Digital Apocalypse

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In this third and final article of a series on digital technology published in the *Research Bulletin*, I intend to explore some of the larger themes, perspectives, and implications connected with the digital gesture. The previous two articles focused on the origins and elements of this gesture—binary, Boolean algebra, data as *the* medium for the digital age—and elaborated on the experiences, ideas, and technologies emerging from the present state of the art, with particular emphasis on various virtual and augmented reality systems, further touching on the incipience of artificial intelligence. Throughout, it has been my aim to trace the trajectory of the digital gesture as an underlying impulse. In what follows, I hope to identify some final landmarks along the path marked out by the digital gesture as it disappears into the horizon of the future.

Simulacra

What is an image? This single question can call to mind a litany of others, many of which touch on historic difficulties in the domains of philosophy and religion that lead far beyond the scope of an exploration into the nature of digital technology. Yet, working with this question and some of the difficulties connected with it can lead to a deeper understanding of the digital gesture, even if the journey is somewhat circuitous.

One simple answer as to what an image *is* could be: anything that represents something else. A photograph of a rose, for instance, *re-presents* the rose of which it is an image. But what is the difference between the image and what it represents? What makes them the same? Why is this difference or sameness important? Leaving aside, for the time being, almost the entirety of aesthetics, semiotics, and other pertinent fields of investigation, one could naïvely venture that an understanding of the difference between an image and the *something* that it represents is vital when approaching the question as to what that something *is*. And a feeling for the *difference* between image and object is in turn essential for one's orientation to what could be called *reality*. Without the right orientation, one is in danger of confusing the menu with the meal, or, as in Plato's Cave, the shadow for the object—or being—that casts it.

To study the digital gesture in light of the questions surrounding the nature of an image requires, in the first place, a shift in hue. Since words themselves are images of a sort and have their own origins, orientations, and shades of meaning, a word more apt than "image" is called for, as the latter carries connotations not proper to the digital realm. Happily, the all-embracing genius of the English language readily supplies a word, adopted from the Latin in the 16th century, that illuminates the traces of the digital gesture perfectly, and that word is *simulacrum*.[1]

Jean Baudrillard, one of the preeminent postmodern philosophers of the 20th century, wrote extensively about what he saw as a growing tendency toward abstraction living in every aspect of modern civilization. He described a "precession of simulacra" whereby the simulacra begin to function in place of the "real." He delineated four "successive phases of the image":

> It is the reflection of a profound reality;
> it masks and denatures a profound reality;
> it masks the *absence* of a profound reality;
> it has no relation to any reality whatsoever:
> It is its own pure simulacrum.
> (Baudrillard 1994, 6)

Baudrillard coined the term *hyperreal* for the last and highest level of simulacra, highest in the sense of being the most abstracted from any origin or reality.[2] He theorized that as the simulacra precess further and further from the axis delineated by their real counterparts—and appear to become more and more "real" in and of themselves—they increasingly work back on whatever remains of the original world and set it spinning on a new axis: the axis of "pure simulation."

At the beginning of his book *Simulacra and Simulations*, Baudrillard recalls an image from the Argentinian author, Jorge Luis Borges, of a map that completely covers its territory both in extent and detail. Simply covering the territory (real) with a map (simulacrum) is only the first step, however, toward "true" simulation. Once the map itself begins to be copied, transformed, reflected, distorted, destroyed, et cetera—once the simulacrum increasingly receives the attention and activity of human beings while simultaneously concealing what it is not—all ties to the original territory are in danger of being severed. Baudrillard predicted that eventually all cultural, economic, and individual experience would become mediated by an opaque system of functional code.[3] He believed that advertising would be one of the prime mediums for the development of this system.[4] As an exemplar of a 20th-century simulation driven by advertising, Baudrillard evokes a well-known "mirage" in the desert:

> When one sees Las Vegas rise whole from the desert in the radiance of advertising at dusk, and return to the desert when dawn breaks, one sees that advertising is not what brightens or decorates the walls; it is what effaces the walls, effaces the streets, the facades, and all the architecture, effaces any support and any depth, and that it is this liquidation, this reabsorption of everything into the surface (whatever signs circulate there) that plunges us into [a] stupefied, hyperreal euphoria that we would not exchange for anything else, and that is the empty and inescapable form of seduction. (Baudrillard 1994, 91-92)

Inside the simulation, everything collapses into an empty image of seduction: What happens in Vegas stays in Vegas. How might one counter such a "stupefied, hyperreal euphoria" in the 21st century when the surface of seduction lurks no further than the nearest smartphone?

