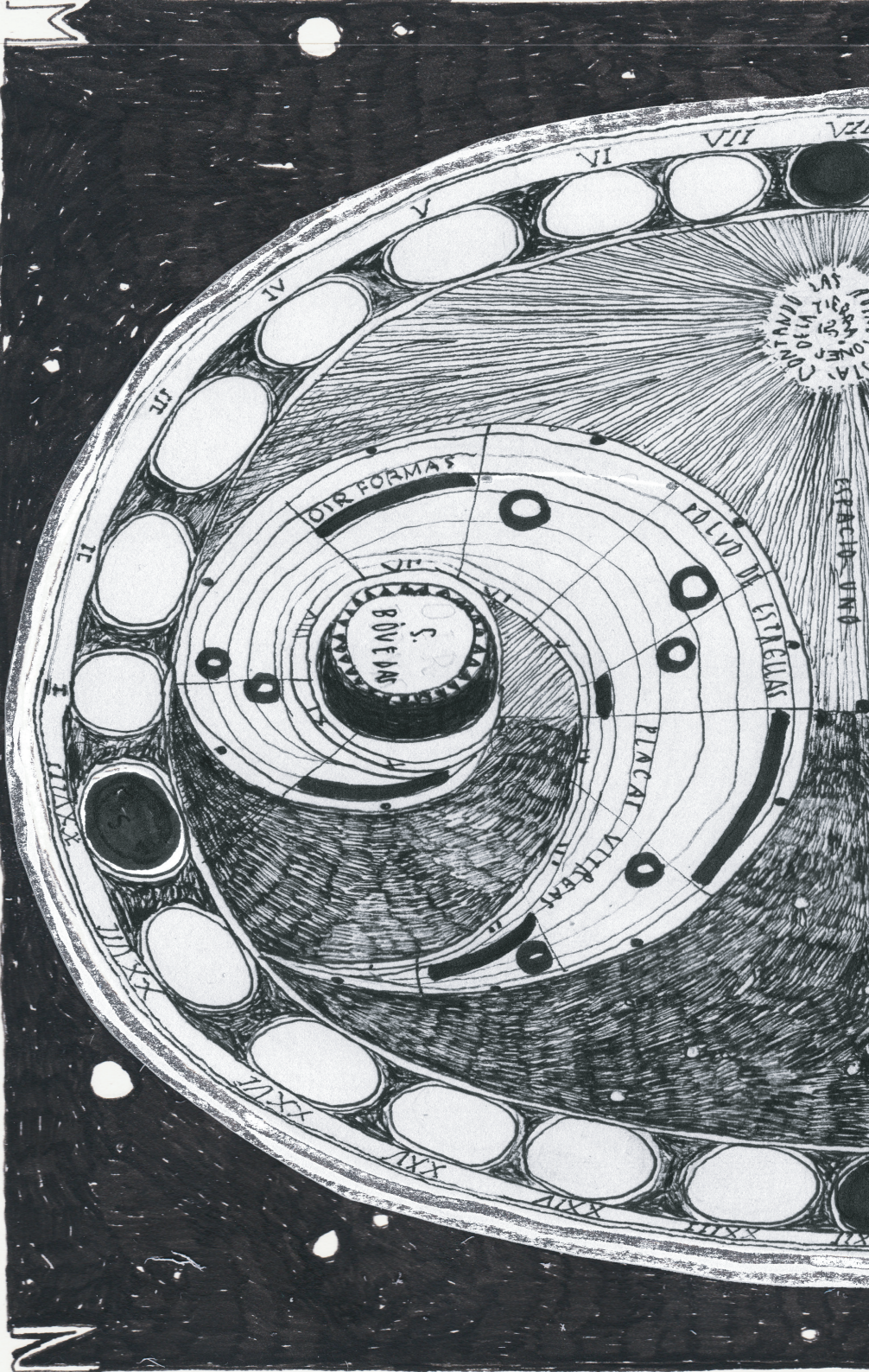


**NATURAL MAGIC**  
Protocol Room





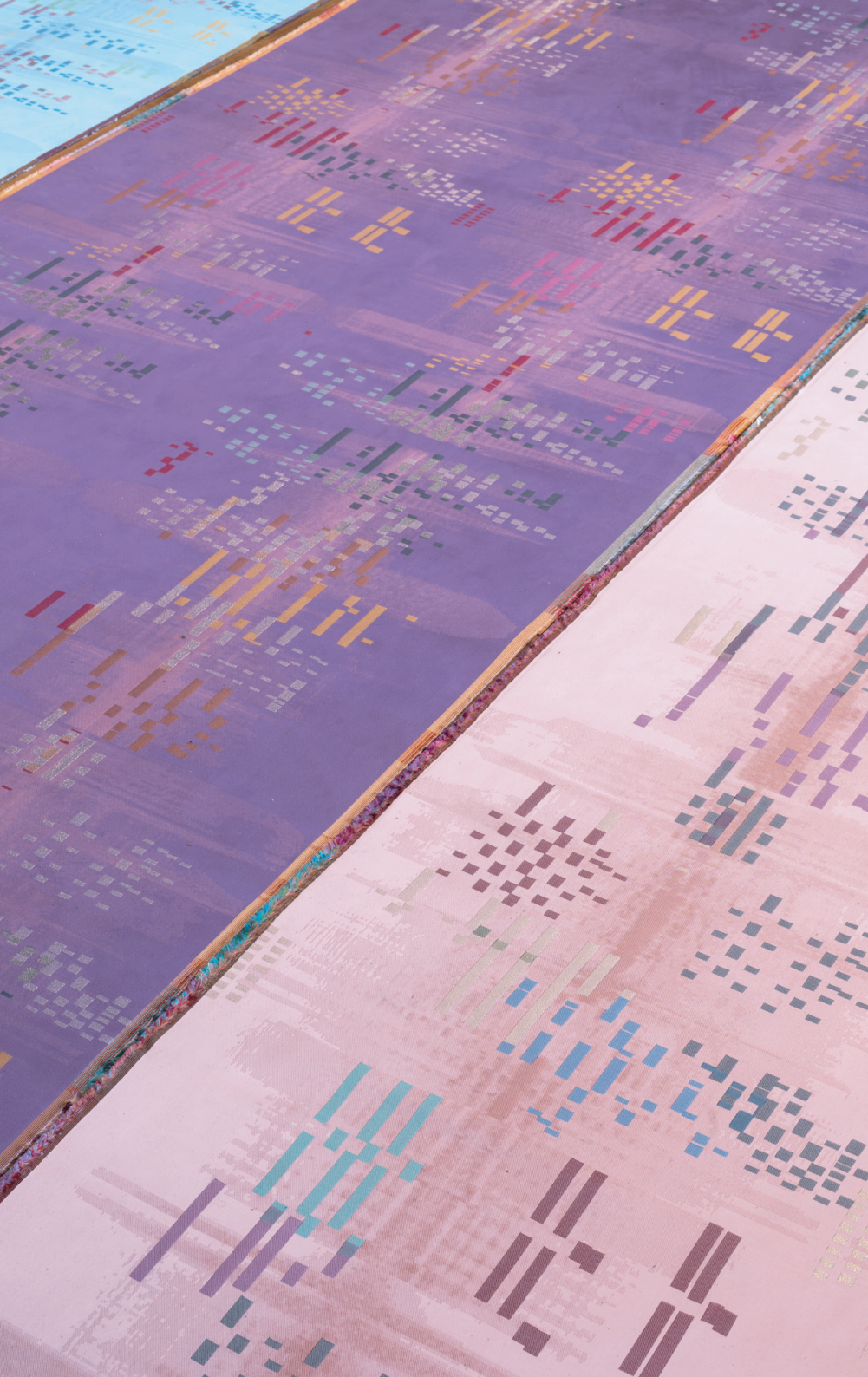
### 3.

At eye level, on the contrary, proceeds the person who believes  
that human actions are still, or are now,  
the most powerful acceleration  
that can be introduced into the world.

The person who proceeds below eye level recognizes  
that progress has not been sufficient  
and that only the animal part of the human,  
or the part that humbles itself, can solve conflicts.

