Episode Book

EPISODE #5714

The Moon's Junkyard Has a Gift Shop

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SYNOPSIS

There are roughly 3,000 human-made objects on the Moon — about 150 tons of hardware, trash, and souvenirs, almost all left without ceremony. But on a single square meter of regolith at Tranquility Base sit two artifacts with completely opposite design philosophies: an off-the-shelf nylon flag bought for five dollars and fifty cents, and a silicon disc etched with goodwill messages from 73 nations and four U.S. presidents, built to survive for thousands of years. This episode digs into the inventory, the frantic month-long rush to manufacture the disc at GCA Corporation and Sprague Electric, the near-miss when Buzz Aldrin almost kept it in his spacesuit pocket, and the messages themselves — from Liberia's president addressing the Moon's hypothetical inhabitants to Ivory Coast's sermon to the astronauts. It also asks the question a listener named Daniel raised: was the disc ever meant for extraterrestrial eyes? The answer is more political than cosmic.

TRANSCRIPT



Corn

There are, by the most careful count anyone's bothered to make, something like three thousand artificial objects sitting on the Moon. About a hundred and fifty tons of hardware, trash, and souvenirs.



Herman

And almost all of it was left by accident, or at least without much ceremony.



Corn

Daniel sent us a prompt about the one exception. Or the closest thing to an exception. He'd been thinking about that episode on Russia planting a flag under the North Pole, and the Apollo flag precedent that came up in it — the idea that adventuring states have always planted flags as a matter of course, even when the gesture later comes to look a bit insincere.



Herman

He took that personally, I gather.



Corn

He did. He was disappointed to find out the Apollo flags were nothing special. Ordinary material, ordinary poles, and by now they're probably ruined. But he noticed that the missions did leave one thing meant to survive: a tiny silicon disc, carrying messages from world leaders, sitting up there by the Sea of Tranquility. And he wants to know whether it was ever actually intended for extraterrestrial eyes — because he can't figure out how anyone up there would read it. He also says it sounds less like a time capsule and more like a specific series of messages from specific heads of state, which I think is exactly right.



Herman

And then he wants the inventory. What else is up there, and what are the colorful moments nobody talks about.



Corn

So let's start with the inventory. What exactly is sitting up there, and what was it all for?



Herman

The Apollo 11 site alone has about a hundred and sixty-five catalogued objects. Four and a half tons. Apollo 17 left roughly seven hundred objects — five and a half tons. So the picture in your head of a pristine wilderness with one small flag on it is wrong. It's a junkyard with a gift shop.



Corn

Two things in that junkyard are the whole episode, though. On the same square meter of regolith you've got the flag and the disc. Those are two completely opposite design philosophies sitting next to each other.



Herman

Deliberately opposite, in a sense. The flag was never meant to last. Off-the-shelf nylon, bought from a government supply catalogue, five dollars and fifty cents, and nobody at NASA lost a minute of sleep over what it would look like in a hundred years. The disc was the other thing entirely. Ninety-nine percent pure silicon, messages reduced two hundred times, built to sit there for thousands of years.



Corn

Built to last. Not built to be read.



Herman

That's the tension. There's no translation key on it. No Rosetta Stone, no diagram, no universal grammar of any kind. It's a message in a bottle with no shared language between sender and finder.



Corn

Which is a strange thing to build on purpose. Let's take the disc first, because there's a lot more to it than people realize.



Herman

It's about the size of a fifty-cent piece. An inch and a half across, roughly thirty-eight millimeters. Fourteen mil thick. It sits in an aluminum case. And the inscription at the top reads, "Goodwill messages from around the world brought to the Moon by the astronauts of Apollo 11." Around the rim: "From Planet Earth, July 1969."



Corn

And on it?



Herman

Goodwill statements from four American presidents — Eisenhower, Kennedy, Johnson, and Nixon. Messages from the leaders of seventy-three countries. A listing of Congressional leadership, the four House and Senate committees that oversaw NASA legislation, and NASA's past and present top management. Pope Paul VI's message from the Vatican has a gold ornate frame around it and sits at the center of the disc.