A Feeling for Difference in the Ways of Revealing

As a university student in the early 1990s, about the same time when I first met the work of Baudrillard, I encountered a computer system that could purportedly create original musical compositions in the style of well-known classical composers. The system's capabilities were demonstrated through a kind of musical Turing test.[5] Two music pieces were played in succession through hidden speakers; one of the pieces was the actual work of a human composer, say, Beethoven, and the other a work "composed" by software. Determining which was which was left up to the listener. (Strictly speaking, both pieces were simulacra in that they were both played through the medium of an electronic sound system.) I am somewhat abashed to report that I was unable to discern the "real" from the "simulated" music. But what prevented me from doing so? Perhaps it was a lack of familiarity. If, instead of my limited exposure to Beethoven, I had been previously acquainted with every single instance of the composer's work, I could have easily deduced which of the two compositions was not among those instances. Such a method, however, in addition to being implausible, would have missed the spirit of such a test. What then?

In my case, upon learning which work was which, even my underdeveloped musical sense could detect a certain repetitiveness in the music that was "composed" by the software, a repetitiveness that I found to be satisfyingly absent from the work once conceived by a living,

breathing human composer. Only in retrospect—and by repeating the test—was I able to distinguish between the real and the simulacrum. This new-found sensitivity took the form of a *feeling for the difference between the two*.

I have since come to associate this and similar experiences with the two-edged sword of digital technology: It can ultimately only reveal what it lacks, and the revelation of what is absent emphasizes that which may otherwise be present. Or, put another way, the experiences built upon the minimal difference implicit to the digital gesture can stimulate the development of a fine sense of discernment between differing qualities of *difference as such.* Like the sudden epiphany that comes when one finally grasps the elusive solution to a seemingly impossible riddle, one of the obscure gifts that the digital gesture can offer to human consciousness is a realization of the very thing that is otherwise effaced by digital technology.

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Eight years after the invention of the transistor, the philosophic underpinnings for just such a viewpoint were laid by Martin Heidegger, when he gave an enigmatic lecture on "The Question Concerning Technology." In a subsequent essay based on this lecture, Heidegger describes the essence of all technology as "a way of revealing" in line with the Greek concept of *poiēsis,* which is the origin of the English word "poetry." By contrast, he characterizes the "modern" technology of 1955 as a kind of "enframing" that threatens to "conceal *revealing itself*" by reducing the act of revealing to mere ordering. He goes on to say that, if the revealed world were to become "merely ordered," then humankind would be cut off from any access to truth and beauty. He concludes the essay by claiming that the only way to save humanity from such a fate is to hold the danger of technology "always before our eyes" and to decisively confront it in the realm of art (Heidegger 1977).

Language in a Hall of Mirrors

Heidegger's contribution to an understanding of the digital gesture is not straightforward or easy to grasp, especially for non-German speakers. Throughout his essay on technology, Heidegger plays with language and the meaning of words in ways that are more akin to poetry than to prose. Heidegger's "poetic revealing" is apropos of his conviction that art is the necessary countermeasure to the dangers posed by technology. The words of the essay become more than representatives of meaning; they begin to have resonance with each other and with their own origins; they sound forth and are no longer content simply to lie on the page. In a way reminiscent of Plato's *Cratylus*, Heidegger strives to let the words, and even the sounds composing the words, begin to speak for themselves. By confronting the question of technology through "that revealing that brings forth truth into the splendor of radiant appearing," Heidegger opens a way forward. Even in our time "we can be astounded," for instance, that, despite the specter of a rapidly multiplying digital opus—overstuffed by millions of Twitter feeds and threatening to swallow every last bit of attention—one can still be open to the question as to whether humankind can successfully "dwell poetically upon this earth."

