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One Small Step: An Analysis of International Space Law and How it Effects Historic Preservation

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ONE SMALL STEP: AN ANALYSIS OF INTERNATIONAL SPACE LAW AND
HOW IT EFFECTS HISTORIC PRESERVATION

A Thesis
Presented to
the Graduate School of
Clemson University

In Partial Fulfillment
of the Requirements for the Degree
Master of Science
Historic Preservation

by
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Accepted by:
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ABSTRACT

From 1969 to 1972 NASA's Apollo Program successfully completed six separate manned lunar landings. Since 1972 there has been no human presence on the Moon. The lunar landing sites of Apollo's 11, 12, 14, 15, 16, and 17 have sat in situ for forty years in the absolute zero vacuum of outer space. As the next phase of lunar exploration draws closer, it is important to protect the Apollo Lunar Landing Sites from exploration and damage because of their importance to human cultural heritage. This thesis assesses the international treaties that govern outer space, the Moon, and other celestial bodies and interprets whether they allow for the legal protection of human archeological sites in extraterrestrial settings. This thesis explains that it is not impossible, however extremely complicated to protect the Apollo Lunar Landing Sites because of these international laws. However, preservation on a national level is legally possible and explained in detail.

DEDICATION

I dedicate this to my family, friends, and coworkers, for keeping me grounded while my head was in orbit.

ACKNOWLEDGMENTS

Without the following people this would have turned into Apollo 13: To Lisa Westwood for introducing me to this topic, and always answering my questions no matter how many of them I emailed. To Barry Stiefel, for consistently going above and beyond in your assistance of this endeavor. To Carter Hudgins, for my always enjoyable “Tuesdays with Carter.” To Ashley Robbins Wilson, for letting me into this program, because this is all your fault. To My Classmates, for enduring this process with me, because writing this alone would have been far less entertaining. To My Coworkers, for giving me a place to refuel from school

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1 - Introduction

Through the viewport he could see the first light of the day shining on the eastern seaboard of his native country. He could barely discern the sliver of land known as Cape Cod from this distance, the curling finger that called to the *Mayflower* so long ago. He began to think of how terrifying a journey across the vast Atlantic Ocean must have been in the 1600s, and how welcome the sunrise must have been after a stormy night at sea. He looked out the viewport at where he was going and wondered if any human being had ever been this far away from home before?

Out of the other viewport he could see where he came from, the grey desolation of the Moon. He had been staring at it his whole life, and he was now one of two people to ever set foot on it. Neil Armstrong was quickly coming to terms with the fact that he had just accomplished what no one had ever done before. He was part Christopher Columbus the explorer, part Isaac Newton the fearless scientist, and now to get home, he would have to be part Harry Houdini the escape artist. Neil Armstrong was slowly realizing the gravity of his current situation when the static of the radio buzzed and a familiar voice came over the communications unit.

“Eagle this is Houston, do you copy?” squawked the comm. unit

Armstrong looked over at his friend and fellow space traveler Buzz Aldrin who was deeply focused on a panel of blinking lights and instruments and saw that he had no interest in replying. Buzz was still disappointed that he lost the coin flip in Florida to

decide who the first one out of the lunar module would be. Neil told himself that one day he would reveal to Buzz that he used a two headed coin, but now was not the time.

“Houston, this is Eagle, go ahead,” replied Armstrong

“Eagle, We have the President here for you,” said Houston. The news got Aldrin to turn completely away from his display panel and look at Armstrong with a raised eyebrow.

“No kidding, the President,” said Aldrin wearing a wry grin, “I landed on the moon and all I got was a lousy phone call from the President.” Neil responded to his friends comment with a chuckle and before he could activate the comm. unit to respond, the familiar voice of President Richard Nixon filled the lunar module.

“Commander Armstrong, Astronaut Aldrin, this is President Nixon, I just wanted to express my gratitude and display my praise in the mission you have just undertaken. The journey from the Earth to the Moon has been the sole focus of this nation for the last ten years. You have a very proud nation waiting for your arrival.”

The two astronauts exchanged satisfied looks upon receiving the praise of the leader of their nation and attempted to share a congratulatory high five, but they had yet to master that maneuver in zero gravity.

“Mr. President, on behalf of me, and astronauts Buzz Aldrin, and Michael Collins, we want to say thank you for your praise, and with God’s help we shall see you in three days’ time.” Armstrong responded. There was a slight delay in communications due to the 200,000 miles his words had to travel before being heard.

“Gentleman, one of my aides wanted me to run an idea by you two” said Nixon through the static, “Recently the government drafted legislation to protect this country’s most important buildings, sites, and places of historical importance. In a few minutes I’m going to sign an Executive order that will nominate the Apollo 11 Landing Site as a National Monument. I wanted to know how you feel about your descendants being able to see your footprints in lunar dust a hundred years from now?”

The two astronauts stared at each other from across the lunar module unable to respond. They had taken off from the moon only hours ago and had not even returned to the command module that housed the third member of their team and already the President wanted to enshrine what they had just done. The five minutes Neil Armstrong had taken to understand the importance of what he and Aldrin had just accomplished was not enough to make him fully grasp what was being asked of him. Armstrong and Aldrin were focused on returning to Collins and the command module, then Earth. Preserving the landing site they had just created was not on their mind in the least.

“Well Gentleman, it’s not polite to keep the President waiting,” Said Nixon in a playful tone. Armstrong quickly mouthed the words “what do I say?” to Aldrin, and all he got in response was a shrug.

“I...I...I’m sorry Mr. President, I wasn’t sure exactly how to respond to that,” said Armstrong, “I would be honored at the thought of our descendants being able to see our first footprints on the moon as a National Monument.”

“Well that’s that I wanted to hear Gentleman. By the time you get back here the historically significant achievement you accomplished on your trip will be forever

protected by the laws of the United States,” said President Nixon, “Good Luck. God speed. Get back to us safe, Nixon Out.”

This conversation recalls a transaction where a proud national leader expresses his gratitude for the historically significant actions two of his citizens just completed. Everything that transpired during that conversation happened in the course of recent world history and is entirely possible. Everything about that conversation is completely realistic, except for the conversation itself.

Sadly, President Nixon never made that radio transmission, and Apollo 11 Lunar Landing Site National Monument was never created. The astronauts of Apollo 11 returned home to become interstellar celebrities on par with The Beatles and were then followed to the lunar surface by Apollo’s 12, 14, 15, 16, and 17. Since Apollo 17 left the moon’s surface on December 15th, 1972, no member of our species has returned to the Moon. Each of the five successful lunar landing missions left behind equipment, and those objects left on the Moon represent the pinnacle of human space technology. If the objects at the Apollo 11 Lunar Landing Site were on Earth, they would be preserved in a museum for all to see. There are, obviously hurdles involved in preserving one of human beings most significant achievements. One of those hurdles is that the site is on the Moon.

The purpose of this thesis was to examine if the laws the international legal community created during the space race of the 1960’s will allow for the protection of one of mankind’s most significant achievements. By examining the major international

treaties and conventions that govern the heavens, this thesis explains the complicated legal situation involved with the process. This thesis will delve into both universally accepted, and highly controversial international treaties to seek answers about lunar preservation initiatives. Since all of the objects that were left on the Moon during the Apollo Missions are still US government property, this thesis also explores US preservation law. The ultimate goal of this endeavor is to have the Apollo Lunar Landing Sites included onto the World Heritage List so that it will be protected for all time.

In order to fully understand the rules and regulations that pertain to the Moon, outer space, and other celestial bodies, this thesis examined the opinions and scholarly writing of noted legal historians and space enthusiasts in regards to the major space treaties. NASA documents, National Park Service archives, various World Heritage Sites, scientific journals, and news outlets were combed to provide insight, information, and historical data on the topic. Because outer space and its celestial bodies have been deemed areas of international commons, International conventions pertaining to the ocean floor and Antarctic continent were examined for similarities.

When Astronauts Neil Armstrong, Edwin “Buzz” Aldrin, and Michael Collins returned to Earth safely from the first successful journey to the Moon on July 24, 1969, they did not return to find the laws of the United States, or the international community interested in forever preserving the site of their historic achievement. Instead, the site in which human beings first set foot on another celestial body has been preserved by an entirely different method.

The Apollo Landing Sites are not only significant because of their importance to human scientific achievement but also because they are the only site in human history that has sat frozen in time. The Apollo 11 Landing Site consists of 106 objects made specifically for the first manned mission to the Moon's surface including the lunar module lander, active NASA experiments, and our first footsteps on the Moon. This site is roughly the size of a baseball diamond and constitutes the first archeological site on another celestial body. The lack of atmospheric conditions on the Moon has created an almost perfectly preserved site because it has dealt with little interference since Armstrong and Aldrin left it in 1969. The extremely delicate nature of that site creates a very difficult situation in regards to protection and preservation if and when humans should return. Especially when the site is in danger from the next wave of potential lunar explorers.

The space tourism industry is not as far off as people believe it to be. Companies like Virgin Galactic are within years of being able to bring travelers into space and eventually the Moon. The Google LunarX competition is offering a \$30 million prize to the first team of scientists to design a rocket that will get a robot to the Moon. In order to stop the potential human disturbance of this historic site this thesis will present new ideas that could be useful in the fight to expand human preservation methods outside of our atmosphere.

Some say the idea of preserving human archeological sites on the Moon as far-fetched, laughable, and a waste of taxpayer dollars. Once all of the facts are presented maybe people will still think of the idea as "out there," but they'll leave the conversation

with a head full of new ideas, and an appreciation for the efforts of this endeavor. The hopes of this thesis were to answer the initial question, and to put the idea into a palatable enough context that the idea of preserving human artifacts 233,000 miles away does not seem like science fiction.

2 - Legal Analysis and Interpretation

On the morning of December 15th, 1972, Apollo 17 astronauts Eugene Cernan, Ronald Evans, and Harrison Schmidt took off from the moon, leaving anything that was not required for the return trip home from the lunar surface. Those three Americans are the last three human beings to visit the lunar surface, almost forty years ago. Much like the fictitious conversation between President Nixon and the crew of Apollo 11, no recorded conversations took place during Apollo 17 in which protecting the lunar landing sites was discussed. We can only imagine the immediate needs that dominate the conversations of men returning to Earth.

The legality of preserving human archeological sites on the moon is an incredibly complex topic that deals with some universally accepted, and some highly controversial international laws. This chapter will explore the five major conventions and treaties that were drafted by the United Nations during the first age of space exploration. The text of this section will explain how the laws humans have created to govern outer space and its celestial bodies interact with laws we have created on Earth to allow us to preserve our culturally significant objects and sites. This chapter presents the historical context of the five major space treaties, the nations that drafted them, the conversations and concerns of the delegates who molded the drafts into international conventions, and how, if at all those legal documents allow us to preserve one of the most important achievements we have ever accomplished. Because the objects located on the lunar surface are still United States Government property it is important to examine how US law can provide

protection. Along with a section on US law there is a section examining a World Heritage Listing that bears legal similarity to the Apollo Lunar Landing Sites.

The United Nations Committee on the Peaceful Uses of Outer Space (COPUOS) drafted the five major space treaties governing human usage of the heavens from 1967 to 1979. COPUOS was an ad hoc committee created by the UN to explore “the nature of legal problems which may arise in the carrying out of programs to explore outer space.”¹ The committee was created in 1958, one year after the launch of *Sputnik*, and within weeks of the creation of NASA. When COPUOS was created in 1958 there were 24 members, which comprise only 1/3rd of the members of the committee today.² The members of COPUOS are split into two sub-committees, one being the Legal Sub-committee, which was comprised of lawyers, legal scholars, and diplomats; and the Scientific and Technical Sub-committee, comprised of members with scientific backgrounds.

It is noteworthy that the members of the early sessions of COPUOS were drafting language to govern outer space and its celestial bodies without any precedent, and in some instances, prior to the first humans stepping foot on the Moon. Laws pertaining to space had never been created before, and so these legal pioneers had to draw from more

¹ S. Neil Hosenball, “The United Nations Committee on the Peaceful Uses of Outer Space: Past Accomplishments and Future Challenges,” *Journal of Space Law* 7 (1979): 95.

² United Nations Committee on the Peaceful Uses of Outer Space Members, UNCOPUOS, Accessed February 21st, 2012. www.oosa.unvienna.org/oosa/COPUOS/members.html.

theory and less hard data. As a result, omissions and loopholes were bound to plague these new treaties, not the least of which pertains to historic preservation.

2.1 - The Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies (The Outer Space Treaty)

The foundation of international space law is *The Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies*. What is commonly referred to as the Outer Space Treaty (OST) is the first of five space laws created by the Legal Sub-Committee of the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS). While it is not the first treaty passed in regards to human usage of the heavens, the OST is an advancement of the principles set forth in previous general assembly resolutions, international agreements, statements by elected government officials, domestic laws, and the opinions and articles written by scholars in the field.

Largely written over the summer of 1966 during the fifth session of the UN COPUOS, the creation of the majority of the treaties' text was by US and Soviet delegations that wanted an agreement before the first human landed on the Moon. The drafting of this treaty was a historic moment in international law because two nations with radically different political ideologies, put their differences aside and compromised on a treaty that would help structure the next age of human exploration.

The Political Committee of the UN General Assembly approved a first draft of the OST on December 17th, 1966, and endorsed unanimously by the General Assembly two days later. The OST was opened for signature in London, New York, and Moscow in January of 1967 and entered into force in October of that year. As of 2012 there are 24 signatories, and 101 states that are party to the OST.³ The four laws created after the OST all expand on articles created for the OST.

