

The importance of education in comprehending and judging technology

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Abstract: Technology, in its broadest sense, is the greatest resource of the human species. If philosophers contemplate the cosmos in its entirety, they do so by using a wide range of technical tools, developed over the course of human history. Moreover, as part of the cosmos, philosophers contemplate technology itself: not only the development of technology, but also the reason for its use and how it is passed on to future generations. Education therefore assumes a central role in the existence of humankind. While in the first instance the task of education is the transmission of technical skills, in the second instance it is perhaps more important to educate to judge technology and technological progress. Judging technology is crucial whenever progress leads to new gaps in the normative system and value system of a human society.

Keywords: education, technology, judgment, humanity.

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The relationship between technology and philosophy

Technology is a term derived from the Greek τέχνη (tékhne), which used to mean “knowledge of how to do something” or “knowledge of how to make things.” In this paper, the term technology is considered as broadly as possible, including the ability to know how to do something and the technical application of scientific knowledge. If by technology one means the roof one builds for shelter (*tek*²) or the language or the development and use of any tool, one sees that it is intrinsically linked to the existence of humanity³.

An unforgivably simplified overview of the history of philosophy highlights the effort to use technical tools to describe reality.

After a period of religious spirit, characterised by myth, art and poetry, the physicists set out to define, through the use of reason, a principle (also to regulate their community). For Thales it is the wet element, for Anaximander the indefinite (*apeiron*), that which allows all things to become, for Anaximenes the air, for Heraclitus the conflict (*polemos* or *logos*) and in particular the becoming in which one opposite becomes the other, for the Pythagoreans the principles are numbers, harmony and numerical ratios. Parmenides logically affirms the static nature of being 'which is and it is not possible for it not to be', giving rise to the science of being, i.e. ontology. The pluralists "save phenomena" (Plato): the four roots earth, water, air and fire of Empedocles, the seeds of Anaxagoras with the nous as the ordering cause, the atoms interspersed with the void of Democritus. Anaxagoras is also a pioneer of the theory of knowledge: from sensation to experience, memory, knowledge, and art.

The Sophist breaks the harmony between thought and reality and opens a less comforting discourse on human nature. Whereas for Protagoras 'man is the measure of all things', for Gorgias 'nothing exists, if something exists it is unknowable, if something is knowable it is inexpressible for something else'. Nature enters into a dialectical relationship with law: for Callicles, humankind is divided into the strong desirous and the weak; for Thrasymachus, justice is useful for power; for Critias, the gods are an invention of the first lawgivers. Socrates, with the art of the midwife (*maieutics*), directs towards care and self-knowledge. For Plato, ideas (essences) really exist, and the sensible world is but a copy. The first idea is the (Pythagorean) idea of good, order and proportion, because the task of philosophy is ethics and politics (axiology, i.e. doctrine of values). Aristotle, through the four causes (formal, material, efficient and final), aspires to know the foundation of reality, also using highly effective logical tools such as the syllogism: all men are mortal, all Athenians are men, all Athenians are mortal. The right medium between two excesses, in ethics, is indicated by both Plato and Aristotle.

The crisis of the Greek polis led to a philosophy that was less and less involved in political life. For Epicurus, the good becomes pleasure (hedonism), the absence of pain and serenity (*ataraxia*). For the Stoics, the *logos* is God who produces the world, including the individual who is governed by it, and this world is necessary, hence destined, being composed of things that tend to degenerate, to a cyclical destruction and reconstruction, i.e. the eternal return of the same. Sceptics find their tranquillity in the suspension of judgement, against all dogmatism, but also against all certainty.

² Cerroni, Andrea, «Techne, logos e utopie. Ripensare la fabbrica del mondo per un umanesimo tecnologico», *Cambio. Rivista sulle Trasformazioni Sociali* 12, fasc. 24 (3.3.2023): 97–108, <https://doi.org/10.36253/cambio-13297>.

³ Ferraris, Maurizio; Guido Saracco, *Tecnosofia; Tecnologia E Umanesimo Per Una Scienza Nuova* (S.L.: Editori Laterza, 2023).

Plotinus sees in the One the principle that gives rise to the manifold, the intellect, the soul up to matter, which is deprivation of being. St Augustine reconciles faith and reason (“I believe in order to understand - I understand in order to believe”), through divine illumination; evil is the absence of good. St Anselm gives an ontological demonstration of God's existence: 'that of which nothing greater can be thought', but also an ontological reality beyond human limits. A similar mode to Aristotle's, but through creation, is pursued by those medieval philosophers who were inspired by Aristotle (Scholasticism). St Thomas reconciles divine revelation with the Aristotelian study of intellect and nature: faith and reason do not contradict each other. For Avicenna and Averroes, God is the necessary being. For Cusanus, being is explicit in the universe and complex in God. And in God, being infinite, all opposites coincide.

Many moderns mostly consider metaphysics ineffective, preferring a Galilean scientific method that suspends judgement on essence. From Galileo to Kant, we have a path focused primarily on science and the theory of knowledge. If with Francis Bacon 'action and contemplation are the same thing', Galileo is the true systematiser of the scientific method: experiment-abstraction-prediction. Descartes proposes a method of knowledge that consists in doubting everything. However, through doubt one acquires the certainty of existence (*cogito ergo sum*), while also acquiring the consciousness of one's own imperfection, a consciousness that derives from the idea of perfection (God). The being of meditation is *res cogitans*, as opposed to geometric extension (*res extensa*). Newton demonstrates the power of method using the mathematical instrument. Newton's ether: the luminous ether responsible for colours; the ether, associated with the unctuous spirit, the cause of gravitational phenomena; the ether that mediates between soul and body (matter and no longer Descartes' pure geometrical extension).

