

# PICTURES

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## 2 | ONE HUNDRED PICTURES, FROZEN IN TIME

Sometime around 1910, a storm near the French town of Montignac uprooted a pine tree, revealing a deep cavity in the earth. Local farmers quickly filled it up with sticks to prevent their sheep from falling in. Thirty years later, the story goes, a local woman removed the sticks so that she could throw her dead donkey into the hole. She watched as the beast's body fell into the darkness. The cavity was much larger than she'd expected. Believing that she'd uncovered an old underground passage leading to a nearby chateau, the woman spread word of her discovery around town.

Then, one day in September 1940, four boys set out to explore the underground passageway. They didn't find any secret Middle Age architecture, but they did find something remarkable. In the flickering torchlight, the boys could see animal figures covering the cavern's walls. The cave held a tapestry of prehistoric art that had been hidden for seventeen thousand years. The boys were enraptured. "Our joy . . . was indescribable," one of them recounted. Another told interviewer Georges Bataille that they "felt like someone discovering a treasure, a casket of diamonds or a cascade of precious gems."<sup>1</sup> The boys had discovered the cave at Lascaux, now recognized as one of the world's greatest prehistoric troves of art.

For much of the time I've spent researching the images and ideas for *The Last Pictures*, a print showing one of Lascaux's most enigmatic paintings has hung above my desk. I've looked at it every day and thought

about all the different things it could mean, if indeed it means anything at all.

### THE PIT

This particular painting lies in one of Lascaux's deepest recesses, past the Hall of Bulls, through the Passageway, and beyond the Apse, in a secluded corner that archaeologists and prehistorians have come to call the Shaft or the Pit. The image lies in utter darkness at the bottom of a fifteen-foot drop, where the air is thick with carbon dioxide. The painting is so strange that it's difficult to describe without unintentionally interpreting it. From right to left, there is a bison, its head lowered and tail raised. A circular shape hangs under the bison's abdomen. A line is drawn through (or over) the bison's rear section. In front of the bison is an ithyphallic stick-figure humanoid with an inordinately small and forward-pointing head. The bird-like head of the man had led some scholars to dub him the bird-man; others have called him the dead-man because he seems to be falling backward in front of the bison. Just below the bird-man or dead-man is a bird with a vertical line below it, drawn in the same stick-like style as the man. To the left is what looks like an incomplete painting of a rhinoceros facing away from the bird-man, bird-stick, and bison. Under the rhinoceros's tail are six dots, evenly arranged in two rows.

This Pit scene is unique. Prehistorian Norbert Aujoulat, who directed research at Lascaux for a decade, explains that the greater cave system contains 915 ani-



"The Pit," Lascaux

mal figures, 434 signs, and 613 depictions of indeterminate figures. In total, there are 1,963 representations. Of these nearly two thousand images—most of them without any obvious referent—the bird-man is the only humanoid.<sup>2</sup>

This Pit scene has several common interpretations. Abbé Henri Breuil reads the scene as a hunt gone wrong: a disemboweled bison and half-dead man are left in the wake of a rampaging rhinoceros, which is "moving away peacefully after having destroyed all that annoyed it."<sup>3</sup> Other scholars, notably Mircea Eliade and David Lewis-Williams, see shamanistic motifs in the painting:

"Sex is sometimes associated with shamanistic travel," explains Lewis-Williams of the bird-man's erection.<sup>4</sup> Jean Clottes adds to the shamanic interpretation of the Pit scene: "Death—that of the bird-man and the bison—is obviously a prominent theme of this mysterious panel, and the bird a significant motif. Traditional cultures often conceived of both death and shamanic trance as the flight of the soul from the body, which birds often symbolized."<sup>5</sup> Clottes adds that altered states of con-

sciousness might be involved, pointing out that the Pit is “a place prone to extremely high rates of carbon dioxide, which may cause hallucinations and acute discomfort.”<sup>6</sup>

My own interpretation of this painting changes from day to day, hour to hour, and is based on nothing more than letting my mind wander while staring at the print on my wall. My thoughts vacillate. Sometimes I see an image that’s profoundly unknowable. A painting from tens of thousands of years ago surely lies beyond some horizon of intelligibility. Such a painting, separated from the world that gave rise to it, can only elude interpretation. On those days, I question the act of trying to make sense of the painting. Does the concept of *sense* apply to such an image? Does the image have meaning, or does this image live outside the world of things that mean anything at all?

On those days, I see something profoundly unknowable, something utterly alien. Indeed, this is the opinion of Norbert Aujoulat, the person who probably knows Lascaux better than any other scholar: “[W]e have succeeded in identifying and decoding only a fraction of its message . . . [the painting] remains all the more difficult to grasp in that some of its numerous aspects lie on the threshold with the irrational.”<sup>7</sup>

If the painting lies beyond concepts such as meaning, representation, and intelligibility, then the prehistorians who’ve written so much about this image have done so in vain. Whatever this painting may have been is irretrievably lost, and nothing connects the present to the deep past from which this painting came.