The OST was not the first legally binding document to curtail human behavior in space. As early as 1959, the American Bar Association (ABA) passed a resolution declaring, “in the common interest of mankind...celestial bodies should not be subject to exclusive appropriation.”⁴ Resolutions like this mirror how edgy the US was about losing the race to the moon to USSR. In a 1960 speech to the UN General Assembly, US President Dwight D. Eisenhower mirrored the ABA’s sentiments about sovereign land claims on the lunar surface along with addressing the issues of armed conflict and weapons of mass destruction in space.⁵ President Eisenhower was trying to urge the UN to create laws so that a war did not break out on Earth over the Moon.

The priorities of COPUOS in the early 1960’s are laid out very clearly when looking at the history of space law. In 1962-63, COPUOS convened for its first two

³ “Treaty Signatures,” United Nations Office for Outer Space Affairs, Accessed January 23rd, 2012. <http://www.oosa.unvienna.org/oosatdb/showTreatySignatures.do?d-8032343-p=3&statusCode=PARTY&treatyCode=RA&stateOrganizationCode=>

⁴ Paul G Dembling and Daniel M Arons, “The Evolution of the Outer Space Treaty,” *The Journal of Air Law and Commerce* 33(1967): 421.

⁵ “Address Before the General Assembly of the United Nations on Peaceful uses of Atomic Energy, New York City, December 8th, 1953,” The American Presidency Project, Accessed January 23rd 2012. <http://www.presidency.ucsb.edu/ws/index.php?pid=9774#axzz1jpNTV79I>

sessions and the topic of discussion was not in line with what former President Eisenhower hoped for. The discussions that took place during the first sessions of COPUOS were directed primarily toward the assistance and return of astronauts and space vehicles, and liability for damages caused by space vehicles. The members of COPUOS felt the need to concern themselves with the matters directly in front of them before dealing with a far-reaching topic such as land claiming. The largest issue facing COPUOS was the growing nuclear armament of the US and USSR, and stopping either nation from placing one of those bombs on the Moon. These discussions led to the creation of Resolution 1962, entitled *The Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space*. *The Declaration*, as it is commonly called, was adopted by the General Assembly on December 13, 1963 after two years of discussions on the issues space faring states were most likely to encounter. Even though the forces behind the writing of *The Declaration* were concerned with immediate challenges, they did address former President Eisenhower's wishes in the text of Articles 2 and 3. *The Declaration*, unlike the OST, is not legally binding, but it does display the ideals in which the General Assembly felt should govern the exploration of outer space.

In 1965-66 the UN was pushing COPUOS to create a treaty intensifying on the principles of *The Declaration*. Specifically, the General Assembly was urging COPUOS to draft internationally binding legislation on the issues of assistance and return of astronauts, liability, and the exploration and uses of outer space. Not only did COPUOS have the General Assembly to deal with, on May 7, 1966, US President Lyndon B. Johnson stated "the need to take action now...to insure that explorations of the moon and

other celestial bodies will be for peaceful purposes only.”⁶ President Johnson not only made the previous statement, but also outlined five things he felt were required in our advancement as a space faring culture. He mirrored Eisenhower’s thoughts by proposing that space be free for exploration and that no state should be allowed to claim sovereignty. During the same speech he spoke about free scientific investigation of celestial bodies, assistance for astronauts by astronauts, avoiding harmful contamination from space objects, and a ban on weapons of mass destruction to the list of ideas he presented.⁷ Less than three weeks later, Soviet Minister of Foreign Affairs A.A. Gromyko sent a letter to the General Assembly requesting the conclusion of an international agreement on legal principles governing the activities of states in the exploration and conquest of the moon and other celestial bodies.”⁸ In that letter the Soviets included four principles for the treaty to be based on that were remarkably similar to President Johnsons. This agreement, from differing political philosophies, came at a time when the United States had just added 150,000 troops to the conflict in Vietnam and the Soviets had recently admitted to supplying the North Vietnamese Army.

On June 16, 1966 US Ambassador to the UN Arthur J. Goldberg submitted the American draft of “*The Treaty Governing the Exploration of the Moon and Other Celestial Bodies*” to the Chairman of COPUOS. On that same day Platon Morozov, the

⁶ “Lyndon B Johnson – May 1966,” The Miller Center, University of Virginia, Accessed January 23, 2012.

http://millercenter.org/scipps/archive/presidentialrecordings/johnson/1966/05_1966

⁷ Paul G. Dembling and Daniel M. Arons, “The Evolution of the Outer Space Treaty,” *The Journal of Air Law and Commerce* 33(1967): 426.

⁸ *Ibid*, 427.

Soviet Ambassador to the UN, submitted the Soviet draft of “Treaty Principles Governing the Activities of States in the Exploration and Use of Outer Space, the Moon, and Other Celestial Bodies.” COPUOS agreed to begin drafting the discussions on the treaty on July 12, 1966, the date the US wanted to begin, in Geneva, Switzerland, the place the Soviets wanted it to take place.⁹

During the Fifth Session of UN COPUOS, the 28 member delegation decided that a decision needed to be made rapidly on the rules of conduct of states on celestial bodies due to the impending landing of humans on the moon by either the US or Soviet governments. There was an overwhelming agreement by the delegates that the use of celestial bodies for military purposes, especially weapons of mass destruction, was not desirable for the future of our species and should be made illegal with this treaty. The Polish Ambassador to the UN supported this part of the treaty by saying “The arms race and the conflicts which took place on Earth were bound to affect space...every effort should therefore be made to limit the arms race wherever possible.”¹⁰ Because of the urgent need for laws governing human usage of space COPUOS was forced to work quickly and was only interested in the “maximum results in a minimum of time,” and “limiting itself strictly to settling essential and urgent issues,” according to the Belgian Delegate.¹¹

The delegation felt that the US and Soviet drafts were good starting points, but there needed to be more compromise on the broader issues before any resolution could be

⁹ Ibid, 427.

¹⁰ Ibid, 427.

¹¹ Ibid, 428.

started. The US felt as though this treaty should govern only the celestial bodies; the Soviets felt that both outer space and the celestial bodies should be governed. The US compromised and agreed with the Soviets. The US believed that celestial bodies should be free for all to explore and that the scientific findings of researchers on any celestial body should be reported to all; the highly secretive culture of the Soviet Union was not compatible with this. Because of the earlier US compromise, the Soviets gave in on this point. Despite this need for compromise, the US and Soviet drafts were remarkably similar. The two super powers could not be farther apart in the way they created laws on Earth, but could not be any closer in the ways they created laws above Earth.

An article-by-article analysis of the OST and how it relates to the preservation of the Apollo Lunar Landing Sites is necessary for the understanding of this topic. The OST is composed of 17 articles that accompany UN General Assembly Resolution 2222.

Articles I, II, and III of the OST address the issue of land claims on celestial bodies by sovereign states. The OST strictly forbids any state from claiming or appropriating land on the surface of any celestial bodies for the purposes of expanding a state's territory, economic claims, or discovery of mineral resources. It states that the exploration of outer space be carried out for all humans despite economic stature or scientific development. Article I proclaims that there will be free access to all areas of celestial bodies, and that all activities in space shall be carried out with international peace and cooperation.

The text for the first three articles was taken largely from articles I, II, and III of the Soviet draft. The same principles were present in articles 1,2,3 and 6 of the US draft,

but the delegation preferred the language of the Soviet draft. The text of these articles is also present in the first four paragraphs of *The Declaration* and are very similar to the principles set forth in The Antarctic Treaty of 1959. The text of Articles I, II, and III was accepted by COPUOS on July 29th, 1966.¹²

The first three articles of the OST prevent any nation from claiming land on the Moon. Because of preservation methods on Earth, the inability to own land makes preservation of the Apollo Landing Sites extremely complicated. A state's ability to preserve a culturally significant site stems from the fact that the site is on its land and can be protected and managed by the state. The Apollo Sites present a difficult legal situation because they are on land that has been internationally agreed upon not to be controlled by any state, and the preservation and management of the site would prove to be extremely difficult. The most realistic way the site could be properly protected is through an international preservation agreement, such as an amendment to the World Heritage Convention.

In 1972, the UN Educational, Scientific, and Cultural Organization (UNESCO) created the World Heritage Convention to help establish criteria for saving the worlds' natural and cultural heritage. The 37-article convention was created to help protect those places essential to understanding human history and without which the entire planet is diminished. Since the creation of this convention, UNESCO has helped protect over 900 natural and cultural places for future generations to experience.¹³

¹² *Ibid*, 432.

¹³ "The World Heritage List," United Nations Educational, Scientific, and Cultural Organization, Accessed February 9th, 2012, <http://whc.unesco.org/en/list>.

Inclusion onto the World Heritage list is decided by a list of ten criteria. There are six criteria for cultural sites and four for natural sites. The Apollo Landing Sites are eligible for inclusion to the World Heritage List under criteria I, II, and IV.¹⁴ The Apollo Landing Sites are achievements that are unparalleled in human history. Only 21 human beings in the history of our species have embarked upon the 233,000-mile journey safely undertaken by the crew of Apollo 11. The fact that 600 million television viewers tuned in to watch the Apollo 11 lunar landing alone, displays its level of significance in our history.¹⁵ The sites are equally as significant to human civilization as the Pyramids of Giza and The Great Wall of China. But debating the level of significance matters very little when those two World Heritage Sites are on land governed by the laws of a sovereign state, and the Apollo Landing Sites are on territory administered by international treaty.

¹⁴ The Apollo Landing Sites are eligible for inclusion to the World Heritage List under the following criteria:

- 1: to represent a masterpiece of human creative genius;
- 2: to exhibit an important interchange of human values, over a span of time or within a cultural area of the world, on developments in architecture or technology, monumental arts, town-planning or landscape design;
- 3: to bear a unique or at least exceptional testimony to a cultural tradition or to a civilization which is living or which has disappeared;
- 4: to be an outstanding example of a type of building, architectural or technological ensemble or landscape which illustrates (a) significant stage(s) in human history;

¹⁵ "Apollo 11 Moon Landing: Ten Facts about Armstrong, Aldrin, Collins' Mission," The Telegraph. Accessed February 9th, 2012.
www.telegraph.co.uk/science/space/5852237/Apollo-11-Moon-Landing-ten-facts-about-armstrong-and-collins-mission.html

The World Heritage Convention repeatedly makes the point in its articles that a property has to be on land that belongs to a state in order to be listed. Section II, Article 4 of the World Heritage Convention states:

Each State Party to this Convention recognizes that the duty of ensuring the identification, protection, conservation, presentation and transmission to future generations of the cultural and natural heritage referred to in Articles 1 and 2 and *situated on its territory, belongs primarily to that State*. It will do all it can to this end, to the utmost of its own resources and, where appropriate, with any international assistance and co-operation, in particular, financial, artistic, scientific and technical, which it may be able to obtain.¹⁶

The language of this article could be used by UNESCO to refuse inclusion of the Apollo Lunar Landing Sites to the World Heritage List because it is not situated on its host states' territory.¹⁷ To make the situation even more muddled, the *Vienna Convention on the Laws of Treaties* states that if two treaties contradict each other, like the WHC and the OST do, and all of the concerned members are party to both treaties, then the earlier treaty applies only to the extent that its provisions are compatible to the newer treaty.¹⁸ Because these documents were not designed to work in conjunction with each other than it could be argued that in regards to preservation the OST only denies the ability to protect sites to the extent that the WHC convention allows it to. If UNESCO were to not allow a culturally significant site to be listed because of this reason it would be very hypocritical.

¹⁶ The United Nations Educational, Scientific, and Cultural Organization, "*The World Heritage Convention*," The United Nations, 1972

¹⁷ This text is supported by text in Article 5 paragraphs 1 and 3, Article 6 paragraphs 1 and 3, and Article 11 paragraphs 1 and 3 of the World Heritage Convention.

¹⁸ The United Nations, "*Vienna Convention on the Laws of Treaties*," The United Nations, Vienna, 1969

In 1981, “Jerusalem and its Walls” was inscribed on the World Heritage List because of its significance as a holy city of Christianity, Islam, and Judaism, along with having 220 religious monuments.¹⁹ The nomination of the World Heritage Site by The Hashemite Kingdom of Jordan was highly controversial among members of the World Heritage Committee at the time, because of the legal situation that exists surrounding control of Jerusalem. In 1947, UN General Assembly Resolution 181 created the State of Israel, but did not include Jerusalem in the state because of a tense political situation. To this day it is governed by a UN Special Committee and is still not legally included into Israel, despite 30 years of continuous occupation. The reasoning behind the controversy creates parallels between “Jerusalem and its Walls,” and any potential nomination of the Apollo Lunar Landing Sites. This issue and the legal precedents involved will be discussed in Section 2.7.

The Apollo Landing Sites present a multitude of issues when it comes to the legality of preserving them. The largest issue is that they are not situated on the sovereign territory of the nation that would claim them as their own. To make the matter even more complicated the objects on the lunar surface are still owned by the United States Government, so it would fall to the US to sponsor this World Heritage Site.²⁰ Because it is relevant to discuss, this thesis will delve into US preservation law in Section 2.6. However, it could not nominate the site because it is 233,000 miles above US soil. Because Articles I, II, and III declare the lunar surface as an area of international

¹⁹ “Old City of Jerusalem and its Walls,” The World Heritage List, Accessed February 9th, 2012. <http://whc.unesco.org/en/list/148>.

²⁰ Memo from Alan Jones, Executive Secretary NASA Artifact Committee meeting on March 15, 1983

commons there are parallels that can be made between it and international waters, the sea floor, and the continent of Antarctica.