Jumping, arguing, crawlin  
—these are, in sum, the three human methods  
of responding to a single world.

(And Bloom will employ them all.)



*Natural Magic* ends in the **Protocol Room**. While in Space 1, the film *The Sun Is Counting the Earth's Rotations* set in motion an illusion that incorporated visitors into the reflected images, here the film's soundtrack materializes in image form.

The sequence is as follows: The soundtrack of *The Sun Is Counting the Earth's Rotations* was replicated as a score for music boxes. Once written down, the score determined the patterns of the punched cards used to produce the Jacquard tapestries covering the floor.

We find ourselves before a double device or apparatus: one is the Jacquard loom that functions as the fossilized translation of a song, static in nature; the other is dynamic, with the music boxes amplified by suspended cymbals that replicate fragments of the soundtrack of *The Sun Is Counting the Earth's Rotations* when visitors activate the music boxes.

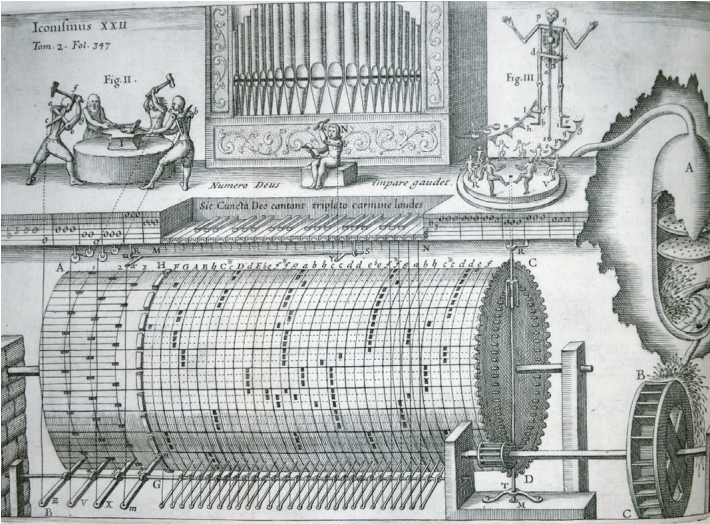
There is a close relationship between the score and the punched cards: both are pieces of stiff paper or cardboard containing abstract information encoded in the presence, absence, and position of the holes in the paper. The textile installation *Tables of the Moon* takes its name from the lunar tables in which Ernest W. Brown attempted to specify the movements and rotations of the moon, reducing them to basic, quite abstract representations written down on cardboard.

Our loom thus sits somewhere between mind and hand, reason and memory: it is linked to the music translated onto punched cards, which are then used to create a pattern that can eventually be inhabited, stepped on, touched, contemplated, and performed through music.

With its countless transformations, *Natural Magic* bids visitors farewell in this room with a gradually fading song, a circular illusion. Magic becomes a loom on which we walk and on which the invisible notes of a stellar wind come into being.

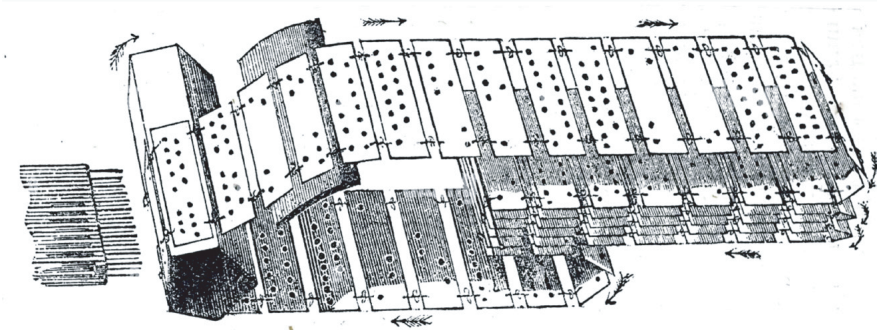


**MICRO**



Athanasius Kircher, *Musurgia Vniuersalis siue Ars Magna Consoni et Dissoni in X Libros Digesta* (Romae: Ex tyographia Haeredum Francisci Corbelletti, 1650), Iconismus XXII.

