Chapter 6
Technological System and the Problem of Desymbolization

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Who is Jacques Ellul? Prophet, sociologist, philosopher, theologian? How should we read an author who has taken on such a multiplicity of roles in a career of prolific productivity? Shall we read using the theoretical frames he set himself, challenge him with postmodern theory, or link his theory to the different schools that characterize contemporary discussion? My reading takes the third approach, adapting the work of Gilles Deleuze, to create consistent concepts that allow us to renew our understanding of reality. It is undeniable that technology itself is the source of a transformation of reality, and this prompts us to constantly rethink the milieu in which we are living. This essay focuses on what Ellul calls a technological system, especially on the aspects of symbolization and desymbolization that characterize the technological evolution which separated human from nature. On the one hand, this system characterizes a permanent departure. It takes human beings to the middle of the sea, where they can no longer identify their own land, nor can they reach the horizon which had seemed to be so close, to paraphrase Nietzsche from *The Gay Science*. On the other hand, the separation presents us with contemporary situations that bear their own specificities and pose risks that must be tackled individually and in detail.

Ellul's conceptualization of a technological system suggests a new way to mediate the relation between human beings and, following the vocabulary of Gilbert Simondon, technical reality. The technical reality constitutes the world in which we dwell, an existential analytic (if Heidegger's project still holds its importance today) that can only be reinvented by admitting that we are actually beings-in-the-technological-system. But it is also essential to evaluate the technological system according to a

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H.M. Jerónimo et al. (eds.), *Jacques Ellul and the Technological Society in the 21st Century*, Philosophy of Engineering and Technology 13,
DOI 10.1007/978-94-007-6658-7_6,

technical reality that never remains static, and this requires reinvestigating Ellul's technological system in contemporary terms.

This essay is divided into three parts. The first discusses the relation between a technological system and desymbolization in Ellul's thought. The second evaluates the technical system and desymbolization through a discussion of Ellul's inspiration by Simondon, looking at the technological system we confront today. The third examines the technical system from the perspective of another French philosopher, Bernard Stiegler, who was also inspired by Simondon. These steps help bring Ellul's thought to bear on contemporary technical reality.

1 Evolution of the Technological System

My reading of Ellul will thus focus on his *Technological System,* which was published in 1977 and translated into English in 1980. In this book, Ellul proposes technology as both an environment and a system. An environment is easier to understand, since it is indicated by the artifacts that surround us everyday. A technical system presents something different. Considering the constantly evolving technical system, Ellul proposes that it is useless to talk about a single technology, but rather that we must grasp the technological system as a totality. A technical system for Ellul is made up of the technical phenomenon and its progressions. A progression is not what people commonly understand as evolution through time, but rather a vital force within the objects themselves that constitutes their progress from one stage to another. The technological system in this sense is no longer a collection of objects or technologies, but rather a gigantic force that pushes forward the technical lineage. One of the key consequences that Ellul identifies with such technological progress is the process of desymbolization. Put simplistically, the evolution of a technological system is characterized by a dialectical movement between the destruction of old symbols and the creation of new ones. This may sound similar to Ernest Cassirer's well-known proposal that culture is a constant movement between *forma formata* (structured structure) and *forma formans* (structuring structure) (Vandenberghe 2001), but Ellul's theory is distinct from Cassirer's. The relation between desymbolization and the technological system is one of the more interesting but least developed points in Ellul's theory.

Consider now the meaning of symbolization and desymbolization in this context. Commenting on the relation between the technological system and rituals, Ellul proposes that

> the function of symbolization no longer attests to a specifically human power. It is now subordinated to a different order, a different function, which are both already created by man. And if that function is performed, it proves that technology is now the true environment of man (otherwise, he would not feel the need to operate with symbols in this connection) (Ellul 1980 [1977]: 177).

We can easily recognize this concept of desymbolization in an anthropological sense. Symbolization is a process that creates association between human and nature, gods, or spirits through artificial objects such as totems, figurines, and more.

As Ellul illustrated, in certain civilizations it was forbidden to work on the ground with iron tools since nature was conceived as mother and iron tools were considered harmful to the mother.[1] The symbol of earth as a mother figure is transcended when a technological system is adapted due to different cultural factors, such as war and famine. Symbols that were once mediated between different powers and were included in ritual practices are eliminated in the process of technological development. Desymbolization is thus a process of short-circuiting that brings forth an efficient and automatic technological system in exchange for the traditional values and forms of life.

