

Doctors, Actants, and Thing-Powers Without Borders: A Reflection on the Joining Together of
Bodies and Things

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Are you curious about forms of cohesion between bodies, as well as between bodies and things? Donna Haraway notes that the "knowing self is partial...it is always constructed and stitched together imperfectly, and therefore able to join with another." Discuss this process of stitching together with another. What forms of cohesion, entanglement, or interconnection do you find or imagine? In your reflection, reference at least three other course readings. Option: include the work of an artist who also explores forms of cohesion.

The human body is commonly imagined as an isolated entity with clear boundaries, making its integration with “foreign” objects impossible. This phallogentric idea is so pervasive that it even influences how science, an allegedly objective field, understands the immune system (as defending the body from “intruders” crossing the skin boundary). As such, though bodies may enter into assemblages with other bodies and things, they can never be assemblages themselves. Applying immunologist Niels Jerne’s understanding of the immune system, however, causes these boundaries to disappear. He suggests that molecules are both the antibody *and* the antigen. Thus, “there could be no *exterior* antigenic structure, no ‘invader’ that the immune system had not already ‘seen’ and mirrored internally.”¹ Unfortunately, due to the dominant phallogentric model which focuses on intrusion, Jerne’s theory is seldom explored; potential knowledge that could help humanity better understand the world and “live in meanings and bodies that have a chance for the future” is undiscovered.² Donna Haraway cautions readers against relying on one perspective, arguing that a feminist and nomadic-subjective view, which sees the body as “constructed and stitched together imperfectly, and therefore able to join with another,” can reveal important truths about the world.³ This paper will challenge the phallogentric idea of bodies’ isolated identities by revealing how bodies and things can join together via assimilation, interconnection, and entanglement, which in turn reveals the tangible impacts of actants in assemblages and the different natures of assemblages themselves.

Assimilation: The First Frontier

Even though the act of eating appears to align with common discourse’s idea of the body as an isolated entity, it is a prime example of how bodies can assimilate other bodies and things into themselves. Admittedly, some portion of the ingested food passes through and out of the digestive system as waste; there is little cohesion between bodies and things there. However, what happens to the remaining portion? It “‘gets assimilated to what [the body is],’” slowly breaking down with the help of teeth and bile and merging with the body until it can no longer be

¹ Donna Haraway. “The Biopolitics of Postmodern Bodies: Constitutions of Self in Immune System Discourse.” In *Simians, Cyborgs, and Women: The Reinvention of Nature*. (Routledge, 1991), 218.

² Donna Haraway. “Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective.” In *Simians, Cyborgs, and Women: The Reinvention of Nature*. (Routledge, 1991), 187.

³ Haraway. “Situated Knowledges,” 193.

found in its original form.⁴ Just as teeth and bile act on the food, the food acts on the body via assimilation. Once the food is fully digested, it becomes part of the muscle mass and flesh that comprises the body. Thus, both parties “exercise formative power and both offer themselves as matter to be acted on.”⁵ In other words, a body is not isolated from the food it ingests. Rather, as some portions of food exit while others adhere to the body, the body and the food are “stitched together” not wholly and completely, but “imperfectly.”

When these actants join together in an assemblage, there is a tangible effect on both parties. As previously discussed, the body acts on the food by decomposing and absorbing it. Then, the food gives energy to the body. For example, healthy fat can help one have a more peaceful or successful day, as “several recent studies suggest that...omega-3 fatty acids...can make prisoners less prone to violent acts, inattentive schoolchildren better able to focus, and bipolar persons less depressed.”⁶ However, actants in the assemblage need not have positive impacts on other actants. Consuming poisonous berries may cause one to become ill, even fatally so. Moreover, certain foods can have positive impacts for some portion sizes, and negative impacts for others. For example, too much coffee can render sleep impossible, or make the body jittery and unable to stand still. Digesting large amounts of carbohydrates can trigger “postprandial somnolence,” otherwise known as a “food coma,” robbing the body of time that could be spent completing other tasks.⁷ Therefore, the body-food assemblage reveals each participant as an entity with power (a “thing-power,” as Jane Bennett would say), cautioning humanity to not overlook the tangible effects of the food it consumes and to give the actant the respect and attention it deserves.