**MACRO**



Punch cards encrypted with the pattern necessary to work a Jacquard loom, 1843.

## Weaving a New Cosmos: The Tables of the Moon

Lotte Johnson

The stage is set and we are invited to enter. In a spartan antechamber, like a greenroom where actors or musicians might prepare before setting foot on stage, three cymbals hang at ear height—reverberating, transmitting the dancing and sometimes faltering sounds of a music box into our bodies. The shimmering gold metal vibrates and resonates, the music finding its lilting way through the melody as our ears trace the movement of the winding key of the music box as it articulates the tune, translating a score into a sound. Hidden within the music box attached to the cymbal is an intricate device, composed of a rotating metal cylinder with a score of protruding metal pins on its surface, each plucking the metal teeth of a comb as the cylindrical drum revolves, working like a tuning fork translating marks into music. A mechanical contraption is transformed into a sensory experience.

Translation, transmission, transformation—these are the alchemical processes at play in *Tables of the Moon*, the final section of Leonor Serrano Rivas's three-part installation.

In this antechamber, the room becomes an instrument, vibrating with undulating sound. For Serrano Rivas, this final space is indeed another “instrument for imagination,” as is each of the three spaces that make up the exhibition *Natural Magic*. The space stimulates the senses and stirs memories—just as the instruments invented by the philosophers, researchers, and scientists of the *magia naturalis* (natural magic) movement<sup>1</sup> in the mid-sixteenth century were devised to create new images, stimulate new perspectives, and generate new languages to describe the natural world around them. The music stops. We are invited

to step forward, to touch, to wind up the key of the music box and start the melody again, a simple turn of a hand setting the instrument into motion.

The melodies we hear and activate in the antechamber are adapted from Serrano Rivas's film *The Sun Is Counting the Earth's Rotations*, encountered in the first section of *Natural Magic*. To translate the soundtrack from recorded music to music box score, Serrano Rivas worked with composer Daniel Goddard to replicate fragments of the film's soundtrack, transposing them into a notation that the music box can read. The music is transformed by each medium that it passes through—beginning its life as a paper score, translated by musicians into a live recording, transposed into the liquid digital medium of film, and then transformed back into a physical paper score for the music box. While a standard musical score uses inked dots to indicate notes, a music box score is a long strip of paper whose notes are articulated through punched holes. These holes dance across the unfurled paper, inscribing a rhythmic pattern to be transmitted via song, to be transformed from static marks to moving, undulating sounds.

The punched scores for the music boxes appeared to Serrano Rivas to be like the hole-punch cards used for creating patterns for Jacquard weaving, in which a system of holes determines the directions for the loom. In the artist's imagination, one card is transformed into another. A trick of the eye, a slip of the hand.

We are invited to take our shoes off. We walk onto the stage, a wood-paneled room whose floor is lined with four unfurled rolls of Jacquard fabric, each in a different color palette and each marked with intricate patterns. Constellations of marks, grouped in formations that cluster and disperse along the length of the fabric. These are the *Tables of the*





*Moon*, their woven surfaces charting an entire cosmos. Their title is borrowed from Ernest W. Brown's lunar tables from 1919, with which he attempted to classify the movements and rotations of the moon using mathematical tabulation.<sup>2</sup> However, his theory of planetary gravitation was never quite resolved, his calculations full of unexpected fluctuations that required him to make arbitrary adjustments, amendments, and additions to the lunar charts, ultimately transforming them into something that would convey what he had observed in the cosmos. A slip of the hand, a trick of the eye.

Just like Brown, Serrano Rivas and Goddard had to adjust, translate, and transform the audio of the film, which Serrano Rivas considers to be the voice of the sun, into a punched musical score. Embracing the gaps and glitches to create something new, the process was reenacted again when translating the musical scores into the punched scores for the Jacquard loom, which were finally used to weave the fabric rolls that unfurl beneath our feet. Working closely with the artisans who would make the Jacquard fabric, Serrano Rivas and her collaborators had to devise ways to adjust and amend the scores so that they made technical sense for weaving fabric. Invention was key over the nine months that Serrano Rivas spent working first with Goddard and then with the Spanish weaving company that helped the artist with the production of the tapestries.