Corn

The Pope gets the center.



Herman

That's diplomacy.



Corn

So what does a message from a world leader look like at that scale?



Herman

This is the engineering part, and it's impressive. Each message was reduced two hundred times. The full message ends up smaller than the head of a pin — forty-two and a half thousandths of an inch by fifty-five thousandths. The letters are no larger than a quarter of the width of a human hair. You can't see it with your eye. You need a microscope.



Corn

How do you even make something like that?



Herman

GCA Corporation in Burlington, Massachusetts used a reduction camera to make a negative photomask. Sprague Electric Company in North Adams, Massachusetts then imaged and etched it onto the silicon wafer. And Sprague actually took out a patent on the lithographic thin-film technique — patent number three million, six hundred seven thousand, three hundred forty-seven, if you're the kind of person who keeps track.



Corn

And how much time did they have?



Herman

Almost none. This is the part that gets me. The State Department only authorized NASA to solicit the messages in June of 1969. That's about a month before launch. NASA contacted a hundred and sixteen countries. Seventy-three got their messages back in time.



Corn

Which means forty-three heads of state missed the deadline for the Moon.



Herman

And presumably went to their graves knowing it. NASA delivered the letters on the Fourth of July. Sprague finished the first printing at three in the morning on July fifth. Then on July ninth, they got told to start over with eight additional messages. They redid it. The final disc was delivered to Houston at three thirty in the morning on July eleventh. Five days before launch.



Corn

Ray Carswell, one of the Sprague engineers, said — and I want to get this right — "It was a rush to get it done. We slept on lab benches for two days in a row."



Herman

John Sprague, who ran the semiconductor division, said, "Crash course is an understatement. We had almost no time to put this together." You can hear him saying it through his teeth forty years later.



Corn

So the single most durable human artifact on the lunar surface was made in a panic, by people sleeping on benches, because somebody in Washington had a nice idea in June.



Herman

That's the disc. And then it almost stayed in Buzz Aldrin's pocket.



Corn

Explain that.



Herman

The disc traveled up in Aldrin's spacesuit sleeve pocket. Aldrin climbs the ladder to re-enter the Eagle, and Armstrong suddenly remembers it. He says, "How about that package out of your sleeve? Get that?"



Corn

And Aldrin says?



Herman

"No... want it now?" And Armstrong says, "Guess so." So Aldrin tosses the package down, and Armstrong nudges it with his foot. And that's it. "Okay?" "Okay." That's the ceremony. As one account put it, that's all the pomp and circumstance the disc would ever receive.



Corn

That is the most human thing I've heard all week. The grandest gesture in the history of the species, and it gets delivered with a foot.



Herman

Owen Garriott, the CAPCOM, later radioed up to confirm the disc was on the surface "as planned." Which it was. Barely.



Corn

And Aldrin knew. Years later he said, "Neil Armstrong and I almost forgot to leave the silicon disc on the Moon." Then the line that's been quoted a thousand times: "The disc will last on the lunar surface for thousands of years."



Herman

Almost certainly true. The temperature swings on the Moon run from about two forty-two Fahrenheit in the day down to minus two hundred eighty at night. Over the last forty-some-odd years that's roughly five hundred temperature cycles. Silicon handles that. Silicon is what we build everything out of, and it does not care about a nice breeze.



Corn

So what did the leaders actually write? Because I imagine most of it is fairly anodyne.



Herman

Most of it is. But there are three or four that are worth hearing. Liberia's President Tubman came closest to addressing extraterrestrials directly. He wrote: "I ask them to bear this message to the inhabitants of the Moon if they find any there. If they do not, it is my desire that this message be one of greetings from the people of Liberia and myself to the Moon, Nebulous satellite of the Earth." He capitalizes "Nebulous."



Corn

He's hedging. He's covering both audiences in one sentence.



Herman

He's the only one who bothered to compose for the possibility. Ivory Coast's President Houphouët-Boigny wrote an instruction to the astronauts themselves. He asked them to "turn towards our planet Earth and cry out how insignificant the problems which torture men are, when viewed from up there."