At other times, however, the universe seems a little less profound, things seem more connected, and the image seems to speak. On those days, I can imagine that the painting captures something about the deeply intense relationship between a nearly naked human,

armed with little more than a few pointy sticks, and a bison, or humans’ relationship with nature in general. Perhaps this painting represents an erotic encounter with death, signified by the falling man and a disemboweled bison. But maybe the bison is not disemboweled at all, and the shape toward its rear legs is actually the bison’s penis and testicles or an engorged vulva. In this case, perhaps, the image is a lament over a fissure between humans and animals, and at the same time a celebration of the continuities between them.

But perhaps this is not a hunt scene at all. Perhaps it is, in fact, a murder confession. I can imagine a Cro-Magnon artist looking at the world around her, a world where humans had begun to systematically exterminate the megafauna with which they shared the land. Before long, mastodons, aurochs, cave lions, cave bears, woolly rhinoceroses, and most of the European bison would be extinct. Perhaps the painting shows a man enraptured and stimulated by the megadeath he has brought to the surrounding landscape. Perhaps the artist knew that killing the rest of the world was ultimately a suicidal proposition. Maybe this painting is hidden in the darkest recesses of a cavern because it is a secret admission of bloodlust and guilt, like the scrawled handwriting of a serial killer on a note to the police, half pleading, half taunting: “Stop me before I kill more; I cannot control myself.”<sup>8</sup>

Or not. Sometimes I imagine something far simpler—that the person who made it was simply insane. Or a big joke: the bird-man is drawn in a stick-like style because it’s the work of a prehistoric vandal; the sexually excited bird-man is like a penis drawn with a sharpie on a subway advertisement.

Finally, I’ve thought that this enigmatic painting may not have been intended for its own time at all, but per-

haps was intended for the far future. Maybe this painting was actually made for us. That would explain why it lies so deep in the recesses of a primordial cavern. Maybe the cave's depths are the prehistoric equivalent of outer space. Indeed, some prehistorians have hypothesized that the majority of unintelligible marks at Lascaux, the vast collections of dots and lines, are a coded guide to Cro-Magnon stars.<sup>9</sup>

The Pit painting may have been born out of futility and frustration. When the ancient artist or cave-cosmonaut set out to paint an image for the future, she may have realized the ridiculousness of such a proposition, the insanity of what she'd set out to do. And so she decided to paint an image that was insane. She could have imagined a time in the far future where her painting would be seen as a key to understanding "early humanity," and, realizing the absurdity of that, painted a picture to impart the following message to us: early humanity, whatever that is, is absurd. The painting's meaning might be precisely its own meaninglessness.

Maybe that is what we're supposed to learn from the Pit at Lascaux.

#### THE GREAT RING OF DEAD MACHINES

Communications satellites never cease to fill me with wonder and awe. I find them deeply strange, unsettling, and *untimely*. While they are powered up and active, these spacecraft route signals and broadcast media at the speed of light, connecting noncontiguous places across the globe to one another, creating new geographies. Images and sounds rush through their titanic hulls, which face down toward Earth from their position high above the planet. But when these electronic megaliths power down and die or use the last of their fuel to boost themselves into a graveyard orbit just above the

Clarke Belt, they become the stuff of a future real-life science fiction drama. They join a ring of dead spacecraft ruins destined to remain in Earth orbit until Earth is no more. Like other spacecraft, they will far outlast anything else humans have created.

This project, *The Last Pictures*, was inspired by the idea that we should take communications satellites seriously as the cultural and material ruins of the late twentieth and early twenty-first centuries. When Creative Time asked me to develop an idea for an artwork having to do with space, I proposed developing a cultural artifact and attaching it to a future ghost spacecraft. The artifact's message would be a story about what happened to the people who built the great ring of dead machines around Earth. The message would not be a grand representation of humanity. It would not be a portrait of life on earth. Instead, the message would be a riff on an observation made by the British historian Arnold Toynbee: "Civilizations die from suicide, not by murder."

I thought about the early Rapa Nui people of Easter Island, who erected iconic statues (Moai) that look endlessly up toward the sky. To create the ropes, timber sleds, ladders, and levers needed to move the Moai, the Rapa Nui felled every last tree on their island home. The deforestation decimated the local ecosystem, rendering Easter Island nearly uninhabitable. Maybe the early Rapa Nui understood perfectly well that their statues were a means of collective suicide and went ahead and kept building them anyway. Until they cut down the last tree to make the last rope to erect the last monolith.<sup>10</sup>

I printed out a text and stuck it on my studio wall: "How is it that we knew exactly how we were going to kill ourselves, and went ahead with it all anyway?"

The entire premise of the project was, of course, absurd. The idea that someone in the future might actu-

ally find the Artifact was close to nil. The notion that the message could actually mean anything at all seemed ridiculous. The message could only be a failure. For me, that wasn't the question. The question was whether it could be an *interesting* failure. The probability of the artifact having an audience in the far future was almost nil, but the probability of people on Earth thinking about it here and now was guaranteed.

