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The Adobe Frontier

by

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Abstract

The Adobe Frontier is a 60-minute documentary film about Ronald Rael and Virginia San Fratello—together known as “Studio Rael San Fratello”—and their work connecting contemporary technology with the legacy of pottery making and adobe architecture in the Southwest United States. The film follows them over the course of two years, during which they undertake a series of design, reclamation, and art projects connected to the social, political, and cultural history of the San Luis Valley in southern Colorado. Their goal is to “show people the value of a building made of earth,” (Rael, Interview) while pioneering new ways of creating adobe dwellings. The team creates house-like structural experiments and traditionally-inspired clay pottery using 3D printers and earth as a building material. The structures were created during the summers of 2019 and 2020 in Rael’s ancestral village of La Florida, Colorado, on land that has been home to his family for 11 generations. These mud structures are an extension of traditional adobe techniques, but Ron spends equal time purchasing and renovating dilapidated and nearly forgotten old adobe buildings, including one that played a key role in the founding of the state of Colorado, and where the legacy of Indigenous slavery permeates its architecture. Along the way, Ron and Virginia confront ghosts of a layered history of conquest, enslavement, and identity in this historic borderland.

Origin Story

In 2018, I met Ronald Rael and Virginia San Fratello through my role as the video producer for Cooper Hewitt, Smithsonian Design Museum. Ron was invited to give a talk and 3D-printing demonstration at the museum, which was hosting an exhibition that featured several 3D-printed vessels by the Studio Rael San Fratello. During the talk, Ron presented a nascent project, the next iteration of their 3D printing work. They had just started testing a new printer, one that would enlarge the size of the objects they were printing, making them human scale, and using a mixture of dirt, water, and straw. During the lecture, I leaned over to my colleague, Associate Curator of Latino Design Christina de Leon and whispered, “We have to document this story.”

A lot of the work of the Smithsonian Design Museum focuses on collecting objects and telling the stories long after the project is complete, and when there is something to exhibit. Never has the museum undertaken a storytelling endeavor to film designers every step of the way over the course of an entire project.

A few days after the lecture, Christina and I met to work on a proposal. We would follow the studio from the beginning of their next round of tests, capturing a close look at the design process, revealing the mistakes, failures, and learning moments that many designers experience along their way to success. The modest proposal was accepted, and Ron and Virginia invited us to their studio at La Florida, Colorado, on land that has been in Ron’s family for ten generations. And so, one crisp spring morning in 2019, we found ourselves in the San Luis Valley, looking for a village that did not appear on any of our online maps.

Located in southern Colorado, the San Luis Valley is a remote and rural area with a distinct culture, language, and landscape. Humans have hunted and gathered there since 1AD, but there is no evidence of settlements until the 1600s (Wilson 204). Since then, communities including Uto-Aztecan and Athabaskan-speaking Indigenous groups, Spanish-speaking colonists and armies, and United States armies, among others have lived both in harmony and in conflict with one another. In the nineteenth century it became a settlement area during the United States' push for westward expansion. Throughout all this time, the confluence of history, language, and customs sparked a distinct way of life that continues to evolve. The tradition of adobe architecture is a prime example.

“The use of earth started with the Indian Pueblo people, and their culture furnished the basic methods and materials for early Spanish Colonial architecture. Later these two cultures were the basis of Anglo architecture in the region” (Özen 4). Native Americans built dwellings and outbuildings using a technique and material called “cob,” in which mud, clay, and straw are stacked on top of each other and left to dry. “Later, the Spanish brought the adobe brick, and the Native Americans adopted that tradition” (Rael, Interview).

Ron's fascination with adobe building and “buildings made of earth,” as he says, started from a young age. “My interest in buildings made of earth came from growing up here in southern Colorado where the majority of the buildings were made out of earth... that was my childhood playground. And my father built new adobe houses, and we restored old ones as well” (Rael, Interview). Ron essentially became an expert in building and restoring these types of buildings. After working for his dad throughout his teenage years, he left La Florida to earn a B.A. in engineering at the University of Colorado, and soon after, he earned an M.A. in architecture at Columbia University in New York. After several years working in the field and

teaching, in 2018 Ron was named the Eva Li Memorial Chair in Architecture and Director of the Master of Architecture at the University of California Berkeley. He has written extensively about use of earth in architecture, including a book on the topic titled *Earth Architecture*, and has built and/or renovated several adobe buildings as part of his architecture practice.