A body can also assimilate a miniscule, extracted portion of another body into itself. Between the years 2003 and 2008, artist Eduardo Kac examined how flowers could assimilate human DNA. Working with scientists to inject his extracted DNA into a petunia flower, he created a new lifeform and named it the “Edunia.”⁸ The flower expressed his DNA in its red veins, which were framed within its original “petal pink background.”⁹ While the previous

⁴ Jane Bennet. *Vibrant Matter: A Political Ecology of Things*. (Durham: Duke University Press, 2010), 47.

⁵ Bennett, *Vibrant Matter*, 49

⁶ Bennett, *Vibrant Matter*, 41

⁷ Chris Kesser, “Postprandial Somnolence: Why a ‘Food Coma’ Happens,” Kresser Institute: For Functional and Evolutionary Medicine, May 5, 2021, <https://kresserinstitute.com/postprandial-somnolence-why-a-food-coma-happens/>.

⁸ Eduardo Kac, “Natural History of the Enigma,” Kac Web, accessed October 23, 2021, <https://www.ekac.org/nat.hist.enig.html>.

⁹ Kac, “Natural History of the Enigma.”

food-body assemblage demonstrates a natural act of assimilation, as animals instinctively eat when confronted with the uncomfortable feeling of an empty stomach, the Edunia demonstrates an unnatural act of assimilation. Kac had to spend six years figuring out how to “feed” his DNA to the petunia, which is much longer than the act of eating and digesting food. Moreover, he had to enlist the help of boundary-shattering, intelligent scientists; while a body can enter into an assemblage with food immediately, Kac could not complete his work alone. Thus, upon further examination, the Edunia is an assemblage of more than a petunia flower and Kac’s DNA. It also contains the scientists’ knowledge, the medical equipment used to draw Kac’s blood and separate his DNA, and the hundreds of years of experiments that resulted in the knowledge of DNA and inspired Kac. Therefore, the Edunia illustrates the existence of natural and unnatural assimilation, as well as the idea that other actants may be lurking in the shadows of an assemblage.

Moreover, the Edunia reveals how two assemblages, though both created through the assimilation of various actants, can serve one of two purposes: vital or not. For example, the assemblage of the body and food is created for a vital purpose; the body must eat to survive. This is not the case for the Edunia. While it can be said that Kac created the Edunia for posterity, aesthetics, or, as he claims, a “reflection on the contiguity of life between different species,” it is difficult to argue that any actant in this assemblage would not survive without the assemblage. On the other hand, without food, the body perishes. Without the body, animals and vegetation would not exist as they are today; the numerous species of the former and the enlarged or even seedless states of the latter are products of the body and its need for sustenance. Thus, the assemblage influences and sustains the actants’ existences. However, the non-vital purpose of the Edunia does not make it any less important than the body-food assemblage. Perhaps the latter sustains life, while the former makes life intriguing. Thus, these two examples reveal the existence of vital and non-vital assemblages, and how they all have a place in this world.

Interconnection: The Second Frontier

While the previous assemblages may imply that one actant must assimilate into another when two actants join together, that is not the case. Bodies and things can also stitch together via interconnection, even entering into the other without losing the individual self. For example, modern science has revealed that DNA resides within a cell’s nucleus. The body, represented by

the cell, and the “thing,” represented by the DNA, connect and thus enter into an assemblage together. While the DNA *is* inside the cell, it is not absorbed into the cell’s matter. Its identity is distinct. If one draws a cell diagram, one can pinpoint exactly where the DNA is. As such, the two actants also do not entangle until a person cannot tell where one ends and the other begins. Instead, the cell and the DNA interconnect, as the former gives the latter a home, and the latter helps the former sustain that home.