From the moment I began thinking about dead satellites and suicidal civilizations, the ghost machines in Earth orbit became an allegory for what happened to the people responsible for them. An allegory for the recent history; perhaps even an allegory for modernity itself. Like the suicide statues at Easter Island, the dead satellite embodied a cruel paradox: perhaps the interactions of production, technologies, and forms of knowledge that allowed us to explore the heavens also enabled us to destroy our own island Earth. The science that enabled us to understand the insides of stars was put to practical use in the inner workings of a hydrogen bomb; the rockets that took us to space, we designed primarily to deliver thermonuclear Armageddon. Of course, many people envision that humans will indeed commit thermonuclear suicide or exhaust Earth's resources. For some, this represents "progress." In this view, it is our collective destiny to colonize other planets. The dream of colonizing space is a farce, but it fuels the ideology that humans are separate from the earth and that destroying our own habitat is a problem we can outrun." Perhaps the satellites we've established in the heavens are our own version of the Easter Islanders' Moai statues.

I decided that the artifact I was planning could only be a grand gesture about the failure of grand gestures. The message should be a collection of images—a slide-show for eternity.

## CONVERSATIONS

The project I envisioned was too big for one person. On a practical level, I had no experience with aerospace engineering or materials science. On a philosophical level, I knew that a great number of people in a broad range of fields had already spent a lot of time thinking about the questions I was asking. I also knew that critical thinkers would be skeptical of the project. The notion of creating something timeless or universal is the stuff ideologies are made of.

One person who immediately came to mind was the biologist Ignacio Chapela at UC Berkeley. Chapela became a public figure in late 2001 when he and graduate student David Quist published an article in *Nature* showing how genetically modified corn imported from the United States was infecting traditional strands of Mexican corn. The biotechnology industry launched a massive smear campaign against him. *Nature* retracted the article under industry pressure, and UC Berkeley, which had recently received a \$25 million grant from biotech giant Novartis, denied Chapela tenure despite the support of his department (his tenure case was overturned on appeal).

Chapela was uneasy about my project: he didn't think that such a grand gesture could inspire much critical thought. Big gestures, like tinkering with life to create genetically modified Frankenfoods, were very much a part of the problem.

Others agreed. Author Mike Davis warned me that he couldn't imagine a project "that doesn't risk reproducing the solipsism of Carl Sagan's Rosetta Stone for aliens" before suggesting what became one of my favorite ideas: that artifact be a "a few cc's of mothers' tears" sealed in a vial of Trinitite (the glass created at Trinity, when desert sand melted under the world's first nuclear explosion).

UC San Diego cognitive scientist Rafael Núñez was deeply skeptical of any gesture toward universal communication. A specialist in how humans do mathematics, Núñez spent the better part of a year teaching me the math I was supposed to have learned in high school, then showing me how the entirety of mathematics emerges from a series of spatial metaphors that arise from our bodies' interaction with the surrounding world. Our ideas of math and numbers are an eminently human set of inventions. He enjoyed making fun of science fiction authors and astronomers who imagine that prime numbers or transcendental numbers such as pi might provide a basis for communication with extraterrestrials.<sup>12</sup>

Despite a general unease with the project among some of the people I approached, others were willing to entertain a set of sustained conversations around the question of "how the humans committed suicide." But, as was to be expected, the questions multiplied: Was this a project about global warming and ecological collapse? Or about technology gone out of control? Was it a conversation about the Cold War or Big Science, or was it a question about the nation-state? Was it a conversation about the Enlightenment? About capitalism? About modernity? Or about the old myth of the naked people who ate from the forbidden tree of knowledge?

I began holding weekly seminars in the Creative Time offices, where research assistants Emily Parsons-Lord, Katie Detwiler, Max Symuleski, Laura Grieg, Anya Ventura, and I looked at thousands of images and held long conversations about everything from cybernetics to messages in bottles, from medieval bestiaries to various kinds of mathematical infinities. Often the discussion topic was more abstract: what the heck were we doing, exactly? On several occasions we had guests

come speak to our group. Sundar Sarukkai of Manipal University led an outstanding seminar on the history of Indian mathematics, showing how provincial the metaphysical assumptions underlying Greek-descended geometry are. Moreover, Sarukkai argued that our common assumption that curiosity is a value-free trait is, in fact, a deeply ideological and relatively recent notion. (For Sarukkai, the idea that scientific *discovery* is a good thing in and of itself is a rather dangerous proposition. If scientific truths are *discovered*, then the *discoverer* bears no responsibility for them. If, however, science is *invented*, then the people doing the inventing have a great deal of responsibility for the implications of their work. If, for example, nuclear physics is discovered, then Szilard, Fermi, Oppenheimer, Teller, and their compatriots are absolved of any responsibility for the advent of nuclear weapons. If, however, nuclear science is invented, then they bear a great deal of responsibility.<sup>13</sup>)

As we sifted through thousands of pictures, sometimes going to a great deal of effort to locate a particular image or document, we came to realize something else. Biologist Susan Oyama put it well in a conversation about ecological collapse: the things that most threaten us are those for which there are no images. What does a picture of global warming look like? (A terrified polar bear on a piece of melting ice?) What does rampant resource depletion look like? (A clear-cut rainforest?) What sort of picture signifies ecological destruction? (An aerial image of an oil spill?). What is a photograph of economic inequality? (Portraits juxtaposing the lives of rich and poor?) What does a picture of capitalism look like? (A factory spewing filth into the sky? A day trader in front of a computer terminal?)