In a recent book review for *The New Yorker* that questions the life-changing nature of poetry, Louis Menand writes that "language is a profoundly mysterious technology." He then reveals that he himself became a writer (and Pulitzer Prize winner) due to his own encounter with poetry as a teenager.[6] It is just this sort of acknowledged *experience* that stands over and against the digital gesture as a counterweight, even as the "mysterious technology" of language itself comes under threat of being digitized, enframed by an only *apparently* mysterious technology.

After all, it is no small occasion that the office formerly attributed to the leader of the free world is currently occupied by a man who conveys some of his most influential missives through a messaging system limited to 140 characters. Imagine! Once set into order via a tiny virtual keyboard, those few dozen characters are sent through thousands of interconnected digital systems. They then gleam forth from the surface of millions of screens positioned all around the globe, one digital copy for each subscriber, revealing... what? These cryptic messages—simulacra of printed words—are "read" by millions of human beings in turn, mostly through the lens of a pre-established bias of one sort or another, triggering more messages to be loosed back into the system, messages which then gleam forth and are read, and so on, and so on. Throughout this wholly digital realm, there is no revealing, no "bringing forth truth into the splendor of radiant appearing." There is only the functional operation of the code cycling within the system. The entire cycle bears the mark of *recursion*. The tendency to be recursive, for the code to work back on itself in a feedback loop, is a sign of the digital gesture, the algorithm, the simulation.

The simulation *requires recursion to create distance from the real*. Simulations enabled by the digital gesture ultimately alter the beholder's belief as to what the simulacrum *is* by enframing an entire ecosystem for it, by creating a context in which the simulacrum can "really" exist. What *is* being communicated through the Presidential Twitter feed? Or, returning to the image: What *is* the image of a rose that appears on my screen? *Is* it an email attachment? Or is it part of a tweet instead? Is it my desktop background? Is it an image *of anything at all*? Or is it an image of all the ones and zeros hidden from view? But aren't the ones and zeros themselves an image of the "real" rose that has been rendered into digital data? Does the image cease to exist if I delete it? A hall of mirrors. How many layers of context and meaning are needed before these questions can even be approached?

Similar to the saving power of the poetic, turning one's attention to the natural world can help one to reorient after such dizzying questions. Nature is abundant with layers of context and meaning that work together as an "open secret." What if, instead of transplanting a rose into the digital realm, we were to take an exact simulacrum of a rose seed—an atomic likeness of the "real thing"—over into the natural realm? Would the exact simulacrum respond poetically in this context? It is difficult to imagine that cold, water, sun, and soil would conspire to make the simulacrum sprout.

Apocalypse as Revealing

Just as definitively answered questions can end the fruitfulness of a good conversation, images or words fixed within a cultural context can dull individual creativity. For the modern reader, the word "apocalypse" most likely conjures a mediated vision of the end of times, replete with images of desperate survival in the face of scorched landscapes, zombies, malicious machines, or all of these at once. The ongoing financial success of the *Matrix* and *Terminator* franchises—both of which are slated to be "rebooted" soon for a new generation—is a testament to the fact that the depiction of a dystopian future wrought by renegade machine intelligence continues to be a trope in popular culture. This version of the future, magnified by an unstable political climate and seemingly relentless technological innovation, can appear to be an inevitability. The individual can seem to have no recourse. Nonetheless, the fact remains: Each small step toward a future enframed by digital technology must be taken by an individual human being. This fact looms less large and has been far less dramatized.

