempt to get their draft resolution passed in the First Committee. After a year of protesting the fairness of the membership of the COPUOS, the Soviet Union reentered the discussion with a renewed emphasis on disarmament. As historians Thomas Graham and Damien J. LaVera observe, the Soviet Union "declined to agree to restrict outer space to peaceful uses unless American foreign bases — where short-range and medium-range missiles were stationed — were eliminated also."[3] Since the United States and many Western powers refused to acknowledge the link between outer space and disarmament, the Soviets' participation in the COPUOS blocked any significant process for several years.[4]

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[2] U.N. General Assembly, 13th Session, First Committee, [*Summary Records of Meetings*], *994th Meeting*, 24 November 1958 (A/C.1/994), Official Record, New York, 1958, 235.

[3] Thomas Graham and Damien J. LaVera, *Cornerstones of Security: Arms Control Treaties in the Nuclear Era* (Seattle: University of Washington Press, 2003), 34.

[4] It is interesting to note that while neither party reached an agreement on the military uses of outer space, neither side orbited any type of weapons platform.

Despite their rigid stance, the Soviet Union shifted its emphasis away from disarmament in 1963 and called for a binding agreement "banning the orbiting of objects carrying nuclear weapons."[5] Graham and LaVera point to the signing of the Limited Test Ban Treaty in 1963 as the decisive event in shifting Soviet rhetoric, and following the signing of the treaty, "Soviet Foreign Minister Andrei Gromyko told the UN General Assembly that the Soviet Union wished to conclude an agreement banning the orbiting of objects carrying nuclear weapons."[6] Adlai Stevenson, the American ambassador to the United Nations, assured the UN that the United States had no intention of orbiting nuclear weapons or any other weapons of mass destruction, and in October 1963 the General Assembly, as Graham and LaVera describe, "unanimously adopted a resolution welcoming the Soviet and U.S. statements and calling upon all states to refrain from introducing weapons of mass destruction into outer space."[7] Still, while the resolution was a move in the right direction, it was little more than optimistic rhetoric, and both the United States and the Soviet Union knew it, and as both superpowers came ever closer to landing on the moon, the need for a binding agreement governing cosmic activities became increasingly clear.

In May 1966, Andrei Gromyko, the Soviet Minister for Foreign Affairs sent a letter to the United Nations requesting "Conclusion of an international agreement on legal principles governing the activities of States in the exploration and conquest of the moon

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[5] Ibid., 34-35.

[6] Ibid.

[7] Ibid., 35.

and other celestial bodies."[8] Gromyko explained that the Soviet Union had made several major advances in lunar exploration and that the goal of placing a man on the moon seemed to be imminently possible. As he wrote, the flights of several lunar probes "demonstrated the real possibility of man's conquest of the Moon in the very near future — a feat which will undoubtedly be the outstanding event of our century." While he emphasized that "there is no doubt that this exploration will enrich mankind," he emphasized that "the conquest of the moon and other celestial bodies" would raise "not only technical and scientific problems but also the question in what direction and on what basis States will conduct their activities in this sphere." This latter question, according to Gromyko, needed to be answered prior to the actual conquest of the moon.

Even in discussing the moon, Gromyko did not abandon the Soviet emphasis on disarmament that had pervaded the discussions within the COPUOS. Since the United States had consistently claimed that its military bases located around the world were for self-defense, in his letter to the UN Gromyko used the rhetoric of self-defense to poke fun at his American counterparts. "It is quite obvious," he wrote, "that plans for the military use of the Moon and other celestial bodies cannot in any way be justified by reference to the national security interests of States and are intended merely to serve the purposes of aggression, the purposes of preparing for global war."[9] While the United States had

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[8] U.N. General Assembly, 21st Session, [*Annexes*], *Union of Soviet Socialist Republics: request for inclusion of an item in the provisional agenda of the twenty-first session*, (A/6341), Official Record, New York, 1966, 1.

[9] Ibid., 2.

never expressed any interest in militarizing the moon, Gromyko sought to head off the possibility of such an action by precluding their traditional reasoning.