My thoughts continually came back to the Lascaux bird-man. I thought of the Pit scene as not just a paint-

ing from prehistory, but a painting about the power and limitations of images. The scene seems to imply a narrative, but there is none. It creates an impression but explains nothing. Moreover, what's true of the Pit is true of all images: they can't explain or narrate much of anything at all. Instead, they ask us to see what we're predisposed to see. In this way, all images are like cave paintings.

#### OUTSIDE OF TIME

In weekly seminars, our group discussed all sorts of ancient and contemporary artifacts: eighth-century Islamic astrolabes, fifteenth-century alchemical manuals, present-day livestock cloning kits, Renaissance cryptography handbooks, tomes of medieval magic, late twentieth-century eschatological maps, nineteenth-century proto-calculators, and twenty-first-century source code for weaponized computer viruses. We came back to a few objects so often that they became major touchstones for our own process. A source of almost endless interest was the work of a handful of scientists, artists, and journalists, who in the 1970s did their best to design a series of messages for aliens. A few years later, some of these same people applied their theories to a series of postapocalyptic warning signs in New Mexico.

In the 1970s, space probes were things of discovery and wonder, the stuff of a better future. When a series of missions put spacecraft on trajectories that would ultimately take them out of the solar system, NASA commissioned a series of visual greeting cards to be attached to their probes.

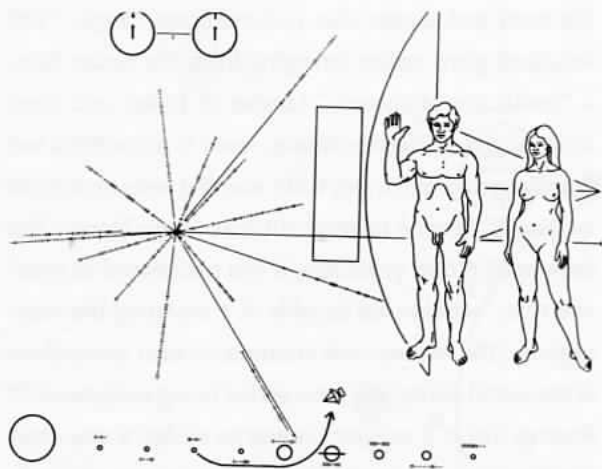
For the 1972 and 1973 *Pioneer* spacecraft, a small group—including Carl Sagan, Linda Salzman-Sagan, and astronomer Frank Drake, a luminary in the search for extraterrestrial intelligence (SETI)—developed a postcard

for any aliens that might find the spacecraft on its grand voyage through interstellar space. Salzman-Sagan drew a naked couple, with the man raising one hand, standing in front of an outline of the spacecraft. Below them, a drawing of the solar system attempted to show *Pioneer* leaving the third planet from the sun. To explain where the probe came from, Frank Drake developed an ingenious galactic map based on newly discovered celestial objects called pulsars. Pulsars are collapsed stars that spin rapidly, giving off intense, directed radiation. They are often compared to cosmic lighthouses. Drake figured that if he provided the unique time signatures of various pulsars, extraterrestrial scientists could use them to triangulate the location of Earth.

In 1974, Frank Drake created another message intended for extraterrestrials to celebrate the opening of the refurbished Arecibo radio telescope in Puerto Rico. This message took the form of a powerful radio transmission directed at the star cluster M13. The message was a series of 1,679 bits, which are decoded by arranging them into 23 columns and 73 rows. Drake reasoned that because 1,679 is a semi-prime number, divisible only by prime numbers 23 and 73, the correct arrangement of rows and columns should be self-evident. Properly decoded, the message forms a graphic reminiscent of an old Atari video game. The image is meant to convey information about the chemical makeup of DNA, along with the double helix DNA structure, a human figure, the solar system, and a picture of the Arecibo radio telescope.

