

Vital practices: Self-experimentation
as artistic and scientific form

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- A Tear ecologies > (1) (2) (3) (4) (5) (6)
- B Secluded time > (7) (8) (video 1) (9) (10) (11) (video 2)
- C Mediating vision > (12) (13) (video 3) (14) (15) (16) (17) (18) (19)
(20) (21) (22)
- D Strains of speed > (23) (24) (25) (26) (27) (28) (video 4) (29)
(video 5) (30) (31) (32)
- E Artificial openings > (33) (34) (35) (36) (37) (38) (39) (40) (41) (42)
(43) (44) (45)
- F Edge conditions > (46) (47) (48) (49) (50) (51) (52) (53) (video 6)



At the time of this writing, news outlets worldwide are reporting the case of a Taiwanese woman found to have four bees living underneath her eyelid.¹ Only a few millimetres in size and known colloquially as “sweat bees,” these insects were consuming the proteins found within the tears of a woman identified only as He, her family surname. Remarking on the successful removal of each of the tiny specimens by a confounded ophthalmologist, much of the media coverage failed to mention the worldwide presence of these insects attracted to perspiration and other saline bodily fluids, as well as their study by scientists who use their own eyes to attract and feed their apian subjects. One example is Hans Bänzinger, a Swiss entomologist who has researched bee and moth lachryphagy in forest regions across southern Asia since the mid-1960s. In 2009, Bänzinger allowed more than 250 bees to consume tears from his eyes at several sites throughout Thailand, later conducting a similar study between 2013 and 2014.² Bees imbibed his tears during day-long stretches held over several weeks, most often staying for minutes at a time and proving barely noticeable or producing minimal discomfort. Only on a few occasions were the foraging bees too “pestiferous” to bear for more than a couple of hours.³

Bänzinger’s investigations and their accompanying photographic records constitute a form of self-experimentation: single-subject research where a person carries out processes within and through their body to gather information on a specific phenomenon, assess a prototype, or otherwise test a hypothesis, remedy, or procedure. Hans Bänzinger’s examination of sweat bees falls into a robust lineage of self-experimenters in entomology. These range from William Baerg and Allan Walker Blair, a U.S. entomologist and Canadian physician who allowed black widow spiders to bite

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1 See Hannah Ellis-Petersen, “Doctors Discover Four Live Bees Feeding on Tears Inside Woman’s Eye,” *The Guardian*, 10 April 2019; Tiffany May, “Four Bees Living in Her Eye, Feeding on Her Tears,” *New York Times*, 10 April 2019; and Timothy Bella, “She Went to the Hospital for an Infection; Doctors Found Four Bees Living in Her Eye, Eating Her Tears,” *Washington Post*, 10 April 2019.

2 See Hans Bänzinger et al., “Bees (Hymenoptera: Apidae) That Drink Human Tears,” *Journal of the Kansas Entomological Society* 82 (2010): 135–150, and Hans Bänzinger, “Congregations of Tear-Drinking Bees at Human Eyes: Foraging Strategies for an Invaluable Resource by Lisotrigona in Thailand (Apidae, Meliponini),” *National History Bulletin of the Siam Society* 62, no. 2 (2018): 161–193.

3 Bänzinger et al., “Bees That Drink Human Tears,” 164.

their hands to examine the effects of their venom in 1923 and 1933, respectively,⁴ to Justin Orvel Schmidt, a U.S. entomologist who for the last 35 years has been bitten and stung by approximately 150 different species of Hymenoptera—the order of insects that includes bees, wasps, and ants—to create a quantitative scale to measure the resulting pain.⁵

Yet Bänzinger's absorbed examination of tear-sipping bees in the Thai tropics also allows for comparison with artists who use their bodies to engage first-hand with insect and ecological activity. In his film *Springtime* (2010–2011), Dutch filmmaker Jeroen Eisinga captures himself sitting in front of the camera while 150,000 bees cover his face and upper body. Viewers witness Eisinga growing concealed by the engulfing swarm, his nose and eyes barely remaining clear. Serving as director and subject, for *Springtime* Eisinga collaborated with beekeepers from Cahir, a town in County Tipperary in Ireland, as no beekeepers in the Netherlands were willing to participate.⁶ Eisinga's restraint in the face of teeming bees—comprising a total of twenty-five kilograms in weight—exemplifies the deliberate use of his body both for the creation of an artwork and a biological encounter, one thoroughly familiar to apiculturists and bee bearders, but that nevertheless requires a commanding exercise in surrender. At the time Eisinga performed his work, the record for bee-bearding on a person was 350,000 bees, or the equivalent of 39.5 kilograms.⁷

What follows is an attempt to survey instances of self-experimentation in two distinct fields: single-subject (or *n* of 1) studies in human physiology and the life sciences, and durational, body-based work in contemporary art.⁸ In drawing

4 Allan Walker Blair, "Spider Poisoning: Experimental Study of the Effects of the Bite of the Female *Latrodectus mactans* in Man," *Archives of Internal Medicine* 54 (1934): 831–843.

5 Justin O. Schmidt, *The Sting of the Wild* (Baltimore: Johns Hopkins University Press, 2016). For a refinement of Schmidt's "sting pain index" by pain variability of honey-bee stings in different parts of the body, see also Michael L. Smith, "Honey Bee Sting Pain Index by Body Location," *PeerJ* 2 (2014): e338.

6 For more information and still images of *Springtime*, see <http://jeroeneisinga.com/films/springtime>.

7 U.S. animal trainer Mark Biancaniello held the world record in bee bearding from 1998 until 2014.

8 A notable exception is the edited work by Katrin Solhdju, *Introspective Self-Reports: Shaping Ethical and Aesthetic Concepts 1850–2006* (Max Planck Institute for the History of Science, Pre-print 322, 2006), a volume which includes texts on self-experimentation by both scholars and contemporary artists.

distinct operational commonalities between the two contexts, I do not aim to equate or simplify the different ends to which artists and scientists have used their bodies as a site for intellectual and creative inquiry. Rather, I am driven to advance a perspective—now more of a proposition than a definitive statement—of self-experimentation as a form of knowledge production and a consummate vantage point for embodied research⁹, one that goes beyond the hackneyed characterization of eccentricity¹⁰ or the facile allure of transgression.¹¹

9 An exceptional document for self-experimentation as embodied philosophical reflection is Paul B. Preciado, *Testo Junkie: Sex, Drugs, and Biopolitics in the Pharmacopornographic Era* (New York: Feminist Press at CUNY, 2013 [2008]).

10 See, for example, Mel Boring and Leslie Dendy, *Guinea Pig Scientists: Bold Self-Experimenters in Science and Medicine* (New York: Henry Holt and Company, 2005); Alex Boese, *Electrified Sheep: Glass-Eating Scientists, Nuking the Moon, and More Bizarre Experiments* (London: Boxtree/MacMillan, 2011); and Trevor Norton, *Smoking Ears and Screaming Teeth: A Celebration of Scientific Eccentricity and Self-Experimentation* (New York: Pegasus Books, 2012). Amidst these conspicuous titles on self-experimenters as idiosyncratic mavericks or historic curiosities, two book-length studies stand out: Lawrence K. Altman, *Who Goes First? The Story of Self-Experimentation in Medicine* (Berkeley: University of California Press, 1998), and Arsen P. Fiks and Paul A. Buelow, *Self-Experimenters: Sources for Study* (Westport, USA: Praeger, 2003). For two dynamic articles surveying eighteenth- and twentieth-century self-experimentation, respectively, see Londa Schiebinger, "Human Experimentation in the Eighteenth Century: Natural Boundaries and Valid Testing," in *The Moral Authority of Nature*, ed. Lorraine Daston and Fernando Vidal, 384–408 (Chicago: University of Chicago Press, 2003), and Andi Johnson, "'They Sweat for Science': The Harvard Fatigue Laboratory and Self-Experimentation in American Exercise Physiology," *Journal of the History of Biology* 48 (2015): 425–454. Finally, for a critical self-reflection on self-experimentation, see the excellent article by British dietician Elsie M. Widdowson, "Self-experimentation in nutrition research," *Nutrition Research Review* 6 (1993): 1–17.