The exploration of the history and tradition of making buildings and other structures out of adobe is central to the film. Its significance to Ron's story cannot be overstated, and to ensure as complete an understanding as possible of adobe and how it came to the San Luis Valley, it is essential to understand how Ron sees it.

If you think about the development of civilization and agriculture and humans being sedentary and building cities, the two things that coincided in our own evolution is agriculture and the growing of wheat, and discovering that those unused wheat stalks, when they were in the muddy soil, became very hard and that you could actually stand those up and begin to build walls. In some ways, I think that our own physical makeup of being human is all about the ability to manipulate mud and to stack it to make buildings...We can trace the word "adobe" back to the Egyptian word "*atob*." It has the same lineage. The dimensions of a brick that is used in Colorado today are the same dimensions of a brick that was used in ancient Egypt (Rael, Interview).

Ron's theory about the evolution of human hands is hard to prove, but there is evidence of mud bricks being used as far back as 7,200 years ago (Rosenberg), and indeed, the word for adobe likely came from the ancient Egyptian word for brick (Emery 1).

In the film, Ron teaches about this evolution of language with as much interest as he does about adobe, peppering in lessons on how his own unique culture and dialect are influenced by a spectrum of civilizations and communities, from the Spanish language of the colonists to the Nahuatl language of the Aztecs and Toltec (Real, Interview).

In short, Ron is the ideal guide to the adobe history of the San Luis Valley (and beyond). It turns out he is great with directions, too. After several miles of straight dusty roads, a

handmade sign that reads “La Florida” welcomed us. Just beyond the first cow pasture we saw a small adobe home that looked as if it was newly built. In the front yard was an *horno*, a wood-burning oven made of adobe. We had done as much research as we could on adobe structures in the area, and I had seen pictures of houses and *hornos*, but seeing them in person impressed me much more than I anticipated. The texture of the hardened adobe was a little hard and brittle, but also solid. Ron was in full professor mode, talking to a group of college students about how *hornos* are made and used. He welcomed us and invited us for a tour of the rest of the property. The camera was rolling for what became a master class only Professor Rael could teach.

I assumed that my previous work as a museum video producer, having created dozens of designer profiles, would prepare me to film Ron. During preproduction, I consulted with Christina and wrote questions with the intention of filming sit-down, talking head style interviews. I sketched up a few shot list ideas about how I would capture his work on camera. I researched films to watch that I thought would be relevant to this project: *Unfinished Spaces*, to see how another film tackles an architecture story, *Burden* and *Sky Ladder: The Art of Cai Guo-qiang* to see how other profiles are done, and *Cutie and the Boxer*, hoping to gain insight about how to film couples who work together. I also took inspiration from one of my favorite process-oriented films, *Le Cousin Jules*, because I anticipated the need to film several repeating processes. I also pored into Google Maps of the area, but I tried to set low expectations, because I somehow knew that this would be a very different experience than I usually had.

This first encounter with Ron on his family’s ancestral land set the tone for the entire production. At home he is comfortable, energetic, and ready to share his knowledge. He also had a lot on his plate. We only had four days with him on this first trip, and he had a lot of preparation work to do for the first printing tests. This, plus hosting this group of students, made

it difficult to schedule time to sit down for an interview. Instead, I had to work on the fly, filming Ron as he was engaging in tasks, working, or interacting with folks who were vying for personal attention. He bounced from one person to another, periodically checking the *horno*, where he was baking bread for the group. I had to do my best to make sure he had a working microphone that did not rub on his shirt. Christina did what she could too, but since she had never worked with audio or camera equipment, I was essentially a one-person production team. I was relieved to know that this was only our first trip, and that we would have a chance to better prepare for our next one. Despite the challenges, we were able to capture some critical moments.