But the grandest "postcards for aliens" are undoubtedly the Golden Records that were placed onboard the two *Voyager* spacecraft in 1977. Developed by a committee led by Carl Sagan, these gold-plated copper phonograph records are intended to explain something





Top: The Pioneer Plaque

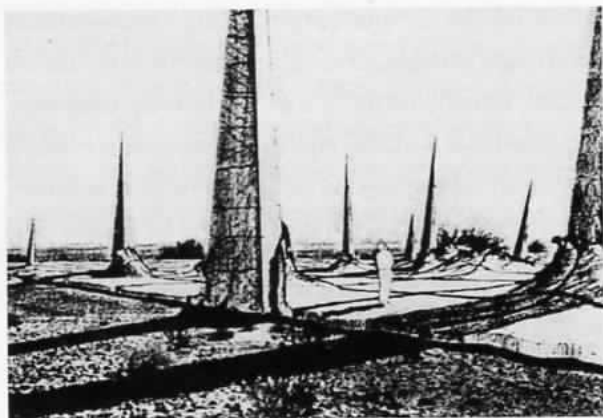
Bottom: The Arecibo message (decoded)

about human life and culture to any extraterrestrials who might stumble across the spacecraft in the distant future. Timothy Ferris, one of the record's coauthors, explained that the LP is "intended to preserve something of human culture beyond what an intelligent extraterrestrial, encountering the craft at some far-distant time and place, might infer from the spacecraft itself."<sup>14</sup>

One side of the record holds a collection of 116 photographs encoded as a video signal. It is a smorgasbord of snapshots: the Great Wall of China, the Taj Mahal, a woman in a supermarket eating a grape, dolphins jumping, diagrams of human anatomy, rush hour traffic, a Chinese dinner party, a sunset. The record's other side is a collection of world music: a Navajo night chant; Western classical music from Bach, Beethoven, Mozart, and Stravinsky; Javanese gamelan; Senegalese percussion; Peruvian pan pipes; Chuck Berry. There are greetings in dozens of languages—"Hello from the children of planet Earth" (English); "Friends of space, how are you all? Have you eaten yet? Come visit us if you have time" (Amoy); "Good day to all" (Spanish)—and a selection of sound effects from Earth: "fire and speech," "tame dog," "kiss," "Morse code," "crickets, frogs," and "mud pots."<sup>15</sup>

Today the Pioneer Plaques and Voyager Golden Records continue hurtling through space at nearly 35,000 miles an hour relative to Earth. Their dose of "It's a Small World" benevolence remains ready to explain something about life on earth to any extraterrestrial contacts.

With the end of the 1970s and the onset of the 1980s, however, some of the people responsible for the iconic record reconvened for a rather darker thought experiment. At the Waste Isolation Pilot Plant (WIPP) near Carlsbad, New Mexico, semioticians, anthropolo-



"Spikes Bursting Through Grid," concept by Michael Brill, art by Safdar Abidi

gists, scientists, and science fiction writers have spent decades developing a set of signs intended to last, and to be legible, for the next ten thousand years. Their message is simple: *Stay away; this site holds invisible death.* The Waste Isolation Pilot Plant is an underground chamber filled with nuclear waste.

The warning sign project began in 1981, when the U.S. Department of Energy and Bechtel Corporation convened a series of working groups to "determine whether reasonable means exist (or could be developed) to reduce the likelihood of future humans unintentionally intruding on radioactive waste isolation systems."<sup>16</sup> The various groups included Frank Drake, who developed the Arecibo message and the pulsar map for *Pioneer* and *Voyager*, and the artist Jon Lomberg, who oversaw much of the visual material for the Golden Record. Carl Sagan was asked to join, but refused to participate on moral grounds.<sup>17</sup>

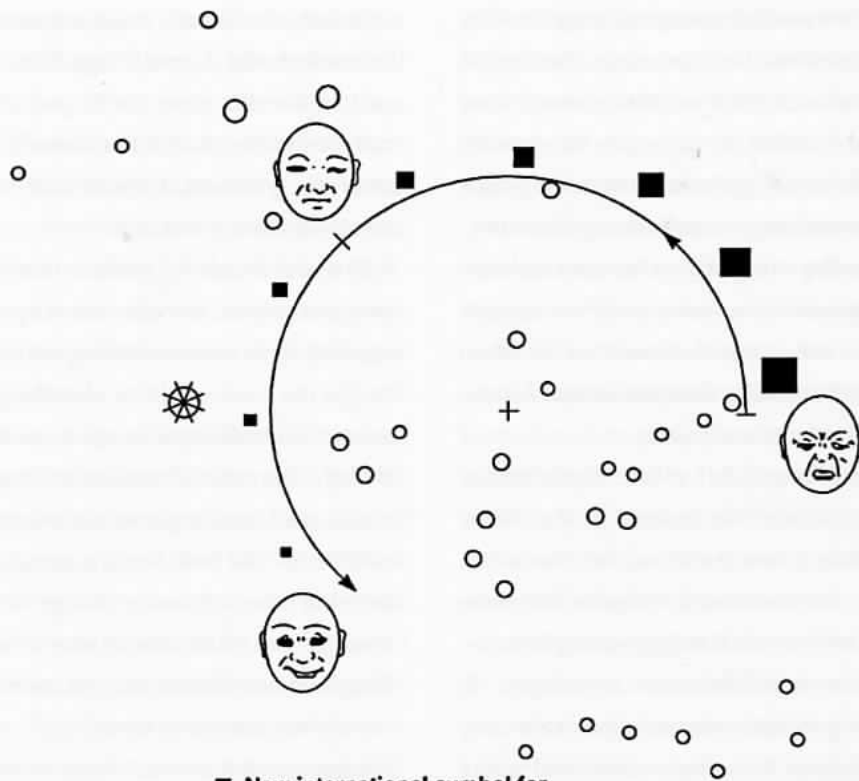
The two teams came up with a number of proposals. Architect-planner Michael Brill imagined large-scale "menacing earthworks," composed of "shapes that hurt