In September 1966, American ambassador Arthur Goldberg sent a similar letter to the United Nations proposing consideration of a "Treaty governing the exploration and use of outer space, including the Moon and other celestial bodies."[10] Less caustic in his tone, Goldberg echoed Gromyko‟s call for haste by writing "the urgency of this matter is made apparent by man‟s rapid strides in space."[11] Alongside his letter, Goldberg sent a draft of a treaty intended to guide the exploration and use of outer space as the Space Race continued.

By 1966 a manned landing on the moon had been the goal of both the United States and the Soviet Union for several years, but the serious political ramifications of such a landing did not become entirely clear until it seemed that a manned lunar landing was imminent. The biggest problem lay in the fact that the Moon, unlike orbital space, consisted of real land mass that could be claimed as national territory. Such a claim would have dire consequences for international relations as any subsequent lunar landing by a competing power would constitute a territorial invasion, and neither the United States nor the Soviet Union was likely to abandon its own space programs after the success of its counterpart. While neither the Soviet Union nor the United States sought

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[10] U.N. General Assembly, 21st Session, [*Annexes*], *United States of America: request for the inclusion of an additional item in the agenda of the twenty-first session*, (A/6392), Official Record, New York, 1966, 5.

[11] Ibid., 6.

conflict in space, the moon seemed to be a likely catalyst for such a conflict if the COPUOS were unable to find a viable solution to the problem.

Working ahead of a problem also presented the COPUOS with a new challenge. Up to this point in its history, the COPUOS had not been required to deal with tremendously difficult issues. The problem of orbital overflight predated the committee, but despite fears about the international implications of a satellite orbiting over another country"s territory, *Sputnik 1* solved the problem by setting a precedent for international, orbital overflight. While allowing a particular act to set a precedent had worked with the question of orbital overflight, it was too risky to leave the question of the Moon to chance. Therefore, the COPUOS had to work ahead of the problem and arrive at a viable solution before any problems arose.

The COPUOS started its eighth session on September 19, 1966 with the hope that it could successfully produce a definitive document to guide the Space Race forward. Chairman Kurt Waldheim of Austria began the proceedings by congratulating both the United States and the Soviet Union on the successes of their various programs and by exhorting both superpowers to make every effort to reach an agreement on the proposed treaties.[12] The successful robotic ventures on the moon illustrated how close both the United States and the Soviet Union were to landing men on the Moon and how important

[12] Waldheim also mentioned that France had launched its first satellite since the last COPUOS meeting in 1965. "Finally, I wish to mention the technological satellite A-1, which was launched by France on 26 November 1965, by which France has become the third independent space Power." U.N. General Assembly, 21st Session, [*Annexes*], *Report of the Committee on the Peaceful Uses of Outer Space*, (A/6431), Official Record, New York, 1966, 10.

it was to solve the problems that could be created by a manned lunar landing before such a landing took place.

Both the United States and the Soviet Union presented draft treaties to the COPUOS during the early stages of its work in May 1966, and while certain articles sparked limited debate, the tone of the 1966 meetings of both the COPUOS and the First Committee was much more genial than earlier sessions had been. Whereas the debate over the creation of the *ad hoc* COPUOS had been tremendously tense and unfruitful, both the United States and the Soviet Union seemed to realize the importance of the task at hand and sought fruitful negotiation instead of tedious bickering, and by December 1966, the First Committee presented the "Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies," which is better known as the Outer Space Treaty of 1967.

The first thing that the Outer Space Treaty sought to do was to limit certain actions in outer space. In Article II, the treaty declares that "outer space, including the Moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means."[13] In other words, outer space was defined as international territory. While any capable nation could explore the moon or any other celestial body, that nation could not claim territory in outer space. This precluded fears that the moon might become the catalyst for territorial wars in space and also ensured that nations that developed space programs in years to come

[13] U.N. General Assembly, 1499th Plenary Meeting, "Resolution 2222 (XXI) [Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies]" (A/RES/2222), 15.

could still land on the moon. Article IV banned the orbiting of nuclear weapons or any weapon of mass destruction as well as specifically forbidding the construction of military installations on the moon or other celestial bodies.