Here again, the genius of language can come to our assistance by offering a more potent meaning for *apocalypse*, a meaning quite unlike the culturally encrusted images of an inevitable disaster. The origins of the word "apocalypse" dwell in some other future vision. In that place—

that of the original Apocalypse—illuminated and resounding, self-knowledge works to *uncover* or *reveal.* Apocalypse is not, in this sense, a vision of an unavoidable future, but rather a mood or imaginative context that can facilitate the exploration of intentions rather than outcomes. Becoming aware of the differences in meaning inhering within the word "apocalypse" can be instructive for evaluating the true impulses behind the images that arise in day-to-day life, especially those that are the result of mediation or bias.

Recall, for example, the historic encounter between the chess grandmaster Garry Kasparov and IBM's Deep Blue computer. Before the match, Kasparov expounded on how the computer was unable to "understand" chess the way he could and vowed to "be the man who [would] save our pride, human pride." The lead computer programmer, on the other hand, wanted to create a machine intelligence "in the image of man." Neither came to pass. Despite heroic claims to an intelligence beyond the capabilities of mere calculation, Kasparov was eventually defeated by a subsequent iteration of Deep Blue. And, despite its obvious efficacy, a chess computer—even one without human peer—can not be a true "image of man." Furthermore, the fact that a human being lost to a computer at chess does not *mean* that human beings are obsolete, or that a computer has attained human intelligence; these are merely appearances. Both Kasparov and the computer scientist invoked their own *personal images* as justification for their respective intentions. But these personal images do not inhabit a common reality any more than the *Terminator* and *Matrix* movies describe a common apocalypse. The frame of an image, whether it is *of* "man" or *of* technology, necessarily sets limits to the very image it enframes. The digital gesture insists that one oscillate ceaselessly between the two. An apocalyptic mood does not insist.

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The Black Box of Machine Learning

In both senses of the word, the apocalypse is now. The machines are "learning" without being "taught." Just as many children today are regularly exposed to touchscreen technology as a sort of digital babysitter[7]—often justified in the minds of caregivers by the installation of "edutainment" and "infotainment" apps—so too is digital technology increasingly left to its own self-education.

Many of the most advanced digital systems are not "programmed" in the traditional sense. Instead, they are designed as "neural networks" that simulate the kinds of layered connections found—or imagined to be found—in the nervous systems of living organisms. (Whether an artificial neural network can be regarded as an image *taken from* or *projected onto* an organism is an open question.) And, just as young children need experiences to learn anything at all, an artificial neural network, or ANN, first needs to be "trained" if it is ever going to successfully perform useful functions, a process sometimes referred to as "deep learning." Unlike the case of a young child, the training of an ANN does not require much attention from its guardians after it is created. The training *does* require a prodigious amount of digital data to percolate through the layers of the neural network. The data are fed into the visible input layer of the network, progress through hidden processing layers, and then emerge at the visible output layer. As the adjective "hidden" implies, what exactly occurs in the inner processing layers is *not known.* Meaning, literally *no one knows* exactly what is happening at this level of the simulation.

There are many examples of artificial neural networks already "in the wild." Facebook, for instance, uses a neural network for its translation services. Google uses deep learning techniques to index online images for better search results. Existing resources have proven to be sufficient for

the training regimen of these intelligent digital machines. Soon, however, the data collected from the vast online troves of digitized images, texts, and financial transactions will no longer suffice.

Here, as in many other cases, Baudrillard is uncannily prescient. Writing in 1981 about the now-commonplace technology of cloning, Baudrillard speculated that, in effect, such prowess was the result of "what happens to the body when it ceases to be conceived as anything but a message, as a stockpile of information and of messages, as fodder for data processing" (Baudrillard 1994, 99–100).

In 2017, we need not clone our physical bodies for such a conception to play a role in our everyday experience. Our "algorithmic self" serves this purpose instead.[8] An individual's Fitbit data, Amazon Prime viewing habits, and Google search history constitute a digital body that has indeed become "fodder for data processing"; more than fodder: It is a gold mine.

