CONSERVING SPACE HERITAGE: THE CASE OF TRANQUILLITY BASE

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One of the most important and spectacular events in the history of space exploration was the first Moon Landing of 1969. Safe from the ravages of erosion, agriculture, industry or the expansion of human settlement, the greatest threat to the site of this momentous event - Tranquillity Base - is likely to be from a meteor impact. However, with the advent of space tourism and commercial space travel, the site of humankind’s first visit to a celestial body may come under threat of a different kind - that of souvenir hunters and miners. In this paper, the historical background to the Apollo programme is outlined and the sequence of events that made up the Apollo XI mission, which conducted the first Moon landing, is described before concluding with a consideration of the heritage conservation issues of Tranquillity Base.

Keywords: Apollo XI, archaeology, conservation, Moon, Tranquillity Base, space heritage

1. INTRODUCTION

The first Moon landing, which was achieved by the Apollo XI mission in 1969, represents one of humankind’s greatest technological feats ever by allowing people to walk on a celestial body for the first time. It is thought that some 600 million people around the world watched the event unfold live on television [1, 2, 3]. Given both the known and the unknown risks of sending people on such a mission in a potentially fatal environment, it is a testament to the extraordinary courage of the men who first walked on the Moon. Indeed, the crew of Apollo XI came close to aborting its mission as the Lunar Module approached the lunar surface [1, 4, 5, 6, 7, 8]. Images from NASA’s collection of Apollo photographs are probably now familiar to most people—notably the snapshot of astronaut Buzz Aldrin on the Moon’s surface, with Neil Armstrong and part of the Lunar Module reflected in Aldrin’s spacesuit visor. In this paper, the historical background to NASA’s Apollo programme will be outlined and the sequence of events that made up the Apollo XI mission will be described before the heritage conservation issues of Tranquillity Base where the Lunar Module made its momentous landing will be considered.

2. HISTORICAL BACKGROUND

The primary motivation of sending people to the Moon had been a political one and once the task had been achieved, interest in repeating the effort soon dwindled. The last person- nel-bearing mission to the Moon (and the first to carry a scientist – Harrison Schmitt, a geologist), which took place in 1972, was Apollo 17, the subsequent Apollo 18 and 19 missions being abandoned though the bulk of their equipment had already been paid for [1,6,8]. A further plan to land astronauts aboard Apollo 20 in Crater Copernicus in December 1972, which was included in a NASA schedule of Apollo missions released in 1969, was also abandoned [1,9,10].

The political motivation was clear from the outset. On 25 May 1961, the Apollo space programme was set in motion when President John F. Kennedy gave an address to a joint session of the United States Congress. In his speech, Kennedy expressed the belief that the United States “should commit itself to achieving the goal, before this decade is out, of landing a man on the Moon and returning him safely to Earth” (quoted in [1, 5, 11] and, less accurately, in [12]). For Kennedy, “no single space project will be more impressive to mankind” than landing a man on the Moon but, more importantly, its success would “demonstrate to a watching world that America is first in the field of technology and science” (quoted in [13]).

Only the month before, the Russians had placed the first man (Yuri Gagarin) into space, having previously launched the first artificial satellite (Sputnik 1) into Earth orbit in 1957. These technological leads were due partly to Russia’s advanced rockets. By contrast, when Alan Shepard became the first American to orbit the Earth in 1962 [1, 13], the Russians remained firmly in the lead, placing the first woman, Valentina Tereshkova, into orbit in 1963 [1, 14]. Even so, the Russian decision to compete in a race to the Moon did not occur until 1964, though this was not openly admitted until 1989 [11]. Eventually, a political commitment to achieve Kennedy’s goal and the possession of greater financial resources on the one hand, as well as more advanced computing technology on the other, allowed the Americans to win the race to the Moon before the decade was out.