the body and shapes that communicate danger." Brill imagined giant spikes emerging from the desert floor, a "landscape of thorns," tangles of spikes and steel. Another group, "Marker Group, Team A" proposed a less grandiose approach: just write warning texts in multiple languages. Team A pointed out that "since literacy first developed 6,000 years ago, it has not ceased to exist" and that "scholarship capable of translating the messages on the markers will continue to exist somewhere in the world during the time period being considered."<sup>18</sup> Another Team A suggestion was to design a star chart showing how the danger from nuclear waste contamination diminishes as the celestial pole moves away from Polaris toward Vega over the next twenty-six thousand years.<sup>19</sup>

But one of the most surprising proposals for how to relay a warning to the future came from the person with the deepest knowledge of how symbols and signs work. Semiotician Thomas Sebeok recommended against using images or symbols for timeless warning signs. In the words of communications professor Peter C. Van Wyck, Sebeok "saw clearly the futility of merely launching a sign into the future."<sup>20</sup> But this didn't discourage him from tackling the problem at hand. He merely took another approach, swapping semiotics for theater and performance. To warn future people about the dangers of nuclear waste, Sebeok wanted to convene an "atomic priesthood" to act as the site's caretakers. Members of this priesthood



Proposed warning sign, Waste Isolation Pilot Plant, New Mexico



■ New international symbol for "radioactive waste buried here," or standard radiation trefoil.

would invent myths and stories as they saw fit to secure the nuclear waste not only in physical space, but also in the imaginations and stories of future people. Knowledge about the nuclear site would be passed from generation to generation among the initiates of a mystery cult charged with protecting the site's secret.<sup>21</sup>

#### STAR CHARTS

Back in New York City—1,800 miles from the New Mexico nuclear waste site and about 11 billion miles from the *Voyager* spacecraft—curator João Ribas from the

Star map intended to show passage of time and decrease in radiation over thousands of years

List Visual Arts Center at the Massachusetts Institute of Technology (MIT) heard about our project and invited me to MIT to work on the project. One of the technical problems I was trying to solve was that of archivability: what materials and techniques exist, if any, to produce an "ultra-archival" medium for storing images? Project manager Alexis Lowry had been researching materials

and fabrication; at one point we were exploring the idea of writing photographs into the crystalline structure of a diamond. Then we found out it would cost more than a hundred thousand dollars to fabricate. We needed something more affordable, but had diamond-like properties, such as an exceptionally stable atomic structure, the ability to survive the stress of a rocket launch, drastic temperature fluctuations in space, and the constant radiation bombardment it would experience in orbit. Professor Brian Wardle of MIT's Aeronautics and Astronautics Department volunteered to help.

During our first phone call, I asked Wardle about making something that would be archival for five billion years. "That's actually a new question," he responded in an upbeat voice. Wardle enlisted Professor Karl Bergreen of the Materials Science and Engineering Department, an expert on nano-fabrication techniques. It didn't take them long to settle on a solution: we'd create a finely-etched silicon disc using a nano-fabrication process typically used to build microscopic circuits. We could modify that process to imprint photographs on a small silicon wafer. It would be extremely archival—and spaceworthy. I was also pleased that the images would be visible without any complicated decoding techniques. They'd be visible to the unaided human eye and would come to life under a magnifying glass or microscope. Our object would be like an old microfiche, but one that could theoretically last for an eternity. The only downside was that working at a human scale (as opposed to a truly nano-scale) would limit the number of images we could write. I thought that was a good tradeoff—fewer images, but a far greater chance that someone would be able to actually see them.

As fabrication and delivery deadlines started looming, I had to decide what the disc cover should look like. In

our weekly discussions, my group and I had decided that the cover should do two things. First, it should be obvious that the disc cover isn't a part of the host spacecraft—it should call attention to itself, and it should look out of place. Second, it should look like a piece of treasure. It should look valuable.

Of all the decisions I made in researching and developing the project, the one that surprised me the most was what the final cover etching would look like. I always thought the cover would be something deliberately surrealistic, a nonsensical image or pattern. At one point I thought the cover should be an image of a tall, goat-headed man towering over a startled child. But as the deadline for the final designs got closer and closer, I started to have a dramatic change of mind. At another, I thought the cover should bear a simple inscription: "Please do not disturb me. Let me stay here so that I may witness the end of time."

A few months earlier, I'd met astronomer Joel Weisberg at a series of events at Carleton College in Minnesota. Joel was from the same generation of astronomers who'd worked on the '70s-era extraterrestrial postcards. He'd been good friends with the late Val Boriakoff, the man eating a tuna sandwich in my favorite image from the *Voyager* collection: a bizarre photograph meant as a "demonstration of licking, eating, and drinking." I knew that Joel was a pulsar specialist, and I knew that Frank Drake had used pulsars as the basis for his *Pioneer* and *Voyager* maps. Joel and I began working on a time-map design for the cover plate (see page 174 for a full description).