A recent article in *The Guardian* summarizes the present situation well:

> Silicon Valley is an extractive industry. Its resource isn't oil or copper, but data. Companies harvest this data by observing as much of our online activity as they can. … [C]ompanies can [thereby] discover patterns that help determine what kind of person you are–and what kind of things you might buy.
>
> These patterns are highly profitable. Silicon Valley uses them to sell you products or to sell you to advertisers. But feeding the algorithms that produce these patterns requires a steady stream of data. … For Silicon Valley... anything less than total knowledge of its users represents lost revenue. Any unmonitored moment is a missed opportunity.
>
> Amazon [who recently acquired Whole Foods Market] is going to show the industry how to monitor more moments: by making corporate surveillance as deeply embedded in our physical environment as it is in our virtual one. Silicon Valley already earns vast sums of money from watching what we do online. Soon it'll earn even more money from watching what we do *offline*. (Tarnoff 2017)

Transforming the Digital Crown

Such is the nature of the digital apocalypse; we human beings *are* growing together with the technology of our own creating. But *how* we grow together will continue to depend on individually-induced inflection points. It is still possible to live *without* a smartphone, just as it is possible to live *with* the intention of understanding what a smartphone actually *is*.

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The advent of functional machine intelligence is proof that a certain type of enframed thinking can be projected into the external world as an image taken from the tapestry of soul experiences accessible to human consciousness. "Thinking" that has been separated out and isolated by the digital gesture can be easily mistaken for the *activity of thinking itself*, precisely because the former is, relatively speaking, *visible*, manifested to the senses through the medium of digital technology, while the latter—the activity of thinking—remains, at least initially, *unrevealed.* According to Rudolf Steiner, there cannot be "a satisfactory solution to all the riddles of life" without an experience of what lies unrevealed, nor can human beings progress beyond what the intellect alone provides to consciousness. It follows that any form of intellect that can be simulated by a digital machine will also be unable to reveal solutions to the "riddles of life."

In his work, Steiner repeatedly points to the fact that the first step toward higher cognition always requires clarity of thinking and the capability to follow a thought through to its logical end. He also emphasizes that "never before has there been a time when clear thinking

has been as necessary for human evolution as are eating and drinking for the preservation of the physical body" (Steiner 2006, 109). And, paradoxically, that "illusion is the driving force for [the] development of [our] consciousness" (Steiner 2000, 163).

Whether or not the crescendo of illusion being orchestrated through the digital gesture can be turned to the advantage of human evolution depends on which digital apocalypse comes to pass. In this sense, digital technology is not a tool among tools. It is the state of the art of a certain form of consciousness, the essence of which is based on a minimized difference and the aim of which is to enframe an entire cosmos in terms of that difference. Yet, to echo Heidegger's words, the "saving power" of art also still holds sway. The digital gesture creates distance, but the poetic gesture draws near to what lies concealed in that distance.

In a lecture on November 25, 1917, Rudolf Steiner stressed the enormous role that machine technology will play in humanity's future:

> The point is not *what* is going to happen, for it certainly will happen, but *how* it happens—how these things are handled. The welding together of human beings with machines will be a great and important problem for the rest of the earth-evolution. (Steiner 1966)

It is my earnest wish that this problem will be taken seriously.

ENDNOTES

1 The nouns "simulacrum" (singular) and "simulacra" (plural) stem from the Latin verb *simulare*, meaning "to make like, imitate, copy, represent" ("similar" and "semblance" come from the same root). Between the word "image" and the word "simulacrum" lies a philosophical divide. In *The Sophist*, Plato made the distinction between the work of those artists who respect the proportions of the model and those who do not. The latter, who alter the original proportions of the model in their oversized or inappropriately-colored works, "depart from the truth" and produce "appearance" instead of a true "likeness." It is this sense of (mere) appearance or of illusion that is captured by the word "simulacrum"; to make a work "similar" to the model is not equal to making a "true" image of it. Ironically, accuracy, an attribute Plato assigns to the true image, seems to be exactly what digital technology has perfected. But this is itself an illusion, as digital calculations can only ever be approximate.