11 Recent monographs on "endurance art" offer little departure from earlier studies on performance from the 1960s and 1970s, with the partial exception of works by Patrick Anderson, *So Much Wasted: Hunger, Performance, and the Morbidity of Resistance* (Durham: Duke University Press, 2015), and Lara Shalson, *Performing Endurance: Art and Politics since 1960* (Cambridge: Cambridge University Press, 2018). These texts tend to extol the artist's heroic stamina, martyr-like sacrifice, or iconoclastic extremity—tones that, ironically, do not ring far from the extravagant or feat-like terms in which scientific self-experimentation has also been habitually presented. For writing on "hardship/ordeal art," see Peggy Phelan, *Unmarked: The Politics of Performance* (London: Routledge, 1993); on "masochistic performance," see Kathy O'Dell, *Contract with the Skin: Masochism, Performance Art, and the 1970s* (Minneapolis: University of Minnesota Press, 1998), and Roselee Goldberg, *Performance: Live Art Since the 1960s* (New York: Thames and Hudson, 1998). For artists as martyrs, see Erika Fischer-Lichte, *The Transformative Power of Performance: A New Aesthetics*, trans. Saskya Iris Jain (Abingdon and New York: Routledge, 2008); Marla Carlson, *Performing Bodies in Pain: Medieval and Post-Modern Martyrs, Mystics, and Artists* (New York: Palgrave Macmillan, 2010); and Karen Gonzalez Rice, *Long Suffering: American Endurance Art as Prophetic Witness* (Ann Arbor: University of Michigan Press, 2016). More recent examples on endurance as extremity include Francesca Alfano Miglietti, *Extreme Bodies: The Use and Abuse of the Body in Art*, trans. Anthony Shugaar (Milan: Skira Editore, 2003), and Dominic Johnson, *Unlimited Action: The Performance of Extremity in the 1970s* (Manchester: Manchester University Press, 2019).

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The majority of selected examples are from after 1945¹² and often took place outside of established institutional contexts, such as a commercial gallery, laboratory, university, or similar space. Several of the individuals mentioned are well-recognized self-experimenters, while others are those who have not outwardly presented themselves as such. Some works have benefitted from public recognition¹³, whereas others actively curtailed their renown. Without exception, all cases are accessed through the examination of some form of corresponding documentation, such as photographic records, audio-visual production, academic articles, legal reports, memoirs, and eye-witness accounts. In focusing on the production of “self-evidence”—a term I borrow from historian of science Simon Schaffer and his article by the same name, which examines public scientific demonstrations involving self-experimentation in the 18th century¹⁴—I prioritize the heterogeneity of technical and non-technical approaches involved in “making evidence out of the person of the experimenter,”¹⁵ a growing catalogue that will continue to develop well beyond this essay.

Before moving on to the presentation of examples, I offer the following personal disclaimer. The motivation for this article lies in a project that began as an artwork and has expanded into applied and written reflections on self-experimentation. In 2013, I germinated a begonia seed in my right eye. For this purpose, I used a silicone punctal plug, a miniscule ophthalmological device that, when placed in one’s tear duct, blocks the drainage of lachrymal fluid and collects this moisture in a hollow interior. I deposited within the plug’s opening the

12 This timeframe matches the establishment of international principles on human subject research, such as the 1946 Nuremberg Code and the 1964 Declaration of Helsinki (the latter with its multiple revisions). Although neither directly regulates self-experimentation, these instruments nevertheless bear significant relevance to single-subject research. See George Annas, “Self-experimentation and the Nuremberg Code,” *British Medical Journal* 341 (2010): c7103.

13 This essay does not go into depth examining Nobel Laureate self-experimenters; for further information on this, see Allen B. Weisse, “Self-Experimentation and its Role in Medical Research,” *Texas Heart Institute Journal* 39, no. 1 (2012): 51–54.

14 Simon Schaffer, “Self-evidence,” *Critical Inquiry* 18, no. 2 (1992): 327–362. Schaeffer’s text examines the instrumentalization of the body in the eighteenth century, where scientists using their bodies for the public performance of science—physical demonstrations of devices, phenomena, and natural laws—gradually gave way to the “disembodiment” of the scientist and the “embodiment” of scientific, self-registering instruments.

15 Schaffer, “Self-evidence,” 330.

seed of a *Begonia semperflorens*, a species chosen to fit the internal dimensions of the plug. I then positioned this plug within my lower right tear duct, using the provided applicator. Following this, I began a waiting period for the sprout to appear. For the better part of two weeks, I laid on top of a table located underneath a skylight and stayed there during the course of the day and night. I covered my eye with a perforated eye shield in order to prevent accidentally touching the implant and also to control the access of sunshine, as begonia seeds grow optimally under mottled light conditions. I remained indoors and fairly motionless, moving only occasionally to stretch, eat small amounts of food, and go to the bathroom. After approximately twelve days of this process, I finally noticed the appearance of a tiny sprout emerging from the edge of my eyelid. When I realized that the new growth would not be able to develop further because of the limited capacity of the plug and the flattening weight of my eyelid when blinking, I took a photograph of my eye with the sprout and removed the plug with the same applicator I employed for its placement. I titled this project *Inoculate*, a word that is now most commonly used in reference to medical vaccination, but which originally described the grafting of plants to create hybrids in horticulture. More significant than the individual instantiation of *Inoculate* in my own body is the communication on how the project was carried out. This has led to the preparation of a manual providing step-by-step instructions that will be presented online in the future under the domain name <http://manual.vision>.

Inoculate is based partly on a phrase written by Ralph Waldo Emerson in his 1835 essay *Nature*: “The ruin or the blank, that which we see when we look at nature is in our own eye.” It was through this idea of a “mutual implication of self-knowledge and knowledge of nature”¹⁶ that I began to examine the roots of U.S. Transcendentalism in British and German Romanticism, leading me to self-experiments in their interconnected scientific, artistic, and literary traditions. First-person accounts in the use of opium and nitrous oxide by Romantic scientists and poets offered a significant reprieve to the rigidity of

16 Stuart W. Strickland, “The Ideology of Self-Knowledge and the Practice of Self-Experimentation,” *Eighteenth-Century Studies* 31, no. 4 (1998): 453.

contemporary disciplinary demarcations.¹⁷ Galvanic self-experimentation, or the intensive application of electricity to different parts of the body, also provided compelling examples beyond psychoactive chemicals. German physicist Johann Wilhelm Ritter, arguably the most committed follower of this practice,¹⁸ investigated the application of poles from a voltaic pile on his hands, tongue, ears, nose, and genitalia. In addition to his high-voltage experiments, Ritter was known to pursue other types of bodily investigations as well: in one instance, he pinned each eyelid open to stare at the sun, an experiment inspired by a similar attempt from poet and physician Erasmus Darwin, Charles Darwin's grandfather. Ritter reported to Danish chemist Hans Christian Ørsted: "Through looking into the sun for 20 minutes, I have gone so far that for 26 days (until today) I have in each eye a place which has no more sense for black and white, and which sees colours reversed: red [as] blue and blue [as] yellow or red."¹⁹ Ritter's expansive approach to self-experimentation, ocular and otherwise, has served as a continuous touchstone for *Inoculate* and its ongoing derivations.

In looking for contemporary projects akin to *Inoculate*, I came across several interpretations of botanical implants by contemporary artists. Yang Zhichao's piece *Planting Grass* (2000) consisted of the surgical placement of water grass shoots into his shoulder, a gesture informed by his forced transplantation to Beijing as a migrant from a rural province in China. This work harkens back to Petr Štembera and his performance

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17 See for example Noel B. Jackson, "Critical Conditions: Coleridge, 'Common Sense,' and the Literature of Self-Experiment," *ELH* 70, no. 1 (2003): 117–149; Jan Golinski, *The Experimental Self: Humphry Davy and the Making of a Man of Science* (Chicago: University of Chicago Press, 2016); Emily B. Stanback, *The Wordsworth Coleridge Circle and the Aesthetics of Disability* (London: Palgrave Macmillan, 2016); Larry Stewart, "Pneumatic Chemistry, Self-Experimentation, and the Burden of Revolution, 1780–1805," in *The Uses of Humans in Experiment: Perspectives from the Seventeenth to the Twentieth Century*, ed. Erika Dyck and Larry Stewart, 139–169 (Leiden: Brill, 2017); and Neşe Devenot, "Medical Ecstasies: Chemical Synthesis and Self-Experimentation in Romantic Science and Poetry," *European Romantic Review* 30, no. 1 (2019): 1–24.

18 For information on Johann Wilhelm Ritter, see Strickland, "The Ideology of Self-Knowledge and the Practice of Self-Experimentation"; Fergus Henderson, "Novalis, Ritter and 'Experiment': A Tradition of 'Active Empiricism,'" in *The Third Culture: Literature and Science*, ed. Elinor S. Scaffer, 153–169 (Berlin: Walter de Gruyter, 1998); and Jocelyn Holland, *German Romanticism and Science: The Procreative Poetics of Goethe, Novalis, and Ritter* (New York: Routledge, 2012).