Nevertheless, this is too simplistic a reading of Ellul. Instead we should go back to Simondon, who directly inspired Ellul's concept of the technological system. By harkening back to Simondon, we can discover some latent aspects of desymbolization in Ellul's thought. This proposal is also in response to Ellul's proposition that in order to study the technological system, one must go inside the technological system and its specificity. Ellul's debt to Simondon is obvious in *The Technological System*, where he quotes Simondon extensively, especially in the chapter on "Technology as a System," where he repeatedly references *On the Mode of Existence of Technical Objects*, Simondon's doctoral dissertation from 1958.

But to begin, note something concerning the English translation of *The Technological System*. Ellul term is *le système technicien*, which literally means "the technician system." What I understand by Ellul's use of *technician* is this: that we are living in a culture that depends on technical reason, which is no longer constrained by moral or religious judgment. Technicians are producing a culture with technical reasons. Hence culture is more technical than technological, if by technological we refer to infrastructures, machines, and all kinds of artificial objects. The translation of technological system should not be understood merely as an ensemble of artificial objects, but includes reason operating within technical constraints.

On the Mode of Existence of Technical Objects proposed what Simondon calls a "mechanology." "Mechanology" investigates the existence of technical objects through their lineage toward perfection. Mechanology suggests that the traditional conceptualization of technologies as in opposition to culture is mistaken; instead, culture is technological and technical. Simondon describes this lineage from the origin of technology to the point where it provides an increasingly concrete object through the example of the Lee de Forest triode. The triode is an evolved version of the diode, a device that controls the flow of direct current. In the simplest diode vacuum tube the cathode is heated and hence activated to release electrons; the anode is positively charged so that it attracts electrons from the cathode. If the voltage polarity is reversed, the anode is not heated and thus cannot emit electrons so that no current passes through. A triode places a grid between the anode and the cathode; a direct current (DC) can give a bias to the grid: if negative, it repels some of the electrons back to the cathode and hence serves as an amplifier. Simondon proposes that the origin of the triode is not the diode but "the condition of irreversibility of the

[1] Jacques Ellul, 1992. *La trahison de la technologie*, video. http://www.dailymotion.com/video/xczyxj_jacques-ellul-le-systeme-technicien_webcam

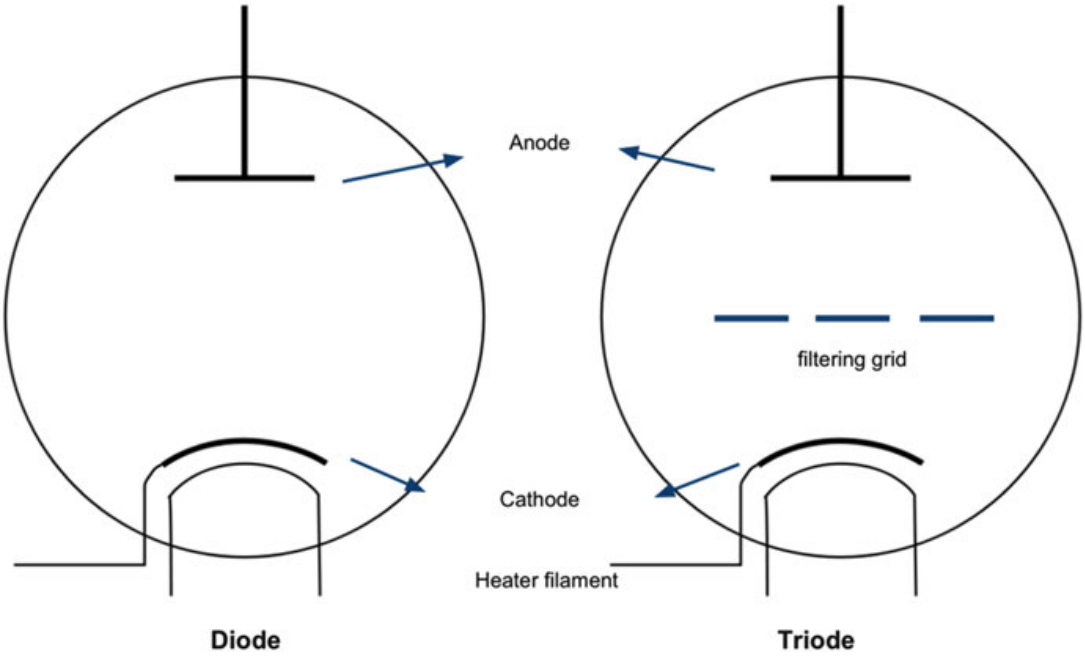

Fig. 6.1 An indirect heated vacuum tube diode and triode (Illustrated by the author)

electrodes and the phenomenon of the transport of electric charges across the vacuum" (Simondon 1980: 36) (Fig. 6.1).