This new assemblage can join with similar assemblages, ultimately creating a large assemblage known as the human body. By joining together, the numerous combinations of cells and DNA can create organs, muscle tissue, and the like, building a human body bit by bit. In some instances, the mini-assemblages connect. For example, the cells and DNA of the mouth connect with the assemblage of the stomach. It is undeniable that one affects the other, for the former will send food down to the latter, and the latter will alert the former when it is empty and in need of sustenance. However, in some perspectives, one assemblage assimilates another. For example, from an external point of view, cells and DNA have been assimilated into organs and muscle tissue; organs and muscle tissue have been assimilated into the body. Ultimately, one can only see the body. Even so, if the perspective shifts to that of a microscope, the mini-bodies are not assimilated; for example, skin cells connect with one another to form the skin organ, but their individual selves are still distinct. Therefore, not only can bodies and things stitch together into a new body and enter into an assemblage, but these new assemblages can also stitch together with other bodies and assemblages. Moreover, there are numerous ways for bodies to join together, and how they do so may even change based on the viewer’s perspective.

In *Life at the Speed of Light*, John C. Venter examines the idea that genetic code and digital code can connect with one another, saying, “All living cells run on DNA software, which directs hundreds to thousands of protein robots.”¹⁰ By combining biological terminology (such as “living cells,” “DNA,” and “protein”) and technological terminology (such as “software” and “robots”), Venter highlights how the mundane, often overlooked act of sustaining life is the result of an assemblage. In addition, genetic code and digital code connect in a more explicit sense: scientists can now “digitize life...by sequencing DNA.”¹¹ Though a living animal may be sitting on a scientist’s table while an electronic representation of its DNA sits in a folder on a nearby

¹⁰ J. Craig Venter, “Dublin.” In *Life at the Speed of Light*. (New York: Viking, 2013), 6.

¹¹ Venter, “Dublin,” 6.

computer, the two are inextricably connected. The genetic code in the animal is represented by the digital code in the computer, and vice versa. On the other hand, the scientist may not start with a living animal, but with “computerized digital code” representing a “new form of life.”¹² From here, the scientist may “chemically [synthesize] its DNA, and then [boot] it up to produce the actual organism.”¹³ Once again, even though the starting point differs from the previous example, the genetic code in the creature on the operating table still connects to the digital code in the laptop. A new assemblage has been made via interconnection.

Within the new assemblage, genetic code and digital code act on each other in numerous ways. For example, one has clearly aided in the creation of the other. In a similar vein, an actant can also *edit* the other. When genetic code changes, such as through the process of mutation, digital code must change as well, because it is the electronic representation of genetic code. In this way, humanity will be able to explicitly see and understand changes in an animal on the molecular level; the assemblage thereby furthers humanity’s understanding of the world and its inhabitants. On the other hand, scientists can design and engineer digital code before manufacturing it and introducing it into a living organism. The digital code then changes the organism’s genetic code through genome editing. One such example is CRISPR-Cas9, a genome-editing system in which an artificially created strand of RNA binds to the Cas9 enzyme, which “cuts the [cell’s] DNA at the targeted location.”¹⁴ The digital code edits the genetic. Thus, the genetic code/digital code assemblage creates power, which can be used for good causes, such as curing cancer, or deadly causes, such as instigating a new frontier of genetic warfare. The actants’ actions are meaningful, and should not be underestimated or overlooked.

Aside from the joining together of DNA and similarly miniscule things, the entirety of the human body itself can also connect with self-created objects. As humanity uses science to categorize all living things into taxonomic ranks (such as kingdoms, phyla, and species), it is inevitable that humanity will categorize itself in measurable criteria as well. For example, a body and its corresponding identity is connected to a fingerprint. The identity and the fingerprint enter into an assemblage together. When one boards an airplane, the fingerprint verifies the person. For crime cases, police can find the culprit by searching a database and matching a fingerprint to

¹² Venter, “Dublin,” 6.

¹³ Venter, “Dublin,” 6.

