In *Frankenstein, Or The Modern Prometheus* (1818), Mary Shelley reveals the extent to which she is overwhelmed by new technological inventions that try to dominate nature, but which in turn escape human control. With this premise, Shelley knew that hers must be a frightful story, «for supremely frightful would be the effect of any human endeavour to mock the stupendous mechanism of the Creator of the world» (Shelley, 1831 (2018): 351). Technology, like the author's creature, seems to have a mind of its own that often has devastating effects on society. It was precisely this same suspicion that disturbed Martin Buber almost a century and a half later, when he came to the following conclusion about the future: «the state is no longer led: the stokers still pile up coal, but the leaders merely seem to rule the racing engines. And in this instant while you speak, you can hear as well as I how the machinery of the economy is beginning to hum in an unwonted manner; the overseers give you a superior smile, but death lurks in their hearts. They tell you that they

have adjusted the apparatus to modern conditions; but you note that henceforth they can only adjust themselves to the apparatus, as long as that permits it» (Buber, 1970: 97); or Jacques Ellul, who asserted: «Let no one say that man is the agent of technical progress... and that it is he who chooses among possible techniques. In reality, he neither is nor does anything of the sort. He is a device for recording effects and results obtained by various techniques» (Ellul, [1954] 1964: 80).

This idea of lack of control over technology has become a kind of two-sided social fable: technological development as the engine of society (technological determinism), and as an inherently uncontrollable beast or an impossible-to-fence prairie, driven by its own intrinsic powers (technological autonomy). The massive technological development of industrial societies, the intuition that we cannot do what we want with technology (or at least not all of us can) and the realization of the influence that technology has on our values and habits in everyday life, have in recent decades re-

vealed the importance of philosophical and social studies of technology. This is where the analysis offered by the work of Miguel Ángel Quintanilla comes in.

This book problematizes technological development by asking whether an alternative model of technological development is possible, and highlighting technological alienation and societies' incapacity to control technology. As Quintanilla (2009) has already stated, «We have, use and produce increasingly complex and efficient technologies, but while we use or produce them, we feel that they are slipping out of our hands and that they are shown to us as something alien». Faced with this situation, Quintanilla presents us with an alternative model of technological development that can serve as a stimulus to regain control of technological change without resigning ourselves, in Winnerian terms, to technological somnambulism: the engaging technologies (*tecnologías entrañables*, in their original language).

The book is structured in three chapters, in which the notion of engaging technologies (ETs) is offered, from a plural perspective, through several re-readings on an alternative construction of technological control, using the conceptual framework de-ployed by the ETs themselves. Emulating the musical metaphor used by José A. López Cerezo in the introduction (p. 11), the book is a three-movement sonata performed by Martín Parselis, Darío Sandrone and Diego Lawler with a violin solo, Miguel Ángel Quintanilla.

In the first chapter of the book, titled «Tecnologías entrañables: un modelo alternativo de desarrollo tecnológico» (pp. 15-53), Quintanilla begins by echoing the optimistic and humanistic nature of his perspective on the phenomenon of technique, which he understands as a space of possibilities for realizing humanity (p. 16), as compared to the pessimistic positions of the philosophers of the 20th century, who were influenced by the strange and alienating character of industrial technologies. For Quintanilla, the risk is not that the technical system is imposed on human beings, but that humans forget that the technical system is a system that comes from humans themselves as intentional agents.

Quintanilla may be optimistic as a defender of technological indeterminism, but he is also aware that current technologies are even more impenetrable than traditional industrial technologies, revealing himself to be somewhat outside the users' sphere of application, which apparently grows

and develops autonomously and uncontrollably. In this way, Quintanilla exposes the scope of technological development in the environment in which it is applied and, from a descriptive point of view, clearly distinguishes the fact of alienation. However, Quintanilla specifically proposes the concept of «estrangement» to refer more precisely to the aspects of technologies that distance certain users from the technological systems and the knowledge of those who belong to the context of technological design.

The fact of estrangement is the fact that there is a relational contrast, a break in the relationship, between technological development —and the production of increasingly sophisticated and less understandable artifacts for the common user— and the ever diminishing options of decision on the technological way of life that users want, and on how they want to satisfy it. The opacity of the artifact's design and the simplification of the evaluation criteria that predominate in the design and dissemination of technologies are two of the main sources of technological alienation (p. 21). Quintanilla recognizes that we are immersed in a technological culture made up of epistemically blind individuals, as opposed to the increas-

ingly specific knowledge that is required in the development of new technologies. It can almost be said that the only one hundred percent conscious interaction between the user and technological artifacts occurs in the use of conveniently designed interfaces.