19 Strickland, "The Ideology of Self-Knowledge and the Practice of Self-Experimentation," 459.

Grafting (1975), in which the Hungarian artist implanted a small offshoot from a fruit tree under the skin of his left arm. Imitating the methods used by farmers to cut and bind parts of plants to produce new varieties, Štembera conceived this work to express his unity with nature, claiming his desire to "make contact with the plant, to put it in my body, to be together with it as long as possible."²⁰ Accounting for more invasive forms of botanical insertion, both Štembera and Zhichao photographed their pieces prior to the predictable infection caused by their bodies' rejection of these foreign organic elements. A different representational approach was taken by Estonian artist Ene-Liis Semper in her work *Oasis* (1999). In collaboration with the artist Kiwa, Semper recorded a close-up shot of herself lying down and facing the camera. In the video we see Semper have her lips opened by a different set of hands that slowly fills her mouth with soil and then sets a flower plant inside. The piece ends with the watering of Semper's face and the plant held inside her oral cavity.

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To the best of my knowledge, there are no previously documented attempts of voluntary intra-corporeal plant growth as a form of self-experimentation. Medical reports of bodily germination are rare, although unconfirmed examples tend to trigger copious press coverage (similar to the media frenzy provoked by the aforementioned sweat bee encounters). A recent case of a plant growing in living human tissue is Ron Sveden, a 75-year-old retired teacher from the United States who in 2010 had a 1.5 centimetre pea plant sprout removed from his left lung by thoracic surgeon Jeffrey Spillane at Cape Cod Hospital in Massachusetts.²¹ Although not an intended self-experiment per se, Sveden is an example of a "first patient" — people who by virtue of exceptional circumstances are the subject of inimitable "natural experiments," unique medical conditions with treatments often designed and tested for the first time on them. This description also fits the sole

20 Kristine Stiles, "Inside/Outside: Balancing between a Dusthole and Eternity," in *Body and the East: From 1960s to the Present*, ed. Zdenka Badovinac (Ljubljana: Moderna Galerija, 1998), 28; cited in Maja Fowkes, *The Green Bloc: Neo-avant-garde Art and Ecology under Socialism* (Budapest: Central European University Press, 2015), 226.

21 Although picked up by multiple media sources, the original article reporting this case was Colneth Smiley Jr., 2010, "Sprout Grows in Brewster Man's Windpipe," *Boston Herald*, 10 August 2010. See also Steve LeBlanc, "Docs Discover Sprouting Pea in Massachusetts Man's Lung," *Associated Press*, 12 August 2010.

case of ocular germination I have found thus far in the medical literature. In 1979, Julian Fabricius, an eight-year-old boy from Worcester, South Africa, complained to his mother of not being able to see properly out of his right eye. Upon medical inspection, a small sprout was discovered inside his iris.

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The hypothesis is that, while playing outdoors, Fabricius would have accidentally created a corneal lesion large enough for a stray seed to become embedded therein. Solomon Abel, the ophthalmologist who removed the sprout (recognized subsequently as belonging to the Compositae family) stated that "the aqueous environment of the eye appears to be a favourable hydroponic medium."²² *Inoculate* resembles this opportunistic germination of a seed through the eye's lachrymal surface moisture, albeit one mediated by a self-administered procedure of insertion and removal, as well as other circumstances described as follows.

22 Solomon Abel, "Germinating Seed in Anterior Chamber: Report of an Unusual Case," *Archives of Ophthalmology* 97, no. 9 (1979): 1651.

Perhaps the most considerable component of *Inoculate* was the extended period of waiting for a sign of life to emerge. This completely reoriented and altered my daily routine. Lying down while staring at the autumn sun, I was restless and fidgeting for the first few days, trying to find comfort on the flat surface of a table in my apartment that I adapted into a bed. Yet gradually, I transitioned into a calmer pattern of wakefulness, absorbing the subdued sunlight or the dim night sky, and falling into more regular (albeit shorter) patterns of sleep. Regardless, by the end of *Inoculate*, I did feel my 24-hour cycles fluctuate outside of naturally recurring periods of light and dark. This alteration was not a goal in and of itself, but the secondary effect of attempting to physically condition my body to sustain internal plant growth—a routine I fashioned for myself that proved effective as an anchoring method, as well as one of plausible benefit for the seed's cultivation.

However, radically modifying a corporeal sense of temporality has been an enduring ambition among artists and scientists alike. In 1962, French speleologist Michel Siffre remained in total isolation for two months inside the chasm of Scarasson, a subterranean glacial formation in the French Alps. During his stay 130 metres below the surface of the earth, he examined the effects of living without access to sunlight or any artificial time-keeping devices, such as clocks and calendars. Keeping a written record of his activities, Siffre communicated his periods of waking, sleeping, and eating via a one-way telephone to his colleagues above ground, as well as his pulse rate and other measurements. He attempted to track the passing of days through his sleeping patterns alone, staying underground until what he believed was August 20, the date set for the end of his study. He emerged to the surface only to learn that it was actually September 14—almost an entire month later. Siffre's study in temporal perception proved ground-breaking for the emerging field of chronobiology, or the study of cyclical physiological phenomena. With his time underground, Siffre demonstrated that the human internal clock was independent from the terrestrial day/night cycle, disproving that human circadian rhythms are inherently and exactly 24 hours long.²³

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23 For a detailed account of this experiment, see Michel Siffre, *Beyond Time: The Heroic Adventure of a Scientist's 63 Days Spent in Darkness and Solitude in a Cave 375 Feet Underground* (London: McGraw Hill, 1964), the English translation of Michel Siffre,

In the following years, Siffre also guided other researchers through similar studies (largely funded by research for military and aerospace industry applications), including Josie Laures and Antoine Senni, who in 1964 lived for 85 days and 126 days underground, respectively, in caves near Nice, as well as a man only known as J. P. Mairetet, who in 1963 also spent 174 days inside a cave in southern France.²⁴

Siffre himself would later perform this self-experiment again on two different occasions. In 1972, he stayed alone for six months in Midnight Cave, located near Del Rio, Texas, the longest scientific experiment in sensory deprivation and human isolation ever undertaken. Monitoring once more the effects of remaining underground in his heart, brain, and muscle activities, Siffre set a dedicated camp where he kept detailed records of his activities and vital functions, both sleeping and waking (for a documentary showing the conditions of Siffre's experience, see also *Midnight Cave: The Time Experiment*). Again, Siffre was in contact with his research team throughout the day, without his colleagues ever exchanging information about the day or time. Although at a physical level he was able to function normally, his eyesight was left permanently weakened by the prolonged stay in the dark, and the psychological implications of his 205-day isolation proved emotionally demanding. Despite this, Siffre would return to Scarasson for his third and final experiment between 1999 and 2000, in order to examine the effects of aging on the circadian cycle.

> (8) (9)

> (video 1)

Taiwanese-American artist Tehching Hsieh also offers a dedicated practice centred on a personal relationship to timekeeping. Between 1980 and 1981 he carried out *Art/Life: One Year Performance (Time Clock Piece)*, where he punched a time card every hour on the hour for a year. In addition to the series of hourly marked time cards, documentation for *Time Clock Piece* consisted mostly of photographs Hsieh took of himself each moment he documented the central activity of this piece. These images were subsequently placed together into a single film, a spasmodic visual experience that reduces one year of Hsieh's life to approximately six minutes—a fixed, if somewhat fitful portrait that allows viewers to see the hands of the clock face moving unflinchingly. In order to more visibly document the passage of time, Hsieh also let his hair grow out entirely, having shaved his head prior to beginning of the piece. Hsieh's isolated practice in his studio was open to the public on specific days throughout *Time Clock Piece*. In both the documentation photographs and his in-person appearances, Hsieh always wore the exact same personal jumpsuit uniform.

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> (video 2)

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Between 1976 and 1986, Hsieh did several *Art/Life: One Year Performances*, which like *Time Clock Piece* were bound by a specific set of rules.²⁵ His other year-long performances entailed remaining alone in a locked cell furnished only with a bed, a sink, and a pail (*Cage Piece, 1978–1979*); living entirely outside without entering shelter or transportation of any sort (*Outdoor Piece, 1981–1982*); tying himself by the waist to fellow U.S. artist Linda Montano with a rope (*Rope Piece, 1983–1984*); and spending one year without looking, producing, or interacting in any way with art (*No Art Piece, 1985–1986*).²⁶ Hsieh always included a signed, written statement listing the rules for each piece, as well as letters from lawyers bearing proof of witness to his performances.²⁷ These accompanied the extensive documentation of his works through photographs, films, maps, and artefacts. *Time Clock Piece*,

25 Further analysis of *Time Clock Piece* and Hsieh's other *One Year Performances* is provided in Adrian Heathfield and Tehching Hsieh, *Out of Now: The Lifeworks of Tehching Hsieh* (London and Cambridge: Live Art Development Agency/ MIT Press, 2009). See also Shalson, *Performing Endurance*, 109–145.