Preservation of cultural resources in areas of international commons is not unprecedented. The Antarctic Heritage Trust was created to help preserve the landmarks from the Heroic Age of Antarctic Exploration.²¹ Antarctica is the only continent left that still contains the first buildings built there by humans.²² The trust contains two chapters, one based in New Zealand, created in 1987, and one based in Great Britain, created in 1993. The trust's goal is to complete the Ross Sea Heritage Restoration Project, which contains structures from Southern Cross (1898-1900), Discovery (1901-04), Nimrod (1907-09), and Terra Nova (1910-13) expeditions.²³ It has created management plans for the bases of all four expeditions that dictate the rules of how to preserve the specific sites, what needs to be preserved, and the amount of visitors allowed in each building on the site at one time. The trust is a charitable entity based out of New Zealand that is run by officers of the New Zealand, British, and US governments. The trust is funded by the New Zealand government, various preservation foundations, museums, the Christchurch International Airport, Whyte & Mackay (distillers of the whiskey Sir Ernest Shackleton brought with him on his expedition in 1904), and by individual donations. This trust is an excellent example of how preservation can be undertaken on land that is not owned by any nation, but is in an area of commons set aside for everyone.

²¹ "Welcome to the Antarctic Heritage Trust," Antarctic Heritage Trust, Accessed February 9th, 2012. www.nzaht.org

²² Ibid.

²³ "The Expedition Bases," Antarctic Heritage Trust, Accessed February 9th, 2012. www.nzaht.org/aht/theexpeditionbases.

In a New York Times article on December 9, 1966 US President Johnson described Article IV of the OST as “the most important arms control development since the 1963 treaty banning nuclear testing in the atmosphere, in space and underwater.”²⁴ Article IV of the OST specifically forbids the use, or presence of weapons of mass destruction in outer space or on celestial bodies. It also forbids any state from placing military bases, fortifications, or installations on any celestial body. While Article IV makes illegal the usage of any type of military weapons, or installations, it does allow for the usage of military personnel and equipment.

The language of Article IV comes from both the US and Soviet drafts because they both mirror the intentions of the Nuclear Test Ban Treaty and United Nations Resolution 1884. COPUOS felt the language of the US draft was superior, so the language from Article IV is taken from Articles 8 and 9 of the US draft.²⁵ The last part of Article IV, pertaining to the usage of military staff and equipment, are taken from the US draft, which is remarkably similar to Article I Paragraph 2 of the Antarctic Treaty.²⁶ It is interesting to note that the article that banned military bases on the moon was written by the same government that named the first place humans landed on the moon, Tranquility Base.

This article has very little to do with the preservation of objects on the lunar surface. While it could be said that a ban on nuclear weapons is good for the preservation

²⁴ Paul G Dembling and Daniel M Arons, “The Evolution of the Outer Space Treaty,” *The Journal of Air Law and Commerce* 33(1967): 432.

²⁵ *Ibid*, 433.

²⁶ *Ibid*, 433.

of everything, there is little doubt that this Article was included into the OST for the preservation of human life, and not artifacts.

Article V of the OST, addresses with the topic of providing assistance to astronauts in the event of an accident. The article states that any astronauts, regardless of nationality, should render assistance to any other astronauts, in need. As stated prior, the basis of this article had been discussed by the members of COPUOS well before the drafting of this treaty. The text from the Article was taken verbatim from Article IX of the Soviet draft, which took its text from Paragraph 9 of *The Declaration*. The language in Article V is directly expanded upon in the *Agreement on the Rescue of Astronauts, the Return of Astronauts, and the Return of Objects Launched into Outer Space*, which would be written in 1968, and will be discussed in Section XX, below.

Article VI states that “states party to the treaty shall bear international responsibility for national activities in outer space.”²⁷ This means that states will not be able to avoid their international obligations under the treaty because their activities in outer space are being conducted through a nongovernmental agency or international organization. This article specifically states that nongovernmental entities in outer space can only be there because they were allowed to be there by their launching state. This article puts responsibility for actions in outer space not only on the nongovernmental agency, but also on the government themselves. The language of this Article stems

²⁷ The United Nations Legal Sub-Committee of COPUOS, “*Treaty on the Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies*,” The United Nations Committee on the Peaceful Uses of Outer Space, 1967.

directly from Article VI of the Soviet draft. Which was based off of Paragraph 5 of *The Declaration*.²⁸

Article VI is important to the preservation of the Apollo Landing Sites because of the rules it places on the governments and individual corporations that have plans to return to the moon. As of February 2012, China, India, Japan, and Russia have plans to return to the moon that range from very serious to tentative.²⁹ Among these plans are Japan establishing a moon base by 2030. However the most likely candidate to land on the moon second is not any nation, but that of private enterprise.

There are a multitude of enterprises that are attempting to create a new industry of space tourism. Companies like Virgin Galactic,³⁰ Lunacorp,³¹ and Space Adventures,³² are all attempting to offer private citizens the ability to experience space flight, and eventually time spent on the lunar surface. The addition of human visitors to the moon, if unregulated, could rapidly deteriorate the condition of the Apollo Landing Sites because of the fragile nature of the lunar environment. Despite the amount progress those

²⁸ Paul G Dembling and Daniel M Arons, "The Evolution of the Outer Space Treaty," *The Journal of Air Law and Commerce* 33(1967): 434.

²⁹ "Which Country Will Be The Next To Put An Astronaut On The Moon?" IO9, accessed February 9th, 2012. <http://io9.com/5463846/which-country-will-be-the-next-to-put-an-astronaut-on-the-moon>

³⁰ "Overview," Virgin Galactic, Accessed February 9th, 2012. [http://www.virgingalactic.com/news/item/sir-richard-branson-and-new-mexico-governor-susana-martinez-dedicate-the-virgin-galactic-gateway-/](http://www.virgingalactic.com/news/item/sir-richard-branson-and-new-mexico-governor-susana-martinez-dedicate-the-virgin-galactic-gateway/)

³¹ "The New Moon," Lunacorp, Accessed February 9th, 2012. <http://www.lunacorp.com/new-moon.html>

³² "Lunar Mission," Space Adventures Inc., Accessed February 9th, 2012. <http://www.spaceadventures.com/index.cfm?fuseaction=Lunar.welcome>

companies are making toward reaching their goals, none of them are closer to realizing their lunar dreams than The Lunar X Prize Foundation.

The Google Lunar X Competition is one of the private endeavors that is threatening the Apollo Lunar Landing Sites. The competition, which is slated to end by 2014, is a 26-team global challenge to build a privately funded rocket and lunar rover that will travel from the Earth to the lunar surface. Once on the Moon the rover must then travel a distance of no less than 1/3 of a mile and transmit high-resolution digital images back to Earth. The first team to accomplish this feat will earn up to 30 million US in prizes.³³ Additional financial incentives are available to teams that reach additional objectives, to allow the team that lands first to earn more prize money, such as distance traveled by the rover, identification of ice on the surface, or operating the rover on the evening side of the moon. Another of those incentives is to land in close proximity of the Apollo Landing Sites, which depending upon the distance that is defined as “close,” could adversely affect the site’s integrity.

Article VII contains language pertaining to the liability of state actions in outer space. Because work on this topic had been in progress since the first session of COPUOS the members of the fifth session decided to keep Article VII short and succinct because they had not properly finalized their legal opinion on the matter. The language of Article VII, like the articles prior, came verbatim from the Soviet draft, which stems from Paragraph 8 of *The Declaration*. Article VII was expanded by COPUOS in 1972 to create

³³ “Rules Overview,” Google Lunar Xprize, Accessed February 9th, 2012. <http://www.googlelunarxprize.org/prize-details>

The Convention on International Liability for Damage Caused by Space Objects, which will be discussed in Section 2.4, below.

Article VIII is comprised of three sentences, all pertaining to ownership and registry of objects launched into outer space and is another article that was further expanded upon once the OST was completed. Article VIII was introduced by the Soviets in Article V of their draft and Paragraph 7 of *The Declaration*, and created the idea of returning space objects to the launching state. COPUOS felt that once agreed upon, this article, along with Article V would be further expanded upon to create legislation that would call for the return of astronauts and space vehicles in the same treaty. Article VIII would be expanded upon in 1976 in *The Convention on the Registration of Objects into Outer Space*. To be discussed in Section 2.5.

This article is important to the preservation of the Apollo Lunar Landing Sites because it states that “a state party to the treaty on whose registry an object launched into outer space is carried shall retain jurisdiction and control over such object, and over any personnel thereof, while in outer space,”³⁴ This means that because the objects left upon the lunar surface have never returned from space, they are still the property of the United States Government. Since Articles I, II, and III say nothing about ownership of the objects left on the moon, it raises the question of “Can the US government nominate the objects for inclusion to the National Register or World Heritage List, and not the site?” This question will be discussed in Section 2.7.

³⁴ The United Nations Legal Sub-Committee of COPUOS, “*Treaty on the Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies*,” The United Nations Committee on the Peaceful Uses of Outer Space, 1967

Dr. Kurt Waldheim, former chairman of COPUOS, described Article IX as “a provision which is designed to protect outer space and the celestial bodies from contamination and pollution and to protect the legitimate programs of states from undue interference.”³⁵ The text of Article IX says that states will cooperate with each other while exploring the heavens, and while cooperating they will do their best to avoid contaminating outer space, the celestial bodies, and most importantly Earth. It informs states undertaking potentially risky experiments to seek consultation from its international peers before doing so. The language of this Article was taken from Article VIII of the Soviet draft, and Article 10 of the American. The Soviet text was taken directly from Paragraph 6 of *The Declaration*.

Article X of the OST allows for states to witness first-hand the launch of a space object by another state. While Article X has little to do with the preservation of artifacts on the lunar surface, it was a major point of debate between the US and Soviets in the drafting of this treaty.

Article XI of the treaty is a provision that calls for the reporting of activities in outer space to the UN Secretary-General. The Secretary- General is to be informed of “the nature, conduct, locations, and results,”³⁶ of a launching states activities while in outer space. This language originated from Article 4 of the US draft, which called for

³⁵ Paul G Dembling and Daniel M Arons, “The Evolution of the Outer Space Treaty,” *The Journal of Air Law and Commerce* 33(1967): 440.

³⁶ The United Nations Legal Sub-Committee of COPUOS, “*Treaty on the Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies*,” The United Nations Committee on the Peaceful Uses of Outer Space, 1967

mandatory reporting of information to the UN, yet the Soviets countered the voluntary argument with precedent from General Assembly Resolution 1721, which called for the exchange of information relating to space activities on a voluntary basis. This showed two fundamental differences in the foundations of the US and Soviet space programs. The US space program had been founded with the basis of open access to scientific and technical information for peaceful purposes, the Soviets had not. Article XI is another article in the OST that draws similarities to the Antarctic Treaty, which also has an article that discusses dissemination of scientific information. Article III of the Antarctic Treaty and Article XI of the OST both begin with the phrase “In order to promote international cooperation in the peaceful exploration of outer space/Antarctica...”

Article XII states that any installations, vehicles, or stations on the moon or other celestial bodies shall be open to representatives of any visiting state based upon their giving advanced notice, and or reciprocity. This Article was proposed by the American delegates in Article 6 of their draft, but without the notion of reciprocity, and with visitation being able to happen “at all times.” The Soviets agreed in principle, but added a few changes. The Soviets proposed the idea of reciprocity, meaning that admittance into another states space station had to be earned, or paid back with letting that states astronauts into the other states space station.

The issue of reciprocity brought up significant discussion amongst the delegates. If a particular state has a station on a celestial body and has no desire to inspect or visit stations or installations of another state, they would not be obligated to permit visitors to their station. The Americans argued that the article in their treaty was based entirely off

of Article VII, Paragraph 3, of the Antarctic Treaty, and that no difficulties had arisen on the Antarctic continent because of this. This article was agreed upon by all delegations when the issue of right of access would only be granted at the safest and most convenient time for the crew of the space station.

Because the issue of reciprocity was allowed to stay the US could use that to help protect its lunar artifacts. If a situation were to present itself where a visiting foreign astronaut wanted to examine the Apollo 11 Landing Site, the US could simply ask that astronaut to stay away because of the issue of reciprocity. If that astronaut does not have anything of interest to the US government on the lunar surface, it can ask that astronaut to stay away until it does. Because some of the objects left on the lunar surface, like the Lunar Laser Ranger Retro Reflector, are still generating scientific data, the US government could ask other visiting astronauts to respect their scientific endeavors and stay away from their equipment. While this line of logic could be considered tenuous, it is a realistic option because of Article XII

The remaining five articles of this treaty deal with the technical aspects that are involved in all international treaties, such as signatures, ratification, entry into force, depositaries, amendment, and withdrawal.

Because of Articles I, II, and III of the OST and Articles 4, 5, 6, and 11 of the World Heritage Convention, preserving the Apollo Lunar Landing Sites may not be possible by traditional methods, but that doesn't mean it isn't possible. Because of articles 30-32 of the *Vienna Convention on the Laws of Treaties*, the interaction between the OST and the WHC creates a complicated legal situation. The analysis of the four

treaties and conventions written after the OST will support this statement. It is clear from the information presented in this section that when COPUOS drafted the OST, they were only concerned with the immediate matters at hand. Because the treaty was created before any human had visited the lunar surface, or the creation of the World Heritage Convention, preserving human artifacts was not a pertinent issue. An amendment to the World Heritage Convention, or a new form of treaty or convention would be beneficial, but not necessary for proper legal protection of these sites. Despite the amount of information present that supports this theory, there are instances where legal protection for objects and sites has been enacted despite the language of the law. These instances will be presented in Sections 2.6 and 2.7. Sections 2.2-2.5 will discuss the four laws drafted by COPUOS that were created after the OST.