This, at least, is the traditional Western-oriented narrative of the process by which humans came to walk on the Moon. Australian archaeologist Alice Gorman has rightly highlighted alternative views of the history and origins of the Apollo programme in taking a cultural landscape approach to interpreting space heritage [15]. She sees Tranquillity Base as part of a
“spacescape”, which she defines as a “three-tiered vertical landscape, starting from designed space landscapes on Earth (launch facilities, tracking stations, etc.), organic landscapes in orbit and on the surface of celestial bodies (satellites, rocket stages, landers, debris) and beyond the solar system, where only the Voyager [and Pioneer?] spacecraft have yet ventured, a realm rich with [cultural] associations though devoid of human material culture”. This cultural landscape approach to understanding the history or significance of the Apollo programme emphasises the bigger picture by accommodating a range of different values or interpretations of space heritage by various persons or groups. So, while it is possible to see the rockets used to transport the astronauts to the Moon as a positive and significant technological achievement, it is also possible to take account of the negative but no less significant origins of the technology in Nazi Germany’s V2 rocket programme. Not only did these rockets kill people when they were deployed during the Second World War, but also a third of the 60,000 slave labourers used to manufacture them perished in the process. Similarly, the indigenous Pitjantjatjara and Kokatha people of central Australia view the construction, in the 1960s, of tracking stations used for the Apollo programme across their land as part of the same colonial process that began with the establishment of the Woomera Rocket Range in 1947, despite their opposition to it, and which “led to alienation from their country and deprivation of their human rights”. In positive terms, the 1947 “protest at Woomera had an important role in the development and growth of Aboriginal political activism [and acted as] a catalyst for debate about the participation of Aboriginal people in contemporary Australian society”. With respect to Tranquillity Base itself, the raising of the United States flag on the Moon, as opposed to the original idea of the United Nations flag, can be seen to “reflect the metaphor of conquest and unarticulated colonial aspirations of the Cold War antagonists”[15]. Gorman argues that in allowing multivocality, it is “not necessary […] to privilege one [cultural association] over another”; rather, “conflicts of meaning” can not only co-exist but can also be emphasised in the management of a cultural landscape [15].

3. THE MOON LANDING: SEQUENCE OF EVENTS

By describing the Moon landing’s sequence of events, it is possible to develop a better appreciation of various aspects of the site where the Moon Landing took place as well as of the event itself.

Launched on a Saturn V rocket from Kennedy Space Centre at 9:32 a.m. (all times are in Eastern Daylight Time-EDT) on 16 July 1969, Apollo 11 was crewed by astronauts Neil A. Armstrong, Edwin E. (“Buzz”) Aldrin, Jr, and Michael Collins. Their destination was a small area of the Sea of Tranquillity on the surface of the Moon. After parking their craft into lunar orbit at 1:28 p.m. on 19 July, the Lunar Module (named Eagle) was carefully examined to test its systems and equipment before Armstrong and Aldrin undocked it from the Command and Service Module (named Columbia) after 1:11 p.m. the following day. The Lunar Module “descended to land on the Sea of Tranquillity at 4:18 p.m.” on 20 July [9]. The first words spoken by anybody on the surface of the Moon was the phrase “Contact light!” uttered by Buzz Aldrin at the moment that the Lunar Module touched down [1, 4, 5, 8]. Once the module’s engine had been shut down and various other checks had been made, Armstrong, as the mission’s commander, announced to mission control in Houston (and to a much larger audience following the event on radio or television): “Houston, Tranquility Base here - the Eagle has landed” [1, 9]. The safe touch-down of the Eagle was a truly remarkable event. For the first time, human beings had travelled from the earth to land on a celestial body. To historian Alex Roland and his “generation of Americans, born during the Second World War”, the Moon Landing is recalled as “the defining moment in the space age” [16].

Armstrong was the first person to set foot on the surface of the Moon and he did so at 10:56 p.m. on 20 July [9], a historic moment that was captured in a telecast. As he stepped off the Eagle’s ladder, Armstrong proclaimed “That’s one small step for a man, one giant leap for mankind”. Television audiences, however, heard the phrase spoken without the word “a” appearing before “man”, but Armstrong later claimed that this had apparently been lost in radio static [1, 5]. Andrew Smith has, however, cast some doubt on this claim. He states that Armstrong got “the words wrong… because he meant to say – and for years insisted that he did say – ‘one small step for a man …’”. Smith adds that “even his [i.e., Armstrong’s] memory is not definitive” [8]. Armstrong’s momentous declaration (and never mind the gender bias it implied) is nonetheless partly what makes the Moon Landing so memorable. How different would our understanding of the event be if this declaration were worded completely differently? One science fiction author, Howard Waldrop, has offered a fictional alternative in a story about three possible lives that fatal kidnap victim Charles Lindbergh, Jr, might have experienced had he been given the opportunity. In one of these possible lives, Waldrop proposed that the younger Lindbergh could have been the first person on the Moon, only the words he could have uttered might have been much less inspiring:

“Here’s one for Mom, and one for Pop, and one for Uncle Robert and…” – he jumped onto the ground with both feet – “one for the good old USA.” [17]

Aldrin followed Armstrong onto the lunar surface at 11:15 p.m. In the short time that the two astronauts spent on the Moon’s surface, they unveiled a plaque mounted on a strut of the Eagle and read aloud its inscription to a near global television audience:

Here men from the planet Earth first set foot on the moon July 1969, A.D. We came in peace for all mankind. [3,9]

They also raised the American flag and spoke to President Richard Nixon by radiotelephone before deploying equipment to be used in a range of scientific experiments [1, 8, 9]. Samples of lunar rocks and dust, amounting to 22 kilograms, were also collected by the astronauts for laboratory analysis back on Earth [1, 9].

Aldrin and Armstrong then re-entered the Eagle and closed its hatch at 1:11 a.m. on 21 July and, according to Ivan Ertel et al., the ascent stage of the Eagle “lifted off from the moon at 1:54 p.m. EDT July 21, having spent 21 hours 36 minutes on the lunar surface” [9].Docking with the Columbia some three and a half hours later, Aldrin and Armstrong transferred themselves and their lunar samples to it before jettisoning the Eagle’s ascent stage into lunar orbit. Soon afterwards, the Columbia departed for earth and eventually splashed down in the Pacific Ocean at 12:15 p.m. on 24 July [9].

The scientific results were impressive, though they took a back seat to the simple achievement of the Moon Landing...
itself. According to Ertel et al., the “passive seismometry had recorded a series of minor events and withstood temperatures of up to 364 kelvins (195 degrees F)” [9]. The recorded average temperature ranged from 361 K (190 degrees F) at solar noon on July 27 to 243 K (157 degrees F) on July 31. The laser reflector was also used to establish the average distance between the earth and the moon at 373,794.3333 kilometres. This measurement is to within an accuracy of four metres [1, 9]. Also, geochronological dating of two lunar samples indicated that the Sea of Tranquility’s minimum age was about 3.1 billion years - plus or minus 200 million years [9].

4. CONSERVING TRANQUILLITY BASE

The archaeological dimension of Tranquility Base, which has been estimated to cover an area of c. 60 m² [3], is primarily a heritage preservation issue, but there are two discrete components of the Moon Landing that illuminate different dimensions in preserving it. A totality of the site: the touchdown of the Lunar Module and the step-down of Armstrong and Aldrin onto the Moon’s surface. In the case of the former, the largely metal components of the Eagle’s descent stage and the various scientific instruments left behind by the astronauts are reasonably robust but could be targeted by future souvenir hunters or salvage operators. Especially vulnerable to theft might be the memorial plaque, mentioned previously, or an olive branch, which the astronauts left behind as a symbol of peace. A silicon chip measuring about 3.8 cm across and bearing messages of goodwill from the heads of state of many nations was also left on the Moon by the astronauts and might similarly be sought after by a souvenir hunter.

Both museums and private collectors have acquired a wide range of artefacts and documents relating to Apollo 11 but most of these are peripheral to the mission itself. Barclay and Brooks state that “museums exhibit test pieces, mock-ups, and back-up of these are peripheral to the mission itself. Barclay and Brooks have estimated to cover an area of 60 m² [3], is primarily a heritage preservation issue, but there are two discrete components of the Moon Landing that illuminate different dimensions in preserving it. A totality of the site: the touchdown of the Lunar Module and the step-down of Armstrong and Aldrin onto the Moon’s surface. In the case of the former, the largely metal components of the Eagle’s descent stage and the various scientific instruments left behind by the astronauts are reasonably robust but could be targeted by future souvenir hunters or salvage operators. Especially vulnerable to theft might be the memorial plaque, mentioned previously, or an olive branch, which the astronauts left behind as a symbol of peace. A silicon chip measuring about 3.8 cm across and bearing messages of goodwill from the heads of state of many nations was also left on the Moon by the astronauts and might similarly be sought after by a souvenir hunter.