26 For more images of *Time Clock Piece* and Hsieh's work, see <https://www.tehchinghsieh.com>.

27 For elaboration on Hsieh's use of legal documentation, see Joan Kee, *Models of Integrity: Art and Law in Post-Sixties America* (Berkeley: University of California Press, 2019), 129–162.

Hors du temps: L'expérience du 16 juillet 1962 au fond du gouffre de Scarasson par celui qui l'a vécue (Paris: Julliard, 1963).

24 For a detailed account of these studies, see John Rasmussen (ed.), *Man in Isolation and Confinement* (New Brunswick (U.S.A) and London: Transaction Publishers, 2009 [1973]), 86–97, under the section "French Cave Studies." Siffre published multiple articles analyzing the data on underground life, both from himself and other members of his research team. Three examples from several co-authored papers include Michel Siffre et al., "L'isolement souterrain prolongé: Étude de deux sujets adultes sains avant, pendant et après cet isolement," *Presse Médicale* 74 (1966), 915–919; Jean Colin et al., "Rhythm of the Rectal Temperature During a 6-month Free-running Experiment," *Journal of Applied Physiology* 25, no. 2 (1968): 170–176; and Franz Halberg et al., "Human Biological Rhythms During and After Several Months of Isolation Underground in Natural Caves," *Bulletin of the National Speleological Society* 32 (1972): 89–115.

1980–1981 is no exception; together with the snapshot portraits and the time cards, Hsieh also kept a table divided by month and year, where he marks the number of times he failed to punch a time card (133 out of a total of 8,760 punches), as well as the reasons for these omissions, such as oversleeping, having a meal, punching the time card early, etc.

Siffre and Hsieh engaged in heightened examinations of time, be it living in the total absence of temporal cues or under the relentless submission of hourly tracking machinery. These self-imposed rules allowed Siffre to adapt to the most natural bodily rhythms determined by context, and in Hsieh's case, to continuously act against them. What becomes most salient in both, however, is their formal dependency on conventions of daily segmentation. Be it by comparative omission or exaggerated enforcement, Siffre and Hsieh underscore the relatively recent human practice of conforming to international temporal measurements (such as Coordinated Universal Time, which came into effect in 1972) as well as their unusual exigencies when applied to human bodies. Siffre's self-experiment preceded the adoption of Coordinated Universal Time by ten years, while Hsieh's took place less than a decade after its implementation. Although not exclusively dedicated to this purpose, Siffre and Hsieh draw attention to subjective forms of adaptation to the larger social experiment of living under this new global chronology.

During the realization of *Inoculate* I did not wear eyeglasses, which I have used every day from a young age to compensate for my near-sightedness. This absence in itself caused a significant disruption; throughout *Inoculate* I could only view my surroundings indistinctly, which allowed me to concentrate on the task of absorbing sunlight. However, my vision was also altered by the aforementioned perforated eye shield. My experience of partial sight deprivation was not uncomfortable, although the unevenness was certainly noticeable on the few occasions I removed the shield to inspect my eye for the appearance of a sprout. After *Inoculate* was completed, my eyesight returned to normal. This unintended consequence of the project became a focus of attention in its own right, resulting not only in my progressive adjustment to the sole use of one eye (and the slightly receding vision of the other), but also leading to the development of a keener sense of hearing which allowed me to perceive previously unnoticed sounds in my surroundings—a heightened sensorial shift that only grew more acute throughout this process.

Yet the eye shield used in *Inoculate* pales in comparison to more aggressive forms of ocular intervention. In his 1964 book *The Formation and Transformation of the Perceptual World*,²⁸ Austrian scientist Ivo Kohler describes what is one of the longest recorded experiments in psychological research. Between November 1946 and March 1947, he wore a set of binocular prisms for a period of 124 days. During this time, Ivo Kohler and other subjects from the Institute of Experimental Psychology at the University of Innsbruck would carry out everyday activities donning these ocular devices that would upend their vision, so that the ground would be literally turned “upside down”. Known colloquially as “inversion goggles,” their uninterrupted usage was thoroughly researched, with data involving both subjective self-observation as well as study by third parties, who would also carry out “quantitative measurements of adaptation performance in everyday life.”²⁹ Although the first few days of the experiment were difficult,

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28 Ivo Kohler, *The Formation and Transformation of the Perceptual World*, trans. Harry Fiss, *Psychological Issues* 3, no. 4, Monograph 12 (New York: International Universities Press, 1964).

29 Pierre Sachse et al., “‘The World Is Upside Down’: The Innsbruck Goggle Experiments of Theodor Erismann (1883–1961) and Ivo Kohler (1915–1985),” *Cortex* 92 (2017): 227.

Kohler and his subjects gradually grew accustomed to these eye pieces and were able to engage in increasingly complex activities, from taking a walk and manipulating domestic objects, to eventually going to see a film, riding a bike, or even skiing. Neither Kohler nor the other subjects presented any long-term impact to their visual capabilities. The goggles were designed by Theodor Erismann, Ivo Kohler's mentor, who also executed earlier iterations of this experiment (for a humorous 1950 short film in German featuring Kohler wearing the inversion goggles while being guided by Erismann, see *The Reversing Glasses and Upside Down Vision*).³⁰ The "Innsbruck experiments" were inspired by the research of George M. Stratton (1865–1957), a U.S. psychologist who was the first to study human vision through special glasses also constructed for inversion. Kohler and Erismann proved Stratton's claim that "there is no exclusively visual problem of upright vision," but rather "the harmonious interorganization of motor, tactual, and visual experience."³¹

>(video 3)

Swiss artist Alphons Schilling pursued an analogous investigation. Originally trained as a painter, between 1978 and 1986 Schilling created different *Vision Machines (Sehnmaschinen)*, portable ocular apparatuses that altered visual perception through intensity of transposition: here, top becomes bottom, left becomes right, and background becomes foreground. Combining stereoscopic and binocular arrangements, these were "wearable prosthetic devices built of wooden rods, mirrors, lenses, rotating shutter blades, and other accessories."³² These include *Small Wheel* (1978), *Large Wheel* (1981), *Little Bird* (1978), *Darkroom* (1984), *Light Pump* (1981), *Gazelle* (1985), and *Exhumed Bird* (1985/1986).³³ Often, the Vision Machines would not be limited to the eyes alone, but comprised full-scale sculptural structures intended to be worn on the body, as if to make explicit the haptic and proprioceptive associations gleaned previously by Stratton, Erismann, and Kohler. Schilling took additional steps to facilitate ambulation,

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30 The original title in German of this film is *Die Umkehrbrille und das aufrechte Sehen*.

31 George M. Stratton, "Upright Vision and the Retinal Image," *Psychological Review* 4, no. 2 (1897): 182–187.

32 Christiane Paul, *A Companion to Digital Art* (Oxford and Chichester: Wiley Blackwell, 2016), 78.

33 Most of Schilling's *Vision Machines* and their corresponding drawings and documentation are owned by the MAK Museum in Vienna.

such as using lightweight wood and emphasizing elements in the architecture of the pieces to increase users' awareness of their own mobility. For example, in *Small Wheel*, he included "a partial wheel that surrounds the head and maintains orientation and distance from adjacent objects,"³⁴ helping the viewer navigate the reversal of left to right and front to back, as well as the incrementation of the space between the eyes. Other pieces, such as *Gazelle*, are intended to be viewed in a fixed position, providing structures for gripping and balancing the device in place.

Art historian Romana Karla Schuler draws connections between Schilling's *Vision Machines* and the aforementioned examples of experimental psychology, as well as earlier creations by the physicists Ernst Mach and Hermann von Helmholtz.³⁵ Although exact accounts on the lengths of time Schilling used each one of his given *Vision Machines* are unavailable, there is no doubt that he completed intensive self-experimentation in their development and subsequent deployment. In particular, he tested several on himself in rugged environments such as the Canyonlands National Park located in Utah, a state in the western United States. The *Vision Machines* were arguably meant exclusively for exterior use—a characteristic corroborated by their size and the fact that almost all photographic documentation related to their handling is set outdoors.

What is clear for Schilling, as well as for Kohler and Erismann, is the dedicated motivation to counter longstanding and unfounded beliefs about human eyesight. For the Austrian scientists, like Stratton before them, this was "the myth of upright vision," what Schilling in turn interpreted as "the hegemony of seeing"³⁶ or "the tyranny of Cyclopic vision."³⁷

34 Madeleine Schwartzman, *Seeing Yourself Sensing: Redefining Human Perception* (London, Black Dog Publishing, 2011), 53.