2.2 - The Agreement on the Rescue of Astronauts, the Return of Astronauts, and the Return of Objects Launched into Outer Space (The Rescue Agreement)

One year after the 1967 OST was adopted, the US and USSR felt the need to further expand on the rules of outer space and began drafting the language that would become the 1968 *Agreement on the Rescue of Astronauts, the Return of Astronauts, and the Return of Objects Launched into Outer Space*, commonly referred to as the 1968 Rescue Agreement. The Legal Subcommittee of the Committee on the Peaceful Uses of Outer Space (COPUOS) deliberated on the language of the Rescue Agreement from 1962 to '67, and it was adopted by the UN General Assembly in 1967 in GA Resolution 2345.

The Rescue Agreement was entered into force on December 3rd, 1968 and as of December 13th, 2011 it has been signed by 24 nations, ratified by 90 nations. Along with those nations the European Space Agency and the European Organization for the Exploitation of Meteorological Satellites (EUMETSAT) have accepted the rights and obligations of the agreement.³⁷ All of the major space powers are party to the 1968 Rescue Agreement.

Despite being finished in the late sixties, the origin of the *Rescue Agreement* comes from a document written a decade earlier. A report made by COPUOS in 1959, discusses the major issues that comprise the *Rescue Agreement* in Paragraphs 21, and 74. The *Rescue Agreement* was adopted in record time, having been adopted in December of 1967, opened for signature in April of 1968, and entered into force in December of the same year. The haste in which it was passed was due to two circumstances. First, the frequency astronauts were being launched into space at the time, and second, the needs of the Soviet Union. The USSR was a major part of pushing the *Rescue Agreement* through because it did not have the resources that the United States had when recovering spacecraft or astronauts after they had returned to the atmosphere. The Soviet Union

³⁷ "Treaty Signatures," United Nations Office for Outer Space Affairs, Accessed December 14th, 2011.
<http://www.oosa.unvienna.org/oosatdb/showTreatySignatures.do?d-8032343-p=3&statusCode=PARTY&treatyCode=RA&stateOrganizationCode=>

lacking the resources of the US to undertake recovery missions was the more likely of the pair to require assistance from a third party state.³⁸

The language of the *Rescue Agreement* was largely written by the two Cold War superpowers. Despite their differences at the height of their mutual tension, the Soviet Union and the United States drafted this legislation rapidly and handed it to the Legal Sub-Committee of COPUOS a day early. After two days of review, the Legal Sub-Committee amended several articles and then handed it to COPUOS, who made minor amendments and then passed it on to the General Assembly, who approved the text with a unanimous vote on December 19th, 1967.³⁹

The 1968 *Rescue Agreement* was written with two purposes in mind. The first is to promote international cooperation in the retrieval of astronauts if an accident were to take place in outer space, or they were to land outside of the territory of the launching state. The second is similar to the first, only instead of rescuing and returning astronauts; it is to return downed spacecraft or satellites. The 1968 *Rescue Agreement* is an expansion on the language of articles in the two space laws written prior. Principle 9 and Principle 7 of the 1963 Declaration, and Article V and VII of the 1967 OST both deal with the issues of the return of astronauts to the launching state and foreign objects in outer space.⁴⁰

³⁸ Robert C Beckman, "1968 Rescue Agreement – An Overview," (paper presented at the United Nations/Republic of Korea Workshop on Space Law, Daejeon, Republic of Korea, November 3-6 2003)

³⁹ Ibid.

The 1968 *Rescue Agreement* is comprised of 10 articles. Articles 1 through 6 relate to the rescue of astronauts, and the return of downed spacecraft or satellites. Articles 7 through 10 address the technical aspects that are involved in all international treaties, such as signatures, ratification, entry into force, depositaries, amendment, and withdrawal.⁴¹ In the six articles that pertain to retrieval of astronauts and spaceships, Articles 1 through 4 are directed specifically towards the return of astronauts to their launching state. Article 5 was written to help with issues regarding the landing of space objects in territory different from its launching state. All of the previously mentioned Articles also deal with the obligations of the contracting parties to the *Rescue Agreement*.

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Article 1 deals specifically with the issue of notifying the launching authority if their manned spacecraft has landed on either the high seas or the territory of another nation, and the process a Contracting Party must go through to ensure a safe retrieval. Article 2 was written in to set guidelines for the search and rescue of downed astronauts in a territory of a Contracting Party. Article 3 is similar to Article 2 in reference to the search and rescue of downed astronauts: only this article deals with the issue on the high

⁴⁰ The United Nations Legal Sub-Committee of COPUOS, *Treaty on the Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies*, The United Nations Committee on the Peaceful Uses of Outer Space, 1967, The United Nations Legal Sub-Committee of COPUOS *1963 Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space*, The United Nations Committee on the Peaceful Uses of Outer Space Committee on the Peaceful Uses of Outer Space, 1962

⁴¹ The United Nations Legal Sub-Committee of COPUOS, *The Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space*, The United Nations Committee on the Peaceful Uses of Outer Space, 1967

⁴² *ibid.*

seas. Article 4 details the obligation of the Contracting Party that rescued the downed astronauts to return them to the launching authority. Article 5 is the longest of all of the articles in the Rescue Agreement, and it deals with the situation in which an object has returned to earth and lands in the territory of a Contracting Party, or on the high seas. This article discusses the procedures for retrieving and returning the space object to its launching authority.

It is important to note that the *Rescue Agreement* does not govern liability when damage occurs in outer space to space objects launched by a State. Paragraph 2 of Article V of the 1967 OST provides guidelines for an event such as that. The OST states that astronauts regardless of launching state should help out any astronauts in need of assistance in space.⁴³

Article 6 defines the term “launching authority,” which helped clear up the ambiguity of previous literature in space laws.⁴⁴ *The Declaration* and the OST use the term “the state on whose registry the space object or space vehicle was launched,” which does not require responsibility for private parties launching objects into space. Western countries represented in COPUOS wanted the *Rescue Agreement* to encompass private entities, as well as states, to be responsible for the rescue of space personnel. The term “launching authority” being included into the *Rescue Agreement* was seen as a major

⁴³ The United Nations Legal Sub-Committee of COPUOS, “Treaty on the Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies,” The United Nations Committee on the Peaceful Uses of Outer Space, 1967 Article 5 P 2

⁴⁴ Robert C Beckman, “1968 Rescue Agreement – An Overview,” (paper presented at the United Nations/Republic of Korea Workshop on Space Law, Daejeon, Republic of Korea, November 3-6 2003)

concession by the Soviet Union to Western ideals, because the idea of private entities had no business in a communist government.

Notification under Article 5 has been executed several times since the inception of the Rescue Agreement. The most notable took place on April 3rd, 2001 when “a metallic cylinder, 140 cm long, 120 cm in diameter and weighing 70 kg,”⁴⁵ was found on January 12th, 2001, 240 km west of Riyadh, Saudi Arabia. The object was the cover of a Star 48-type motor used on a GPS2 satellite launched into orbit by the US. The Saudi mission to the UN reported this on March 8th, 2001. This is a significant report because the government of Saudi Arabia is not a party to the agreement. This is a perfect example of a state voluntarily adhering to space laws even though they are not legally bound by them, simply in the spirit of international cooperation.

The 1968 *Rescue Agreement* is a straightforward document that expands on Article V of the OST and deals with the return of astronauts to the safety of their launching authority, and the return of fallen objects from space. There is little that is controversial about this document. In regards to preservation, and specifically that of the Apollo landing sites, there is little in this document to help protect them. This document has a great deal to do with the preservation of human life. If a significant space object, such as the Hubble Space Telescope, or the International Space Station were to succumb to gravity, this document would be crucial in the return of any remaining debris to the launching state so that it may be preserved. In regards to the *Rescue Agreement*, it is

⁴⁵ Note dated march 8th 2001 from permanent mission of Saudi Arabia to the UN.

important to note that significant objects are sent into space every day, and this is the document that will help us as a species preserve those objects when they return to Earth.

2.3 The Convention on International Liability for Damage Caused by Space Objects (The Liability Convention)

Five years after creating the 1968 Rescue Agreement to establish the parameters for safely returning astronauts, the UN Legal Sub-Committee of COPUOS addressed the issue of damage caused by objects returning from space, or still in space. The Legal Sub-Committee was faced with the question of “What happens when something goes wrong in space? And who pays for it when it does?” *The Convention on International Liability for Damage Caused by Space Objects* was their answer and the third law created governing the uses of outer space. As of December 16th, 2011 the treaty, commonly referred to as the Liability Convention, has been ratified by 84 countries, signed by 25 countries, the European Space Agency, European Organization for the Exploitation of Meteorological Satellites (EUMETSAT), and EUTELSAT, have all signed Declarations of Acceptance.⁴⁶ The Liability Convention was presented to the General Assembly in 1971 and entered into force in September of 1972.

The *Liability Convention* is largely an expansion on the principles of liability for damage from outer space objects that was introduced in Articles III and VII of the 1967 Outer Space Treaty. It contains 28 Articles that address issues ranging from determining the launching state when multiple parties are involved, determining liability for

⁴⁶“Treaty Signatures,” United Nations Office for Outer Space Affairs, Accessed January 14th, 2012. <http://www.oosa.unvienna.org/oosatdb/showTreatySignatures.do>

destruction caused by space debris, and who is liable when a private party launches an object into space. The major principles discussed in the *Liability Convention* are who is liable when damage is caused by a space object on the Earth's surface (or collision with aircraft), when damage is caused due to circumstances in outer space, and the procedures for settling claims for damages.

The late outer space legal scholar Carl Q. Cristol wrote at length about the 1972 *Liability Convention* in his 1980 article for the *American Journal of International Law* titled "International Liability for Damage from Space Objects." With the OST entered into force in 1967, COPUOS decided quickly that it needed to further deliberate the meaning of the term "damages" as described in Article VII of the OST. COPUOS had a difficult time drafting language on the topic of liability, and in December of 1970 it adopted Resolution 2733B which pointed out that "until an effective convention is concluded an unsatisfactory situation will exist in which the remedies for damage caused by space objects is inadequate for the needs of the nations and peoples of the world."⁴⁷ Cristol describes the drafting of the language as being handled primarily by the United States. The US specifically wanted to make sure that any damage caused by objects in outer space was rendered moot by the amount of financial compensation given to the victim.⁴⁸ The treaty does not specify the difference between accidents happening to a military or civilian space object.

⁴⁷Carl Q. Cristol, "International Liability For Damage Caused by Space Objects," *The American Journal of International Law*, 74 (1980):346

⁴⁸*ibid.*

Article I defines four terms that are pertinent to the rest of the convention. The terms damages, launching, launching state, and space object are all defined to make the rest of the convention easier to understand, and help clarify legal principles. The treaty broadly defines “space objects” as “The term space object includes component parts of a space object as well as its launch vehicle and parts hereof.”⁴⁹ Italy originally proposed that the term “space object” encompass everything inside of the space object as well, but other countries disagreed and this was not adopted. According to this definition of “space objects” the artifacts left at the Apollo Landing Sites are covered under the 1972 Liability Convention.

Article II states that liability will be placed upon the launching state for any damage caused by a space object that has fallen to the Earth’s surface, or impacted an aircraft on its way to the earth’s surface. Article III discusses the second scenario discussed in this convention. Article III states

“In the event of damage being caused elsewhere other than on the surface of the Earth to a space object of one launching State or to persons or property on board such a space object by a space object of another launching State, the latter shall be liable only if the damage is due to its fault or the fault of persons for whom it is responsible.”⁵⁰

Unlike Article II, which implies strict liability, Article III implies that the launching state can only be found liable if it is at fault.⁵¹ Article III also holds the launching state liable for the actions of its agencies and private individuals while in outer space. While Article III does not provide definite protection for objects left on the lunar surface, it could be

⁴⁹ The United Nations Legal Sub-Committee of COPUOS, “The Convention on International Liability for Damage Caused by Space Objects,” The United Nations Committee on the Peaceful Uses of Outer Space, 1972 Article 1 Section D

⁵⁰ *Ibid.*

⁵¹ *Ibid.*

argued that if they were damaged by a state conducting activities on the lunar surface that the United States could be paid compensation because of those damages. The argument then deals with how much money can compensate the loss of our cultural heritage? This, once again, complicates matters because damages are generally not rewarded in international court. While Article III could place liability for damages on a state it cannot provide monetary compensation if the artifacts at the Apollo Landing Sites were damaged.

Article IV discusses how joint and several liability is applied to the damage scenarios in Articles II and III. This article discusses who is responsible if two states are involved in a launch, and how they are to compensate a third state for damages done. Article V seems as though it was written out of order because after Article IV lays out the complex arrangements involving damages due to a third party, it discusses who is liable in a two party launch. Article VI allows a launching state to be exonerated from absolute liability if it can clearly display that the claiming State wholly or partially caused the damages. Article VII discusses the inability to use the Liability Convention if the damage to the launching state is self-inflicted. Articles VIII through XXI all deal with the pursuing, resolution, and dispersal of compensation from the launching state. Articles XXII through XXVIII address with the technical aspects that are involved in all international treaties, such as signatures, ratification, entry into force, depositaries, amendments, and withdrawal.

