

California to vote on naming Apollo 11's garbage a historical resource

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When the Apollo 11 astronauts blasted off from the moon, they left behind not just the small steps of men but a giant pile of equipment and junk for all of mankind.

Some of the 5,000 pounds of stuff [Neil Armstrong](#) and Buzz Aldrin abandoned at Tranquility Base was purposeful: a seismic detector to record moonquakes and meteorite impacts; a laser-reflection device to make precise distance measurements between the Earth and moon; a U.S. flag and commemorative plaque. Some was unavoidable: Apollo 11's lunar module descent stage wasn't designed to be carted back home, for instance.

The rest was cast aside to lighten the load of the Eagle lunar module and allow for takeoff. To compensate for the weight of [moon rocks](#) and [soil samples](#), the astronauts gave the heave-ho to more than 100 items, creating a veritable yard sale of high technology and lowly debris. Space boots and portable life support systems. The arm rests from their cockpit seats. A hammer, scoops, cameras and containers. Tethers and antennas. Empty food bags and bags filled with human waste.

Low-impact campers they were not.

"They were told to jettison things that weren't important. So they starting tossing stuff," said Beth O'Leary, an assistant professor of anthropology at New Mexico State University and a leader in the emerging field of space heritage and archaeology. "They were essentially told, 'Here's eight

minutes. Create an archaeology site.' "

There are countless places on Earth that have been awarded protection to preserve their historic or cultural importance. The moon has none. But that may be about to change.

California is poised to become the first state to register the items at Tranquility Base as an official State Historical Resource. If the State Historical Resources Commission approves the idea at a meeting in Sacramento, Calif., on Friday, it would be a victory for scientists who want to build support to have Tranquility Base designated a United Nations World Heritage Site in advance of what they believe will be unmanned trips to the moon by private groups, and even someday by tourists. Proposals to place the items on historic registries in Texas and New Mexico are planned for later this year.

"There's a really good chance that we will be up there again in the next decades," said Jay Correia, a California state historian who manages the registration process. "It's one of the most important historic events in the history of mankind. A first glance, it seems bizarre to even talk about it. But we have to talk about it. Can you imagine someone driving a cart over Neil Armstrong's first footprint? Wouldn't that be terrible?"

Because of the moon's lack of an atmosphere, Armstrong's left boot print remains in the gray powder just where he planted it at 7:56 p.m. Pacific time on July 20, 1969 -- a mind-blowing moment watched by hundreds of millions of television viewers worldwide.

How to preserve such a treasure is a top priority for the space heritage movement. A loose group of engineers, historians and anthropologists, they regard the Space Age the way other scientists do the Stone Age. It is an epoch of technological advancement and human exploration that will be studied for generations to come.

More than 27,000 tons of rockets, probes and satellites have been hurled into space. The moon is the grandmother's attic of space junk, home to remnants from six manned Apollo missions and unmanned missions launched by the United States, the former Soviet Union, the European Space Agency, Japan and India.

"We lose a lot of stuff every day on Earth because of neglect, vandalism and erosion," O'Leary said. "As things are destroyed, we lose part of our knowledge about the past. On the moon, if you take the long view -- say, 100 years out -- there's a good risk that we will lose the information that is sitting there."

O'Leary is one of the founders of the Lunar Legacy Project, which cataloged the items at Tranquility Base by scouring government archives. She was drawn to the issue in 1999 after a student asked her an intriguing question: Can federal preservation laws be applied to the moon?

The short answer: It's complicated.

The United States is a signatory to the Outer Space Treaty of 1967. While its delightful name suggests a truce between Flash Gordon and Ming the Merciless, its provisions are serious and clear. Nations own the objects they put into space, no matter where they land. But they cannot claim sovereignty over any part of space.

It's similar to the international Law of the Sea and the reason space heritage advocates are concentrating efforts on protecting the items left behind by Apollo 11 -- not the site itself. The reason they're targeting state historical registries, O'Leary said, is because federal officials believe they don't have jurisdiction.

Correia says California law allows listing historical resources beyond the

state's borders -- even if it's more than 238,000 miles away. And, he notes, California's connection to the Apollo program -- from the Jet Propulsion Laboratory to aerospace companies that did contract work -- is undeniable.

Discarded artifacts on the moon hold plenty of useful scientific information. Apollo 12's [astronauts](#) understood this. When they landed near the Surveyor 3 lunar probe, which had been on the moon for more than two years, they removed hardware from the craft, including its video camera, and brought them back for analysis. The camera is on display at the Smithsonian's Air and Space Museum in Washington D.C.

Much of the hardware for the moon missions were one-of-a-kind designs, and documentation on the "craft aspects" -- the retooling and tweaking of equipment by hand -- no longer exists, said Allan Needell, the Smithsonian's curator for the Apollo program.

"For instance, the heat shields were filled in by hand and defects had to be drilled out and fixed by hand," Needell said. "These were things that were learned on the floor on the fly. ... The machine tools that were used no longer exist."

NASA engineers working on the next generation of space flight routinely visit the Smithsonian to study equipment made decades ago_a wheel from a lunar rover that utilized piano wire, or the mechanism for the unfolding legs of a lunar module. Much of what they examine are training or testing versions of items used in space.

Items that were actually on the moon are rare as condors.

Of the approximately 100 items from [Apollo 11](#) at the Smithsonian, Needell said, only the space suits worn by Armstrong and Aldrin and some containers logged any moon-time.

"It wasn't NASA's mission to provide museums with materials," he said. "For every ounce of hammer they didn't bring back, there was an extra ounce of lunar sample that they could."

There are only two people who have first-hand knowledge of how items were chosen to be discarded. Aldrin, who at 80 is a globe-trotting speaker, entrepreneur and author, says much of it was planned in advance. But plenty of stuff was discarded on the fly.

Items he regrets leaving are his and Armstrong's lunar boots -- tossed because of contamination concerns.

"My wife constructed a title for a movie or a book -- 'They Left Their Boots on the Moon,' " Aldrin said.

He says any move to preserve Tranquility Base should be done in concert with a badly needed rethinking of international space law to create "a unified space vision" on issues of future exploration, commercial development, property rights and security.

"Certainly there is value there from a historical and cultural perspective," Aldrin said.

Well, maybe not everything there.

"You think anyone wants the urine bags?" he said with a laugh.

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