35 Romana Karla Schuler, *Seeing Motion: A History of Visual Perception in Art and Science* (Berlin: De Gruyter, 2016), 208–224.

36 Andreas Spiegl, "Create an Image of Seeing," in *Alfons Schilling: Beyond Photography*, ed. Fabian Knierim, Rebekka Reuter et al. (Vienna: Verlag für Moderne Kunst, 2017), 270–271.

37 Lenka Donlanova, "Don't Believe Everything You Hear: Alfons Schilling," *Umelec* 4 (2007); as cited in Schwartzman, *Seeing Yourself Sensing*, 53. Schilling borrows the phrase "cyclopean perceptions" from U.S./Hungarian neuroscientist and experimental psychologist Belá Julesz' work *Foundations of Cyclopean Perception* (Chicago: University of Chicago Press, 1971).

Thanks to the Innsbruck experiments, gravity and hand-eye coordination were proven to be the organizational basis for human sight, rather than our vertical anatomical position. Several of Schilling's *Vision Machines* riff on this idea, furthering its physiological implications, as well as expanding them into the question of representation. The *Vision Machines* are thus artistic instruments that modify the perception of space, not just in relation to a singular perspectival point of view, but as constituted in a person's subjective observation of their physical movement as it unfolds. As opposed to Erismann's goggles, Schilling's *Vision Machines* challenge users to move within irregularly altered conditions—not the “stable” inversion of the Innsbruck experiments that, while disorienting, allowed for their subjects' eventual adaptation to everyday activities. Nonetheless, as self-experimental artefacts, both Erismann's goggles and Schilling's *Vision Machines* challenge a basic and overlooked condition: that social convention and habitual patterns of behaviour reinforce assumptions of physiology, preconceived notions that obscure the outright interrogation of lived visual experience in relation to anatomic structures or natural surroundings.

In pursuing *Inoculate*, I decided to commit to an indeterminate period of retreat and inactivity. My goal in so doing was to optimize my body as a physical substrate for plant growth: a stable environment that would not be disrupted by changes in temperature, agitation, or other unforeseen variables. I carried out *Inoculate* during a cold autumn in the northeast United States, characterized among other features by dry, bitter wind. Although the seed was confined to the punctal plug located within the tear duct of my eye, I deemed it indispensable to engage my entire body in the process by remaining warm and indoors, as well as restricting my individual movement in order to avoid any possible alteration. This isolation might seem excessive in hindsight, it nevertheless served to concentrate my efforts on the task at hand, while also providing a palliative encouragement that I was somehow increasing the chances for plant growth to take place. In a way, this choice to remain stationary resembles another plant-centred work, *Skotopoesis* (2015) by Špela Petrič, where the Slovenian artist cast a permanent light impression onto a field of cress by standing rigidly in place for 19 hours using a supporting back frame.³⁸ Slowing down becomes essential when attempting to accommodate to such vegetative processes.

>(23)

Creating the conditions for altering one's mobility offers a range of self-experimental practices. For example, U.S. performance artist Lisa Bufano tailored limbs out of ready-made objects which she used as extensions to her own body. As a bilateral below-the-knee and complete finger-thumb amputee, Bufano experimented with various means for locomotion, an element featured in several of her works. A parallel approach is pursued by the French duo Art Orienté Objet; in their piece *May the Horse Live in Me* (2011), Marion Laval-Jeantet fabricated stilts resembling horse limbs, using them in a performance which accompanied a self-experiment involving the incremental injection of horse immunoglobins and full-spectrum plasma into her bloodstream over the course of several months.³⁹ In his piece *Visiting Hours* (1993), U.S. poet

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38 Špela Petrič, "The Conundrum of Plant Life," *Leonardo* 49, no. 3 (2016): 268–269. For more information on *Skotopoesis*, see Petrič's website: www.spelapetric.org.

39 For images of this work, see Art Orienté Objet's website: <http://aoo.free.fr>. See also Leon J. Hilton, "'The Horse in My Flesh': Transpecies Performance and Affective Athleticism," *Journal of Lesbian and Gay Studies* 19, no. 4 (2013): 487–514.

and artist Robert Flanagan would be tied by his ankles and hoisted to hang upside-down from the ceiling in unpredictable intervals determined by his collaborator and dominatrix partner Sheree Rose—a common act in BDSM circles, but which proved of particular effort to Flanagan who was diagnosed with cystic fibrosis.⁴⁰ Finally, in the previously described piece *Art/Life: One Year Performance 1983–1984 (Rope Piece)*, Tehching Hsieh and U.S. artist Linda Montano remained tied together for an entire year, unable to move independently from each other save for a 2.4-metre stretch of cord.⁴¹ >(27)

U.S. Colonel John Paul Stapp conducted a dramatic self-experiment on the sudden imposition of velocity on a static body. On December 10, 1954, Stapp, a flight surgeon and physician in the U.S. Air Force, took part in one of the most extreme speed trials to date. Strapped to the seat of a sled powered by nine solid fuel rockets named “Sonic Wind No. 1”, Stapp went from being in complete standstill to 1,017 kilometres per hour in five seconds, only to be brought to a full stop again a few seconds later. This acceleration and deceleration experiment at the Holloman Air Force Base, near Alamogordo, New Mexico was part of *Project MX-981: Effects of Deceleration Forces of High Magnitude on Man*.⁴² The entire process was documented in detail by sensors placed on his body and sled, as well as photographic cameras located at precise intervals around the high-speed track (for a U.S. Air Force film narrated on-location by Stapp and featuring original footage from the experiment, see the first five minutes of the documentary *Space Age Railroad*). >(28) >(video 4)

40 Bob Flanagan, Sheree Rose, and Ralph Rugoff, “Visiting Hours,” *Grand Street* 53 (1995): 65–73. See also Linda S. Kaufmann, “Sadomedicine: Bob Flanagan’s ‘Visiting Hours’ and Last Rites,” *Performance Research* 3, no. 3 (1998): 33–40. For footage of *Visiting Hours*, see the documentary by Kirby Dick, *Sick: The Life and Death of Bob Flanagan* (1997).

41 For more on *Rope Piece*, see Heathfield and Hsieh, *Out of Now*.

42 See Richard F. Chandler, “Project MX-981: John Paul Stapp and Deceleration Research,” *Stapp Car Crash Journal* 45 (November 2001): v–xxii; Maura Phillips Mackowski, *Testing the Limits: Aviation Medicine and the Origins of Manned Space Flight* (College Station: Texas A&M University Press, 2006), 137–172; and Erik Seedhouse, *Pulling G: Human Responses to High and Low Gravity* (New York: Springer, 2012), 1–21. Publications, reports, and presentations by Stapp on Project MX-981 are located at the Aviation Safety and Security Archives at Embry-Riddle Aeronautical University in Prescott, Arizona.

Stapp’s experiment was one of several which provided essential data for the development of pilot emergency ejection procedures, aviation safety criteria, and aerospace engineering. From the late 1940s through the 1950s, Stapp had participated in controlled simulations to study the effect of mechanical forces on living human tissue, serving as a research subject in several car crashes, wind blasts, and high-altitude skydiving experiments. At the time, aviation medicine was still not highly formalized, and there were few standard guidelines for aircraft performance, let alone future space travel. Stapp survived his self-experiment at near supersonic speed, earning him the label of “the fastest man alive” and proving that humans could withstand a force equivalent 46.2 times the gravity of Earth, or 46.2 g. He was bruised on his body and face, and suffered from severe retinal haemorrhages in both eyes, although he fully regained his sight afterwards. For comparison, today’s shuttle astronauts only experience about twice the force of gravity, and early astronauts rarely surpassed 10 times that amount. Stapp literally was “faster than a speeding bullet”: a .45 calibre shot from a pistol has a slower speed.⁴³ >(29) >(video 5)

U.S. artist William L. Pope (known as Pope.L) also personified Superman and emphasized the strength of human body undergoing strenuous movement, albeit under different conditions of speed. In his work *The Great White Way, 22 Miles, 9 Years, 1 Street* (2000–2009), Pope.L crawled along the entire length of Broadway in New York City. He completed this process in increments, dragging himself on the sidewalks for a few blocks at a time or for as long as he could stand the discomfort in his knees and elbows. Pope.L covered the full stretch of New York City’s longest thoroughfare during the course of nine years. Beginning with a ferry ride from the Statue of Liberty to Fulton Street, he ended near his mother’s residence in the Bronx. During several segments of his multi-year crawl, Pope.L occasionally wore a business suit and a Superman outfit, replacing the cape with a red skateboard tied to his back that bore the trademark “S” logo. >(30) (31)

43 Craig Ryan, *Sonic Wind: The Story of John Paul Stapp and How a Renegade Doctor Became the Fastest Man on Earth* (London and New York: W.W. Norton, 2015).