While the treaty limited certain actions, it made certain responsibilities explicit. For instance, Article VII makes the country of origin responsible for any damage done by a faulty rocket or spacecraft. By 1966 the rockets being launched were much more stable than the rockets of the 1950s, but they were also much larger. The failure of a rocket destined for the moon could cause considerable damage wherever it landed, and according to the treaty, the nation that created the rocket was responsible for any damage done by the rocket. Article VIII takes this one step further by making provisions for spacecraft of any nation to be returned to its country of origin if it were to land on foreign soil. To some extent this provision took a bit of the edge off the competition between the United States and the Soviet Union. For one, it reduced the potential for conflict if a satellite happened to land in hostile territory. By explicitly stating that a nation must return the craft to its country of origin, the treaty precludes the possibility of another U2 incident in which both the wreckage and the pilot of an American U2 spy plane became the centerpiece of an international scandal.[14]

The treaty also clarified the status of astronauts and cosmonauts as "envoys of mankind in outer space" and promised them "all possible assistance in the event of accident, distress, or emergency." Article V became a key part of the Outer Space Treaty

[14] For more on the U2 incident see Howard Jones, *Crucible of Power: A History of American Foreign Relations from 1897* (New York: Rowman & Littlefield Publishers, Inc., 2008), 334-36.

as it put all nations on the same side when exploring space. By labeling all space travelers as "envoys of mankind," the treaty stripped the Space Race of a bit of its national impetus.[15] The Space Race continued to be competitive, but at least rhetorically, every man or woman who traveled into space was a representative of Earth rather than a representative of any single nation.

The treaty also sought to encourage international cooperation in various efforts. Article X asks that all capable nations aide in the observation and tracking of satellites and spacecraft from other nations, and Article XI requested that nations inform the UN of any developments in technology that might be helpful to other nations and any discoveries that could prove either helpful or harmful to future explorers. The treaty also made provisions for international oversight of space efforts. Article XII states that "all stations, installations, equipment and space vehicles on the Moon and other celestial bodies shall be open to representatives of other States Parties to the Treaty."[16] Even though the technology of the 1960s made inspecting any spacecraft nearly impossible, by establishing a legal precedent for international oversight, the UN hoped to prevent illegal activity with the threat of inspection.

The relative ease with which the Outer Space Treaty of 1967 passed through the COPUOS, the First Committee, and ultimately the General Assembly is intriguing considering the political climate of 1966 and 1967. The Vietnam War had gained

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[15] This rhetoric was carried throughout the rest of the Space Race. This discussion sheds light on Neil Armstrong"s famous quote when he first stepped onto the lunar surface. Describing his "one small step" as a "giant leap for mankind," Armstrong played into the rhetoric of being a representative of humanity rather than a representative of the United States. Ibid., 14.

[16] Ibid., 14.

momentum, which placed considerable strain on relations between the Soviet Union and the United States. In fact, in his address to the First Committee in 1967, N. T. Fedorenko of the Soviet Union pointed to American aggression in Vietnam as limiting the practicality of Soviet and American cooperation in cosmic ventures. Not surprisingly, L. H. Fountain of the United States contested Fedorenko"s remarks, but the effect was the same.[17] Practical cooperation was untenable given the present circumstances, yet the two superpowers continued to cooperate within the United Nations to arrive at a viable solution to the problems created by the Space Race. As has been discussed in prior chapters, the threat of nuclear war certainly helped to keep the two superpowers at the negotiation table, but the speed of the debate over the Outer Space Treaty of 1967 can likely be traced to the technological state of both space programs.

Throughout the Space Race the United States had always been one step behind its Soviet counterpart, and this did not seem to be changing. In 1966, the Soviets had achieved the first soft robotic landing on the moon with *Luna 9* and had taken the first pictures of the back side of the Moon with *Luna 10*.[18] The United States was not able to respond immediately to either of these achievements with anything similar. So for the United States, the prospect of landing on the moon before the Soviet Union seemed bleak. The possibility that the Soviet Union might claim the surface of the moon as Soviet territory represented a tremendous threat to the American space program. Further,

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[17] U.N. General Assembly, 22nd Session, First Committee, [*Summary Records of Meetings*], *1497th Meeting*, 17 October 1967 (A/C.1/1497), Official Record, New York, 1967, 2-4.

[18] Ibid.

if the surface of the moon were to be claimed by the Soviet Union, an American landing would constitute an invasion. If the Soviets landed first, the Americans would have to decide whether to risk landing anyway or to abandon the entire project.