Thus, one of the fundamental problems with the current model of technological development is its tendency to produce opaque technological products, fueling the misconception that the user should be able to use and enjoy a technology without having to understand it. For a technology to be user-friendly, ideally it should not require a learning effort that incorporates new knowledge, its use practices should be extremely simple, and the values it incorporates should be easily assimilated (Quintanilla, 2002). The quickest and easiest way to achieve this is to hide the content of the technology and show the user a friendly interface, a technology that is as easy to use as it is impossible to unravel. For Quintanilla, the important thing is therefore to challenge this trend for opaque and alienating technologies and to open technology up to the possibility of non-estrangement.

To overcome these significant challenges of technological development, Quintanilla proposes a decalogue with

some of the criteria that a technological system must include, to some degree, to conform to an indeterministic model of technological development: it must be open, versatile, docile, limited, reversible, recoverable, understandable, participatory, sustainable, and socially responsible (p. 29). Thus, ETs are a normative framework for technological development that establishes the way in which we should relate to technologies, that «we could not just incorporate them into our daily life, but also understand them, appropriate them, maintain their control and even participate in their design» (Quintanilla, 2012); and a way to overcome the user's estrangement and their disconnection with the design context and with the general process of technological development that produces estrangement.

In the second chapter of the book, titled «Repensando la relación entre diseñadores y usuarios a través de las tecnologías entrañables» (pp. 54-80), Martín Parselis addresses the relationship between the design context and the use context, based on the changes proposed in the new Quintanilla technology model. Drawing on the distinction between use context and design context, Parselis analyses the presence of artifacts in relation to different intentional agents and notes that some intentional agents, namely users, are

further away from technological development and from the artifacts themselves than other intentional agents, namely designers (p. 57).

For this author, artifacts are a technical-cultural synthesis that articulates the contexts of design and use, and it is in this broad context that we experience technological estrangement. The causes of persistent estrangement are various. Parselis refers to these causes as «disengagement» and explains four: technical disengagement, sociocultural disengagement, representational disengagement, and disengagement from the decision on «commons» (pp. 59-65). He ends this section by outlining some contributions to the analysis of the need for new ways of relating to artifacts and the design context, which should be clearly related. ETs could be an alternative criterion for evaluating technological development, which also promotes a program of integration and social legitimization of this development. This legitimacy can be understood as a political parameter, for example, in designing public policies that help to reduce the distance between technology and users.

Finally, in the third part of the book, titled «Una excursión ontológica a las tecnologías entrañables» (pp. 81-108), Darío Sandrone and Diego Lawler embark on an ontological exploration

that they believe complements the works of Quintanilla and Parselis. For these authors, the set of technological objects, systems and processes allows for a double ontology, a double layer of technological entities in coexistence: on the one hand, the existence of closed technological objects, of fixed functions, and, on the other hand, the existence of open and versatile technical objects (p. 86). This approach considers artifacts as the last unit of analysis of the set of existing technological objects. Now, this definition of artifact only makes sense when human intentionality and purpose are taken into account, with the understanding that artifacts themselves have an inseparable material and functional dimension (p. 88). For Sandrone and Lawler, however, human intentionality in the context of use cannot always modify the operation of artifacts (of machines), as operations are found to be irreversible and closed.

To show the harmony with the ET proposal, Sandrone and Lawler embrace the Simondonian approaches to open machines and advocate the development of individuals with technical capabilities, to understand closed, automatic and opaque technical objects. This implies that citizens can engage with open technical objects. The aim is to achieve the ability to predict and control the behavior of machines, in order to design open, reversible, and self-regulated systems that eliminate human alienation from technology.

Technological democracy requires not only that ordinary users have access to technical knowledge, but that technology itself can be integrated with all its content as an element that is not alien to the user. Of course, if we renounce our responsibility for machines, we cannot then complain about their mistakes. By dint of making machines increasingly intelligent and opaque, we can predict that users will become even more unfamiliar with the technologies. There are no absolute answers to these problems, although they are beginning to be intuited. Quintanilla proposes a new model in which technological systems can be assimilated and integrated in our lives, are friendly and participative, and that can be enjoyed, not only through their use but by appropriating their internal logic, by understanding them.

REFERENCES

Buber, Martin (1970). *I and Thou*. New York: Charles Scribner's Sons. Translated by Walter Kaufmann.

Ellul, Jacques ([1954] 1964). *The technological society*. New York: Vintage Books. Translated by John Wilkinson.

Quintanilla, Miguel Ángel (2002). La democracia tecnológica. Arbor, 173(683-684), 637-651.

Quintanilla, Miguel Ángel (24 October 2009). Tecnologías entrañables. [Opinión. Blog de Público]. Recovered from: http://blogs.publico.es/delconsejoeditorial/351/ [Accessed 23 December 2020].

Quintanilla, Miguel Ángel (2012). El pensamiento científico y la ideología de izquierdas. Recuperado de http://www.pensamientocritico.org/migquio312.html [Accessed 16 December 2020].

Shelley, Mary ([1831] 2018). *Frankenstein o El moderno Prometeo*. Madrid: Cátedra.