LIVING DATA

BARRY ALLEN

Abstract: We see new technologies changing how we live, and seemingly set to do so at a rising pace. How should we describe these changes, and what exactly is changing? I discuss the theory of technical change in Simondon, *On the Modes of Existence of the Technical Object*. Once we understand precisely what sort of change qualifies as “technical,” we see that the changes in question today have little to do with technology as such, more with a new infrastructure for its deployment.

Key words: Simondon, Georges; technical evolution; infrastructure; surveillance; big data.

We see new technologies changing how we live, and seemingly set to do so at a rising pace. How should we describe these changes, and what exactly is changing? To introduce a theoretical argument, I shall discuss the theory of technical change in the work of Georges Simondon, *On the Modes of Existence of the Technical Object* (1958). Once we understand precisely what sort of change qualifies as “technical,” we see that the changes in question today have little to do with technology per se, more with a new infrastructure for its deployment.

The locus of technical change

Simondon’s preferred term for what he is talking about is “technical object” (Simondon 1958). He does not define this, though we can say that a technical object is any device that we use, as well as its parts, and the systems it interacts with. To understand what makes a technical object different from other kinds, such as non-technical artifacts or organisms, we must adopt a genetic point of view, because what makes a technical object *technical* is the process that engenders it. This is what Simondon means by the *technicity* of technical objects, which is a word for something’s technical quality, its technicality—high-tech, low-tech, primitive, or sophisticated. Technicity is a quality, not of the form or the material, but of the genetic process by which these come together. How is the form materialized? How is the material informed? How high tech is the process? How state-of-the-art?

He identifies three modes of existence for technical objects. A technical object may be a technical element, which is a part in a larger device; or it may be a technical individual,

an individuated unit of technology that people operate or apply; or it may be an ensemble, multiple technical individuals in a network. To take a familiar example, a personal computer has a processing chip and some memory chips, as well as various tiny LED bulbs for controls—those are technical elements. The computer itself, in its case, is a technical individual, a well-individuated unit that we use to do various tasks. It is an individual part of a technical ensemble when we include the peripherals that we typically connect, and it is a node of a much larger ensemble when we connect to the Internet.

It is a general truth about individuals, technical no less than biological, that they exist only with an associated milieu. Individual and milieu are not really even two things, and every genesis co-occurs in both registers. Individual existence is existence in a milieu, whether the individual is technical or biological, but here is also a difference between technical individuals and technical elements. The individual cannot operate apart from an associated milieu, but technical *elements* have no associated milieu (or an exceedingly etiolated one), and can operate in many different devices and environments. Technical elements are characterized by this ‘detachableness’, retaining functionality when released from one device and milieu and reused elsewhere. LED bulbs from the same warehouse might be found in a laptop, a surveillance system, or a toaster.

What passes from one technical generation to another are primarily technical elements, not technical individuals. The machines of few factories today resemble those of fifty years ago. Yet if we look closer, not at the machines, which are technical individuals, but their elements, their parts, we find evidence of continuity and evolution. Machines, as technical individuals, do not evolve; their parts, their elements, do. Technical change arises with new elements, not new individuals. This is the reverse of biology, where individual organisms are the only way to evolve new organs. In technology, the organs, the technical elements, are the principal site of evolutionary change, and technical individuals—devices or machines—may be forgotten in a generation, while the elements live on.

Technical change concentrates in *elements*, not individuals. A profusion of new devices is no more a *technical* change than is the profusion of annual new car models. It is something else that is changing, something else that is new, not the technology.

The movement of technical change

Technical objects begin in relatively abstract form, and evolve over generations of use toward concreteness. A technical object is abstract to the extent that its elements are isolated functional units, like the boxes designers draw to represent operations on a flow chart. Such an arrangement is ‘abstract’ because the elements are selected and combined according to stipulated function. How they do what they do does not matter, yet. Elements so combined necessarily lack integration, their operations are serial, self-contained, concatenated, but not continuous.

The first designs of any industrial technology tend to be logically simple but technically complex, because they comprise multiple complete, non-communicating elements that are coerced into convergence. That is fine in a diagram, where drawing a line makes it so, but to translate the diagram into a real machine we have to make the units work together. It suddenly matters what is inside those boxes and how they do what they do. The flow chart is

analytically transparent yet technically primitive, incognizant of any number of interactions and efficiencies. Cognizance will come, but only after a period of use.