Unlike its predecessor, the *Rescue Agreement*, The *Liability Convention* has had one case where it was invoked and two cases where it could have been invoked. On

January 24th, 1978, the USSR satellite Cosmos 954 entered the atmosphere above Canada, and proceeded to crash near Great Slave Lake in the unpopulated area of the Northwest Territory.⁵² The Canadian Government, relying on Article II, sought a settlement of roughly \$6,000,000 (Canadian) from the Soviets for the costs of cleanup and damages.⁵³ The two signatories of the convention settled without the need for a claims commission under Articles XIV through XX in 1981 for \$3,000,000 (Canadian)⁵⁴

In a peculiar and amusing case, the US-registered Skylab space station reentered the Earth's atmosphere on July 12th, 1979, and pieces of debris were reported to have fallen in the Indian Ocean. However, several pieces of debris landed in the small Australian town of Esperance. While no formal claim was made under the Liability Convention, the President of the town's council issued a ticket to NASA and the United States for littering. Neither NASA nor the US Government has paid the ticket as of yet.⁵⁵

In regards to the preservation of artifacts on the lunar surface, the 1972 *Liability Convention* does not specifically protect space objects. Because the purpose of the convention was to set up a system for placing fault on a state were an accident to happen out of our atmosphere it is not surprising that nothing is specifically in the convention about preservation. The discussion of how being liable for the damages caused to an

⁵² Marietta Banko and Kai-Uwe Schrogl, *Essential Air and Space Law 2: Current Problems and Perspectives for Future Regulation*. (Utretch, Eleven International Publishing; 2005) 99.

⁵³ "Examining Space Law and policy Part 3: The Liability Convention of 1972," The Examiner, Accessed December 12th, 2011. www.examiner.com/space-policy-international/examining-space-law-and-policy-part-3-the-liability-convention-of-1972

⁵⁴ *ibid.*

⁵⁵ *ibid.*

object may deter anyone visiting the Apollo Landing Sites from damaging the artifacts, but that is still a far cry from actual protective international law.

2.4 - The Convention on the Registration of Objects into Outer Space (The Registration Convention)

The fourth treaty drafted by COPUOS to govern human usage of outer space is the 1976 Convention on the Registration of Objects into Outer Space, commonly referred to as the 1976 *Registration Convention*. The *Registration Convention* was created for the straightforward reason of registering of spacecraft so that should an event occur where there was damage or loss of life, the space craft that caused the event could be identified. As previously discussed the Liability Convention was created to answer the question of “What happens when something goes wrong in space? And who pays for it?” The *Registration Convention* was created to make sure the *Liability Convention* worked properly.

The *Registration Convention* was adopted by COPUOS in November of 1974 after years of discussing the need for expanding Article VIII of the OST. The *Registration Convention* was opened for signature on January 14th, 1975 and entered into force on September 15th, 1976. As of January 11th, 2012 the Registration Convention was signed by 4 nations and another 52 were party to the treaty, along with the European Space Agency, European Organization for the Exploitation of Meteorological Satellites

(EUMETSAT) having signed Declarations of Acceptance.⁵⁶ It should be noted that even though there are less states that are party to the Registration Convention than any other space law other than the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, which will be discussed next, all of the major states that are involved in space usage and exploration are party.

The main principles of the *Registration Convention* are the following; to preserve the peace of outer space by creating a registry of all non-military spacecraft being launched into orbit with the intention of lessening the chances of a weapon of mass destruction from being brought into space. Without a registry, it would be very difficult to hold anyone liable for damage caused by a spacecraft whose owner could not be determined. Like its predecessor, the *Rescue Agreement*, the *Registration Convention* is a relatively short convention that is comprised of 12 articles. The first six articles of the convention all relate to the topic of the convention, the registration of space objects, while the last six deal with the legal matters involved with all treaties.

In the first article of the Registration Convention, COPUOS defines three terms, two of which that were previously defined in the *Liability Convention*. The terms are “launching state,” “space object,” and a new term “state of registry,” which means a launching state on whose registry a space object is carried in accordance with article II.⁵⁷

Article II discusses the national registry of space objects that are created by individual

⁵⁶“Treaty Signatures,” United Nations Office for Outer Space Affairs, Accessed January 23rd, 2012. <http://www.oosa.unvienna.org/oosatdb/showTreatySignatures.do?d-8032343-p=3&statusCode=PARTY&treatyCode=RA&stateOrganizationCode=>

⁵⁷ The United Nations Committee on the Peaceful uses of Outer Space, “*The Convention on the Registration of Objects into Outer Space*,” The United Nations Committee on the Peaceful Uses of Outer Space, 1976.

launching states, and defines the conditions of when a launching state must create a registry of a space object it has or plans to launch. Article II also outlines the rules for determining a register for a space objects being launched by two parties.

Article III requires the maintenance of an international registry of space objects to be undertaken by the UN Secretary General. This registry is open for public viewing at any time. Article IV describes the information a launching state is required to provide the Secretary General. Some of the information required is the name of the launching state (or states), its registration or designation number, date and location of launch, general function of the space object, and its basic orbital parameters. Article IV allows states to update the information about their space object, including, when the object is no longer in orbit around our planet. Article V is similar to Article IV in regards that it involves updating the UN Secretary General of a registered space object leaving the orbit of Earth. However, the Secretary General is usually only informed of something like this if the intended purpose of the space object was to leave Earth's orbit. Such situations occur in instances like the Mars Rover.

In keeping with the theme of global cooperation, Article VI of the *Registration Convention* outlines what a state is to do when a space object from another state lands in its territory and the object cannot be identified. Because the object cannot be identified, the state in which the object landed cannot inform the launching state (Article V of the *Rescue Agreement*) or if damages occurred, it cannot seek compensation (Article II of the *Liability Convention*). If an incident this were to occur, the Secretary General could then

ask other states that are party to the agreement to provide as much information as they can about the fallen space object.

Much like its post OST predecessors, the *Registration Convention* has little to do with the preservation of artifacts on the lunar surface. Despite the fact that nothing was written into the Registration Convention specifically dealing with preservation of space objects, it could be said that the existence of a registration of space objects makes the possibility of future efforts to preserve items easier. If everything that is sent out of Earth's orbit has to be cataloged, than if that object were to become of some importance there would already be an abundance of information about it available. It would be considered highly doubtful that the members of COPUOS had this in mind when writing the articles of this convention.

2.5 The Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (Moon Agreement)

From 1967 to 1979, COPUOS created five treaties and conventions that began the process of creating guidelines for human behavior on other celestial bodies, and in outer space. The fifth and final treaty created during the initial phase of drafting laws is the *Agreement Governing the Activities of States on the Moon and Other Celestial Bodies*. This legislative document, commonly referred to as the *Moon Agreement*, is far and away the most controversial of any of the laws governing the heavens. Of the five space laws created by COPUOS, the *Moon Agreement* is the only one not to be signed by the US, the Russian Federation, the People's Republic of China, or Great Britain. Despite these

nations not signing the treaty, it still collected enough signatures to be entered into force, and is considered international law.

The *Moon Agreement* is a 21-article international treaty that was opened for signature on December 18th, 1979, and was entered into force on July 11th, 1984. There are five signatories to the treaty, and eight more nations are party to it. The nations party to the treaty are Australia, Austria, Belgium, Chile, Kazakhstan, Lebanon, Mexico, Morocco, Netherlands, Pakistan, Peru, Philippines, and Uruguay.⁵⁸ Even though the document acquired enough signatures to be entered into force, it could be argued that because it lacks any of the major space powers, it is more of a source of legal principles than binding international law.⁵⁹

The *Moon Agreement* was not the only major international treaty being written in the 1970's. *The Third United Nations Convention on the Laws of the Seas* (UNCLOS III) was being written during the same years as the *Moon Agreement* and both documents contain similar language because the authors viewed them both as areas of international commons. The language in the two treaties is the most similar when pertaining to the peaceful uses of the areas, scientific research and exploration, and the extraction of natural resources.

Much like the laws before it, the *Moon Agreement*, was created to establish guidelines for the human usage of resources on other celestial bodies, but specifically on

⁵⁸ "Treaty Signatures," United Nations Office for Outer Space Affairs, Accessed January 30th, 2012. <http://www.oosa.unvienna.org/oosatdb/showTreatySignatures.do?d-8032343-p=3&statusCode=PARTY&treatyCode=RA&stateOrganizationCode>.

⁵⁹ Thomas Gangale, *The Development of Outer Space: Sovereignty And Property Rights In International Space Law* (Santa Barbara: ABC-CLIO, 2009) 22.

our closest satellite. The major points of the treaty are to safely develop and manage lunar resources, to create more opportunities to use these resources, and to share whatever benefits come from those resources. Like the Registration Convention, Liability Convention, and Rescue Agreement, The Moon Agreement was derived from articles in the OST and then expanded upon. Unlike the OST, whose language was written by US and Soviet delegates, the language of The Moon Agreement was written largely by other nations.⁶⁰

The scope of the two documents is very similar in regards to what they were created to accomplish. Both the OST and the *Moon Agreement* call for the peaceful usage of outer space, and the moon. Both treaties call for international cooperation, especially when working on scientific research or exploration. Both treaties call for international responsibility for a nation's activities, and freedom from interference from a nation's activities in outer space. Neither treaty allows for national appropriation of land on the lunar surface. The *Moon Agreement* takes that one step further and does not allow for any personal or corporate appropriation of land on the lunar surface, or the surface of any celestial body unless it is administered by an international body. Because prior laws had not specifically forbade private appropriation of land on the lunar surface, crafty entrepreneurs saw an opportunity to create businesses selling land on the moon to gullible

⁶⁰ Carl Q. Cristol, "The Moon Treaty Enters Into Force," *The American Journal of International Law* 79 (1985): 164

customers. Dennis Hope is one example of an entrepreneur who has been illegally selling property on the Moon, Mercury, Venus, Mars, and the moon of Jupiter, Io.⁶¹

While the similarities between the *Moon Agreement* and the OST are numerous, the differences between the two really define this treaty. The *Moon Agreement* is a highly controversial legal document that has been argued by legal scholars and space enthusiasts since its creation. This thesis will refrain from voicing its opinion on the treaty and not delve into the controversy surrounding the document. Because there are articles in the treaty that are relevant to preservation of the Apollo Lunar Landing Sites the treaty must be discussed.

The *Moon Agreement* introduces the concept of the “Common Heritage of Mankind,” to international space law in Article XI of the treaty. This article is considered to be the only reason this treaty was drafted, because it is one of the few articles present in the treaty that is not present in any of the other treaties.⁶² If an area has been labeled “Common Heritage of Mankind” (CHM) it means that no one can legally own that area, though everyone manages the area, claims of national sovereignty do not exist. This means that while no one state or group of states can claim to own an area such as the lunar surface or international waters, as human beings were are all responsible for the

⁶¹ “Extraterrestrial Property and Space Law: Fact and Fiction,” The Lunar Embassy, Accessed January 30th, 2012
[http://www.lunarembassy.com/lunar/shops.lasso?-database=aa654s5677556pr&-layout=US\\$_pr9981_en&-response=index_e.lasso&-NoResultsError=index_e.lasso&-token.affindex=&-token.trackindex=2128702&-token.rn=91966635&-token.cs=US\\$_&-token.rs29=33&-token.rscd=LE&-token.firstlogin=&-token.skip=&-show](http://www.lunarembassy.com/lunar/shops.lasso?-database=aa654s5677556pr&-layout=US$_pr9981_en&-response=index_e.lasso&-NoResultsError=index_e.lasso&-token.affindex=&-token.trackindex=2128702&-token.rn=91966635&-token.cs=US$_&-token.rs29=33&-token.rscd=LE&-token.firstlogin=&-token.skip=&-show)

⁶² Thomas Gangale, *The Development of Outer Space: Sovereignty And Property Rights In International Space Law*(Santa Barbara: ABC-CLIO, 2009) 85.

care of it.⁶³ While there is no universally accepted definition of CHM areas there are five general elements.

1. The CHM area is not subject to appropriation
2. All states share in the areas resource management
3. States must share the benefits derived from exploitation of area resources
4. The CHM area must be dedicated to peaceful purposes exclusively
5. The CHM area must be preserved for posterity.⁶⁴

When the CHM principle is implemented it usually involves the creation of income sharing schemes from the natural resources extracted from the area. Developing nations view the CHM principle as a way to level the playing field between themselves and developed nations. In regards to the lunar surface, developing nations viewed this as a way to have one source extract the materials, and then distribute them properly amongst all of the involved nations. Developed nations disagree with this notion of CHM because it would alter the current structure of economic power. The developed nations believe that they should be allowed keep any profits earned from their ability to access areas that other nations cannot. This is considered to be one of the major reasons that the major space powers have not as of yet signed the *Moon Agreement*. It has also been argued that the United States did not become party to the *Moon Agreement* because the language in the treaty regarding mining is strikingly similar to the UNCLOS III, which it also has not signed.⁶⁵

⁶³ Harminderpal Singh Rana, "The 'Common Heritage of Mankind & The Final Frontier: A Revaluation of Values Constituting the International Legal Regime for Outer Space Activities" *The Rutgers Journal of Law* 26 (1994-95) 229.

⁶⁴ *Ibid*, 230.

⁶⁵ Thomas Gangale, *The Development of Outer Space: Sovereignty And Property Rights In International Space Law*(Santa Barbara: ABC-CLIO, 2009) 81.

It has also been argued that the *Moon Agreement* was not signed by the space powers because of the time period in which it was written.⁶⁶ When the call for a new treaty had been proposed, the US was in the middle of its manned lunar landing program; by the time it was finished no human being had been on the moon for seven years. The US abandoned its manned lunar landing program with the completion of Apollo 17 in 1972, and the Soviets had all but given up on the task by 1974. By the time Neil Armstrong had landed in Tranquility Base, the US government already had plans for a manned mission to Mars, but those plans were scrapped upon the completion of the Apollo program. When the agreement was in its infancy in the early 1970s human settlement of the moon was just around the corner; by the time it was completed in 1979, lunar settlement was decades away.