From the Soviet perspective, the task of successfully landing a man on the moon was becoming increasingly difficult. Their robotic attempts had been somewhat successful, but they had not been without a significant number of disasters, and they had been unable to reach the moon with any object that could return to Earth.[19] So while the United States feared a Soviet monopoly on the moon, the Soviet Union feared that it would not be able to reach the moon at all and sought to prevent an American take-over of the earth‟s natural satellite. For both the United States and the Soviet Union, the only safe path was to ensure that neither superpower had the opportunity to claim the moon as its own, and as the Outer Space Treaty of 1967 worked its way through the committees, it met little resistance.

The General Assembly passed the Outer Space Treaty as Resolution 2222 (XXI) in December 1966, and it was opened for signatures on January 27, 1967. The first binding document on outer space law, the treaty was signed by eighty-eight nations and came into force on October 10. The treaty finally provided the world with a binding agreement concerning the exploration of outer space, though many felt that it did not go far enough in providing viable mechanisms for cooperation or means of enforcement.

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[19] For more on the Soviet space program throughout the 1960s, see: James E. Oberg, *Red Star in Orbit* (New York: Random House, 1981).

As part of the proceedings of the First Committee in 1967, Ambassador Armond Berard of France pointed out that the line between air space and outer space remained undefined and that this lack of definition was a serious legal problem. "We find it hard to see," he explained, "in the absence of a definition of outer space, it is possible to reconcile in practice the traditional principle of the sovereignty of States over their air space with the new principle, set forth in the Treaty, of renunciation by States of all sovereignty in outer space."[20] While *Sputnik 1* had set the precedent of allowing orbital objects to fly over foreign territory, the line between air space and outer space had yet to be defined, and for Berard and others this was dangerous. Without a concrete definition of this boundary, every object launched into space risked being condemned for violating another nation"s sovereignty and could serve as an impetus for conflict. Berard and the French delegation pushed both the COPUOS and the First Committee to seriously consider the problem of defining this line, but as this line remains undefined to the present day, it is clear that they were unsuccessful in reaching an agreement on the matter.

Many delegations also sought to define further the details concerning national liability for damage caused by spacecraft and the mechanism for aiding and returning foreign astronauts and equipment in the case of an emergency. The Outer Space Treaty provides a broad discussion of both of these issues, but most delegates felt that more

[20] U.N. General Assembly, 22nd Session, First Committee, [*Summary Records of Meetings*], *1498th Meeting*, 17 October 1967 (A/C.1/1498), Official Record, New York, 1967, 2.

specific terms needed to be defined.[21] However, talks on these issues had been slow and inconclusive even a year after the treaty had been approved by the General Assembly, and the loss of both American and Soviet spacemen in separate accidents in 1967 drove the discussion forward.[22]

Despite its shortcomings, the Outer Space Treaty had a number of strengths. The fact that it banned nuclear weapons and other weapons of mass destruction from being orbited was a major move forward in the discussions of outer space. This had been a point of contention from the earliest discussions concerning the peaceful uses of outer space, but the United States and the Soviet Union had never been able to reach an agreement. Defining celestial bodies as international territory was also a big move in the right direction. Whereas lunar landings could have sparked colonial conflicts much like those that developed from the competition among empires that followed Columbus‟ discovery of the New World, by declaring the moon to be international territory, the treaty was able to encourage exploration while stripping it of some of its political risks. The Outer Space Treaty also came at a crucial stage in the Space Race. The various delegates who emphasized the imminent need for such an agreement were correct in their

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[21] Virtually every delegation expressed the same sentiment concerning these shortcomings of the Outer Space Treaty. For more on the specific arguments of each nation see: U.N. General Assembly, 22nd Session, First Committee, [*Summary Records of Meetings*], *1498th – 1502nd Meeting*, 17 October 1967 – 20 October 1967 (A/C.1/1498-1502), Official Record, New York, 1967.

[22] The first American casualties of the Space Race were Ed White, Gus Grissom, and Roger Chaffee who were killed in a flash fire on the launch pad in the Command Module of *Apollo 1*. The first Soviet casual was Vladimir Komarov, who was killed after multiple system failures during reentry caused his *Soyuz 1* capsule to impact the ground at nearly four hundred miles per hour. For a more detailed discussion of both of these tragedies, see William E. Burrows, *This New Ocean: The Story of the First Space Age*, (New York: Random House, 1998), 406-19.

assessment of the situation in that within two years of the treaty‟s signing the United States would land men on the moon.