Goddard extracted each instrument from the original film score in order to visualize their melodies for the music box. Serrano Rivas then translated the code into a Jacquard loom punch card, testing out various technical and mechanical solutions to the glitches between the two scoring systems. Various challenges arose: musical scores are read horizontally, while punched cards are read vertically. The traditional punched cards for Jacquard looms have been replaced by digital coding, so they had to be translated from







the analogue to the digital. Ultimately, each of the digital loom cards held the voices of four different instruments, “represented by four different coloured wefts and chord ligaments.”<sup>3</sup> The scale of the score had to be enlarged so that each knot indicated by the punched card was multiplied by 160, representing 160 threads of fabric, so that the scored design would be visible to the human eye. Serrano Rivas expanded the patterns of each instrument so that the duration of their sounds would be reflected graphically. The sound frequencies of the music were also mirrored with tones that differ slightly from the color of the base fabric, so that they appear like shadows or ghostlike forms around the graphic, multicolored patterns of the notes of each instrument.

Like the proponents of *magia naturalis*, Serrano Rivas employed tricks, alterations, and distortions to offer a transformed experience of both music and film, now expressed through the medium of fabric. The voice of the sun becomes the voice of the moon. Working through gaps and glitches is central to Serrano Rivas’s creative process—they trigger the imagination and invite playful reformulation. The artist insists on them as an imaginative methodology, allowing transformation from one medium to another,<sup>4</sup> enabling the creation of a new vision, a new cosmos.

This interest in the gap between theory and practice, and the imagination needed to translate, transmit, and transform one thing into another, brings to mind the idea of “glitch feminism,” a term coined by writer and curator Legacy Russell. In her analysis of cyberfeminism in the digital era, Russell embraces what she calls the causality of “errors,” which “point towards a wild unknown.”<sup>5</sup> She reframes the error or glitch as a much-needed “positive departure” from something, a form of liberation for the body, for gender, and

for technology.<sup>6</sup> The glitch refuses the binary, guiding us “through wayward worlds toward new frameworks and new visions of fantastic futures.”<sup>7</sup> Russell, like Serrano Rivas, sees the glitch as cosmic, as full of vast potential, the key to a process of creative transformation.

Russell’s theory, rooted in the digital age, seems especially pertinent here, as punched cards are one of the earliest forms of digital data—scores that direct particular inputs. These punched scores (both for music boxes and looms) are binary code systems. When punched cards were introduced in the early nineteenth century, this “made the loom into the first piece of automated machinery.”<sup>8</sup> Stringing punch cards together directed the loom to create the pattern, a machine directed by human minds and hands but operating independently. However, in translating one binary code into another, from music box to loom, Serrano Rivas has to embrace and work with the gaps between the two systems, creatively transforming one into the other. And what results from the complex but binary code of the fabric punch card is anything but binary: a woven cosmos, with intermingling threads, interconnecting planes, a network of ideas.

Donna Haraway’s perspective on what she calls “string figuring” (or “SF,” which also stands for science fact, science fiction, speculative feminism, and speculative fabulation) is resonant here too. In her book *Staying with the Trouble: Making Kin with the Chthulucene*, Haraway explores how the practice of creating textiles involves making patterns with others. She describes how this inevitably involves both active and passive processes, passing patterns back and forth, and ultimately leading to threads being dropped and unraveled and new patterns being formed.<sup>9</sup> Haraway sees this as “a source of possibility and joy.”<sup>10</sup> As for Serrano Rivas and Russell, there is great expansive potential in the glitch, in the new patterns that result from these productive gaps.



Science fiction writer Ursula K. Le Guin and her characters understand these glitches and gaps. In the short story, “A Man of the People,” the male protagonist Havzhiva questions the discrimination against and enslavement of women in his world and reflects on his potential to enact change: “You can’t change anything from outside it. Standing apart, looking down, taking the overview, you see the pattern. What’s wrong, what’s missing. You want to fix it. But you can’t patch it. You have to be in it, weaving it. You have to be part of the weaving.”<sup>11</sup> It is women’s role in weaving—and in embracing what’s missing and creating something new—that is worth bringing to the fore here.