When he was in front of groups of students, Rael spoke with a minor theatrical flair, punctuating his stories with pauses, lingering on the end of words or sentences to add dramatic tension. When there was nobody else around except Christina and me (rolling camera on my shoulder), it seemed natural for him to speak directly to the camera, as if anticipating the audiences of this film to be students discovering a precious catalogue of the adobe buildings of La Florida. It was a split-second decision to direct him to speak to camera while engaged in an activity, but in hindsight, I remember thinking about two films I had recently seen that feature this technique: *Minding the Gap* and *Sherman's March*. Of *Sherman's March*, "The result is visually interesting, provides additional information about each character and the environment, and relaxes the subject so that they can speak more spontaneously" (Anderson & Lucas 246). Ron's gift for teaching emerged quickly as an important element to his character. The way he spoke felt very natural, and it drew me in immediately. When we went back for our second trip and were finally able to conduct a sit-down interview with Ron, I asked him to continue to speak directly to the camera. I felt this framing was an obvious choice because he was comfortable with it; and his eagerness to talk about his homeland, and to teach adobe history was made more

immediate and palpable. During the entire production, Ron shared many important stories and explained highly technical points, but his explanations were never too erudite or inaccessible. Not long after we arrived and got acquainted with the *horno*, Ron brought us into the house, which looked like it had been just built. In fact, it was built in the 1930s, but a few weeks before we arrived, he cleaned it up and freshened the mud plaster on the outside walls. It was not too much effort, he said, and it makes it look like new. He calls it the “Dominguez House.” It was the first adobe building he bought, purchased while he was in graduate school in New York, in 1997. It set him on a path of buying adobe buildings that continues today. Not long after, he purchased the neighboring Casias house, which was built by his great-grandparents, and for which his “grandmother made the bricks at the age of 13” (Rael, Interview). Every few years he buys another. Sometimes they are adjacent properties, and sometimes they have no relationship with one another, except that they are made of adobe. This is what makes them historically significant, and significant to Ron. Most of the buildings he buys are in danger of falling apart and being forgotten. The pattern is clear: Ron buys an old building, fixes it up, and creates something new out of it. Some of them are sold, but he holds on to the others. At the time of writing, he owns eight adobe buildings, including houses, former commercial buildings, an old school, and—perhaps most significantly—a house that was the home of the first lieutenant governor of Colorado, Lafayette Head.

My first lesson in filmmaking on this project was about preparation. First, I was not prepared for the story of Lafayette Head because I had never heard of him. The name did not come up in my searches for adobe history in the San Luis Valley, and it seemed quite removed from what we originally thought the film would be about: 3D printing with adobe. Second, when Ron let us know that he was bringing the group of students to an old building he had recently

purchased, my first thought was not that I should bring all the camera and sound gear. Indeed, I left much of it at our guesthouse to charge batteries and download footage. But I did bring an old DSLR still camera that could shoot video, and what I captured that day became one of the most poignant moments in the film.

Ron was at his animated best as he spoke into a handheld public address system and told the story of the founding of Conejos, Colorado at this adobe house. He pointed out more than a dozen architectural elements, including the exposed adobe brick; the *vigas*—large wood “beams” in Spanish, and the cement plaster that one of the house’s owners put up in the 1950s. He described the grandness of the property when it was first built around 1865 (Rael, Interview), and told the group about its role as a Federal Ute Indian Agency under Lafayette Head. Head was a Missouri man of Anglo descent who fought in the Mexican-American War and then settled in Abiquiú, New Mexico. He took advantage of a land grant for old veterans and led a group of families to settle the land that became Conejos. The town that sprang up around the house included a courthouse, and the first permanent church in Colorado. Most of the people, he said, were known as “*Genízaros*.”

When Ron mentioned the word “*Genízaros*,” I looked to Christina to see if she knew this term. She shrugged. At that moment, I knew our film’s original premise would be upended. This moment forced us to reexamine the complexities of the story. Most immediately, we knew we would have to develop the story to include narratives beyond the story of the 3D printed adobe structures.

Historical Perspective

Our next trip was a few months after our first, and during that time we did extensive research about *Genízaros*, and about more locations we should visit. We also asked Ron for help connecting with people in the area and made inquiries with several experts in museums and universities in Colorado and New Mexico.