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Space tourism formally began when the wealthy businessman, Dennis Tito, reportedly paid $20 million to be taken to the International Space Station aboard a Soyuz rocket in 2001, followed hot on his heels by Mark Shuttleworth in 2002 [10,18,36,37,38,39]. Archaeologists and space professionals alike have repeatedly raised the issue of commercial suborbital and orbital tourism as a preliminary stage in the process by which tourists may eventually come to be brought to the Moon or other locations to visit space heritage sites [2, 10, 18, 31, 34, 35,40]. In a December 2005 interview, Stephen Attenborough, Head of Astronaut Relations at Virgin Galactic, reported that the company intends to launch its first space flight in 2008 with tickets being sold initially at £110,000 for each passenger. For this money, tourists would be brought to an altitude of 110-120 km where they would feel weightlessness for 5-6 minutes before returning to Earth [41]. The two-stage process used to bring the tourists into space bears similarities to proposals made in 2002 by a California-based company, The Aerospace Corporation, but their customers would be taken to an orbiting space station instead [36]. In April 2006, it was reported that another American company, Space Adventures, plans to develop a fleet of commercial suborbital craft for the space tourism industry [42]. Assuming these astrotourism ventures become profitable, it may be only a matter of decades before tourists will be orbiting and then landing on the Moon. There is
now also renewed interest by the governments of China and the United States in sending personnel to the Moon while India would like to send orbiters and rovers there [2,3].

Concerns about the likely detrimental effect that industrial activity would have on the natural environment of the Moon, and other planetary bodies, have also been voiced by writers such as Mark Williamson, who argues that scientists may wish to study a planetary surface uncontaminated by spacecraft debris, while geological features might be preserved because of their aesthetic qualities [33, 34, 35, 43, 44]. Noting that only nine countries have signed or ratified the Moon Agreement of 1979, Williamson has wondered whether legislation could be used to offer environmental protection to celestial bodies such as the Moon [44]. However, the environmental concerns he raises could be incorporated into a new international agreement covering the universal heritage of space travel and exploration.

6. THE ARCHAEOLOGY OF SPACE HERITAGE

The first step in any conservation action over monuments is to catalogue or inventory all known sites in a particular area. Indeed, in 1980-81, the US National Park Service conducted a survey of the terrestrial “historic resources associated with the early American space program (with emphasis on the first moon landing) and followed this up with “a national historic landmark theme study [in 1984], and a study of alternatives involving the private and public entities that would contribute to preservation, use, and overall management of the sites” in 1987 [45]. The national historic landmark theme study “inventoried and evaluated more than 300 resources” of which 25 were earmarked for “designation as national historic landmarks because of their national significance” in that they “represent the best and most important remaining examples of the technology needed to land a man on the moon and to explore the earth, planets, and solar system” [45].

In 1997, it was proposed that the archaeological model of the sites and monuments record (or SMR), which is used in Britain and Ireland to list every known archaeological site or monument on a county-by-county basis, could be applied to produce an inventory of all space heritage sites on the Moon and Mars [26,28]. It was also proposed that the numeric designations given for each spacecraft in the United Nations’ Register of Objects Launched into Outer Space be used to identify all space heritage sites in a lunar or Martian SMR [28, 46]. Apollo 11’s “international designator” in the register is 1969-059A, while that of Luna 17 is 1970-059A. Individual pieces of spacecraft debris or intact components could then be assigned numerical designations prefixed by the spacecraft’s UN register number. While a numeric classification scheme has yet to be applied to space heritage sites, Nicholas Johnson and Mark Williamson compiled, in 2000, an initial catalogue of not only all spacecraft that either landed or crashed on the Moon, Mars, Venus and Jupiter, but also planned planetary missions in the first decade or so of the twenty-first century [34]. Four years later, Dirk Spennemann and Linda Kosmer prepared another “list of 103 spacecraft or major spacecraft components which soft-landed or crashed on the Moon, Mars and Venus” [10]. It may, however, be better to reject the inclusion of spacecraft on Venus or Jupiter in any such list, as the hostile environments of these planets would almost certainly have destroyed all trace of them in the years since their deployment and would, for the same reason, be inaccessible to human beings [26, 28]. Meanwhile, at New Mexico State University, the Lunar Legacy Project – comprising an interdisciplinary team led by Beth O’Leary – arose from a postgraduate seminar on cultural resource management in 1998. This project received a grant in December 1999 to compile an inventory of 106 items associated with Apollo 11 that were left behind at Tranquility Base [2,21,30]. The inventory is available online [47]. O’Leary and her colleagues reported on the project at the fifth World Archaeology Congress in 2003 where Australian archaeologists John Campbell and Alice Gorman spoke on other aspects of space heritage [30,48,49,50]. The World Archaeological Congress adopted a resolution for a Space Heritage Task Force, which met in 2004. O’Leary describes its functions as follows:

The Task Force seeks to recognize the material culture and places associated with space exploration, consider how and what elements of this heritage should be preserved using a set of criteria which benefits humankind, and work with interested parties to create an international structure to manage the cultural heritage of space exploration properly for future generations. [2]

Maintaining the integrity of historic spacecraft and their landing sites in situ is widely seen as a priority among archaeologists, museologists and space professionals with an interest in space heritage [2, 3, 10, 15, 18, 21, 26, 27, 28, 29, 34, 35]. This allows for a “warts and all” approach to the preservation and display/study of a site, since Tranquility Base (for example) retains rubbish discarded by the astronauts before departing the Moon [2, 10, 35]. The rubbish, which includes food packaging and urine- and faeces-filled containers, illustrates an infrequently mentioned aspect of the human as opposed to the scientific or technological side of space travel – i.e., the problems of eating food, relieving oneself and disposing of waste while travelling in outer space. This is, as Michael Shanks et al. say, “the real stuff of archaeology and history – what gets thrown away – garbage” [37]. They add that “99 percent or more of what most archaeologists dig up, record, and analyze in obsessive detail is what past people threw away as worthless – broken ceramics, broken or dulled stone tools, tool-making debris, food-making debris, food waste, broken glass, rusted metal, on and on” [37; cf. 28]. Archaeologists familiar with excavating the soft fill of medieval cess-pits would also, no doubt, add human dung to this list of rubbish!

True to archaeological form, O’Leary and her colleagues focused in on the rubbish thrown away by Armstrong and Aldrin but, more significantly, they applied a “Binfordian toss zone” for this discarded material to the US Geological Survey’s map of Tranquility Base [2]. During the 1970s, archaeologist Lewis Binford had collected ethnographic data on the way of life of a hunter-gathering Inuit community in Alaska – the Nunamiat – to see if it could be applied to interpreting the formation processes of prehistoric sites [51]. As a result, he developed spatial models of seated people around a focal point such as a hearth in relation to items (such as animal bones) that they drop in their vicinity. Binford describes the idealised model thus: “The debris which was dropped produced a ring of small items centered around the hearth; the disposal of large items, however, was different, these objects being tossed behind the people [to remove nuisances] away from the sitting area” [51]. The application of a Binfordian toss zone to describe part of Tranquility Base represents (as far as can be ascertained) the first example of archaeological site analysis being applied to a space heritage site as opposed to merely categorising or inventorying it.
Maintaining the integrity of Tranquility Base also means preserving the integrity of a frozen moment in time – the astronauts’ abandonment of the site on their departure from the Moon – as well as the cumulative one-day history of the landing site. Usually, this happens only with films or photographs. For example, in discussing the Smithsonian’s exhibition about the Apollo 11 astronaut landing site, Shanks et al. note that the “photographs in the New York Times and elsewhere of neighboring apartments abandoned and covered in thick layers of dust as the [World Trade Centre’s] towers came down are archaeological moments frozen in time just like Pompeii, abandoned to its own disaster” [37]. In the case of Tranquility Base, the Moon’s remoteness [2] as well as its lack of an appreciable atmosphere and, consequently, of damaging weather systems, means that “the hardware left by the Apollo astronauts, and their footprints, will remain intact for millennia”, as Mark Williamson puts it [35], though others have noted the long-term damage that will likely be caused to Tranquility Base by its exposure to micrometeorites, sub-atomic particles and solar radiation [10, 18].

7. THE TRANQUILLITY BASE FOOTPRINTS: ARCHAEOLOGICAL PARALLELS

In considering the significance of the astronauts’ traverse across a small area of the Sea of Tranquility, an archaeological parallel has been made repeatedly between their footprints in the lunar regolith and those of two or three hominids (probably australopithecines) found petrified at Laetoli, Tanzania, in 1978 (e.g. [15, 29, 31, 52]). These hominids had crossed an area of ground that had just been coated in a soft layer of volcanic ash (e.g. [15, 29, 31, 52]). These hominids had crossed an area of ground that had just been coated in a soft layer of volcanic ash about 3.6 million years ago [53]. Today, they are covered by a mound specially constructed to protect them from damage by trampling, burrowing animals, plant roots and erosion. An earlier attempt to preserve the site at Laetoli was found only partly effective because root systems had penetrated to the footprint layer. Although new technology may be more successful in preserving these ancient footprints, it is clear that periodic monitoring of the site may help reduce the risk of further damage. At least the hominid footprints are preserved in a petrified soil layer—those of Aldrin and Armstrong are impressed into the fine, dry, powdery dust of the lunar regolith and so must be quite fragile. Hordes of space-suited tourists flocking to see the remains at Tranquility Base therefore must never be allowed to get too close to the site or else these historic footprints would be trampled into oblivion.