Unlike its predecessors the *Moon Agreement* does have one specific article that deals with the preservation on the lunar surface. It could be argued that not only would this article allow for the preservation of the human artifacts left on the lunar surface, but the most important feature left on the moon Neil Armstrong's footprint. Article 7 Paragraph 3 of The Moon Agreement states the following:

States Parties shall report to other States Parties and to the Secretary-General concerning areas of the Moon having special scientific interest in order that without prejudice to the rights of other States Parties, consideration may be given to the designation of such areas as international scientific preserves for which special protective arrangements are to be agreed upon in consultation with the competent bodies of the United Nations.⁶⁷

⁶⁶ *Ibid*, 85.

⁶⁷ The United Nations Committee on the Peaceful Uses of Outer Space, "*The Agreement Governing the Activities of States on the Moon and Other Celestial Bodies.*" The United Nations Committee on the Peaceful Uses of Outer Space, 1979

While it could be argued that archeology and preservation are not “hard” sciences in the same category as astrophysics and molecular biology, the area in question is of unimaginable importance to human history. It is clear that when this article was written it was created to safeguard areas of the moon that contain marketable minerals⁶⁸, or the water that is trapped in the moon’s poles⁶⁹, and not the array of equipment left on the lunar surface by astronauts. Furthermore, the view of Tranquility Base and the lunar land sites as historic-era *archaeological* sites is well-established within the historic preservation community, and the use of the scientific method in the professional of archaeology place the field – and sites – within the reasonable bounds of “science.”

While the delegates could have had preservation of human artifacts in mind when drafting this treaty it is unlikely. The timing of the creation of the *Moon Agreement* (1970-79) and the World Heritage Convention (1972) do coincide with one another, but the major issues discussed in the treaty were about mining, not preservation. It would seem out of place in a treaty discussing complex legal issues pertaining to the distribution of natural resources on a celestial body to suddenly contain an article about the preservation of human artifacts.

The *Moon Agreement* brought a close to the initial phase of drafting laws to govern human usage of outer space and its celestial bodies. Since the *Moon Agreement*, COPUOS has not drafted any more international conventions or treaties.

⁶⁸ “Mining The Moon,” Popular Mechanics, Accessed February 5th, 2012
<http://www.popularmechanics.com/science/space/moon-mars/1283056>

⁶⁹ “NASA finds significant water on moon,” CNN, Accessed February 5th, 2012,
http://articles.cnn.com/2009-11-13/tech/water.moon.nasa_1_lunar-crater-observation-anthony-colaprete-solar-system?_s=PM:TECH

2.6 - Protecting the Apollo Lunar Landing Sites through United States

Preservation Law

The majority of artifacts resting on the lunar surface by the Apollo Astronauts all have one thing in common. They were brought to the Moon by Americans, and are still US government property. Because those objects are still owned by the US government they can be protected by the US government by nominating them as a National Historic Landmark or a National Monument. It is completely legal for the US to do so, hence an analysis of US preservation law is necessary.

The people of the United States of America have been preservation minded since the early days of the country. In 1816, not even fifty years removed from revolution, the citizens of Philadelphia refused to allow the city to tear down Independence Hall because of its importance to the cultural fabric of the Nation.⁷⁰ By the beginning of the 20th century the American government had purchased pieces of northwestern Wyoming so that future generations could enjoy its geothermal splendor. Along with land purchasing the government had also obtained historic native structures like Casa Grande, in Arizona (1889), and Mesa Verde, in Colorado (1906) for protection.⁷¹

The creation of the Antiquities Act in 1906 became the starting point for Federal policy protecting its historic, cultural, and natural sites. However, those sites all had to be in the hands of the government in order to be protected. The Historic Sites Act of 1935 changed the government's policy of protection. It allowed privately owned sites to be

⁷⁰ Norman Tyler, Ted Ligibel, Ilene Tyler, *Historic Preservation: An introduction to its History, Principles, and Practices* (New York: Norton, 2009) pg 28

⁷¹ Ibid.

included in the newly created National Historic Sites program, the precursor to the National Historic Landmarks. The story of early preservation movements in the United States is a well-documented subject that has been written from several viewpoints at length. It is fair to state, however, that like the early space laws, early US historic preservation law was both incomplete and myopic.

In 1966, the National Historic Preservation Act (NHPA) was passed, which created one of the first comprehensive historic preservation laws in the nation. The NHPA established State Historic Preservation Officers, the National Register of Historic Places (NRHP), and National Historic Landmarks (NHL). The creation of this law established a mechanism for federal agency decision making regarding private and public projects that have the potential to adversely affect significant sites, buildings, structures or objects in American history. Pertinent to the growing private sector space exploration industry is the fact that the NHPA requires that federal agencies who will provide federal funding, approval, or permits for a private sector project or activity, must take into account whether or not that undertaking will damage or destroy significant historic properties.

Sites that have been determined to be eligible for listing as National Historic Landmarks are the most significant places, sites, buildings, and objects in American history. In contrast, the NRHP are significant on national, state and local levels, but are not National Historic Landmarks. In order to be included as a National Historic Landmark the site must be eligible under one of the six following criteria:

- 1:** That are associated with events that have made a significant contribution to, and are identified with, or that outstandingly represent, the broad national patterns

of United States history and from which an understanding and appreciation of those patterns may be gained;

2: That are associated importantly with the lives of persons nationally significant in the history of the United States; or

3: That represent some great idea or ideal of the American people; or

4: That embody the distinguishing characteristics of an architectural type specimen exceptionally valuable for a study of a period, style or method of construction, or that represent a significant, distinctive and exceptional entity whose components may lack individual distinction; or.

5: That are composed of integral parts of the environment not sufficiently significant by reason of historical association or artistic merit to warrant individual recognition but collectively compose an entity of exceptional historical or artistic significance, or outstandingly commemorate or illustrate a way of life or culture; or

6: That have yielded or may be likely to yield information of major scientific importance by revealing new cultures, or by shedding light upon periods of occupation over large areas of the United States. Such sites are those which have yielded, or which may reasonably be expected to yield, data affecting theories, concepts and ideas to a major degree.⁷²

It can be argued that the first human footsteps on the Moon, or any celestial body meet National Historic Landmark Criterion 1. The culmination of the Apollo Program was made possible by decades of research into physics, aerospace engineering, and chemistry.

The technology used in the creation of the Apollo 11 rockets, and lunar modules was remarkably advanced for its time, so much so that 42 years later human beings now lack the technology to return to the lunar surface. What is sitting on the Sea of Tranquility could be considered the height of human technology for the mid-20th century. The landing craft present at all Apollo Lunar Landing Sites present the only technology ever created that is capable of sustaining human life on the lunar surface, all other objects

⁷² "Summary of the National Historic Landmarks Criteria for Evaluation," U.S. Department of the Interior, National Park Service. Accessed February 28th, 2012 http://www.nps.gov/nr/publications/bulletins/nrb15/nrb15_9.htm

on the moon were created for unmanned missions. The objects on the moon more than qualify for inclusion as a National Historic Landmark under Criterion 4 and 5 because the majority of the objects left at Tranquility Base only exist on Earth as prototypes.

The site is also eligible under Criterion 3: however the idea of humans being on the moon is not new. An American did not create the idea, nor is the idea a strictly American ideal. However, getting to the moon was done in a very American fashion. It started when President Kennedy declared “This nation should commit itself to achieving the goal, before the decade is out, of landing a man on the moon and returning him safely to Earth.”⁷³ Kennedy knew very well that the United States did not possess the technology to do so at the time of his speech to congress. That did not deter him from making the race to the moon one of the major priorities of America in the 1960’s. Nine years, countless man-hours, and billions of government dollars later, an American citizen became the first member of his species to set foot on another celestial body.⁷⁴

Because these objects are still United States government property, they can be considered for inclusion as a National Historic Landmark.⁷⁵ But because the moon cannot be owned by anyone, only the objects, and not the site can be nominated for inclusion under US law. The states of California and New Mexico have listed the objects left on the

⁷³ “The Decision to Go to the Moon: President John F Kennedy’s May 25th, 1961 Speech to Congress,” NASA History Office, Accessed February 18th, 2012.
<http://history.nasa.gov/moondec.html>

⁷⁴ Memo from Alan Jones, Executive Secretary NASA Artifact Committee meeting on March 15, 1983.

⁷⁵ Ralph Gibson, “Lunar Archeology: The application of Federal Historic Preservation Law to the Site Where Humans First Set Foot Upon the Moon,” (Masters Thesis, New Mexico State University, 2001) 19.

lunar surface by Apollo 11 Astronauts in their state historic registers because of the connections the states have to producing or testing those objects.⁷⁶ However, a listing on a state register for objects 233,000 miles away isn't much of a deterrent for potential lunar explorers. It should be noted that the funding for the prize money of the Lunar X competition comes from Google, which is based in California, one of the two places that legally protect the objects from Apollo 11. If the winner of the Lunar X competition were to damage the objects, Google could be held accountable for damaging a California State Historic Site. Sadly this does not pose any legal ramifications, but will result in bad public relations.

According to amendments to the NHPA made in 1980, if the sites were included as a National Historic Landmark then they would be eligible for inclusion to the WHL.⁷⁷ Additionally, the President of the United States could use the power granted to him by the Antiquities Act of 1906 to declare the objects at the Apollo Lunar Landing Sites (since they are still US government property)⁷⁸ a National Monument by executive order. Being

⁷⁶ "Nomination For Apollo 11 Landing Site for Inclusion to California State Historic Register," California Department of Parks and Recreation, Accessed February 16th, 2012. www.parks.ca.gov/pages/1067/files/tranquility%20base_draft.pdf, "Apollo 11 moon site given historic status," MSNBC, Accessed February 16th, 2012, www.msnbc.com/id/35153291/ns/technology_and_science/t/apollo-moon-site-given-historic-status/

⁷⁷ "Procedures and Guidelines for Compliance with the Freedom of Information Act," US Department of the Interior. Accessed April 19, 2012. <http://www.gpo.gov/fdsys/pkg/CFR-2003-title36-vol3/pdf/CFR-2003-title36-vol3-chapIV.pdf>

declared a National Monument also allows the site to be eligible for nomination to the WHL.⁷⁹

In 1985, Dr. Harry A. Butowsky of the National Park Service conducted a theme study of all of the sites associated with the US space program from its infancy to its successful landing of the first man on the moon and beyond. In his study, Dr Butowsky advised the US Government to include 24 sites as National Historic Landmarks that were associated with significant achievements in aeronautics and the history of our space program. Of those 24 sites, six of them are directly related to Apollo missions that landed the first humans on the moon.⁸⁰ Prior to Bukowsky's study, Cape Canaveral Air Force Station was listed as a National Historic Landmark on April 16, 1984.⁸¹ Launch Complex 39, where all of the Apollo missions lifted off from, at the Kennedy Space Center was listed as a National Historic Landmark on May 24th, 1973.⁸²

⁷⁸ The US Constitution, international maritime law (specifically Articles 95 and 96 of the Law of the Sea Convention) established that the right, title, and ownership of federal property is not lost to the government due to the passage of time. Only by Congressional action can ship and aircraft wrecks be declared "abandoned." Congress has yet to declare the objects at any of the 6 lunar landing sites as abandoned.

⁷⁹ Ibid.

⁸⁰ The Lunar Landing Research Facility and Rendezvous Docking Simulator in Langley, VA, the Lunar Landing Training Vehicle and the Neutral Buoyancy Simulator in Huntsville, AL, Apollo Mission Control and the Space Environment Simulation Laboratory in Houston, TX.

⁸¹ "Cape Canaveral Air Force Station," National Historic Landmark Program, Accessed February 28th, 2012.

<http://tps.cr.nps.gov/nhl/detail.cfm?ResourceId=1885&ResourceType=District>

⁸² "Man In Space: A National Historic Landmark Study," NASA, Accessed February 28th, 2012. http://historicproperties.arc.nasa.gov/downloads/man_in_space_butowsky.pdf

It is ironic that all of the buildings, facilities, test sites, rockets, test modules, and equipment (i.e. objects) that led up to one of the most significant moments in human history are protected under US law, yet the objects that are associated with the pinnacle achievement of the same “historic district of objects” are not because they are located on the lunar surface.

The inclusion of the objects at the Apollo Lunar Landing Sites as a National Historic Landmark is complicated because it is not situated on United States land. However, the idea of a National Historic Landmark not on US territory is not foreign. There are several National Historic Landmark listings that are beyond US soil, or on US protectorates. The World War II battlefields on the Pacific Island nations of Palau, and Micronesia were listed as National Historic Landmarks in 1985.⁸³ The battlefields on Palau and Micronesia are now located on the land of sovereign nations, but at the time of their creation these nations were trust territories under the control of the United States.⁸⁴ The American Legation in Morocco is another National Historic Landmark located outside of US borders.⁸⁵ However, it is located on the site of a former embassy so it is on

⁸³ “Listing of National Historic Landmarks By State,” National Park Service, Accessed February 16th, 2012. www.nps.gov/nhl/designations/lists/micro01.pdf

⁸⁴ Ralph Gibson, “Lunar Archeology: The application of Federal Historic Preservation Law to the Site Where Humans First Set Foot Upon the Moon,” (Masters Thesis, New Mexico State University, 2001) 20.

⁸⁵ “Listing of National Historic Landmarks By State,” National Park Service, Accessed February 16th, 2012. www.nps.gov/nhl/designations/lists/mor01.pdf

US government land.⁸⁶ These three sites do not provide as strong of a precedent needed for a complex legal matter like the one presented by the Apollo Lunar Landing Sites, but they do indicate that National Historic Landmarks can be located outside of US territory.