His first instinct was to introduce us to his cousin, Dr. Estevan Rael Gàlvez, who happened to be the former State Historian of New Mexico, Senior Vice President of the National Trust for Historic Preservation, an author, and a professor—the ideal expert in many ways. Most of Estevan’s career has focused on research about, and advocacy for, the communities and history around the Rio Grande, San Luis Valley, and greater Southwest. He wrote his PhD. dissertation on Indigenous slavery and possesses extensive knowledge (and very strong opinions) about Lafayette Head (Rael-Gàlvez, *Identifying Captivity and Capturing Identity: Narratives of American Indian Slavery in Colorado and New Mexico, 1776-1934*). We had to wait until one of the final days in Colorado to meet Estevan in person, but by then we had a lot more context and knowledge of the story. This proved to be useful because we asked Estevan to confirm and clarify parts of the story that we had already heard from Ron and others. In the film Ron and Estevan meet at the Head House, and together unravel a fascinating narrative.

According to Estevan, the word *Genízaro* comes from the Turkish *janissary*, which was a term used to describe the children of enemies that were captured and forced into servitude, before eventually being “freed” in exchange for military service (Rael-Gàlvez, Interview).

The *Genízaros* of New Mexico [and Colorado] had their origin in women and children, and rarely male adults, of Plains Indian nations who had been captured in intertribal raids, and whose captors then sold them to the Spanish inhabitants of the Rio Grande Valley...The mixed progeny of these people lost their tribal

identity, customs, and language after having been reared in a Hispanic milieu (Chavez 198).

Genízaro was a term that was used here as a euphemistic term, so as not to call them slaves. But, for me, all of these terms were euphemisms so as not to use the word “slave,” because slavery, by this point, by the 1700s, had been outlawed [by the Spanish] (Rael-Gálvez, Interview).

Genízaros were brought up in Spanish households and Christianized. Despite being acculturated through bondage, learning the language, religion, and culture of daily life, they were not Spanish. While some married into Spanish families, many of the enslaved were sent away once emancipated. Servitude lasted into early adulthood, usually until marriage time. Emancipation often came with pregnancy, and the children of such mixed unions were born free. But, because they were no longer connected to their Indigenous communities, nor connected to the Spanish, Genízaro families were isolated and lacked economic power. “They were a ‘new people . . . since they neither spoke the language nor observed the tribal customs of either parent but followed the local Hispanic life patterns—and yet were not Spanish, mestizo, or Pueblo Indian’” (Chavez 199).

Genízaros experienced the cultural change known as ethnogenesis...This term seems particularly applicable to tribal societies that, in the face of conquest and colonialism, were forced to either adapt or perish (Avery 4).

In the film, Ron tells a story he learned from a man named Demetrio Valdez, a 72-year-old who grew up in the Head House about 30 years after the Head family was gone. Demetrio is from the area and has roots in some of the very first families who settled the area. While many of those people were Genízaros, there were many others that were not. The lines between Hispano and Genízaro are blurry, and after slavery was abolished, they became even more unclear. In the film, we intercut Ron’s story with an interview with Demetrio. He conveys a depth of knowledge that is a result of his close connection to family and history. He was also friends with Ron’s late

father, and so the intercutting of his interview with Ron's storytelling emphasizes the intergenerational connection that emerges through these stories. Indeed, as Demetrio says, "This story was told to me by my grandfather, and I told it to Ron" (Valdez, Interview).

One day, a group of Indians arrived in front of the church and offered to sell captured children from a rival tribe. The first time they came, Ron and Demetrio say, the priests refused to buy them, and the Indian warriors slaughtered the children on the spot. "The next time they came," says Demetrio, "the priests said, 'give them what they want, we can't let these children die.'" (Valdez, Interview).

This story is impossible to verify, but there are clues that point to something like this happening. First is the word *criados*, which is a lexiconic artifact used to describe Indigenous children who were adopted by Hispano or Genízaro families (Valdez, Interview and Rael-Gálvez, Interview). According to Ron and others, *criados* means "raised up" or "brought up." Demetrio says his tio (uncle) Luis was a *criado*. Then there is the photo evidence that we found while looking through the Luther Bean Museum archives and the Conejos County Courthouse records. We found a dozen or more Polaroids, some of which appear in the film, that show images of children from the early 1900s. It is difficult to tell their ethnicity, but they all appear to be the same age, around 10 years old. And finally, there are the hand-written records showing the names of young children of Indigenous descent who lived in Conejos with adopted families. When we saw this document, we saw a familiar name: Lafayette Head. According to Ron, Head had for years documented all the enslaved people in the county, but he never documented his own (Rael, Interview and Rael-Gálvez, Interview). Ron says in the film, "the children were brought up in the households as servants, but also as family" (Rael, Interview). It is clear,

however, that an informal caste system was in place and lasted for several generations after the founding of Conejos.