The significance of the Armstrong/Aldrin footprints is not so much archaeological as it is historical. It is known why and by whom the footprints were made so it is likewise unnecessary to speculate as to what species of human they belonged or even why the prints were made with booted rather than bare feet. Instead, the prints are significant because they record in a physical medium (rather than a photographic, video-based, or textual one) an historic event that represents a huge shift in the intellectual and technological development of humankind. However, it should be borne in mind that just as the US flag left behind at Tranquility Base was knocked over by the blast of the Lunar Module’s ascent engine [5], it is also possible that many of the footprints were destroyed or obscured by dust disturbed in the same blast.

The fragility of the Tranquility Base footprints can be paralleled by another prehistoric example, the circa 4,500-year-old footprints left by “a group of prehistoric cavemen” in the moist mud floor of Jaguar Cave, Tennessee, in the United States. A recent report describing the site and the conservation issues surrounding the footprints indicates that the deposits forming the cave floor remain pliable, making “the prints’ preservation vulnerable to subsequent events, agents and processes” [54].

Because of the regolith’s powdery nature, coating or impregnating the ground at and around the site with a heat and radiation-resistant resin might offer the best protection for preserving the shape and distribution of the footprints but not, of course, their original fragility. While this might protect the site from trampling by space-suited feet, some other means would be needed to protect it from a large meteoritic impact (if this is even possible to do). Whatever measures are taken to preserve the site, archaeological conservators might be able to draw upon their expertise to advise on the conservation of these historic lunar footprints, though clearly such a feat in an alien and hostile environment must represent an immense challenge to the individuals involved (not to mention those funding them!). As the likelihood of the commercial exploitation of the Moon increases with time, especially as the costs of space travel come down [3, 38, 40], the opportunity to conserve and legally protect Tranquility Base (and, indeed, other space heritage sites) before the advent of space-faring souvenir-snatchers and lunar miners will gradually recede.

8. CONCLUSION

To date, space heritage literature has been dominated by awareness-raising papers and, to a lesser extent, by compilations of lunar/planetary inventories of spacecraft landing and crash sites. In the process, archaeologists and space professionals, speaking largely for and to different audiences, have to some extent duplicated each other’s efforts. More communication between them, as the British Interplanetary Society’s “Archaeology for Space” symposium facilitates, may bolster their common aim – the protection of space heritage. Now that pleas for protection have been made in different disciplines, is it not time for the politicians to take notice and act to make that protection a reality?

REFERENCES


27. G. Fewer, "Space heritage sites" (correspondence), Spaceflight, 40(8), pp.286, 1999.


41. R. Madeley and J. Finningan, Richard & Judy (television show broadcast on Channel 4, United Kingdom, 13 December 2005).


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Tranquility Base, the spot where humans first set foot on the moon, isn’t the only thing of interest to space archaeologists. Vanguard 1, and the upper stage of its launch rocket, are the oldest human-made objects still in space -- part of a cloud of space junk that circles the Earth. It was launched in 1958 and would be a fascinating relic, Gorman said. More historic missions are on the horizon -- the first settlements on the moon or Mars for example -- but it would be impossible to preserve all these sites as monuments. Gorman said a “reasoned decision-making process” was needed. Sovereignty "Conserving space heritage: The case of Tranquility Base". Journal of the British Interplanetary Society. 60: 3â€“8."  

[permanent dead link] Terms of reference for the Space Heritage Task Force written by Alice Gorman and John B Campbell (2003). Beth L. O’Leary, et al.: Archaeology and Heritage of the Human Movement into Space. Springer, Cham 2015, ISBN 978-3-319-07865-6. Tranquility Base, in reality, is the site of the first lunar landing. But whether we’re actually talking about a sort of hotel-casino complex on the moon or not is debatable. I like the idea that the record be named after a place. It isn’t something that I’ve done before, but I do consider many of my favorite records almost being like places that you can visit.”