¹⁴ “What Are Genome Editing and CRISPR-Cas9?,” MedlinePlus (U.S. National Library of Medicine, September 18, 2020), <https://medlineplus.gov/genetics/understanding/genomicresearch/genomeediting/>.

a civilian. International company Visa has even tried replacing the PIN and signature verification methods when paying with a credit card; instead, one can tap their finger on a card's sensor, and the card will check the fingerprint with the "one stored in the card."¹⁵ Verifying one's fingerprint is enough to verify a purchase. In the assemblage, the fingerprint allows the transactions carried out by the person. The latter acts on the former by creating the former and maintaining it, cleaning and drying the fingerprint so that it can remain useful. Thus, the two meaningfully connect with each other in a new assemblage, even as they have been physically connected and can be argued to be one and the same from the beginning.

Increasingly, a human being's body also connects to "biometrics—technologies that pose identity as encoded in systems of measurement."¹⁶ For example, a common way online companies detect robot hackers is through typing patterns, which analyze overall speed, "the length of time it takes to go from one letter to another," and "the degree of impact on the keyboard."¹⁷ Robots may be quick at typing as they try to "brute-force" their way into an account, but a human who forgets a password may spend time pondering over the right characters or retrieving the password from a personal database. To be sure, robots can be programmed to pause as well. The software engineer can even implement a pause method that changes the duration every time it is called. However, the robot can never truly mimic the human; its pauses can never be truly random, as a computer, which is a "completely deterministic machine," can never generate a random number.¹⁸ Therefore, one typing pattern will never be shared by a human being *and* a robot. The pattern is only connected to the human. In this restricted assemblage, the human acts on the pattern by creating and modifying it throughout the years. In turn, the pattern acts on the human, granting it access into the online spaces it frequents.

As technology advances and humanity begins to test technology's limits, the assemblage of bodies and technology challenges the conventional definition of life. The usage of biometrics

¹⁵ "Biometric Payment Card," Visa, accessed October 23, 2021, <https://usa.visa.com/visa-everywhere/security/biometric-payment-card.html>.

¹⁶ Druckrey, Timothy. "An Itinerary and Five Excursions." In *Stelarc: The Monograph*, Marquard Smith, ed. (Cambridge, MA: MIT Press, 2005), 48.

¹⁷ Maria Korolov, "What Is Biometrics? 10 Physical and Behavioral Identifiers," CSO Online (CSO, February 12, 2019), <https://www.csoonline.com/article/3339565/what-is-biometrics-and-why-collecting-biometric-data-is-risky.html>.

¹⁸ "Can a Computer Generate a Truly Random Number?," Mit Engineering, accessed October 23, 2021, <https://engineering.mit.edu/engage/ask-an-engineer/can-a-computer-generate-a-truly-random-number/>.

revealed the connection between bodies and measured things, so might there be a connection between bodies and technology? Science fiction has already explored this question. In *Children of Time*, Adrian Tchaikovsky paints a picture of a scientist, Avrana Kern, who uploads her consciousness into a program. Though it may seem like the computer has assimilated the consciousness, it becomes clear that the assemblage of human and technology is not created via assimilation, but via connection. For one, Kern's consciousness is distinct from the program. While the program speaks grammatically correct sentences, Kern commonly thinks in one neverending sentence, in which the objects of one clause morph into the subjects of another. For example, she rambles, "What ship let me see the ship is coming from Earth," at the same time that the program says, "Good evening, travelers."¹⁹ Thus, even though she is *inside* the program, she has not absorbed its calm, matter-of-fact demeanor. Moreover, Kern has not been entangled with the program. Tchaikovsky often splits the page in half, with one half containing the program's dialogue and the other half containing Kern's running stream of consciousness. The reader can evidently discern where Kern begins and where she ends in this assemblage. Thus, Kern and her program are connected, but not assimilated or entangled, in one assemblage.