There may have been at one time a delineation between the people who were enslaved and those who were slaveholders, but over time a hybridization occurred. Marriages, new families, emigration from and immigration to the area all factor into the way people understand who they are. During our time in Conejos county, we met folks who expressed a range of manifestations of this, and it became clear to us that there was a generational shift happening in tandem with a more general shift in the way Americans understand identity. Older folks rarely identified with the enslaved or *criados* they knew growing up, but those in Ron's generation and younger were ready to talk about it. The truth is that the mixing of Hispano, Indigenous and Anglo is something that has been going on since the 1500s.

There is such a resurgence of reclaiming this identity in all its manifestations, which is interesting to me, because it's claiming a more complex set of identities. From the early 1900s, there was a claiming of *Spanish-ness*. And I think the early 20th century, we saw this—this pronounced claiming of whiteness globally, right? To be white was better somehow. There was a hierarchy. There continues to be a hierarchy of race globally, including in the United States. New Mexicans and people from the [San Luis] Valley, like many places, claimed that there was a purity to their Spanish, to the language, to the bloodlines. But the reality is that there were mixtures from the very beginning. And as people today claim Genízaro identity, it's like pulling back those layers of who we are and saying, "That's a part of who I am," and it's claiming it (Rael-Gálvez, Interview).

Ron is aware of this shift as well, in fact, he himself experienced this shift. This was a challenge to represent in the film, requiring multiple revisions and conversations between Christina and me about the edit up until the very end of the post-production process. Originally, there was no discussion of the evolving understanding of his identity. But later versions of the film have him discussing the way he has seen the shift happen.

In the past 2 years, even in the conversations I've been having about the Head house and Indigenous slavery, I see how the morals are shifting from "there was never any slavery," to "that's not slavery, that's tradition," to "oh yes, there was slavery," to "oh, yes, we were those slaves," to "we were both the slaves, and the slave holders" (Rael, Interview).

Both the 3d printing of structures for (eventual) habitation, and the work of buying old buildings and fixing them up, are directly related to Ron's goal of showing the value of the people and cultural and traditions of his home. He can point to his obsession with adobe and preserving cultural history as his motivations for buying these buildings, but it is his deep interest in art and art practice that transforms them into places to create new stories. "I don't want to see any more adobe buildings melt to the ground. I want to make places where people can talk about creating new things, give birth to new things, and talk about traditions and fold those two together" (Rael, Interview).

The Process

The "folding together" is an extension of the idea of a hybrid condition, as Ron calls it, that exists at the historic borderland. It is a place where the mixing of ideas, cultures, and traditions at a place where different people groups and armies collided. This can be difficult to conceptualize, but the film explores this by weaving together old stories with new ideas, juxtaposing archival video with contemporary verité footage, and revealing over time a new way for Ron to understand himself. When Ron first discusses his Latino identity, he is cleaning an old extension cord that he says was "left here by my father for this project," (Rael, Interview), despite the fact that his father died over ten years ago, long before this project was conceived. This is an example of what he says a few minutes before, that as a "modern-day Latino" he is a superstitious atheist. For him, this paradox is not incongruous. The film shows him practicing

rituals like offering cracked corn to the spirits when firing clay pots and visiting his family's gravesite on the eastside of La Florida. He even creates a shrine of his father's tools in the shed, something akin to what the Chicano movement would dub "*rasquache*." This term emerged out of the Latino communities of Mexico. "A display made using materials at hand is an expression of *rasquachismo*" (Anderson). When asked about his understanding of this concept, Ron replies that in this area of the San Luis Valley, there is a similar term, "we say '*troche y moche*,' which means, 'ad hoc,' or 'doing the best with the least that you have'" (Rael, Interview).

In many ways this is the mentality that permeates Ron and Virginia's practice, because much of their interest is in democratizing 3D printing by making it work with readily available and cheaper materials. The 3D printers are becoming increasingly less expensive as well. They are literally "folding together" adobe and clay traditions and innovative technology.