The National Historic Landmark that presents an appropriate precedent for the Apollo Lunar Landing Sites is “Old Ironsides.” The USS *Constitution* is a US Navy frigate that earned its nickname for performing gallantly during the War of 1812. The ship is a reproduction of its original self, and was nominated as a National Historic Landmark in 1960.⁸⁷ The *Constitution* is similar to the previously mentioned National Historic Landmark sites because there are times where it is not located inside of US territory, and is mobile, like the Eagle lander at Tranquility Base. Those sites, despite not being on US land are on land owned by a sovereign nation. The USS *Constitution* is different because it is the only National Historic Landmark that can move into international waters under its own power, which are an area of international commons. The *Constitution* is still a National Historic Landmark whether it is docked at a US port, a Russian port, or sailing on the high seas.⁸⁸

The precedent set by the inclusion of the *Constitution* as a National Historic Landmark is one that could be followed in attempts to preserve the objects at the Apollo

⁸⁶ Ralph Gibson, “Lunar Archeology: The application of Federal Historic Preservation Law to the Site Where Humans First Set Foot Upon the Moon,” (Masters Thesis, New Mexico State University, 2001)

⁸⁷ “Maritime Landmarks: Large Vessels,” National Park Service, Accessed February 16th, 2012. www.nps.gov/maritime/nhl/lvesnhl.html

⁸⁸ Ralph Gibson, “Lunar Archeology: The application of Federal Historic Preservation Law to the Site Where Humans First Set Foot Upon the Moon,” (Masters Thesis, New Mexico State University, 2001) 20.

Lunar Landing Sites, especially in conjunction with the number of Apollo testing objects and sites listed already. Because the *Constitution* exists in international waters, or in the territorial waters of a sovereign nation other than the one whose register it is on creates an interesting legal precedent. One of the major fears when nominating the objects at the Apollo Lunar Landing Sites is other countries thinking that the US is claiming sovereignty over the lunar surface by protecting the objects left there. The case of the USS *Constitution* shows how something that is legally protected by a sovereign state can exist in an area of international commons.

What is needed to further the argument towards protection is proof that something can be protected in an area that belongs to no one, without claims of sovereignty.

Because of the 1980 amendments to the NHPA, the *Constitution* is eligible for nomination to the WHL and would provide the perfect precedent for the objects at the Apollo Lunar Landing Sites. Because there is a National Historic Landmark that exists in an international area of commons, it is important to look at a similar World Heritage Site.

2.7 - The Old City of Jerusalem and its Walls

The City of Jerusalem has been a holy city for Christianity, Islam, and Judaism for three thousand years. The city contains over 220 religious monuments and statues for those seeking relics of their respective religion. Along with its religious significance, the city also exists in a state of legal significance that creates similarities between itself and the lunar surface. These matters discussed here are highly controversial legal issues stemming from thousands of years of Middle Eastern regional politics. This thesis does

not claim to understand the political situations in the Middle East, nor does it take a side in the Palestinian or Israeli conflict to govern the city of Jerusalem. This thesis is using the legal precedent established by the declaration of Jerusalem as *corpus separatum* to further the argument for preservation of the Apollo Lunar Landing Sites by inclusion to the World Heritage List.

In 1947, when the United Nations passed General Assembly Resolution 181, creating an Israeli State, they declared the city of Jerusalem “shall be established as *corpus separatum* under a special international regime administered by the United Nations.”⁸⁹ The term *corpus separatum* is Latin for “separated body.” In regards to governing the city of Jerusalem, the UN wanted a “special international regime and shall be administered by the United Nations.”⁹⁰ The UN did not want the city to be considered part of Israel, Palestine, or Jordan because it did not want to support the claims of any state to control Jerusalem.

When the UN established the State of Israel they understood the complicated situation they were creating in the Middle East. Because the religions of Christianity, Islam, and Judaism all consider Jerusalem to be a Holy City the UN realized the international importance of the city and its need for preservation. If they were to give the city outright to the new state of Israel, knowing that Palestinians considered the city their capitol, it would have increased the amount of friction in the area. The decision to

⁸⁹ “The United Nations General Assembly Resolution 181,” The Avalon Project Yale Law School, Accessed February 20th, 2012. www.yale.edu/lawweb/avalon/un/res181.htm

⁹⁰ *Ibid.*

establish an international regime to govern Jerusalem, and its holy sites and monuments instead of granting sovereign rule of the city to Israeli, Palestinian, or Jordanian leaders was furthered along by the passing of UN General Assembly Resolution 303.⁹¹ The situation in Jerusalem is made even more complicated by the fact that Israel has occupied West Jerusalem since 1948, and East Jerusalem since the end of the Six Day War in 1967. Despite 30 years of occupying the entire city, the majority of the world does not recognize Israeli sovereignty over the city of Jerusalem.⁹²

These General Assembly decisions establish a set of legal parameters that allow the city of Jerusalem to exist on land not governed by any state. Legally speaking, there is little difference between the land Jerusalem is situated on, and the Sea of Tranquility. The laws that govern these two internationally significant sites were created by the United Nations, and they are not controlled by any sovereign state. The city of Jerusalem and its complicated legal situation are important to the preservation of the Apollo Lunar Landing Sites because of the city's inclusion to the World Heritage List in 1981.

“Old City of Jerusalem and its Walls,” was proposed for inclusion into the World Heritage List because of its religious significance to three of the world's major religions, its cultural significance because of the vast amounts of religious structures and monuments, and its importance as one of the oldest cities on the planet. The proposal of this site to be included to the WHL created controversy because the country of Jordan

⁹¹ “General Assembly Resolution 303,” The United Nations General Assembly, Accessed February 20th, 2012, www.jewishvirtuallibrary.org/jsource/UN/unga65_303.pdf

⁹² John Quigley, “Sovereignty in Jerusalem,” *Catholic University Law Review* 45 (1995-96) 765.

proposed the site. While Jordan is a geographical neighbor of the city, it does not have a sovereign claim to the city. The proposal of a site by a state that the site is not situated in directly violates Article 11, paragraph 3, of the World Heritage Convention.⁹³

In documents detailing the discussions of the committee members, there is an overwhelming support shown by all in attendance for the high level of significance for the site, and for Jordan's competence in administering preservation to the city. Where the delegations found fault was Jordan's legal ability to preserve the site. A letter to the committee from the Jordanian representative outlines the reasoning behind Jordan's sponsoring the site for its religious significance, and the deterioration of its heritage. That letter specifically states that this nomination was in no way a claim of sovereignty to the city of Jerusalem by the Hashemite Kingdom of Jordan.⁹⁴ A final vote to establish the site passed 14 to 1, with 5 abstentions, and several of the delegates felt the need to voice their concerns for the site before tallying their vote.⁹⁵

The delegations from Australia, France, Germany, Italy, and Switzerland explained their abstention from the vote because UN General Assembly Resolution 181 established a situation where Jerusalem is not a part of a sovereignty, hence Jordan as a sovereignty, has no right to propose its preservation.⁹⁶ For the first time in hundreds of

⁹³ The United Nations Educational, Scientific, and Cultural Council, "The World Heritage Convention," The United Nations, Geneva, 1972.

⁹⁴ "World Heritage Committee: 1st Extraordinary Session, Paris 1981," World Heritage List Archives, Accessed February 20th, 2012.

<http://whc.unesco.org/archive/repext81.htm#annex4>

⁹⁵ *ibid.*

⁹⁶ *ibid.*

years, European powers felt that not meddling in Middle Eastern politics was the best option. The delegations from Argentina, Cyprus, Egypt, Nepal, Zaire all explained their endorsement for including the site as being based off of the cultural significance of the site, and that the proposal does not impose any claim of sovereignty over the city. The delegation from the United States was the sole vote against the inclusion of the site because it went against Article 11, Paragraph 3, of the World Heritage Convention.

The addition of “Old City of Jerusalem and its Walls” to the World Heritage List should be referenced in any attempt to include the Apollo Lunar Landing Sites to the list. The legal similarities between Jerusalem and the lunar surface are enough to create a discussion about the two sites. With multiple nations voting to include this site, despite it not being located on the territory of the sponsor, creates legal precedent that a site like the Apollo Lunar Landing Sites would need for consideration. The fact that nations which voted for its inclusion made remarks pertaining to the sponsorship of the site in no way being viewed as a claim of sovereignty also helps the argument. However, Jordan was successful in its sponsorship because Jerusalem is being threatened by urban construction projects and mass deterioration of its monuments and structures, and something needed to be done to stop it.⁹⁷ In order for any sponsoring state to be successful it would need to properly present the dangers at the Apollo Lunar Landing Sites, and the proper legal background to show that the idea is not as farfetched as it may seem.

⁹⁷ “WH Committee: Report of the Sixth Session, Paris 1982,” World Heritage List Archives, Accessed February 20th, 2012.
<http://whc.unesco.org/archive/repcom82.htm#jerusalem>

2.8 - Chapter Conclusion

The international conventions and treaties created to govern human usage of the heavens were created for various reasons. They were drafted to stop developed nations from treating celestial bodies the same way 16th century European explorers treated the New World by claiming land for their crowns through various cultural ceremonies. These documents were written to stop the US and the USSR from placing nuclear weapons on the Moon. They were fashioned to help astronauts should they ever find themselves in danger in outer space. The laws were shaped to place liability upon a state that did something the wrong way, and ended up damaging another states property. The laws were drafted to keep track of everything humans sent up into space, and to take care of the immediate needs of space faring states at the time of their drafting. One thing the laws were not created to do is preserve locations of human cultural significance on celestial bodies.

That fact that these treaties did not take preservation into effect should not be surprising for several reasons. First, the OST was ratified two years before a human presence was made on the lunar surface. The laws at that point were theoretical, and human beings have a tendency to be more reactive than proactive by only preserving sites of historical importance once they become threatened. Because no human had ever been on the moon before, how could it be threatened? More importantly, because no one had been there, how could anyone protect it? Human occupation of the moon took place intermittently during a brief three-year window from 1969 to 1972, and twelve humans have ever set foot upon the lunar surface. That means the only significant place on our

planet that fewer people have been to than the moon is the bottom of the Mariana Trench, the lowest point on the planet.

Arguing that these laws do not allow for the preservation of archeological sites on the lunar surface is both right and wrong. Just because that idea was not directly factored into the drafting of this legislation does not mean that it is impossible. These conventions and treaties consistently ask for international cooperation in matters pertaining to human usage of the heavens, and that is exactly what is necessary for the Apollo Landing Sites to be protected by the World Heritage Convention.

The lag time of historic preservation considerations in space exploration follows similar concerns on Earth. Human beings have been using the oceans for trade, travel, and warfare for thousands of years. There are an unimaginable number of shipwrecks and culturally significant objects lying on the ocean floor, and it was only in 2001 that UNESCO created the *Convention on the Protection of Underwater Cultural Heritage* to safeguard those objects. Antarctic Exploration reached its peak during the turn of the 20th century, when Roald Amundsen reached the South Pole in 1911. The Antarctic Heritage Trust was created in 1987; 76 years after humans reached the South Pole. Humans had been living in North America for thousands of years before Columbus “discovered” the New World in 1492. It took almost 100 years of independence for the United States to preserve the northwest corner of Wyoming. Yellowstone National Park was created in 1872 by Congress to help prevent the destruction of beautiful and pristine natural heritage, marking the first time a government had set aside land so that future generations could enjoy it.

Historic preservation takes both time and perspective, but more importantly, a proactive stance. Enough time has passed to preserve the Apollo Lunar Landing Sites for their significance to be appreciated, but human beings need far more perspective on the situation to truly appreciate how important Neil Armstrong's footsteps are to the history of our human species.

3 - Conclusion

Researching how historic preservation law interacts with the legal framework of outer space started as a lighthearted conversation which raised many eyebrows between graduate students and their professors. Over the course of this project the playful nature of the conversation has taken on a more serious tone. One comforting aspect of this research is that no matter how many discussions engaged this subject, the conversation always starts off the same way, with a raised eyebrow.

All of the research for this thesis was organized around the deceptively simple question of “does the current international legal framework that governs outer space allow for preservation of human historic sites.” The way to answer that question lay in the analysis and interpretation of the major international space laws and how those treaties work in combination with international preservation documents like the World Heritage Convention, and national preservation laws. The answer to that question is “Maybe.”

The research presented in this thesis shows that current international laws were created with preservation in mind. It was, however, the preservation of human lives from a nuclear threat, not the preservation of human archeological sites, that were of paramount concern. The language of the OST may prevent any nation from protecting the Apollo Lunar Landing Sites as a whole (meaning both the landing site and the objects Armstrong and Aldrin left behind). Articles 1, 2, and 3 strictly forbid the sovereign claim of land on the Moon, and other celestial bodies, but there is no language that strictly forbids the protection of the sites. The lack of preventative language stems from the

absence of a human presence on the Moon at the time of the drafting of the OST. This creates a legal grey area in a largely theoretical area of law.

The analysis and interpretation of current international law did not present a clear answer to the question because there is not one, at least not in regards to international preservation. This is a highly complicated legal matter that deals with the relationship between multiple international conventions and treaties covering multiple topics across more than half a century. Some of these treaties were not created to work in conjunction with each other, but it is not hard to imagine that it will be necessary to weave them into a more coherent treaty in the future. This thesis presented the idea of amending the OST or World Heritage Convention as the most viable option for protecting the sites on an international level.

In regards to national protection, research shows the objects resting on the lunar surface at each Apollo Lunar Landing Site is still claimed by the United States government. Because the US government has not abandoned the materials, it can legally preserve and protect them. Doing so is another story. It is within the President's power to protect the objects at the sites via Executive Order, through creation of a National Monument, or the Senate could approve the site as a National Historic Landmarks. The US government could take either action at any time.

During all of the conversations that took place over the course of this project, a variation of the thesis question presented itself. Where the primary question looked at the possibility of protecting the sites by asking "Can we protect?," the second question looks

at the morality behind protecting the sites by replacing the word “can,” with “Should we?.”