Corn

That's not a goodwill message, that's a sermon. He's using the Moon as a pulpit.



Herman

Trinidad and Tobago's Prime Minister, Eric Williams, wrote: "It is our earnest hope for mankind that while we gain the Moon, we shall not lose the world."



Corn

That one's actually good.



Herman

It's very good. And Mexico's President Ordaz went historical. He wrote: "In 1492, the discovery of the American Continent transformed geography and the course of human events. Today, conquest of ultraterrestrial space recreates our perspectives and enhances our paradigms."



Corn

Nobody in 1969 was thinking about the optics of that analogy.



Herman

Not the way we would.



Corn

Right. But here's the thing about the disc that I think Daniel's really circling. It's built to last. It has no translation key. And the messages are in what — a bunch of different human languages and scripts?



Herman

Chinese, Arabic, Hebrew, English, French, Spanish, and so on. All of them legible only under magnification. Any non-human reader would face an undeciphered-language problem with no key of any kind. And there's no evidence anywhere that anyone at NASA, or at the State Department, or at Sprague, designed the disc to be read by anything but a future human with a microscope.



Corn

So the answer to Daniel's question is probably no.



Herman

Well — I want to be careful. The collectSPACE writeup on the disc, written decades later, describes it as "messages left for future humans, or other creatures, to decipher." And you can find modern retellings that reproduce that framing.



Corn

But that's a modern parenthetical.



Herman

That's a modern parenthetical. I couldn't find any 1969 source describing extraterrestrial intent as a design goal. Everything contemporaneous describes it as a goodwill and commemorative gesture. And the reason for that is quite specific and quite political.



Corn

It's a Cold War artifact.



Herman

There's a plaque on the descent stage that reads, "We came in peace for all mankind." It's a lovely line. It was also deeply contested. The Outer Space Treaty of 1967 forbade territorial claims, and Congress was putting pressure on NASA to do something overtly American. So you get a flag and a plaque and a goodwill disc — the flag for Congress, the plaque for the lawyers, the disc for the other seventy-two nations.



Corn

The disc is a diplomatic fig leaf.



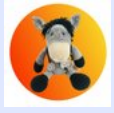
Herman

It's a diplomatic fig leaf. Which doesn't diminish it. Fig leaves are how a lot of civilization actually gets done.



Corn

Now let's talk about the thing everyone actually remembers. The flag.



Herman

Five dollars and fifty cents.



Corn

Robert Pearlman, who edits collectSPACE, put it about as bluntly as anyone could. He said, "We didn't design a special American flag to go to the moon to last thousands of years. They literally sent out a secretary to the nearby Sears and bought an off-the-shelf flag and modified it."



Herman

Annin, the flag company in New Jersey, made it. They sold it to NASA for five fifty. And the historian Anne Platoff said the quiet part out loud: "It wasn't the intention for the flag material itself to last. It was just to be there during the event."



Corn

So the flag was a prop.



Herman

The flag was a prop. And a prop does its job. It doesn't need to do anything else.



Corn

And the current condition?



Herman

Apollo 11's flag is definitely down. There's no ambiguity there. The Lunar Module's ascent exhaust knocked it over on liftoff. Aldrin watched it happen. He said, "I looked up long enough to see the flag fall over." And when the Lunar Reconnaissance Orbiter photographed the site, there's no flag shadow where the flag used to stand.



Corn

At the other sites?



Herman

Apollo twelve, sixteen, and seventeen — strong flag shadows in the LRO images. Those flags are still standing. Apollo fourteen and fifteen are ambiguous. So it's site by site.



Corn

And what's happening to the nylon itself?



Herman

Unfiltered ultraviolet. If any of it survived the thermal cycling, they expect it to be bleached white. Brittle, possibly disintegrated. Dennis Lacarrubba at Annin said, "I can't believe there would be anything left. It's gonna be ashes." Mark Robinson, the principal investigator for the LRO Camera, said, "Personally, I would be surprised if there's anything left on them. If the flags are still there, they're probably in pretty rough shape."



Corn

He was careful, though. He said "if."