A technical individual is a technical object that incorporates or adapts an external milieu into its functioning. This external milieu is what Simondon calls the "associated milieu" or environment that becomes part of its functionality. For example, Simondon often referenced the Guimbal turbine (named after the engineer who invented it). To solve the problem of overheating and energy loss, it uses oil to lubricate the engine as well as to protect its parts from river water, which it uses as a cooling agent (Simondon 2005). The river here is an associated milieu insofar as it is part of the system but not a component in the machine. Simondon's approach to technical objects differs from that of previous philosophers and phenomenologists in that he does not reduce the technical object to the intentional product of consciousness but makes it an object to be examined in its own right. He proposed to study the genesis of the technical object itself, less in a biological sense than in a mechanical one. A technical object regains its materiality and attains a different degree of concreteness or perfection in contrast to what cybernetics terms "control." Technical objects form ensembles; they also create a secondary associated milieu, which maintains the connectivity and metastability of the technical ensemble. Technical ensembles or groups of technical ensembles constitute what Ellul calls a technological sub-system. An example of this would be transportation technology, including the road infrastructure, signs, and more. Such sub-systems then further form the basis of a technological system.

The significance of seeing the technological system in this way is that we can further discover the desystemization process as the materialization of different connections between different technical ensembles. The process of desymbolization

involves the creation of a new kind of materiality. Connections are realized, for example, between the pulleys and the wheels in a mechanical system, and between the optical cables or electronic wires in a modern electronic apparatus. Desymbolization must be seen as the emergence of materiality that compensates for the weakness of the traditional form of mediation, and promotes the concept of control and efficiency. The technical system is in constant struggle for a common ground that allows it to establish material connections. The cybernetic movement in the last century attempted to find common ground in logic, information, and signals that could integrate human beings into a technical system. Finally the system will subject all elements to control. Ellul is not unaware of this, as when he praises Simondon:

> Simondon excellently demonstrates this process of *causal evolution* on multiple levels. First of all, as the technological object evolves, it suppresses secondary effects which may prove to be obstacles and specializes each structure as a 'positive synthetic functional unit': 'The concrete technological object is one that is no longer struggling with itself, one in which no secondary effect damages the functioning of the whole.' Thus, technology itself evolves by eliminating, in its own movement, anything that hinders it from being perfectly realized; this is a progression with no external objective (Ellul 1980 [1977]: 275).[2]

The process of "elimination" in its own movement is what we just mentioned above. The production of a new materiality bypasses the domination of the old one, just as manual labor is replaced by electrically-driven mechanical forces, symbolic mediations is replaced by direct control. Hence Ellul concludes:

> The results are: escape symbolization, as in modern art; artificial symbolization (bearing upon technology but perfectly useless and meaningless, as we shall see later on). The approach to, the grasp, interpretation, and control of, the technological environment cannot take place through symbolization. As for the natural environment, symbolization is made perfectly meaningless here by the dominance of utilitarian technology (Ellul 1980 [1977]: 40).

2 Data Processing and Technological System

Before we go to the third aspect of desymbolization, we must renew our understanding of the technical reality. We have to pose the question: what characterizes the technological system today? Or more precisely: what is the new materiality that produces a unified technological system? We can answer that it is the production and processing of data. In fact, by the end of the 1970s Ellul already identified the significance of data processing as a force that carries out further extensive desymbolization, far before the advent of the Internet. He said:

> Thanks to the computer, there emerged a sort of internal systematics of the technological ensemble, expressing itself by, and operating on, the level of information. It is

[2] Simondon's "objet technique" is often translated as technical object, and sometimes adopted and translated as technological object, as in this quote reproduced from Ellul, but we have to bear in mind that when Ellul talks about technological objects by referring to Simondon, it is what we call "technical object" in this article.

> through reciprocal total and integrated information that the subsystems are coordinated. This is something that no man, no human group, no constitution was able to do (Ellul 1980 [1977]: 102).

It is even more compelling when we noticed that in the late 1970s, Ellul also talked about closed data and open data, a topic that was put on the agenda by the European Union 30 years later.[3] Although Ellul talked directly about information in *The Technological Bluff* (published in 1990), but it was only in his discussion of data processing that I think Ellul grasped the materiality of the contemporary technological system. Of course when Ellul was working, data processing was limited to a small number of computers and only a few data analysis experts. Today, data has become the key question for technological development in different industries, especially with the advance of the Internet. With the proliferation of personal computers and Internet access, data production has become ubiquitous and is no longer limited to experts. Here let me quote the UC Berkeley computer science Professor Michael Franklin about the production of data by a single user, from which we can peep into the universe of data with which we live:

> Most tweets, for example, are created manually by people at keyboards or touchscreens, 140 characters at a time. Multiply that by the millions of active users and the result is indeed an impressive amount of information. The data driving the data analytics tsunami, on the other hand, is automatically generated. Every page view, ad impression, ad click, video view, etc. done by every user on the web generates thousands of bytes of log information. Add in the data automatically generated by the underlying infrastructure (CDNs, servers, gateways, etc.) and you can quickly find yourself dealing with petabytes of data (quoted by Lorica 2009).