The history of weaving is predominantly a gendered history and one that offers insight into women’s work in preindustrial society.<sup>12</sup> This story continues into the industrial age: although Joseph Marie Charles Jacquard is credited with patenting the Jacquard loom, his mother, Antoinette Rive, was also central to its history.<sup>13</sup> Like other women in Jacquard’s family, Rive was instrumental in creating the textiles themselves: she was a “pattern reader,” preparing the looms and selecting and arranging the cords. It was her role to translate the pattern into the final fabric.<sup>14</sup> She was a crucial participant but missing in the master narrative, like many women before and after her. Serrano Rivas is especially interested in Rive’s role—and in a strange coincidence the artist’s mother shares the name Antoinette, drawing threads of connection between a network of women who have influenced her.

We turn our gaze back to *Tables of the Moon*. Natural light floods into the room through the windows, its changing shadows altering the tones of the Jacquard fabrics over the course of each day. The echoes of the humming emanating from the music boxes linger, now joined by a new dancing melody, one inscribed on the fabric under our feet. The





lengths of Jacquard hold multiple histories, sounds, and memories in their threads: the voice of the sun, the ghost of a melody, the marks of a score, the motion of the loom, the story of Antoinette Rive, the artist's mother, the tables of the moon. As our feet make contact with these threads, these histories are transmitted through our bodies. We inhabit them, they weave their way into us. As we walk, we activate the score below us, the patterns invite us to dance upon the woven stage, to perform the music below in our minds and in our bodies.


Ascending upstairs via a spiral staircase (its gold banister bringing to mind the gold cymbals that continue to vibrate in the preceding antechamber), we climb to a mezzanine balcony, where the panoramic punch cards that were used to direct the looms span the length of a wall. They map the process behind the fabric below, inviting us to translate, transmit, and transform their code with our own imaginative glitch.

Weaving together imaginative, political, and historical threads, *Tables of the Moon* is a multisensory investigation of the power of translation and the glitch that it inevitably entails, and an experiment in its emancipatory potential.

#### Endnotes

- 1 Giambattista della Porta, *Magiae Naturalis, siue, De Miraculis rerum Naturalium Libri IIII* (Naples: Matthias Cancer, 1558).
- 2 Ernest W. Brown, *Tables of the Motion of the Moon*, 3 vols. (New Haven: Yale University Press, 1919).
- 3 Ibid.
- 4 Conversation with the artist, August 2022.
- 5 Legacy Russell, *Glitch Feminism: A Manifesto* (London: Verso, 2020), 74.
- 6 Legacy Russell, "Digital Dualism and the Glitch Feminism Manifesto," *The Society Pages*, December 10, 2012, <https://thesocietypages.org/cyborgology/2012/12/10/>





digital-dualism-and-the-glitch-  
feminism-manifesto/.

- 7 Russell, *Glitch Feminism*, 14.
- 8 Sadie Plant, *Zeros and Ones: Digital Women and the New Technoculture* (London: Fourth Estate, 1998), 14.
- 9 Donna J. Haraway, *Staying with the Trouble: Making Kin with the Chthulucene* (Duke University Press, 2016).
- 10 Lauren O'Neill-Butler, "Donna J. Haraway Speaks about Her Latest Book," *Artforum*, September 6, 2016, <https://www.artforum.com/interviews/donna-j-haraway-speaks-about-her-latest-book-63147>.
- 11 Ursula K. Le Guin, "A Man of the People," in *Four Ways to Forgiveness* (London: Cassell Group, 1996), 157.
- 12 See Plant, *Zeros and Ones*.
- 13 Conversation with the artist, August 2022.
- 14 Roger Whitson, "Joseph Marie Jacquard, Antoinette Rive, and a Feminist Media Archaeology of Automated Labor," November 8, 2019, <https://rogerwhitson.org/2019/11/08/slsa-talk-2-joseph-marie-jacquard-antoinette-rive-and-a-feminist-media-archaeology-of-automated-labor/>.