Though fictional, the scientist and her posthuman state in *Children of Time* reveal how the assemblage of body and technology can reject the manifest destiny narrative. When Kern uploads her consciousness, Tchaikovsky demonstrates how "human identity is essentially an informational pattern" which can be copied from one "container" and pasted into another.²⁰ In other words, the original container, the human body, is neither special nor unique compared to other bodies. Humanity is not at the top of an evolutionary hierarchy. Therefore, the assemblage rethinks the relationship between humanity and the rest of the world, stripping away the former's alleged manifest-destiny calling. As the hierarchy of life can be refigured to be horizontal instead of vertical, the desire to "dominate and control nature" is no longer supported by the idea of humanity as a superior, more knowledgeable species. Ultimately, the assemblage topples humanity from its self-built pedestal, revealing the possibility of a "dynamic partnership between humans and intelligent machines" in the process.²¹

¹⁹ Adrian Tchaikovsky, *Children of Time* (London: Orbit, 2018), 124.

²⁰ Druckery, "An Itinerary," 49.

²¹ Druckery, "An Itinerary," 53.

Entanglement: The Third Frontier

Finally, bodies and things need not enter into each other at all; they can join and weave together via entanglement. Scholar Sandy Stone brings this phenomenon to light by examining Stephen Hawking and his prosthesis, a program and speaker that helped him to communicate as his amyotrophic lateral sclerosis advanced in his later years. In particular, she details a memory of when Hawking gave a talk in Santa Cruz. The auditorium was at capacity, and the lawn outside was filled with people attentively listening to the “loudspeakers that were broadcasting Hawking’s address.”²² Though Stone was initially outside, she snuck into the auditorium and got a glimpse of the physicist. He was sitting on stage, “utterly motionless, except for his fingers on the joystick of the laptop”; the outside loudspeakers’ microphone was side-by-side with his personal speaker.²³ The two were acting in an assemblage, with the body giving the prosthesis a home, batteries, maintenance, and a purpose, and the prosthesis giving the body a method of communication. His body was not an isolated entity. Instead, it was entangled with the prosthesis, developing a reciprocal relationship--an assemblage--that revealed that neither could function as well without the other.

At that moment, Stone asked, “Where is Hawking?”²⁴ Upon first glance, the answer seems simple--his physical body was in his wheelchair on stage. However, what about his prosthesis? His voice came from the speaker; his words came from a combination of the program and his consciousness. Therefore, it could be said that Hawking *extended* beyond his physical body and into his prosthesis, which vibrated with his vitality and its own electricity. In other words, this entangled body “neither [stopped] nor [started] at the skin.”²⁵ The organs within Hawking were part of the body, as were the joystick and the speaker. The joining together of Hawking’s body and his prosthesis into one assemblage brought the phenomenon of entanglement to light, thus revealing a new way of perceiving a body. Not only does the body affect and is affected by another in an assemblage, as seen previously, but now it is also difficult to separate them and pinpoint where one starts and the other begins. Instead, they comprise a new whole. A new body is made.

²² Stone, Allucquère Rosanne. “Split Subjects, Not Atoms; or, How I Fell in Love with My Prosthesis.” In *The Cyborg Handbook*, Chris Hables Gray, ed. (New York: Routledge Press, 1995), 394.

²³ Stone, “Split Subjects, Not Atoms,” 395.

²⁴ Stone, “Split Subjects, Not Atoms,” 395.

²⁵ Haraway, “The Biopolitics of Postmodern Bodies,” 215.

Similarly, Neil Harbisson, an artist with achromatopsia (a form of colorblindness), entangles his body with technology to create a new identity as a cyborg. To combat his achromatopsia, which restricts his sight to grayscale, Harbisson underwent brain surgery in 2004, thus entering into an assemblage with a prosthesis called an “eyeborg.” Now resembling an insect or an anglerfish, Harbisson possesses an “antenna that curves up and over from the back of his skull,” and “is connected to a chip that translates colour into sound.”²⁶ With the help of his prosthesis, he experiences colors previously unknown to him as sound waves. Though he cannot *see* the color blue with his eyes, he can recognize it via its distinct sound. Thus, all colors available to humanity are also available to him. Moreover, his “new sensory organ” expands his perception beyond the normal limits of human eyesight.²⁷ In particular, the antenna allows him to perceive 360 different colors, including those in the ultraviolet and infrared spectrums.²⁸ The eyeborg not only helps Harbisson experience the world as the rest of humanity does, but it also shatters previous limits and restrictions. When bodies and things join together, a new body, as well as a new *world*, is created.