On the other hand, we must be aware that the production of data is not limited to user-generated content, for example those the users consciously contribute to search engines and social networking websites such as Google, Facebook, etc. In fact, data collection has also become ubiquitous. Different institutions devoted to the natural sciences and the medical sciences, for example, are producing large amount of online data ranging from the records of patients to protein structure, allowing them to better understand different patterns and to produce simulations. There are also emerging sets of big data which are not consciously produced by users but are collected using different sensors, such as GPS and RFID, etc. This type of data can be perceived as the "unconsciousness" that discloses hidden patterns of human/animal behaviors. All these means contribute to an emerging digital milieu and a concretizing technological system, in which different entities can be digitized and thus connected by data links.

In recent years we heard a lot about the "Internet of things." These data are not raw data in the sense that they are formless; instead, these data are formalized by

[3] See the European Commisioner Neelie Kroes's discussion on open data. http://blogs.ec.europa.eu/neelie-kroes/opendata/2001. Accessed 8 June 2012.

Album• Application• Checkin• Comment• Domain• Event• FriendList• Group• Insights• Link• Message• Note• Page• Photo• Post• Review• Status message• Subscription• Thread• User• Video

Fig. 6.2 List of objects in the Facebook graph API (Facebook developers) https://developers.facebook.com/docs/reference/api/. Accessed 17 May 2012

different metadata schemes. Metadata, literally data about data, are the sources that establish these connections. For example, consider the book *Technological System*. Its metadata consists of title, author, page number, ISBN number, publisher, years of publishing, etc. The more detailed the metadata schemes are, the more connections are established. It is also fair to say that data are taking a more concrete form than Ellul imagined in the 1970s. These digital entities with formalized metadata are what I call digital objects, in a conceptual renewal of Simondon's idea of technical objects.

If we take computation to be a cognitive process as defined in the works of Alan Turing, John von Neumann, and Warren McCullough, etc., algorithms and databases are mechanisms that govern cognitive processes, and data are literally treated as "objects" by computers. Hence the founder of the World Wide Web, Tim Berners-Lee, who proposes the formalization of metadata in the name of the semantic web, is able to call such a technological system a global mind (Berners-Lee 2000). Human beings are also reduced to computational processes, and ultimately digital objects. Digital objects thus become the basic units recognized by both computers and human users. This is not simply a philosophical conceptualization. If we look at the Graph API that defines the core data structure of Facebook,[4] we are not surprised to find out that all the elements are defined by the Facebook engineers as objects (Fig. 6.2).

Facebook is composed of these formally defined objects. The idea behind the Facebook Graph API is to establish connections between different objects. For example we can see intuitively that every album has photos, and every photo has comments. A comment consists of attributes like author, timestamp, and message among other things. Another core concept is the Open Graph Protocol that allows users to create connections between different platforms. By clicking "Like" in another website, Facebook and its partner website will have the data and be able to produce a graphical analysis of a user's social metadata. The aim is to create data-networks which allow these social networking websites to create relevant contexts for the users. In other words, networks are composed of digital objects, which are in turn defined by multiple layers of metadata. Their appearances depend on complicated systems of relations and algorithms that are not accessible to the users who interact with them. These are new types of industrial objects not yet properly addressed in the work of theorists of technological society.

[4]See https://developers.facebook.com/docs/reference/api/. Accessed 17 May 2012.

3 Technological System as Retention Systems

We have discussed before that desymbolization does not only eliminate symbols, but also produces new symbolizations. Commenting on the process of desymbolization by the imposition of technological system, Ellul describes the new symbols in the contemporary capitalistic society:

> On the one hand, man's inherent power of symbolizing is excluded; on the other hand, all consumption is symbolic. The technological system is a real universe, which constitutes itself as a symbolic system. With respect to nature, the symbolic universe was an imaginary universe, a superordinated reflection, entirely instituted by man in relation to this natural world (Ellul 1980 [1977]: 177).

