Is space the next frontier for archaeology?

In the past 60 years, humans have left a lot of stuff on other worlds or floating in space. We’ve landed (or crashed) spacecraft on Mercury, Venus, the Moon, Mars, Comet 67P/Churyumov–Gerasimenko, and Titan. Along with the hundreds of objects in orbit around Earth, the Moon, and Mars, those spacecraft provide a physical record of human activity that could outlast some of the most ancient ruins here on Earth.

Further Reading

After orbiting Saturn for 13 years, Cassini has become part of the planet

“There’s stuff in orbit, particularly in middle to high orbits, that’s up there for thousands or even millions of years,” said Flinders University space archaeologist Alice Gorman.

Luckily, just as archaeologists back here on Earth take interest in the remains of decades past beneath us, some in the industry have started pursuing a similar curiosity in what’s above our pale blue dot. And, accordingly, a branch of archaeology has emerged that wants to bring the study of humanity’s past into the future.

Linking the Stone Age to the Space Age

In 1969, Buzz Aldrin and Neil Armstrong spent their last eight minutes on the lunar surface on the steps of the Eagle tossing things overboard: armrests, overshoes, urine containers, and anything else they thought they wouldn’t need for the trip back. They’d been instructed to discard as much unneeded weight as possible to make up for the 50kg of lunar rock and regolith samples they had picked up, and their lives depended on getting it right.

Further Reading

The Greatest Leap, Part 3: The triumph and near-tragedy of the first Moon landing

There’s no detailed official inventory of everything they threw overboard, although New Mexico State University archaeologist Beth O’Leary and her colleagues have compiled a thorough list in retrospect. The pile of discarded objects to the west of the Apollo 11 landing site offers physical evidence of the astronauts’ thought process in those crucial moments. It also forms a tangible link to a life-or-death human drama. And that, according to the growing number of archaeologists interested in off-world sites, underscores the value of archaeology in space.

“Looking at these technologies as an archaeologist rather than an engineer gives you a whole other perspective—you fall in love with the stories rather than the bits of metal,” said Gorman.

Space archaeologists acknowledge their field is similar to recent excavations of the Antarctic base camps of Shackleton and Mawson. Those explorers, too, left behind extensive written accounts of their adventures, but much of the unwritten story is left behind in the places they lived and the objects they used—and discarded.

And there are Space Age archaeological discoveries yet to be made—lost spaceship wrecks and gleaming metal ruins waiting to be found and explored. Among the lost ships of the Space Age are the first spacecraft ever to land on the Moon, the Soviet Luna 9 lander, and the American Surveyor 4 lander, one of the precursors to the Apollo missions. Finding these missing spacecraft can solve some historical puzzles about their fate and fill in gaps in the story of space exploration. For instance, no one is sure why Surveyor 4 crashed; perhaps it plummeted the final 20 kilometers to the Moon’s surface or maybe it executed a perfect landing only to have its radio transmitter malfunction.
“We don’t know what happened to it, and being able to find it might answer that question,” said Western University geographer Phil Stooke, who maps human activity on Mars and the Moon.

In that sense, the emerging field of space archaeology may share a common thread with nautical archaeology. After all, shipwrecks, polar base camps, and abandoned spacecraft are all pieces of the same broad, sweeping story: human exploration. Humans evolved as tool-users and explorers, and eventually we built the tools to cross oceans and then travel to other worlds. The lunar landers are part of the same human story as the first rough-hewn stone tools, the first campfire, the first boat, and the first domestic animals.

“We can’t pin down when the first human learned to use fire and changed the world,” said Charles Sturt University cultural heritage management professor Dirk Spennemann. “We don’t have any location or point in time we can pinpoint as nicely for one of the big steps of human evolution. We have rough dates and locations, but we don’t have a date, a point, and a person. We do have that for Apollo 11, so everything associated with that one is of significance for all of humanity.”

Archaeologists in spacesuits?

Scientists have been part of NASA missions since geologist Harrison Schmidt joined the Apollo 17 crew as an expert to study lunar geology. And there’s hope future space missions may include archaeologists as science specialists, just as today’s missions include engineers, chemists, or biologists. “I think at some point they’ll need an archaeologist,” said O’Leary. “I’m a little old to go up there, but I would go.”

Although there has never been an archaeologist in space, astronauts may have already done archaeological work on the Moon. On the Apollo 12 mission, astronaut Alan Bean removed the television camera and other components from the Surveyor 3 lander, which had been on the Moon since April 1967. Pennsylvania State University archaeologist P.J. Capelotti wrote in his 1996 dissertation that the Surveyor 3 salvage was the first example of lunar archaeology.

Of course, not everyone sees it that way. Capelotti once ran the idea by Pete Conrad—the astronaut who photographed Bean at work.

“I said, ‘Did you realize you were doing archaeology on the Moon?’ and there was this long pause at the other end of the phone, and he finally said no,” said Capelotti. “He considered it a kind of kooky idea.”