In its wrenching effort, *Great White Way* emphasized not only the mechanical force of gravity, but the staggering strength required to bear the brunt of everyday racism in the United States.⁴⁴ In his practice, Pope.L has regularly addressed issues such as social prejudice, class division, and racial discrimination; it is not by chance that his crossing of New York City began on Ellis Island, the place where immigrants have historically entered the United States, and ended in the Bronx, by far the city's poorest borough. Previous crawls done by Pope.L in New York City hold similar commentary within their structure. *The Great White Way* was preceded by the *Times Square Crawl* (1978) and *Tompkins Square Crawl* (1991), historic sites that acutely reflect New York City's socio-economic contrasts, touristic consumption, and homeless life on the streets.⁴⁵ In a 1996 interview, Pope.L describes his crawls as a way of "giving up verticality," understood as a "physiognomic situation" and a condition of privilege or "urban power."⁴⁶ In enforcing this gruelling, ground-level exertion, Pope.L is thus addressing struggles of mobility in both physical and social terms.

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Where does a seconds-long military self-experiment approaching supersonic speed meet the voluntary movement of a person crawling on their hands and knees on the street? In point of fact, nowhere. The U.S. military infrastructure that supported John Paul Stapp's research was, and still remains, unrivalled worldwide; at present, expenditure on the U.S. armed forces is almost equivalent to the next seven largest national military budgets combined.⁴⁷ Stapp's impressive accomplishments, while commendable for their subsequent societal benefit (the common implementation of seatbelts and pilot safety procedures being two of the most significant), are dwarfed by the extent of these martial resources. In similar

fashion, Pope.L's individual actions are also overshadowed by the cumulative inequality of slavery, segregation, xenophobia, and social disenfranchisement in the United States. If nothing else, both of their self-experiments attest to the individual instrumentalization of the human body to defy questions of scale, be it in the context of technological innovation or the insurmountable cost of enduring structural violence.

44 For a more extensive discussion on Pope.L's 'The Great White Way', see Darby English, *How to See a Work of Art in Total Darkness* (Cambridge: MIT Press, 2007), 260–288; Chris Thompson, "Afterbirth of a Nation: William Pope.L's *Great White Way*," *Woman and Performance: A Journal of Feminist Theory* 14, no. 1 (2008): 63–90; and Valerie Cassel Oliver, "Putting the Body on the Line: Endurance in Black Performance," in *Radical Presence: Black Performance in Contemporary Art* (Houston: Contemporary Arts Museum, 2013), 14–19.

45 English, *How to See a Work of Art in Total Darkness*, 261.

46 "Interview with William Pope.L by Martha Wilson," *BOMB Magazine*, April 1, 1996.

47 "U.S. Military Spending vs. the World," *National Priorities Project*,

<https://www.nationalpriorities.org/campaigns/us-military-spending-vs-world>.

By far, the most challenging aspect of *Inoculate* was the self-administration of a medical procedure. *Inoculate* required the realization of a practice referred to as “punctal occlusion,” which I carried out myself with significant earlier preparation. Despite the individual challenge, this process was relatively straightforward. For an in-progress project titled *Punctum* (2017–present), I am currently attempting to create an artificial extracorporeal circuit to channel blood from an artery to a vein outside of my body. *Punctum* is inspired in part by German surgeon Werner Forßman’s pioneering self-experiment in cardiac catheterization: in 1929, he inserted a urinary catheter into a vein in his left arm, driving this thin tube all the way to the right atrium of his heart.⁴⁸ Rather than tracing the vascular system from within, *Punctum* proposes the externalization of blood circulation through a mirroring structure of synthetic conduits. The creation of an incision in *Punctum* aligns this self-experiment with the question of a surgical operation, posing a larger set of applied, conceptual, and ethical considerations which I continue to grapple with.

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A strong personal influence in this regard is Forrest Bess, a U.S. abstract painter who performed genital self-surgery in 1952. Bess made an incision at the base of his penis to create a hole in his urethra, an orifice purportedly large enough to facilitate sexual penetration by another man. He completed this procedure using a razor blade and alcohol to dull the pain, as he later reported in a letter to art critic Meyer Shapiro.⁴⁹ Inspired by subincision practices among Aboriginal Australians, Bess’s surgery was an attempt to physically integrate the male and female sides of himself. For Bess, hermaphroditism was a mystical path to eternal life, as well as a means to unify the conscious and unconscious psyche.⁵⁰ Working as a fisherman in his father’s bait camp located on the U.S. Gulf Coast in

48 Werner Forßman was awarded the Nobel Prize in Physiology in 1956 along with André Frédéric Cournand and Dickinson W. Richards for this discovery. Prior to this, he had been dismissed from the hospital outside of Berlin where he worked due to his self-experiment, and became further marginalized in the medical community for his subsequent membership in the National Socialist Party during the Third Reich. For more information, see Werner Forßman, *Experiments on Myself: Memoirs of a Surgeon in Germany* (New York: St. Martin’s Press, 1974), translated from the German edition *Selbstversuch: Erinnerungen eines Chirurgen* (Düsseldorf: Droste-Verlag, 1972).

49 Chuck Smith, *Forrest Bess: Key to the Riddle* (New York: Powerhouse Books, 2013), 67.

50 Surviving fragments of Bess’ thesis are now held with the Meyer Shapiro papers at the Archives of American Art, Smithsonian Institution, Washington, DC, available online at <https://www.aaa.si.edu/collections/items/detail/forrest-bess-thesis-13379>.

East Matagorda Bay, Texas, Bess maintained a painting practice alongside research in anthropology, medicine, art history, religion, mythology, and psychoanalysis.⁵¹ Referring to himself as a “visionary painter,” Bess created small, dense paintings with complex visual symbolism, as well as producing a “thesis” —an extensive assemblage of images and references where he outlined his most personal concepts. >(34) (35)

Bess mailed his thesis to scholars and medical practitioners in the United States and worldwide, including Carl Jung in Zürich and President Dwight D. Eisenhower while he was still in office. Bess also sent his thesis to Professor John Money at Johns Hopkins University, a psychologist and sex researcher who also received information on Bess’ initial surgery, as well as a second one performed in 1960, where he allegedly hired a local physician by the name of R. H. Jackson to expand his initial opening. Bess provided photographs that illustrated in explicit detail the operation’s results.⁵² In 1976, Money published an article on what would be referred to today as sexual reassignment surgery, using images provided by Bess (presented anonymously) as one of his three case studies.⁵³

The use of self-surgery for the attainment of spiritual or physical advantage also resonates with the work of Hugo Bart Huges, a Dutch research librarian and former medical student at the University of Amsterdam. In addition to holding open views on LSD and marijuana consumption, Huges was a proponent of trepanation—the surgical creation of a hole in the skull. On January 6, 1965, Huges bore an opening through his frontal bone using a foot-operated electric dentist drill⁵⁴. The procedure was carried out to increase blood flow to his brain, a move that Huges believed would expand his mental capacities and compensate for the alleged decrease in cerebral circulation caused by Homo sapiens’ evolved ability to walk upright. Prior to his self-trepanation, he described his beliefs in >(36) (37)

51 For digital reproductions of Forrest Bess’ paintings, visit <http://www.forrestbess.org>. See also the catalogue by Claire Elliot, *Forrest Bess: Seeing Things Invisible* (New Haven: Yale University Press, 2013).

52 Chuck Smith, *Forrest Bess*, 110–111.

53 John Money and Michael De Priest, “Three Cases of Genital Self-Surgery and Their Relationship to Transsexualism,” *Journal of Sex Research* 12, no. 4 (1976): 283–294. Bess is described as “Case 1.”