With experience, observant users discover that elements can do more than one thing, and different functions can be linked. The textbook case of such an efficiency is the advance of diesel over early gasoline automobile engines. In a gasoline engine the explosive mix of air and fuel in the cylinder is ignited by a spark that is provided by an independent electrical system. In a diesel engine, the mixture in the cylinder spontaneously detonates under conditions of heat and pressure provided by the engine's own operation. When spontaneous detonation occurs in a gasoline engine it produces an undesirable "ping." Lead dampened the effect and poisoned the air. In a diesel, the same tendency to spontaneous detonation is integrated into the work cycle. Instead of being something to prevent, spontaneous detonation becomes a solution to a design problem.

What this case is supposed to show is how the abstract schema of the technical object—how we expect and design it to function—can be embodied in progressively better organized structures. The advance is not mere rationality—the most abstract design is rational enough. Simondon says the redesign that advances technical change embodies the abstract schema more concretely. That means, more of the operational requirements are met by the object's own operation, enhancing the mutual dependence of elements, and making each more effective through the efficiency of the others. Technical advances come with redesigns that eliminate abstractly isolated, concatenated processes (like a gasoline engine's need for an independent ignition system), enhancing synergistic resonance among parts. At the unreachable ideal limit, "the concrete technical object is one that is no longer in conflict with itself, one in which no side-effect is detrimental to the functioning of the ensemble or left out of this functioning" (Simondon, 1958, p. 38).

What is enhanced by concretization is coherence, organization, and also individuation or individuality. Technical change is a movement of diminishing abstraction and differentiating individualization. The more concrete the technical object becomes, the more distinct, coherent, internally unified, and well-individuated it is, not easily replaced by anything else. Technical objects evolve to depend less on external subsystems, which they do by creating internal circuits of reciprocal causality. Greater subsystem interdependence gives rise to a more well-individuated object. It depends so much on itself that it wins a latitude of operation from its milieu without ever becoming entirely autonomous.

These are not the material, mechanical qualities of technology, but rather those that most resemble living things. Yet the artificial organism remains a limit before which technology must recede. Every technical object has residual abstraction, while organisms are completely concrete from the beginning. A completely concrete technical object is impossible, because to be completely concrete entails no elements, no parts. A 'part' is something discontinuous, prefabricated, and 'abstract,' a designated functionality, a black box. A technical element is such a part, prefabricated and introduced for functionality – that is to be introduced abstractly, as a box not to open but directly use, even though it would not function apart from the unconsidered machinery in the box. Abstraction can be reduced, devices made more concrete, but never completely. There will always be parts, there will always be black boxes, and there will always be residual abstraction.

The mere fact that we assemble technical elements implies a certain abstraction. We think of the use, and reach for the component that meets a specification. That is abstract, because we do it without consideration for how the component operates. A designer needs an LED, and orders one from a catalogue. We don't question how it performs, but trust the manufacturer's specifications. We never escape this abstraction, because for any user, everything in technology has its black-box level, where users accept functionality without opening the box.

A technical object never escapes abstraction, but an organism never succumbs to it. Life is not assembled from parts. A completely concrete entity would be one without parts, and that is an organism. We speak of body parts but this is bad physiology. A finger, a muscle, or a cell is not a part because they are not prefabricated and attached. To look at an organism and see parts is to look at it abstractly, ignoring underlying, pervasive continuity and interpenetration. Nothing is a biological structure at an instant. A cell exists only in a milieu it does not create but is born to.

If nothing about an organism is prefabricated, what of a prosthetic device, an artificial limb, say? It becomes a *part* more intensely than the limb it replaces. It is a kind of part, but that does not mean that what it replaces was a part too. The challenge of prosthesis design is the interface, the transducing surface, where the body either takes to the device or cannot be persuaded. That is why biomedical implants are made of titanium, the most bio-compatible metal known. Under ordinary atmospheric conditions the metal is surrounded by an oxide film so strongly adhered as to be insoluble and chemically impermeable. The metal becomes serenely inert to the surrounding cellular environment, resisting corrosion from body fluids, and even structurally merging with bone, like fossilization in reverse.