Their work, however, goes well beyond tradition into new territory, and the film draws on stunning imagery and the movement of the printers to highlight this fact. "Though their forms are drawn from Indigenous sources, the production of 3D printed tiles and other components is anything but" (Brown). Indeed, parallel to the history lessons, the film continues to show the progress of the 3D printing at La Florida. From test prints of the adobe structures to finished micaceous earthenware ceramics, the film attempts to balance old and new.

Before film production began, Ron and Virginia were known as pioneers in the field of additive manufacturing (Brown), and their prestige in the field continued to increase during filming. Over the course of two years from when we started documenting their work, the studio prototyped six different experiments in building with adobe and the 3D printer. We were able to film many moments during the project, and Ron has licensed to us some of the footage that he shot as well.

They called the structures project “Mud Frontiers,” and it garnered international press coverage. The round structures range in size from eight feet tall by seven feet wide to a structure the size of a small house, and the vessels range from ten-inch tagines with multiple pieces, to teacups, plates, and dishes. The results are beautifully rendered and functional ceramics with designs of spirals, loops, and hooks.

I think one of the most exciting things for me about this whole process is that we can 3D print local clays and sands to make walls and enclosures. We can make other architectural components such as stairs. We can make interior components such as furniture and hearths. And we can also use those same clays to 3D print vessels that can be used in the interior, as well. So, we’re talking about architecture, furniture, and objects, all made from the same materials, using the same technology (San Fratello).

Mud Frontiers seeks to provide solutions for more ecologically friendly, energy efficient, and affordable construction methods. It is an analytical exercise that strives to hold on to cultural traditions while pushing the limits of naturally occurring material with the help of twenty-first century technology. It also serves as a test case for building a house using local materials and a relatively small robot. Indeed, one of the collaborators on the project was a former architecture student from UC Berkeley, Logman Arja. Logman is from Sudan and brought to this project a vast amount of experience using adobe. One of his hopes is to help perfect the process, and then bring it to sub-Saharan Africa, where it can be used to build robust housing for people who need it.

From human evolution to the settlement, cohabitation, cross-cultural exchange and violence of his own homeland, Ron tells a cohesive story about the why and how of his identity as an Indo-Hispano living in what is now known as the state of Colorado. This concept of the borderland is vital to how he connects his childlike fascination with the way mud hardens when

dry to his efforts to save the Lafayette Head House from falling back into the earth to building new things, like 3D-printed adobe houses.

My approach to telling the story of the traditional aspects of adobe and pottery-making, along with conveying the permanence of many of the adobe structures in the Southwest, relies on strategic use of archival footage interlaced with voice-overs from experts like Estevan, and Tawney Becker, a historian from the Luther Bean Museum at Adams State University in nearby Alamosa, Colorado. I was inspired by Ava Duvernay's *13th*, which masterfully weaves together dozens of experts and archival clips to tell the history of forced labor through mass incarceration, systemic racism, and violence against Black people after the abolishment of slavery. While this comparison seemed grandiose at the time, I learned that the system that enslaves people long after 1865, when the Thirteenth Amendment was enacted, is not dissimilar from that which existed in the San Luis Valley until the early 1900s. Duvernay's film made me realize that archival footage could be a powerful tool, and while there was no archival footage from the 1880s and 90s, I used some of the earliest known footage of adobe making, and I found images and documents that helped tell the story.

The film also uses several minutes of archival images that show notable adobe buildings, and videos from the 1940s and 1950s depict Indigenous and Hispanic people working with mud, clay, and adobe in traditional ways. The film also shows adobe buildings from China and Sudan, made centuries ago, along with earthen buildings by famous architects Frank Lloyd Wright and Adolf Loos. This serves to contextualize the studio's work within the framework of longstanding tradition.

Archival images and video imbue the film with a sense of long history and timelessness. But another challenge I had was translating the sense of space and grandeur that is felt in the

contemporary San Luis Valley. For this, I asked Ron to license some of the drone footage he was shooting to document his experiments. There are several moments during which I knew the film would need quiet moments, to offer audiences a chance to reflect. The drone footage transports viewers to the area, and gives a bird's eye view of the project. The footage also serves as contextualization, but this time to put the structures in the context of the enormous landscape.