54 For a short film where Huges explains his trepanation (in Dutch), see Louis van Gasteren’s *De Ingreep* (1965).

The Mechanism of Brainbloodvolume (1962), also known as *Homo Sapiens Correctus*, an edition of handwritten, illustrated scrolls in English and Dutch where he identified trepanation as a way of improving brain functionality by balancing the proportion of blood and cerebral fluid.⁵⁵ A decade later, Huges would self-publish *The Book with a Hole: Autobiography* (1972).⁵⁶ This was translated by British students Amanda Fielding and Joe Mellen, who after meeting Huges became inspired to carry out trepanations of their own. Amanda Fielding recorded her trepanation in a film titled *Heartbeat in the Brain* (1970), while Joe Mellen would write the memoir *Bore Hole* (1970).⁵⁷ Both are now activists advocating for scientific psychedelic research and drug policy reform. >(38) (39) >(40)

Huges and Bess offer examples of self-surgery by individuals with specialized and non-specialized training. There are several well-known cases of self-surgery by medical professionals, such as the U.S. surgeon Evan O’Neill Kane, who removed his own appendix in 1921 (at the age of 60), only to operate his own inguinal hernia a decade later.⁵⁸ Two other physicians, Leonid Rogozov from the former Soviet Union and Jerri Nielsen from the United States, also performed surgical procedures on themselves. In each case, both were the sole doctor on staff at their respective research stations in Antarctica: Rogozov removed his appendix in 1961,⁵⁹ and Nielsen took a biopsy on her breast to screen for cancer in 1998.⁶⁰ Yet perhaps the most striking case of self-surgery comes from Ines Ramírez Pérez, a woman from a rural village in Oaxaca, Mexico, who, with no medical background and completely unattended, successfully accomplished a cesarean section on her abdomen in 2000 that allowed both her child and herself to survive.⁶¹

55 An extensive collection of materials related to Huges are available at the Gemeente Amsterdam Stadsarchief and the International Institute for Social History in Amsterdam, The Netherlands.

56 Hugo Bart Huges, *The Book with the Hole: Autobiography*, trans. Joe Mellen and Amanda Fielding (Amsterdam: Foundation for Independent Thinking, 1972).

57 See Joe Mellen, *Bore Hole* (London: Strange Attractor Press, 2015 [1970]).

58 Drummond Rennie, “Do It to Yourself Section: The Kane Surgery,” *Journal of the American Medical Association* 257, no. 6 (1987): 825–826.

59 Vladislav Rogozov and Neil Bermel, “Auto-appendectomy in the Antarctic: Case Report,” *British Medical Journal* 399 (2009): b4965.

60 Jerri Nielsen, *Ice Bound: One Woman’s Incredible Battle for Survival at the South Pole* (London: Ebury Press, 2001).

61 Arturo Molina Sosa et al., “Self-inflicted Cesarean Section with Maternal and Fetal Survival,” *International Journal of Gynecology and Obstetrics* 84, no. 3 (2004): 287–290.

The voluntary self-surgeries of Huges and Bess are far from these life-or-death cases. Even so, the surgical intervention on their own bodies is the materialization of a specific ideal or hypothesis—a motivation shared by other artists and scientists who have pursued surgery for non-vital purposes, some entailing procedures too complex to carry out alone. British artist Genesis Breyer P-orridge and French artist ORLAN have both extensively explored body modification, using transplants and plastic surgery to alter their physical appearance: the former to gain the likeness of their life partner (*Pandrogeny Project*, 1993–2009),⁶² and the latter to approximate art historical representations of the female body or to implant bulbous facial “mutations” (such as in the *Reincarnation of Saint ORLAN*, 1990–1993).⁶³ The Cypriot-Australian artist Stelarc inserted a cell-cultivated ear into his arm (*Ear on Arm*, 2007–2015), a project in line with his previous self-experiments, such as attaching an artificial hand capable of independent motion (*Third Hand*, 1976–1981), and placing his body into full-scale mechatronic machines (*Exoskeleton*, 1999, and *Muscle Machine*, 2003).⁶⁴ At the beginning of the twenty-first century, scientists have also started partaking in authorized and non-regulated surgery to advance medical innovation. In 1998 and 2002, British engineer Kevin Warwick introduced a silicone chip and subsequently an 100-electrode array that connected to the nerve fibres of his arm and transmitted signals to a computer.⁶⁵ Likewise, Phillip R. Kennedy, an Irish neurologist based in the United States, implanted a neurotrophic electrode into his brain through a self-designed surgery in 2014 in order to develop a speech prosthesis for paraplegic or paralyzed patients.⁶⁶

However, the personal decision by Bess and Huges to perform surgery on themselves is best seen through their own anatomical manifestos: Bess’ thesis and Huges’ scrolls. Both of these texts outline self-surgery as a means towards a way of life—or more directly, as an individual way of knowing. Dismissals on the grounds of pseudoscience or eccentricity do little more than reinforce the obvious inconsistency of these self-surgeries with established practices in medicine, a discipline which nonetheless, as Bess and Huges’ writings attest, remained a central point of reference well after the conclusion of their self-surgeries. The specificity of their physical transformation, even if acquired by rudimentary or even reckless means, still warrants at the very least recognition of this intention and internal coherence.

62 For more information on the *Pandrogeny Project*, see the documentary film by Marie Losier, *The Ballad of Genesis and Lady Jaye*, 2012.

63 See C. Jill O’Byrne, *Carnal Art: Orlan’s Refacing* (Minneapolis: University of Minnesota Press, 2005), and Simon Donger and Simon Shepherd, *ORLAN: A Hybrid Body of Artworks* (London: Taylor and Francis, 2010).

64 For more information on these projects, see Marquard Smith, *Stelarc: The Monograph* (Cambridge: MIT Press, 2005), as well as the website <https://stelarc.org>.

65 Kevin Warwick, *I, Cyborg* (Champaign: University of Illinois Press, 2004).

66 Adam Piore, “To Study the Brain, a Doctor Puts Himself Under the Knife,” *MIT Technology Review*, November 9, 2015, <https://www.technologyreview.com/s/543246/to-study-the-brain-a-doctor-puts-himself-under-the-knife>.

So far, this essay has charted the connections between selected artistic and scientific self-experiments, grounding these parallels in the observed commonality of their given inquiries. Can one live outside the temporal cycles demarcated by international standardization or planetary rotation? Can one function and carry out daily activities without the gravitational imperative of upright vision? Can one travel on land and accelerate up to the threshold of the speed of sound, only to immediately come to a halt in a matter of seconds? Indeed, can a seed germinate inside a human eye?

Yet these perceived similarities do not adequately take into account the more inaccessible contexts of self-experimentation. For example, what about self-experiments for which the question and the terms for its resolution remain unknown to a broader public? What happens in those instances in which a person carries out a self-experiment in, with, or through their own body, only to keep its benefits and conditions of execution beyond the scrutiny of others and for their private understanding alone. If self-experimentation offers an individual means to collect information or develop an innovation on one's own, is it reasonable only to consider self-experiments that were comprehensively communicated, or in fact those that came to fruition in such a manner that their full dissemination to others is even pertinent?

Although this survey has thus far focused on cases of self-experimentation that are relevant to *Inoculate*, the open-ended or private experiment points to significant questions that nevertheless tacitly inform this project. Two mirroring instances of this kind of self-experiment are provided by the U.S. artist Lee Lozano and U.S. population geneticist George Robert Price. Lozano is known for *Dropout Piece* (1970–1999), a conceptual artwork whereupon she decided to disengage from the art world entirely—a self-experiment taken to “uncompromising conclusions” and only “making itself knowable without allowing for the possibility of capitalizing on that attention.”⁶⁷ Giving up a successful career as an artist was preceded by previous acts of refusal from Lozano such as *General Strike*

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67 Tirdad Zolghadr, “Shades of No,” *Witte de With Review*, June 2014, https://www.wdw.nl/en/review/desk/shades_of_no.

Piece (1969), which states she would “gradually but determinedly avoid being present at official or ‘public’ uptown functions or gatherings related to the ‘art world’ in order to pursue investigation of total personal and public revolution.”⁶⁸ Lozano moved from New York City to Dallas in 1972, where she remained in self-imposed exile until her death in 1999. In so doing, she gradually lost contact not only with previous professional acquaintances but also with most of those who knew her, remaining in the end only known as “E.” and buried in an unmarked grave at Southland Memorial Park in Grand Prairie, Texas.

A similar self-experiment in removal was pursued by George Robert Price. Beginning his career as a chemist working on the Manhattan Project and with no prior training in evolutionary biology, in 1968 he devised the “Price equation”—a mathematical explanation that shows that altruism is not dependant on genetic relatedness, but can be calculated based on the association between individuals.⁶⁹ Although this led him to a successful placement at the renowned Galton Laboratory, University College London, Price struggled with the social consequences of his equation, which reduced altruism to self-interest instead of an act of selflessness. In response to his findings, he converted to Christianity, becoming incredibly devout in a short period of time. In 1973, Price decided to engage in a self-experiment of extreme altruism in order to prove his own equation wrong. He would seek out strangers with whom to engage in random acts of kindness, giving away all his money and possessions to the homeless and poor, and allowing them to live in his home. Price eventually became completely destitute and resorted to squatting, yet still managed to carry out innovative research in altruism and the application of game theory to evolution; one of the articles he co-authored at that time made the cover of *Nature*.⁷⁰ This purposefulness, however, came to an end when Price took his

68 Sarah Lehrer-Graiwer, *Lee Lozano: Dropout Piece* (London: Afterall Books, 2014). A facsimile of *Dropout Piece* is included as Plate 1 and *General Strike Piece* as Plate 5.