Every technical object has residual abstraction, because every one is composed of elements, which are black boxes of abstract functionality. A completely concrete technical object is impossible because such a thing would not be made of prefigured parts. It would not be *made* at all; it would have to grow; it would be an organism. Organisms are completely concrete, because they are systems first and assemblages of parts only to abstract reflection. To divide an organism into parts is to think of parts *we* would require for a device of comparable functionality. The division of parts belongs to our vision, not to the organism.¹ But a technical object really is put together from the parts that we identify.

Living data

New technologies change how we live and seem set to do so at an accelerating pace. The technologies in question are broadly "informational," and are made feasible and economic by inexpensive computation and the Internet. To use Simondon's terms, these devices and applications are a new deployment of essentially familiar technical elements. There is a tendency to think that effects of technology are inherent, emerging from devices apart from our actions and choices, and inevitable, a direction we cannot resist. The assumption is repeatedly attacked but still not defeated (Bridle, 2018). In our case, so far from irresistible

¹ The argument is from Bergson (1907/1998, chapter 1).

technological advance, the changes we experience are not even properly technical or technological at all, despite the omnipresence of devices.

The change is not strictly technical or technological, yet it is more than merely a deluge of new individuals (devices, gadgets). New is the quality of their presence, its intensity. The engineering is not new, the materials are not new, the functionality is not new. New is its sometimes coercive insistence on co-presence, drawing us online and then sharing every choice we make. No technology works without an infrastructure, Simondon's associated milieu. This new presence for technologies is a change in infrastructure, a change in the media of deployment, and the milieu of usage.

We were not formerly asked to carry media infrastructure around with us. Radio did not ask this of users, nor television. It is not just that we encounter technology wherever we turn, we are driven to *take* technology wherever we turn. We become walking telephone poles. Is the day coming when it will be as suspicious not to have a mobile phone when out in public as it is, in some countries, to be on the street today without papers? The new presence is not just a presence in the environment, like billboards. It is a presence in lives, in what we do at work, at home, eating, traveling, constantly making selections, and emitting data.

We take the technology into our lives and would miss it. The infrastructure, what it takes to use our devices, is personalized, our use is personalized, in a way that brings pleasure and guarantees use, which is the psychic brick and mortar of this infrastructure. The infrastructure that enables surveillance to monitor more penetratingly than it ever has is now voluntarily carried in the pocket of every person who has ever made a bank transaction with a mobile phone. The technology of information aggregation and meta-data analytics require, as infrastructure, a constant source of data, without which they are inoperable. This technology would not function if users did not agree to make it a silent partner to their preferences.

The deployment of information technology for surveillance has been going on for a long time. Book historian Robert Darnton writes, "Every age was an age of information" (Darnton 2010, p. 23; see also Koopman, 2019 and Lee, 2019). The deployment is not new, and technically not even the technology is new. What is new is to have passed a series of obstacles that retarded the tendency of this ancient deployment, and thereby enabled a new promiscuousness. Changes in technology align with changes in the security regime to remove practically all obstacles to harvesting the data people generate merely by living.

The same infrastructure that enables this new modality of surveillance also makes data big business. Surveillance turns out to be more equivocal than Foucault suspected. He thought the principal use of surveillance was discipline. We have discovered a new use—data harvesting. That does not mean it isn't good for discipline too, only that we can do more. The more choices people make using an Internet-connected device the more useful data they produce for harvesting. Devices and their use reach deep into individual life because that is where the data is. So that is where surveillance starts, and there is nothing to stop it—if it stopped, we would be unhappy, and miss our devices.

Before the Industrial Revolution, the social individual was a technical individual too. It was individual people who used the tools, operated the equipment, made the goods. Factory workers of the Industrial Revolution were reduced from individuals to elements, auxiliary to the new machines, which replaced them as technical individuals. Something like that is

happening again, though in a different key. Everyone who uses the Internet has become a technical element, a kind of high-tech proletariat, perhaps happier and better-off, but for sure more deeply surveilled and expropriated (for data) than Europe's first proletariat. Like laborers, we supply something the machines require, though we supply it not by labor, but by living and taking the devices with us. They make us like them, so we are happy to take them everywhere. Merely by living with them we emit the data they seek and pass up to the algorithms that are so good at guessing what we like, selling our expropriated preferences back to us, and taking the preference out of preferences.

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Department of Philosophy
McMaster University
1280 Main St. W.
Hamilton, Ontario L8S 4K1
Canada
Email: bgallen@mcmaster.ca