2 By definition, "hyperreal" means "beyond real" or "more real than real." I was once in a small crowd of people during the demonstration of a then-new ultra-high-definition television set. As a video of a popular movie played on the brilliant screen, a child in the group exclaimed: "It looks better than real life!" Years earlier, I myself had a similar experience when I saw a high-resolution computer screen for the first time. I have also heard others describe the change from black-and-white to color television in comparable terms. Each stage of screen innovation may not look "better than real life," but each stage certainly seems to look "more real" than the last.

3 This idea was the basis for *The Matrix*. The directors of the film required the actors to read Baudrillard and their script makes many references to his work. The dramatic arc of the Matrix trilogy begins with the main character developing the capability to discern the real from the simulated and finally ends when he is able to make a free choice within the constraints of both. The first film of the series won four Academy Awards and the Matrix franchise remains one of the most profitable properties in the history of media.

4 The idea that advertising could be a medium unto itself is no longer a radical notion. Yet the pure inertia of the advertising behemoth has had an impact on the digital revolution beyond the imaginings of even its most clever architects. As a case in point, the fact that almost 80% of Google's revenue now comes from advertising is a circumstance never foreseen or intended by either of its two founders. They both had envisioned an entirely different revenue model based on licensing their proprietary search technology. Moreover, they fundamentally eschewed anything pertaining to advertising. This April, however, Google's parent company, Alphabet, reported first quarter advertising revenue of $20 billion. That number is expected to increase over the course of the year, an expectation driven, in part, by the fact that artificial intelligence—an actual intention of Google's founders—has been systematically woven into nearly every aspect of the business, notably its advertising technology.

5 In 1950, Alan Turing conceived of the influential test that still bears his name. He intended the test to be a means for determining whether a machine was capable of displaying a level of intelligence equivalent, or at least seemingly equivalent, to that of a human being. During the test, an evaluator having access to only a screen and a keyboard is tasked with having a typed conversation with both the machine being evaluated and another human being. Both the machine and the human control are hidden from view. If by the end of the session the evaluator is not able to reliably identify which of the two is the machine, the machine is considered to have passed the test. Turing emphasized that the point was not to determine whether or not a particular machine could think, but rather to see if it could pass this "imitation game" by seeming to act in the way a human being acts.

6 Louis Menand, "Can Poetry Change Your Life?". *The New Yorker*, July 31, 2017.

7 From the journal *Frontiers in Psychology*:
"Young children's access to touch screens has increased rapidly and dramatically. In October 2015, the Pew Research Center reported that at least 83% of all 18- to 49-year-olds in the US—the age group most likely to be parents of young children—owned smartphones. Another recent investigation focusing directly on low-income minority families from suburban Philadelphia with children ranging from 6 months to 4 years painted the same picture: 83% of these families had tablets at home, 77% had smartphones, and 96.6% of the children had used these devices, many before their first birthdays." (Lovato and Waxman 2016)

8 The idea of an "algorithmic self" is a direct progression along the lines that Baudrillard describes. Comparing the industrial age with the information age, he calls the technology of the former "exotechnical," characterized by the "prosthetic," and the latter "esotechnical," represented by "genetic software." Unlike the more-or-less visible "software" encoded by DNA, the "algorithmic self" is equivalent to a digital double that can never be seen directly (we could call it patatechnical). As online systems increasingly become indispensable for day-to-day life, the care of one's digital double has already grown to be an existential concern for some people. Frank Pasquale, author of the book *The Black Box Society: The Secret Algorithms That Control Money and Information*, explains:
"To negotiate contemporary algorithms of reputation and search—ranging from resumé optimization on LinkedIn to strategic Facebook status updates to OkCupid [dating] profile grooming—we are increasingly called on to adopt an algorithmic self, one well practiced in strategic self-promotion. This algorithmic selfhood may be critical to finding job opportunities (or even maintaining a reliable circle of friends and family) in an era of accelerating social change." (Pasquale 2015)

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