CONCLUSION

As the United States' *Apollo 11* made its way toward the moon in mid-July 1969 carrying Michael Collins, Neil Armstrong, and Buzz Aldrin, the Soviet unmanned probe, *Luna 15*, raced ahead and was in orbit around the moon as the three American astronauts made their approach. Most likely an effort to upstage the *Apollo 11* landing, *Luna 15* was to make a soft landing in the Mare Crisium (Sea of Crises) and return soil samples back to earth, but as the Americans prepared for their descent, the Soviet probe maneuvered toward a landing and crashed. As James Oberg writes, "the Soviet failure on the Sea of Crises, and the subsequent American success on the Sea of Tranquility, seemed almost too metaphorical to be real."[1] After twelve years of trailing the Soviet Union, the United States finally pulled ahead and won the Space Race on the last leg.

"From northernmost Norway, where Lapps herded reindeer with transistor radios pressed to their ears, to Wollogong, Australia, where a local judge tried cases with his television on, people all over Earth followed the event. An estimated 600 million of them," recounts William Burrows, "watched the live transmission of Armstrong setting foot on the other world."[2] Just as *Sputnik 1* had dazzled the world twelve years earlier, Neil Armstrong and Buzz Aldrin captivated audiences worldwide as they became the first men to step foot on alien soil. The moon landing was undoubtedly an American victory, complete with the iconic images of Aldrin planting and saluting the American flag, but it

[1] James E. Oberg, *Red Star in Orbit* (New York: Random House, 1981), 125.

[2] William E. Burrows, *This New Ocean: The Story of the First Space Age* (New York: Random House, 1998), 429.

was more than just an American victory. It was, as Armstrong put it, "a giant leap for mankind."

Armstrong"s statement is incredibly appropriate in at least two ways. First, the lunar landing was obviously a tremendous technological leap. The rate of development during the Space Race was extraordinary. From hardly being able to reach orbit in the late 1950s to landing men on the moon by the end of the 1960s is an incredible technological feat. Second, it was a giant leap in the realm of international politics. Given the intensity of the rivalry between the United States and the Soviet Union during the 1950s and 1960s, it seems incredible that the Space Race never turned violent or outwardly militaristic, and had it not been for the efforts put forth by the United Nations and specifically the Committee on the Peaceful Uses of Outer Space, the lunar landing may have been something closer to an invasion.

Whether forced by the realities of nuclear war or by the changing realities of a two – superpower balance of power, the United States and the Soviet Union cooperated throughout the Space Race to prevent the advent of cosmic war. Despite the harsh nature of many of the debates that took place in the UN, both sides maintained diplomatic relations throughout the entire process. They continued to compete, but though one cannot deny the realities of the nuclear arms race or the competitive nature of the Space Race, their competition was tempered by a level of cooperation maintained by constant communication. These competitions never produced the large-scale violence that so many people feared, and this was the case only because the United States and the Soviet Union continued to talk through their issues even when relations became incredibly tense.

The U2 incident, the Cuban Missile Crisis, and the escalation of the Vietnam War all took place within the timeframe of the Space Race, yet through it all the United States and the Soviet Union continued to negotiate in hopes of maintaining peace despite differences.

The COPUOS stands out as a progressive and optimistic attempt to calm Cold War tensions before they escalated beyond control, and in many ways it succeeded. Neither power ever orbited nuclear weapons, despite the technical capacity of both nations to do so; astronauts and cosmonauts never found themselves fighting in outer space despite their rivalries, and finally, the moon never became the grounds for colonial conflicts that could easily have developed out of the Cold War rivalry. Through the efforts of the United Nations to direct the Space Race toward peaceful ends and through the United States‟ and Soviet Union‟s willingness to cooperate in preventing war, the Space Race culminated in a peaceful landing of men on the moon without any violent repercussions. This truly was a "giant leap for mankind." Thanks to the efforts of all of the diplomats involved, the astronauts of *Apollo 11* did indeed go "in Peace for All Mankind."

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