I'd never imagined a time map being part of the project. I always thought that the chance of anyone ever being able to decode the weird drawings onboard *Pioneer* or the proposed nuclear warning signs in New Mex-

ico were very close to zero. I saw those charts and signs as the quixotic scratchings of people who believed in irrational things. The people who made these signs may or may not have believed in God, but they believed, or desperately wanted to believe, in something *universal*, whether it be physics, chemistry, astronomy, geometry, or transcendental numbers like pi.<sup>22</sup> We can't even talk to dolphins or dogs, I reasoned, how are we supposed to find some sort of universal baseline from which to begin a conversation with aliens?

But I knew that could be wrong. After all, humans talk to dolphins and dogs every day. We don't talk to dogs about pi, but we certainly talk to them (incidentally, we don't spend a lot of time talking to other humans about pi, either, and when we do it's not clear that we make much sense). I started to feel haunted, not by the fact that our artifact would be unintelligible, but on the contrary, that someone might actually find it and be able to make some sense of it. A phrase popped into my head from John Knowles' novel *A Separate Peace*, which I'd read in grade school: "Always say some prayers at night because it might turn out that there is a God." What was there to lose by making a sincere effort to inscribe some temporal coordinates into the artifact? If the disc cover was deliberately designed as nonsense, then the chance of someone ever decoding it was zero because there would be nothing to decode. True, even if the scratching did have an underlying meaning, the chances of it ever meaning anything to anyone were close to zero. Nonetheless, the remote possibility of someone finding and being able to make sense of it kept nagging at me.

I'd framed the question of what to put on the cover as one about semiotics and the production of meaning, but maybe there was something else at stake with the

artifact cover. I began to feel that if I made something deliberately nonsensical, I would be abrogating some sort of potential responsibility toward the future. Maybe, I thought, the question of what to do with the cover wasn't a matter of meaning, but a matter of ethics.

One thing that always puzzled me about the astronomers and scientists who put together the 1970s messages to extraterrestrials was their utter sincerity. They really did try their best to develop a language that an extraterrestrial might be able to understand. They truly wanted to share images and information about humans with other potentially "intelligent" life forms in the universe. I always thought their sincerity was at best naïve and at worst potentially even colonialist. But I started to wonder whether I had become too cynical.

I sheepishly skyped Rafael Núñez at UC San Diego, the cognitive scientist who'd generously spent nearly a year explaining to me why we couldn't use mathematics as the basis for any universal language. I told him that I was making a star map for the artifact cover and was planning to use a version of Drake's notation, as a nod to the 1970s messages. Núñez was visibly annoyed. "But what if we're wrong?" I said. I suggested that it might be best to "pray at night," even if we didn't believe in God. If we make a star map, and no one ever finds it, then we've lost nothing. If we make a star map, and someone does find it but can't interpret it, then we also haven't lost anything. But if we're wrong and they *can* interpret it, the star chart might make them very happy. It might truly be a treasure.

With reluctance, Núñez started playing along with the idea, making it very clear that he didn't agree at all but was simply going along with my thought experiment, "praying at night." He helped me decide on the "calibration" shapes for the artifact cover: two geomet-

ric shapes meant to "teach" our notation to someone who might find the disc. We settled on a figure of a right triangle whose sides are 1, meaning its hypotenuse is the square root of two. This would be a reference to a well-known (at least on Earth) ancient Babylonian math tablet called YBC 7289. The other geometric figure shows the proportion of the area of a circle to a surrounding square—a figure chosen because, unlike transcendental numbers such as pi and e, it has absolutely zero meta-physical baggage.

And so the artifact's gold cover is a star map. As such, it may echo the hopeful pulsar map of the 1970s space probes. Or the darker star map of the 1980s, designed to show how many eons must pass and how far the stars must move before the twentieth century's nuclear waste ceases to poison the surrounding landscape. But, more precisely, the artifact's cover is not a star map at all. It is an ensemble of basic shapes, dots and dashes, lines and assorted squiggles etched onto a gold-plated piece of aluminum. It becomes a star chart only if someone chooses to see it that way. In this sense, the cover etching simply recapitulates the inscrutable scratchings, paint marks, lines, and dots that make up the majority of images on the walls of Lascaux. The line through the buffalo, the six dots under the rhinoceros's tail, and the barbed line under the bird-man's feet. After all, these marks may, in fact, be star charts.