69 For more information on George R. Price, see Oren Harman, *The Price of Altruism: George Price and the Search for the Origins of Kindness* (New York: W.W. Norton and Company, 2011) and Oren Harman, “On the Importance of the Parvenu: The Amazing Case of George Price in Evolutionary Biology,” in *Outsider Scientists: Routes to Innovation in Biology* (Chicago: University of Chicago Press, 2013), 312–330.

70 John Maynard Smith and George R. Price, “The Logic of Animal Conflict,” *Nature* 246 (1973): 15–18.

own life in 1975; dying alone in a squat among those he tried to help, he too had an anonymous burial in Islington and St. Pancras Cemetery, London until a colleague provided his grave with an identifying tombstone.

It would be all too easy to equate Price’s suicide to the discouragement produced by his own scientific findings. As with Lozano, a more productive stance is to examine self-experimentation through the lens of vital compromise. For some artists and scientists, the imperative to embody an ideal or principle provides the unwavering drive to sustain a self-experiment; adverse consequences, while perhaps extensively considered, remain secondary to this resolve. Dutch conceptual artist Bas Jan Ader serves as a tenacious example. On July 9, 1975, Ader attempted to cross the Atlantic aboard *Ocean Wave*, a four-meter-long recreational yacht armoured and reinforced for its long voyage. An experienced sailor who arrived in Los Angeles from Morocco as part of a ship crew in 1962, Ader estimated that traversing the North Atlantic would take him approximately two and a half months. He set off on his journey from Chatham, Massachusetts, in the northeastern United States. It is uncertain at what point Ader disappeared at sea; what is known is that radio contact with him was lost three weeks after his departure. Less than one year later, *Ocean Wave* was discovered by a Spanish fishing trawler damaged and capsized off the coast of Ireland. Ader’s body was never found.⁷¹

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Critical analysis of Ader’s fateful voyage—the centre of a three-part project titled *In Search of the Miraculous*, which involved his trans-Atlantic crossing, as well as night walks in Los Angeles and Amsterdam (the latter of which remained unrealized)—tend toward discussions of tragedy or the sublime,⁷² associations underscored as much by Ader’s untimely death as by his previous oeuvre. A significant part of Ader’s work centered around physical or emotional challenges, such

>(50)

>(51)

71 For an excellent resource tracing police reports, files, letters, and other material related to Ader’s disappearance, see Marion Van Wijk and Koos Dalstra (eds.), *Bas Jan Ader: In Search of the Miraculous. Discovery File 143/76* (Vancouver and Los Angeles: New Documents, 2016).

72 Jan Verwoert, *Bas Jan Ader: In Search of the Miraculous* (London: Afterall Books, 2006), and Alexander Dumbadze, *Bas Jan Ader: Death is Elsewhere* (Chicago: University of Chicago Press, 2015).

as *Fall* (1970–1971), a film series showing Ader dropping from the roof of a house or a tree branch into a stream, or *I'm Too Sad to Tell You* (1969), a continuous, three-minute-long close-up shot of him weeping. Among his last performances prior to *In Search of the Miraculous* was *The Boy Who Fell Over Niagara Falls* (1972), which consisted of Ader reading aloud the harrowing account of seven-year-old Roger Woodward's survival after plunging from the Niagara's cascading heights, an oral rendition carefully interspersed with timed and portentous sips from a glass of water by Ader.

Artistic intentions notwithstanding, Ader's final opus can be placed among a lineage of perilous solo trans-Atlantic crossings. Undoubtedly, had Ader succeeded in his goal, *Ocean Wave*—a Guppy 13, one of the smallest pocket cruisers ever built—would have been the tiniest boat to make this journey. The first such documented trans-Atlantic voyage was made by Alfred Johnson in 1876, a Danish-born fisherman who sailed single-handed from Gloucester, Massachusetts to Abercastle, Wales in an open dory—a small, shallow fishing boat named *Centennial* to commemorate the first century of U.S. independence. Shortly thereafter, Howard Blackburn, another Gloucester-based fisherman from Canada would also carry out two solitary tours across the Atlantic in 1899 and 1901 aboard the *Great Western* and the *Great Republic*, respectively; these trips were all the more impressive given that Blackburn had lost his fingers and toes due to frostbite. There is some speculation that Ader read *The Strange Last Voyage of Donald Crowhurst* (1970) by Nicolas Tomalin and Ron Hall, the story of yet another trans-Atlantic crossing by a British businessman whose ill-fated attempt to win a round-the-world yacht race in 1969 led to insanity and suicide in the high seas.⁷³ This would only further place *In Search of the Miraculous* against a complicated history of seafaring forerunners seeking recognition and adventure at the expense of mortal misfortune.

Just a decade after Ader's birth, one-man navigation across the Atlantic became the focus of scientific self-experimentation for medical purposes. French physician and biologist Alain Bombard sailed from the Canary Islands to Barbados in a

>(52)

rubber inflatable named *L'Hérétique* in 1952. Motivated to examine the conditions in which castaway sailors survive at sea, Bombard was sponsored by Zodiac, the same French corporation that produced the lifeboat in which he carried out his trans-Atlantic journey. Understanding that drinking sea water was lethal, Bombard nevertheless urged its ingestion in limited amounts, arguing that subsistence was possible by growing accustomed to its consumption alongside fluids pressed from raw fish and a diet of vitamin-rich plankton. His 1953 memoir *Castaway on Purpose: The Voyage of the Herétique*⁷⁴ inspired German doctor Hannes Lindemann to also “experiment with the problem of survival at sea,”⁷⁵ as he strongly questioned the veracity of Bombard's saltwater consumption. After several failed attempts to cross the Atlantic, he succeeded to navigate from Liberia to the Canary Islands in a five-metre-long Klepper collapsible boat,⁷⁶ and from there to St. Croix in 1955. One year later, Lindemann set out once more from the Canary Islands, this time landing in St. Marteen aboard a sailing canoe. His memoir *Alone at Sea: Survival Experiments During Two Atlantic Crossings in a Dugout Canoe and a Folding Kayak* (1958), describes challenges also faced by Bombard, such as sharks and inclement weather, as well as hallucinatory states and mental strain caused by extreme fatigue and sleep deprivation. On both occasions, Lindemann carried provisions and freshwater supplies to round out his consumption of fish and collected rain; indeed, he concluded that it was impossible to cross the Atlantic Ocean drinking sea water alone.

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(video 6)

74 The English translation of Alain Bombard, *Naufagé volontaire* (Paris: Éditions des Paris, 1953) is *Castaway on Purpose: The Voyage of the Herétique* (New York: Simon and Schuster, 1954). See also Alain Bombard, *The Bombard Story: An Account of Sixty-five Days in the Atlantic, Living Off the Sea*, trans. Brian Connell (London: Penguin Books, 1956).

75 Hannes Lindemann, *Alone at Sea: A Doctor's Survival Experiments of Two Atlantic Crossings in a Dugout Canoe and a Folding Kayak* (New York: Random House, 1958), 4. This is the English translation of Hannes Lindemann, *Allein über den Ozean: Ein Arzt in Einbaum und Faltboot*, (Frankfurt am Main: Scheffler, 1957).

76 Lindemann's Klepper collapsible boat is now owned by the Deutsches Museum in Bonn, Germany.

The confrontation of a single human with an oceanic expanse proves equal in its demands to the artist, the scientist, or the lay person alike. Beyond the complex logistical questions, the intensive individual preparation, and the uncertainty of execution, what remains primary to those outside of the experience is the bare question of survival or lethal failure. Yet while these examples demanded a strong dose of vital compromise, their implications are not restricted to their direct outcome or immediate effects on the investigators. Rather, these self-experiments are equally significant in interrogating existing intellectual safeguards that favour the pursuit of knowledge primarily via recognizable precedent. When scientists and artists place themselves in conditions of physical vulnerability, what is often left in more significant jeopardy is their professional reputation, their insertion into a social or specialized community, and the formal recognition of their work in established institutional contexts. To the self-experimenter, the pursuit of original embodied knowledge, whatever its final purpose, offers the opportunity to break as much with disciplinary consensus on methodological tenets as with the encroaching pressures of dominant societal conventions. The catalyst for this essay lies in identifying self-experimenters whose work accomplishes precisely that—the proposal of alternative anatomical configurations, reorientation of physiological priorities, or transformation of the environments of operation for their bodies—all driving forces that lie at the heart of *Inoculate* and which continue to sustain its ongoing textual representations.

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