The question of whether or not we as citizens of the United States *should* protect the Apollo Lunar Landing Sites is an entirely different pursuit. Should the United States ignore legal grey areas and protect the sites because of their significance as sites of human historical and scientific achievement in the same way that the Hashemite Kingdom of Jordan ignored the World Heritage Convention and protected “Jerusalem and Its Walls” for its-significance as a historical and religious sites. The answer to that question is yes. Yes, the United States should preserve these sites as National Historic Landmarks. Here is why.

The Apollo landing sites are, on one hand, a reflection of American technological and scientific prowess. They are manifestations of the design, fabrication and operation of the most complicated machines humanity has devised. The sites are worthy of protection as representations of those achievements. But there are other reasons the sites deserve protection. These sites should be included as National Historic Landmarks because they represent what may, in historical retrospect, the pinnacle of American bravado. The affect the space race had on our culture cannot be measured in any one way. The technological advances brought on by the audacity of President Kennedy’s claim radically altered the economic and social fabric of this country for decades after. By launching America into a lunar crusade, Kennedy created a culture of innovation and discovery that is just as vital to this country’s history as any of the other social movements that have taken place during the 20th century. When the force of American

innovation combined with the human need to explore, this nation turned a daring claim into something one fifth of the world's population watched on television in less than 8 years.

In conjunction with the culture the space race helped establish in this country, the Apollo Missions gave our nation new explorers and with successful exploration always comes a sense of hope. In the halls of human exploration, Armstrong and Aldrin stand as tall as Leif Eriksson, Vasco de Gama, and Christopher Columbus for their accomplishments. The United States landed twelve men on the Moon. That feat is, a half century later, unmatched. The clock is still ticking for other nations to join us. We as a nation forget this fact. A sense of pride came from our boys changing space from a fictional setting of novels and television shows to a real place. The future was tangible; it was right around the corner. That future was the creation of the culture of innovation that was fueled by the hope of discovery. The Apollo Lunar Landing Sites are a physical manifestation of that innovation, hope and discovery. That is why the US *should* preserve these sites.

The protection of these lunar sites would become a watershed moment for preservation. The preservation of these extraterrestrial sites would mark the changing of a thought process that has enveloped the field of preservation since its inception. As we progress farther away from our colonial and antebellum past, our culture is going to find that the things that are the most meaningful to our country, and to the world, are no longer made of clay, mortar, and wood. Preservation as a field needs to adapt to this or the profession will become irrelevant. The preservation of a site that was the launching

point of the future could become a relatively uncomfortable task for a profession that is rooted primarily in domestic and commercial architecture and embraces technological and industrial sites timidly.. Preserving this site would shift, dramatically, what we define as worthy of preservation and protection. Without that kind of change in how we view sites, this topic will continue to raise eyebrows, and fail to create action.

Why do this? This question was frequently asked during this project. Do we gain anything? Of course we gain something, but because of the short-sighted nature of politics, the future only exists in election cycles. Preserving the Apollo 11 lunar landing site is not grist for the next presidential election. Establishing a new precedent for how the nation cares for significant human sites outside of Earth's atmosphere calls for more reasoned discussion. Following through with this action will affect future human exploration for centuries. Protecting this site announces to our species that no matter how far away from home we go, we will protect the evidence and artifacts that mark our most significant achievements. The change in philosophy we gain from that is not tangible, but the sites we retain because of the change are. We gain the peace of mind that comes from safeguarding our heritage. We reignite a sense of national pride, and in a time when our government gets little accomplished, we could secure a not so subtle reminder of a time when our nation was capable of accomplishing great things..

There are, to be sure, reasonable arguments for not protecting this site. Primarily, the fear that stems from causing an international incident is one of the largest reasons. The protection of this site could be viewed as a direct violation of the first three articles

of the OST.⁹⁸ This view is not correct, because the designation of a National Historic Landmark is a purely symbolic designation meant to remind people of the greatness their country and its citizens have accomplished. The symbolism is even more so for the sites on the Moon because unlike other National Historic Landmarks, visitation to this site is currently unavailable. The designations are not in any way a claim of sovereignty, nor would it mean the US would go to war with any nation or corporation that disturbed or damaged the sites. Designating these sites for protection is nothing more than a national pride building celebration. If another nation were to view this as anything other than symbolic, is to be misinformed.

Sadly, even protection on a national level does not completely solve the issue. To call this only a significant moment in US history is shortsighted. This is a moment in *human* history. The plaque left on the Moon by Aldrin and Armstrong called themselves “ambassadors of the planet Earth,” not just ambassadors from the US. For the US to undertake its protection alone creates a culture of unilateralism on the part of the US, which is not how this species should move forward into the heavens. Like the space race, protection of the site should be conducted on a national level by the US first. Then once we have accomplished our mission, like the Moon, it will be more palatable for every other nation to help protect the sites.

If we as a species decide to change our current legal structure governing outer space to allow for protection of cultural and natural heritage sites, we then have to answer the next question. How do we physically protect the Apollo Lunar Landing Sites?

⁹⁸ “The Space Race II,” The Smithsonian Magazine. Accessed April 17, 2012. <http://www.smithsonianmag.com/science-nature/digs-spacerace.html>

Unlike Earth based historic sites that have to deal with deterioration from atmospheric conditions, and human interaction, the Apollo Lunar Landing Sites have sat in an absolute zero vacuum for the last forty years. These sites are exactly as they were when the dust settled from the astronauts leaving the lunar surface. These sites create a contradiction in preservation. Usually a building, site, or object can be destroyed by neglect, whereas in this case, the site has been preserved by neglect. However, the slightest movement can forever damage the site, so extreme care is necessary when interacting with them.

The simplest answer to that question for the immediate future is to leave the sites alone. Unlike buildings or archeological sites on Earth, this site will not change unless something happens to it i.e. human interference, or a freak occurrence like a meteor strike. Because of the delicate nature of the environment the site exists in, its isolation is its greatest ally.

In 2009, the NASA Lunar Reconnaissance Orbiter (LRO) took photographs of all six Apollo Lunar Landing Sites, showing them in perfectly undisturbed conditions.⁹⁹ The lack of interference from humans, and nature, is what creates the unique set of issues in dealing with a site such as this. Because there is no lunar wind or rain, lunar soil has not been blown into the footprint to erase it, as if it had been on Earth. Because of this if someone were to drive a lunar rover over that footprint in search for prize money, it would be lost forever.

⁹⁹ "Lunar Reconnaissance Orbiter," NASA, Accessed March 5, 2012.
www.nasa.gov/mission_pages/lro/multimedia/lroimages/apollosites.html

In order to properly maintain the level of authenticity at the Apollo 11 Lunar Landing Site this thesis will develop a brief plan to physically protect the site. The plan will deal with protecting the site during the near future phase of lunar exploration. Then the plan will discuss highly theoretical means of protection during increased human visitation to the Moon for tourism, mining, and eventual human colonization of the lunar surface.

In the near future the most likely threat to the Apollo 11 Lunar Landing Site will be exploration by government and private entities. This exploration could be conducted by unmanned rovers like the Google X prize, or by manned missions via governments or tourism. Because the site exists in a perfectly preserved state even the slightest tremor, tire tread, or force of wind from jet propulsion could blow lunar dust into the footprints and forever cover them up. Because of the likely possibility of an errant exhaust plume, or lunar treasure hunters, NASA created a set of guidelines for protecting our lunar heritage in 2011.

How to Protect and Preserve the Historic and Scientific Value of US government Lunar Artifacts, is a document compiled by NASA that explains how to explore the lunar surface without causing irreparable damage to human cultural heritage sites. The document deals with landing and taking off from the lunar surface, along with rover and land based vehicular travel, and human contamination of the sites. The information in the document is based off of experiments involving high velocity lunar dust, and analysis of information gathered by Apollo Mission Astronauts.

When dealing with the landing sites the document breaks them into two categories, Apollo's 11 & 17, and the Apollo's 12, 14-16. Because Apollo's 11 & 17 are the first and last places human beings have ever been on the lunar surface the document creates no fly/travel zones of 2km around the sites. The document feels the sites are too important for disruption and until humans can create a better preservation plan for the sites, this is the best means.¹⁰⁰

For the remaining sites the document stresses the importance of the delicate nature of the sites. The document proposes proper landing trajectories of descending spacecraft, going as far as to suggest landing in craters or placing mountain ranges between the landing craft and the historic sites to help dissipate lunar dust travel.¹⁰¹ The reasoning behind this is that lunar dust is very coarse, and when traveling at a high velocity has the same effect as sand blasting an object does on Earth. Information gathered during the Apollo 12 mission showed that upon landing, the dust that was moved due to the LM propulsion system heavily damaged the Surveyor 3 spacecraft that was parked 155 meters away in a crater.¹⁰²

When dealing with Rovers or human contact, the Exclusion Zone still exists around Apollo's 11 & 17, but does not exist for the other Apollo Lunar Landing Sites. There are guidelines for allowable proximity to objects at the remaining sites, but they are in the 1-3 meter range, as opposed to the exclusion zones, which are 75 meters for

¹⁰⁰ The National Aeronautics and Space Administration, *NASA's Recommendations to Space Faring Entities: How to Protect and Preserve the Historic and Scientific Value of U.S. Government Lunar Artifacts*. Houston: NASA, 2009. pg 11.

¹⁰¹ *Ibid*,13.

¹⁰² *Ibid*, 13.

Apollo 11, and 225 meters for Apollo 17.¹⁰³ NASA does expect the lunar explorers to respect the guidelines for dealing with US government property because of the fact that the majority of these sites are still functioning scientific experiments and that tampering with them would directly violate the OST.

When human traffic on the moon increases due to lunar tourism via Virgin Galactic, or LunaCorp, or mining for valuable minerals such as Helium 3¹⁰⁴ increases, there will need to be a change in the “just leave it alone,” policy suggested by NASA. The initial change could involve methods for specifically preserving the first footprint, and allowing visitation within the 75 meter and 225 meter exclusion zones to the Apollo 11 & 17 landing sites. Assuming scientists will be among the regular visitors to the lunar surface there should be far more information available about the conditions presented on the Moon.

The preservation of the footprint could be taken from the methods used to protect the Laetoli footprints in Tanzania. The footprints are 3.6 million years old, and are the oldest recorded footprint by a hominid ancestor ever found.¹⁰⁵ The reason why the footprints were preserved is because of a volcanic eruption, which deposited a layer of volcanic ash on the footprint, combined with rainfall, which turned the ash into a cement-like substance, then add in another layer of volcanic ash which helped seal the footprint

¹⁰³ Ibid, 19,

¹⁰⁴ L.A. Taylor and G.L. Kulcinski, “Helium-3 on the Moon for Fusion Energy: The Persian Gulf of the 21st Century,” *Solar System Research* 33 (1999) 338.

¹⁰⁵ “Laetoli Footprints,” Public Broadcasting System: Evolution, Accessed March 6th, 2012. http://www.pbs.org/wgbh/evolution/library/07/1/l_071_03.html

perfectly before millions of years of dirt and dust covered it up.¹⁰⁶ If a combination of man-made substances could be used to seal the footprint from lunar dust clouds from jet propulsion, or seismic tremors due to mining, than the exclusion zones on the Apollo 11 & 17 landing sites could be decreased to allow for scientific purposes and possible tourist visitation.

Once permanent human settlement occurs on the lunar surface the proposal of a Lunar Park System could be put into place to allow citizens of the Moon to view their lunar heritage. While the idea may seem far-fetched even today, it was proposed in the mid-1980's by Charles S. Cockell, a British geomicrobiologist, and Gerda Horneck, a German astrobiologist. They present the idea of creating a park system that protects the natural beauty of some of our solar systems more impressive physical features because of the human need for wilderness areas.¹⁰⁷

In a different paper by the same authors, a list of naturally significant sites on the planet Mars that should be preserved was created. The list includes the North Pole for the Chasma Boreale kilometer deep ice canyon, a park that preserves the Syrtis Major desert, and Olympus Park, which protects the volcano Olympus Mons, which is two and a half times the size of Mt Everest.¹⁰⁸ In the paper, Cockell and Horneck also propose the creation of a Historical Park, a park that is based around the region of Chryse Planitia,

¹⁰⁶ Ibid.

¹⁰⁷ Charles S. Cockell and Gerda Horneck, "Planetary Parks: Formulating a Wilderness Policy for Planetary Bodies, *Space Policy* 22 (2006) 256.

¹⁰⁸ Charles S. Cockell and Gerda Horneck, "A Planetary Park System for Mars," *Space Policy* 20, (2004) 291.

where the Viking 1 and Mars Pathfinder spacecraft's are located, along with the Sojourner Mars Rover.

While the ideas presented by Hornbeck and Cockell are entirely theoretical, it is interesting to note that one of the proposed areas was included because of its ties to human space heritage and not because of natural beauty.

In closing, it is important to remember that by protecting these sites, we are protecting more than just objects left on the lunar desert. We are protecting the gold standard in scientific achievement and human exploration. We are protecting the work of brilliant engineers that is responsible for so many of our modern conveniences. But more important than the physical objects we are protecting are the ideals that were created by the space race that are manifested through the site. The objects left at Tranquility Base are the tools that allowed us to push those ideals farther than ever before. We must not forget that through those objects we are advocating for the protection of innovation, hope and discovery.

The protection of the Apollo Lunar Landing Sites is one small step that can, and should, be secured by the US government. The rest of the world should honor the achievement by taking the giant leap and inscribing the sites on the World Heritage List. This site should be protected for all mankind, by all mankind, because that's how the plaque was written. That is how history should be protected, for all mankind.

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