#### NOTES

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12. See George Lakoff and Rafael Núñez, *Where Mathematics Comes From* (New York: Basic Books, 2000) and with Reuben Hersh, *What Is Mathematics, Really?* (Oxford: Oxford University Press, 1997).
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16. Human Interference Task Force, *Reducing the Likelihood of Future Human Activities That Could Affect Geologic High-Level Waste Repositories* (Columbus, OH: Office of Nuclear Waste Isolation, May 1984), BMI/ONWI–537.
17. Peter C. Van Wyck, *Signs of Danger* (Minneapolis: University of Minnesota Press, 2005), 59.
18. Kathleen M. Trauth et al., *Expert Judgement on Markers to Deter Inadvertent Human Intrusion into the Waste Isolation Pilot Plant* (Albuquerque: Sandia National Laboratories, November 1993), SAND92–1382, 3–2.
19. Trauth et. al., F118.
20. Van Wyck, 47.
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22. Pi is an especially poignant image here—in Carl Sagan's book *Contact* (New York: Simon and Schuster, 1985), an advanced extraterrestrial civilization explains that a vast and transcendental mystery is buried somewhere in pi's infinite digits.

## "BELONGING": HUMAN/ARCHIVE/WORLD

BY KATIE DETWILER

From our earliest discussions of what images we might include in the Artifact, we were faced with a question of belonging. This collection, or archive, would be defined not only by what it contained but also by what was excluded; the division of what belongs inside the archive and what does not would be constitutive of the archive itself.

At first our group set a provisional boundary for the archive: no images of the human form would be included; all human figures would be removed or obscured. What would we mean to do by excluding the human form? Different people had different answers to this question. We never wanted or intended the collection of images to be a grand representation of humanity. Removing the human altogether seemed to be a way to avoid this kind of sweeping gesture. The Artifact would be something that would exist well beyond the tenure of humans on earth, so excluding them would imply this and be a way to think about this scenario. Finally, the human tends to be privileged as the central feature of the world. Could the collection, the message, be more unstable and generative without the anchor of the human as the locus and sole purveyor of meaning? What if some other form entirely—why not a machine, or the empty desert?—could be the image through which some Other would know us?

A friend offered a metaphor for what we were doing by excluding humans from this object: "You're building the Flying Dutchman." The Flying Dutchman: a ship at sea, a human construction, yet with no human hands to man it; a ghost ship. Here, the human would be a trace, no longer in control of steering the course of meaning. The Artifact would also echo other things humans have set in motion; things that humans may have helped cre-

ate, but that now seem to function without our notice, understanding, or direction.

But we started to grow suspicious of our idea of making the human ghostly. The idea that we can make ourselves invisible is a very human fantasy. It's the idea that we can suppress the relationship between ourselves and the things we produce, a fantasy of invisible hands that organize and curate without themselves being implicated. The politics of this could backfire. Moreover, if we didn't include images of humans, we'd be implying that humans are somehow able to step outside of the world and ourselves and see things from a detached vantage point. Isn't it disingenuous to pretend that the human is something we can step outside of and look at as if it were an object?

This turned out to be a complicated question. Some would say that this dual subject-object position actually characterizes the human fairly well: We belong to a category that we ourselves have named. We belong in the world according to organizing structures that we ourselves have invented. Depending on how one thinks about this doubled position (and within our own group we disagreed about it), this is a kind of human specialness or a kind of specialness that is also a form of alienation; an exceptionalism that makes us uncomfortable in our own skin and makes our relationship to the world complicated because we see ourselves both as part of it and above it, slightly estranged from it. Shouldn't we (and how could we?) try to represent this double position of humans as archive-makers who can include or exclude themselves, subjects and objects; this position of belonging and exceptionalism?

Alongside these questions, we were encountering another kind of problem as well. If we had started by wanting to avoid a kind of narcissism about humans as the stable center of the world, our attempt to exclude humans pushed us into a position of having to be very confident about when a human form appears. This seemed to be just another way of shoring up and affirming the human as something objectifiable, well-defined, and stable. It also proved difficult. We tend to see "the human" reflected in all sorts of nonhuman things. Does an image of an apparition of a face on the surface of Mars contain a human form? Is a disembodied human brain cradled in latex-gloved human hands a human form? We found that we could answer these questions in a number of ways. If we had thought that we might literally cut humans out of images of bodies, machines, and nature, not only did we start to feel that this was another way of separating the human out and casting it out from the world, but we also grew more and more uncertain about where to even make such cuts.

We eventually had to reframe our idea of excluding the human, realizing that neither human/not-human nor exclusion/inclusion are simple dichotomies.

At our final meeting, we ended up in a discussion of one image that made many of us most uncomfortable. Not necessarily an image of a human form, it's an image of Captain America: a comic book superhero and the alter ego of a frail human. Grotesquely muscular, nearly bursting the seams of his garish costume, he is a mutant. This super-human avenger had an interesting career: at one point purportedly assassinated, later an intelligence agent, born and revived from suspended animation. How like the career of the human.

By the end of the project, we decided to include images of humans in the Artifact. The human belongs to the archive as one artifact among others, another liminal object. It does not stand outside of the collection or outside of composite scenes of bodies, machines, and nature. But, in the end, it seemed equally honest to include something of ourselves as we also are: narcissistic about our humanness and our exceptionalism, archive-makers also exceptionally proud of our reflexivity about our own boundaries.