Consumption is nevertheless a very limited phase of the dialectical process of symbolization and desymbolization. By describing consumerism as the totality of the new symbolization Ellul seems to ignore the question of materialization discussed above. This is what makes "desymbolization" a "problem," as identified in the title of this article. Consumption as symbolization is to a large extent psychological and psychical, more and more motivated by moving images, sounds, and different technological apparatuses. If one is using Facebook, the advertisements that pop up to the users are already determined by the data that represent the browsing history of the users. That is to say, behind consumption is another dimension that has been overcome by the concretized data network. What then are the new implications of our current technological system? It will also be too easy to call it a total control or to follow Gilles Deleuze, who calls it the "control society" that gives way to cybernetics. The remaining task is to understand the mechanism behind this control, to look into the technological system in its details. Here I propose to create a link between Ellul's prophecy and the work of another French philosopher, Bernard Stiegler, who was largely inspired by Simondon.

Bernard Stiegler (2010) calls both technical objects and technical systems *tertiary retention*. Here we may differentiate between two types of tertiary retentions: one the "already there" (following Heidegger) of the world that is already a technological system, as exemplified by the history and material conditions in which we already live. The other is the exteriorization of memories, which was realized in writing, printing, analogue technologies and now digitization. Data processing is one of the most important results of digitization.

The word tertiary retention is a supplement qua a critique to Husserl's understanding of time-consciousness. To explain Husserlian time-consciousness, let us imagine that we are listening to a melody. We are experiencing a flux of consciousness, which is the passing of the now. The now that is retained immediately in my mind is what Husserl calls primary retention, the melody that I can recall tomorrow is called secondary retention; these retentions also condition the protentions, which include anticipations and projections of the future. Tertiary retention supplements the finitude of the first two kinds of retention with an infinite repertoire of memories, made possible by digitization. But tertiary retention is also the source of primary retention, and the support of the secondary retention is also the source of protention.

In this sense, we can see a third sense of desymbolization on top of the first two kinds of desymbolization discussed above, regarding demystification and the materialization of relations within the technical system. Since now the mediation process is subject to the control of retentions, what happens to the symbols when they are no longer a simple transformation from one form to another, but take a more radical move? Hence Bernard Stiegler and Irit Rogoff write, digital technology

> creates a new organization of the circulation of the symbolic. Within this new mode of organization, suddenly the production of the symbolic becomes industrial, subject to industrial processes. Here you encounter the production of symbols on the one hand, and the consuming of such symbols on the other – an aporia because it is impossible to consume a symbol. The symbol is not an object of consumption; it is an object of exchange, of circulation, or of the creation of circuits of trans-individuation. So this situation suddenly produced what I call short-circuiting – of transindividuation (Stiegler and Rogoff 2010).

Fully appreciating this quote would require examining both what Simondon calls individuation and the concept of transindividuation further developed by Stiegler, however this would take the article in a different direction. What we can take from this is that the process of desymbolization and resymbolization, which is also materialization and imagination, no longer operates on the level of signification in linguistic terms. What used to be a signification process within the mind now can be short-circuited by the manipulation of the tertiary retentions, which are digital objects or data. Desymbolization brings humans and machines into a symbiosis, a new nature that is largely overlooked in the classical opposition between nature and technics. What happens in this aspect of desymbolization is not the loss of meanings or references, but the alteration of meanings produced by the new circuits. Symbols cease to be merely representations, but come instead to contribute to the controlling functions of the technological system, in which human and machines are interconnected circuits.

4 Conclusion

The above exposition attempts to bring out the three aspects of desymbolization brought about by the evolution of the contemporary technological system. First, there is deritualization in an anthropological sense; second, the materialization of relations; and third, the creation of circuits within the retentional system that is also part of the technological system. These first two points are briefly mentioned in Ellul's *Technological System* but are not fully developed. The third point to integrate Ellul's commentary on data processing with the contemporary situation of desymbolization. The merit of Ellul's theory is not simply his prophecy but more importantly his attempt to outline the technological cycles that transform our culture and the ontogenesis of human beings.

Desymbolization is a general effect of technological development, as we saw at the beginning of this article regarding Cassirer's proposition on symbolic forms. It is also a process of the concretization of technical objects, the materialization of

technical reasons, and the adaptation of milieus into an expanding technological system. It is no coincidence that for Ellul, Simondon, and Stiegler, the question of capitalism today is not about capital in an economic sense, but rather about machines (Chabot 2003; Jézéquel 2010; Stiegler 2010). Or more precisely, the technological system. The understanding of technological systems and their inner dynamics is crucial to analyzing and problematizing understandings of contemporary culture. Ellul's *Technological System* remains an important place to start.

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