We also had to determine the best method for expanding the pool of voices in the film. This forced us to grapple with questions about our roles as filmmakers not from this community, with no connection to this story but Ron. This predicament was something I have often considered, relative to the power I have as filmmaker in shaping the way a story is told. "There are simply no hard and fast rules about who gets to represent whom, and under what circumstances. [I had to examine my] assumptions about class, race, appearance, speech, and background. Also, [I had to] try to consider how [I] represented the environment" (Anderson et al. 55).

For Ron, one of the central elements to all this is the border itself. The connection was a little abstract during the time we spent together in La Florida. The contemporary evidence of this being a borderland was elusive, and much of the understanding and conveyance of its influence on the culture of the area came out of intellectual discourse. At the end of our time in La Florida, Ron and Virginia invited me to document an art installation project they were planning for the U.S.-Mexico border wall between El Paso, Texas and Ciudad Juarez, Mexico. They scheduled it for the final day of our production but, having learned the lesson of preparedness earlier on, I was ready for anything.

What happened next has become a legend. Ron and Virginia, and a team of artists and other collaborators, had been planning an event on the border wall for nearly 10 years, since the

publication of Ron's book, *Borderwall as Architecture*. In the book, Ron outlines several experimental ideas for reimagining the border wall between the two countries. From houses that use the border as a wall between rooms, to libraries that use the wall as bookshelves, these concepts are subversive, but entirely hypothetical. Except one. The event Ron and Virginia had been planning for so long arrived on July 28, 2019, when for 30 minutes, they installed a set of pink see-saws, using the border wall itself as the fulcrum. Kids and adults from both countries played together in an act of resistance to the violence and separation that the wall represents. Ron was giddy with excitement. The event happened with minimal interest from the authorities; the U.S. Border Patrol parked nearby and watched, and on the Mexican side a pair of armed soldiers passed through to make sure no contraband was being passed. Ron and Virginia called it *Teeter Totter Wall*. After the event, the see-saws were taken down, but the images and videos went viral, attracting nearly millions of viewers from around the world, and photographs that I made from that day were published on dozens of major news outlets, and Ron's social media accounts went from under 10,000 followers to over 60,000 in three days.

A year later, we were fortunate to receive \$5,000 in funding to film and update on the work Ron and Virginia were doing in La Florida after the onset of the COVID pandemic. A former intern who wowed us so much that we hired her as an associate producer on our film, Micah Pegues, traveled to La Florida to film the update. She captured what became the final scenes in the film. Ron and Virginia, together with their assistants, created two additional structures, including "Casa Covida," which is three times larger than any of the previous structures. Ron calls it, "a house for cohabitation in the time of COVID" (Rael, Interview). This structure is the closest to a complete house that they have 3D printed to date.

Audience and Distribution

As this history unfolded through interviews and research, Christina and I were also motivated to re-evaluate the intended narrative and audience for the film. While Ron's work in architecture was our first interest, and one which would cater to our already built-in audiences at Cooper Hewitt, we saw that a much larger story needed to be told. Indeed, the social history of the San Luis Valley was as wrapped up in his work as the architectural history. To tell a complete story, and bring in new audiences, as we had originally set out to do, we would have to dive into the anthropological roots of his work as well. We worked to engage with the community around the Rio Grande watershed about this story, not only in the telling of it on film, but also the sharing of it with their community. This was accomplished with outreach to Historic Colorado, a statewide initiative formed to hold events to help Coloradans preserve heritage sites and stories about their state's history. Historic Colorado put us in touch with locals who were working on and interested in telling these stories, including folks like Cindy Atencio, a local historian and spiritual medium, and Rio de la Vista, a woman who volunteers at history museums and centers in and around Conejos County. They became excellent partners and vouched for us with other community members.

This question of distribution was part of another lesson I learned in this filmmaking process. As a video producer for Cooper Hewitt, I was thinking about the exhibition and distribution of this film within the context of the museum in New York City. But because the story had developed its focus beyond 3D printing to include a lot more historical depth about the region, there was an opportunity to think about audiences beyond those with interest in design.