Herman

He said "if." Nobody actually knows. All of this is inferential. The only instrument anyone has is a camera in orbit, and the shadow tells you whether the pole's still up, not whether the fabric's still fabric.



Corn

So the honest answer to Daniel is, we have a strong suspicion, not a fact.



Herman

Strong suspicion. Every Apollo flag was made by the same company, from the same kind of material, in the same year. Six flags, one supplier, forty years of UV.



Corn

Now Daniel's actual question, the one buried in all this. Did anyone think aliens would read the disc? I think we've got a strong answer.



Herman

The answer is no, and I want to be precise about why the answer is no, because the disc suggests something different. Whoever put the disc together had two goals and only two. It had to last, and it had to be legible to a human being with a microscope in a hundred, or a thousand, or ten thousand years. That's engineering for comprehension.



Corn

And they failed at the second one? They didn't include a key.



Herman

They didn't need to. A human being in the year ten thousand is still a human being. He speaks a descendant of one of these languages, or he can learn one. He has continuity with us. A foreign intelligence doesn't.



Corn

So the disc is precisely engineered to a specification it happens to meet if the reader is human, and fails entirely if the reader is anything else.



Herman

Yep. And the fact that nobody at NASA seems to have written down "what if the reader isn't human" is itself informative. I think people assumed that question was somebody else's problem. It was in the era's ambient fiction, but not in the era's actual engineering documents.



Corn

Which makes Daniel's other comparison land harder. He said it sounds less like a time capsule and more like a specific series of messages from specific heads of state. And that's exactly right, because a time capsule is meant for the future, generically. This is a set of individually signed letters. It's a guest book.



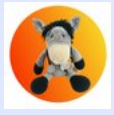
Herman

A guest book is the right analogy. And here's where it gets uncomfortable, because of who signed it.



Corn

Go on.



Herman

One reviewer, FFrench, looked at the actual list of seventy-three signatories and called it "a rogue's gallery of dictators, coup winners, corrupt tyrants." And he's not wrong. Mobutu. Ceaușescu. The Shah of Iran. Somoza. Marcos. Park Chung Hee. Many of them were later deposed, discredited, or shot.



Corn

I'm going to say the obvious thing once and then we can move on. The disc is a peace message signed by a fair number of people who were actively making war on their own populations at the time.



Herman

It is. And the disc doesn't care. That's the beautiful and the strange thing about both silicon and the Moon. It records without judging. Whatever was true in July of 1969 is still there, exactly as it was written, and history has since had quite a lot to say about most of the people who wrote it.



Corn

Does the disc indict the signatories, or does it just date them?



Herman

I think it dates them. And I think the parts of it that date worst are the parts where the writers were reaching for something. That's always the way with documents like this. The safe sentiments hold up. The grand ones curdle.



Corn

There's a great irony here that I don't think we've landed yet. The company that made the disc was Sprague Electric. Same company made firing capacitors for the atomic bomb.



Herman

They did. Sprague had fifty-three thousand components across the Apollo 11 spacecraft. And they'd built parts that ended up in the bomb dropped on Hiroshima. A peace message to the future, manufactured by a weapons contractor.



Corn

Which is, I mean, what humanity is. There's no cleaner summary.



Herman

There's a cleaner one I like more. The disc was made by a company whose real business was capacitors and resistors, on a rush order, by engineers sleeping on benches, using a camera the company had bought for a different purpose. If you wanted to build a message meant for aliens, that's not how you'd do it. But if you wanted to build a message that was actually going to get made on time, that's exactly how you'd do it.



Corn

Okay. Other artifacts. Daniel asked about the colored, rarely discussed stuff. Give me the tour.



Herman

Apollo 11 itself, alongside the flag and the disc: a gold olive branch as the symbol of peace. An Apollo 1 patch carried up to honor Grissom, White, and Chaffee. Two Soviet cosmonaut medals — one for Yuri Gagarin, one for Vladimir Komarov, who died on Soyuz 1. And the laser ranging retroreflector.



Corn

Which is the only one that's still doing anything.