Though the artist’s colorblindness is not life-debilitating, as Hawking’s sclerosis was, Harbisson’s relationship to his eyeborg mirrors Hawking’s relationship to his program and speaker. For both assemblages, the human actant provides a purpose and source of vitality for the nonhuman actant, while the nonhuman actant transforms the way the other actant interacts with and encounters the world. For both assemblages, the two actants entangle. In Harbisson’s case, this entangling is more explicit; while Hawking could replace his prosthesis by disconnecting the laptop and speaker from his wheelchair (which he did every two years), Harbisson must undergo brain surgery once more in order to be separated from his prosthesis.²⁹ However, his prosthesis, like Hawking’s, is not permanent. Even though the eyeborg is more difficult to remove, it has still changed over the years, such as gaining the ability to “hear colors” in distant countries via an app.³⁰ Therefore, these two examples demonstrate how there are varying levels of entanglement.

²⁶ “Neil Harbisson: The World’s First Cyborg Artist,” *The Guardian* (Guardian News and Media, May 6, 2014), <https://www.theguardian.com/artanddesign/2014/may/06/neil-harbisson-worlds-first-cyborg-artist>.

²⁷ Hannah Williams, “The Rise of the Cyborg: Are We Ready for Augmented Humans?,” *Tech Monitor*, April 10, 2017, <https://techmonitor.ai/techonology/ai-and-automation/rise-cyborg-ready-augmented-humans>.

²⁸ Annie Minoff, “Hearing Color through a Cyborg,” *Science Friday*, August 21, 2018, <https://www.sciencefriday.com/articles/hearing-color-through-a-cyborg/>.

²⁹ Joao Medeiros, “How Intel Gave Stephen Hawking a Voice,” *Wired* (Conde Nast, January 13, 2015), <https://www.wired.com/2015/01/intel-gave-stephen-hawking-voice/>.

³⁰ Ross Bryant, “Cyborg Artist Neil Harbisson Uses His Eyeborg to Listen to Colour,” *Dezeen*, December 19, 2016, <https://www.dezeen.com/2013/11/20/interview-with-human-cyborg-neil-harbisson/>.

How easily can one entangled body break apart? It depends on how much its components are stitched together. As such, the assemblage of entangled bodies and things is only as strong and stable as the links between the actants. Even then, the assemblage is not guaranteed to last forever.

Conclusion

Though conventional thought imagines bodies and things as separate and isolated entities, unable to stitch together, a closer analysis of everyday events and far-yet-not-distant realities (such as genetic warfare and uploaded consciousness) challenges this idea. Haraway's feminist and nomadic-subjective view argues that, rather than invading one another, bodies and things can stitch together via assimilation, entanglement, and interconnection. An examination of this phenomenon reveals the tangible effects of actants, the power of assemblages, and the different potential natures of the assemblages themselves. As a result, the importance of an awareness and respect for the power of bodies and things is brought to light. The phenomenon of joining together rejects the phallogocentric model of intrusion, prompting one to explore new ways of connection. Consider a world seemingly divided by borders. The intrusion of a country by a foreign power may spark anxiety, fear, and even war. However, if one adopts Haraway's feminist and nomadic-subjective view, then the borders vanish. Foreign powers are no longer stepping over the line and crossing into new territory, but simply meeting another entity. Ultimately, the rejection of the phallogocentric model discards the worry of the "intruder" or invader, leading countries to interact with each other harmoniously. In the assemblage of countries, countries are able to recognize each other's power without fear or threat of war. They can work together. Thus, in a world without boundaries or borders, humanity lives in "meanings and bodies that have a chance for the future."³¹

³¹ Haraway, "Situated Knowledges," 187.

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