At the same time, we built relationships with folks that could be both subjects of the film and help bring it to local audiences. Along the way, we met people like Tawney Becker and Guillermo de Herrera, a retired state representative from the Conejos. We have committed to partnering with the university to have an exclusive screening and public program around the film. We have discussed, as well, exhibiting the film at the Head House for the local community.

The outreach also led to interviews with locals that have inherent and long-held knowledge of this area. This is important to connect the community to the film project, and to introduce audiences to a more diverse population. This brings a lot more social context and perspective to the film than would have otherwise been possible. Studio Rael San Fratello were in the valley to make adobe structures and clay pots, along the way they were reinterpreting what it means to be from this area through their work with historic landmarks like the Head House.

From 3D printing to reviving cultural practices to raising awareness of the legacy of Indigenous slavery, there is much that the film can teach. The potential for educating people about this history with the film informs our distribution plan. While film festivals in around New York, California, and Colorado are hopeful exhibition sites, the main goal is to allow universities, high schools, libraries, museums, and other historical or cultural organizations to use the film in their programming. Indigenous slavery in this part of the country is as important to the story of the United States as adobe is important to the architecture of the Southwest. But not many people outside of the Rio Grande watershed are aware of this past. We hope the film will change this and foster a dialogue around the legacy of this practice.

Another obvious choice for audiences is a cross section of technologists and hobbyists in the world of 3D printers with overlap from environmentalists and advocates for sustainable building practices. Ron and Virginia's work is squarely in this realm, and their adherents are

fervent fans of new technologies that push the use of 3D printers away from plastics and nonrenewable materials. The potential for interest from film festivals, conferences, and trade shows that focus on issues of environmental conservation and sustainability is not to be overlooked.

As previously mentioned, much of the work around audience engagement is related to the outreach we conducted during the production of the film itself. Through our efforts to include multiple voices of the folks from the San Luis Valley, we developed a network of people who are very eager to see the film and see themselves on screen. Because of this investment, too, they will certainly be advocating for local screenings in the area, and we are keen to accommodate these as well.

Finally, screenings at various Smithsonian Museums and Affiliate Institutions are core to our distribution plans. Because of the cross-subject nature of the film, it is a natural fit in programming with the National Museum of American History, the Renwick Gallery, the National Museum of the American Indian, and the National Museum of Natural History, among others. We have plans for these events already. With the screenings, too, we are developing curriculum for educators to use alongside the film. This includes modules in anthropology, history, design, architecture and more, presenting lessons on Indigenous slavery, the use of additive manufacturing for architecture and ceramic objects, and the history of adobe dwellings around the world. Because we gathered a lot of media materials for the film, educators from Cooper Hewitt have been eager to see how else we can leverage these assets beyond the film itself.

All these plans for distributing the film outside of the Hunter IMA program and beyond the walls of the museum has taught me another lesson in filmmaking: that of patience. I was

eager to be finished with the film in early 2020 but delays due to the COVID pandemic pushed this deadline further and further back. Organizations such as TED and the Library of Congress took months to respond to requests to license footage, and many more weeks to finalize agreements. It has been difficult to obtain music rights, as well. But during the final two months of the spring semester 2021, the paperwork needed to secure these rights arrived in small batches, and we are now on track to clear all the footage and sounds that we need. My rationale for fair use of the news footage is the fact that it was vital to telling the story of the Teeter Totter Wall project, which could not have been obtained any other way.

Conclusion

The Adobe Frontier began as a simple profile video of a design team that was working on an interesting project, but it blossomed into a complex and many-layered narrative that transcends time, traditions, cultures, and design history. As a filmmaker with a background in anthropology, museum studies, and history, I was primed for this to happen. Indeed, my prismatic approach to telling contemporary stories lives at the intersection of personal and social history, and through my career, I have learned that there are no simple stories. For Ron and Virginia, the *why* they do their work is deeply connected to a history that is unfamiliar to many, but important for people to understand. They make work that inhabits an intersection of art, design, storytelling, social activism, and history. For me, the telling of the history and their process to broader audiences is just as important as documenting their work as artists and designers whose bold vision is bringing the future to life. The confluence of the social and cultural factors that influence their vision fill their work with depth of meaning. The challenge of capturing this and telling it through film was an honor, and I hope I succeeded.

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