Herman

The only one that's still doing anything. That's the piece of equipment that still gets pinged by observatories on Earth and returns a signal. Every other Apollo experiment has long since stopped working. This one has been quietly measuring the Earth-Moon distance for half a century and, as far as we can tell, still works.



Corn

It's the only functional Apollo component still in service.



Herman

On the lunar surface, yes. That's an extraordinary run. But it's not the poetic one.



Corn

Go on.



Herman

Apollo 15 left the "Fallen Astronaut." A tiny aluminum figurine, about three inches tall, sculpted by a Belgian artist named Paul Van Hoeydonck. It's a stylized human figure lying on its back. Beside it is a plaque with fourteen names — eight NASA astronauts and six Soviet cosmonauts, all of whom had died in the course of their work up to that point. Grissom, White, Chaffee, Gagarin, Komarov, and the others.



Corn

That one gets me.



Herman

Van Hoeydonck got into an argument with NASA afterward because the agency had assured him nothing would be commercialized and then some replica arrangements happened. So it's got a slightly bitter afterlife. But the piece itself is a memorial left on the Moon, by the crew of a mission, to dead colleagues from their own side and the other side.



Corn

During the Cold War.



Herman

Which is the kind of thing that, when you read it back now, feels impossible. The plaque is small. Two and a half inches on a side, on the surface. Most people have never heard of it.



Corn

Then there's Shepard and his golf balls.



Herman

Apollo 14. Alan Shepard smuggled a golf club head and two balls up on the mission — and pulled it out at the end of the surface EVA. He hit the first ball, and he hit the second ball.



Corn

And?



Herman

And he said they went "miles and miles and miles." They didn't. In the one-sixth gravity, the first ball went maybe two hundred yards, and the second ball — this is the charming part — he mishit. He topped it. It probably didn't go more than a couple dozen yards. And the balls were never retrieved. They're still up there somewhere near the Apollo 14 site.



Corn

Two golf balls on the Moon, one of which is a duff.



Herman

And on Apollo 15, David Scott did the hammer-and-feather experiment. He dropped a geological hammer and a falcon feather from the same height at the same moment, and they hit the ground simultaneously — confirming what Galileo had predicted about air resistance. Both stayed where they fell.



Corn

That's the one I'd want to bring back. The feather.



Herman

The feather is the one that matters scientifically. The golf balls are the one that matters culturally. And somewhere up there is a bag of human waste products, which also matters, but for different reasons.



Corn

Now — Daniel was disappointed in the flags. And I think the interesting response to that disappointment is: it's the wrong thing to be disappointed about, and the right thing to have noticed. The disc is smaller than the flag. It's less photogenic. It's almost impossible to see. And it's going to be there ten thousand years after the flag is ashes.



Herman

Daniel's instinct that the disc is less like a time capsule and more like a set of signed letters is the key insight for me. Because a time capsule is an act of faith in the future. This was an act of diplomacy in the present, dressed as something grander.



Corn

So it's propaganda that happens to also be the most durable thing humanity has ever left anywhere.



Herman

Yes. That is exactly what it is.



Corn

There's one more piece of this Daniel didn't ask about, but we should probably mention, because it's coming.



Herman

Preservation.



Corn

There are more than a hundred missions planned to the lunar surface by 2030. And the Apollo sites are where everybody wants to go.



Herman

Michelle Hanlon, who's a space lawyer and runs For All Moonkind, has said, "Our history is the most valuable and most vulnerable resource we have on the moon right now." The Artemis Accords — there are forty-three signatories — acknowledge "outer space heritage" as a thing. But they're non-binding. They don't have enforcement teeth. And with private landers, and tourists, and the parts of the Moon everybody wants to visit being exactly the parts where the Apollo sites are, the sites are at risk.



Corn

From landing damage. From dust kicked up. From illegal artifact retrieval.



Herman

From somebody walking off with a chunk of an old thermal blanket and putting it on eBay.



Corn

Tahir Rahman, who wrote the book on the disc, said, "The disc is on silicon, which is the basis of our current century. It should stay right there."



Herman

I agree with him. And I think the disc is the one everybody's going to want. It's tiny. It could fit in a pocket. It's got messages from seventy-three world leaders on it. There's no scenario in which its current location is anything but a problem for the people who want to protect it.



Corn

Which raises a slightly odd question. If the disc is going to sit there forever, is anyone ever going to read it again?



Hilbert

I've got the camera in a storage unit in Netanya.



Corn

Sorry?



Hilbert

Not that exact one. Same model. GCA reduction camera, the big one with the vacuum chuck. About four hundred kilos of it. I walked into a government surplus lot outside Tel Aviv in '97 and there it was sitting next to a pallet of typewriters.



Herman

Hang on. The GCA reduction camera is what made the photomask for the disc.



Hilbert

Same maker. Same lens setup. You smell the photoresist before you see the machine. It's a sweet, chemical smell, like a hospital floor. And the operator's table is on isolators, so you can't tap your foot. You breathe through your nose. Everyone in the room knows the rules.



Corn

And they slept on the benches.



Hilbert

You sleep on the benches when the run is on. You can't go home. If the humidity in the building changes overnight, you do the run again. That's the whole story. It's not mysterious.



Herman

So you're saying the disc made sense as a stack of processes.



Hilbert

It's a good plate. I'll say this — I don't think the men who made it were trying to talk to anybody. They were trying to make a good plate by Friday.



Corn

Which is what Daniel's actually asking about. Whether there was intent.



Hilbert

There was intent, just not that kind. The intent was: somebody in an office said make this, and a company in North Adams said we can, and a man with a loupe checked the dots, and they shipped it. The disc was made the way you make any plate. It was going on the Moon because it had to. The people making it couldn't care less who read it.



Herman

The wedding guest book.



Hilbert

Something like that.



Corn

And the disc almost stayed in Aldrin's pocket.



Hilbert

That's the honest part of the story. The disc was an afterthought. The flag was an afterthought. The plaque was argued over by lawyers. The only thing that wasn't an afterthought was the landing itself. Everything else — decoration. Good decoration. But decoration.



Herman

So the thing that outlasts every government that signed it was somebody's chore, completed on deadline, from a bench they slept on.



Hilbert

That's most of what lasts, in my experience.



Corn

Daniel's actual question was whether anyone thought aliens would read it. The answer's no. But I think Hilbert's just reframed the better version of the question, which is: does it matter whether anybody reads it at all?



Herman

And it becomes a different question entirely. If the point was the signing, not the reading, then the disc already succeeded. It succeeded the moment it got left. Everything after is a bonus.



Corn

Which is a weirdly reassuring thing to think about an object that's sitting up there, silent, in a case, on a gray plain, waiting for a reader who may never come.



Herman

And the reader it was probably written for — a human — is the one most likely to go and pick it up and take it home. Which is the only real threat it has.



Corn

Daniel's disappointment about the flags, I think, was misplaced — but in a useful way. It led him to the disc. And the disc is the actual story. It's a monument to goodwill, made in a hurry, signed by dictators, forged by a weapons contractor, almost forgotten on a ladder, and now probably the single most durable human artifact ever made. The flag is a gesture. The disc is a document.



Herman

And the document was almost a pocket lint.



Corn

One forward-looking thing to leave people with. The disc is almost certainly going to outlast every institution that created it, and every language its messages are written in. English, Chinese, Arabic, Hebrew — gone before it is. The one thing that will still be on that disc is a set of names of men who ran countries at a particular moment in 1969, in a language nobody has spoken for ten thousand years, on a plate nobody can read without a microscope and a dictionary that no longer exists.



Herman

Or one dictionary that does. If somebody, at some point, decides to bring the disc home and put it in a vault with its key.



Corn

Also true. That's the other ending. Whoever writes that dictionary will be writing it in Jerusalem or Houston, not on the Moon.



Herman

A review from you would help other listeners find the show, if you enjoyed this one.



Corn

Thanks to our producer, Hilbert Flumingtop.



Herman

This has been My Weird Prompts. We'll be back soon.



Corn

Email us at show at my weird prompts dot com.