Giordano Bruno, Hobbes, and Spinoza are unusual cases of modernity. Bruno and Spinoza propose an extreme immanence: God and Nature are the same thing. Moreover, for Spinoza, intellectual love for God, the understanding that we are all modes of the same substance, enables us to strengthen ourselves together, and this is the highest good. Hobbes succeeds in rationalising a vision that will always be relevant: the totality is body (matter) and the passions of the body drive man to be maximally individualistic; by surrendering part of his freedom, man allows the birth of the state that holds the monopoly of violence. In Vico's historical sense of reality, human consciousness and providence converge. For Leibniz, being is to be found in every single being, in every monad, the centre of action and perception with the entire universe projected within it; the monad is perfect, it has in itself all possible worlds and wisely chooses the best among them.

For Locke, the mind is initially *tabula rasa* and ideas are simple, from sensation and reflection, and then become complex in their composition. Locke, to this mind in which reason develops, attaches political importance: man develops the principle that 'no one shall harm another' and again his reason makes him realise that private property makes the best use of land. So that man is not oppressed, the powers to say what is right (legislative) and to punish (executive) must be divided. Otherwise, a revolt is necessary. Berkeley reduces the corporeal world to perception (*esse est percipi*). For Hume, the world is a series of unconnected impressions. For Kant, pure reason renders the sensible data into categories, objects of experience. Beyond the sensible datum is metaphysics: God, the soul, freedom. The *datum* of practical reason is the moral, universal law, to which tendencies and motivations must be submitted. Practical reason takes up a metaphysical discourse: duty for duty's sake allows freedom in action; man's virtue is rewarded, if not in the world, in the hereafter, hence the soul is immortal, and God is the supreme rewarder. Reflective judgement grasps a finality in nature and makes one aware of God's existence.

Hegel's dialectic, in the three moments thesis-antithesis-synthesis, is the logic that constitutes reality: the real is the whole, and the whole is a process (Phenomenology of Spirit). For Schopenhauer, the world is representation, and the essence of the world is will. Life is pain and the highest degree of justice is compassion. Nietzsche's will to power is the ultimate identification with chaotic becoming. The eternal return of the same (Stoic terminology) is a lack of meaning, direction, and purpose.

For Husserl, knowledge is a relation between subject, intersubjectivity and object. For Jaspers, being is the whole that envelops every object. For Heidegger, being (non-being, nothingness, the soul of becoming) is hidden in everything that makes it appear, and for Severino, being must be thought of as immutable. The efforts of Jaspers, Heidegger and Severino aim at a return of being beyond the object.

To this overview it is absolutely necessary to add Kropotkin's thought. Kropotkin employs an inductive/deductive method in order to describe mutual aid among living beings. Kropotkin reworks Darwin's studies and findings in an original way by proposing a vision of communities of human beings in which mutual aid is the cornerstone for the goal of self-preservation. Humanity thus has no need for state organizations, since mutual aid effectively eliminates the need for sovereignty ⁴. Education is fundamental to Kropotkin. They must be "*education integrale*, or complete education," including intellectual work and manual labor ⁵. If Kropotkin emphasizes overcoming the division of labor for an emancipation of all human beings, the conclusion can also be drawn that complete education enables human beings to obtain the most comprehensive knowledge of technology possible.

Such brief overview of the history of philosophy, albeit limited to a few keywords, was necessary for several reasons. First, philosophy is the privileged discipline that manages to hold education, ethics, and technology together. Second, if philosophers look at the cosmos in its entirety, including the philosophers themselves with their will, their choices, and their history, to contemplate this interest they use the widest possible range of tools and, thus, simplifying, technology.

Once again retracing the history of human thought and focusing on technology, technology is a divine characteristic before tragedy and before Greek philosophy; it then becomes a human capacity, *logos* (speech, reasoning), mathematics, rhetoric with the Sophists, *theoria*, *praxis* and *poïesis* (theoretical knowledge, practical knowledge, production) with Plato and Aristotle, manipulation of a creation in an anthropocentric universe, application of a scientific method, the essence of being human. As highlighted, the discourse on technique and education traces is on a plane that cuts across the philosophical universe, but it is a plane that is always evident. A concept that is under-understood, but which emerges clearly in Kropotkin, for example, is education.

Education and technology

A very profound argument about technology is by Maurizio Ferraris. Ferraris says that what humans are not a surplus reinforced by technology, but a plus, which comes to make up for the shortcomings of not particularly gifted animals, i.e., human beings. Ferraris adds that,

⁴ Kropotkin, Peter, *Mutual Aid: A Factor of Evolution* (New York University Press, 1902), <https://ecology.iww.org/PDF/Kropotkin/Mutual%20Aid.pdf>; Francesco Scotognella, «Being, Technonihil and Ethics as a Three-Valued Model», 2022, <https://doi.org/10.5281/zenodo.7461852>.

⁵ Kropotkin, Peter, «Fields, Factories and Workshops», visited 14.12.2023, <https://libcom.org/article/fields-factories-and-workshops-peter-kropotkin>.

nevertheless, through the power of capitalisation, preservation and transmission of traces, humans have become capable of evolving at the dizzying pace of culture rather than the parsimonious pace of nature (Ferraris wittily concludes that, if it depended on nature, humankind would already be extinct) ⁶.

To these important words by Ferraris, it should be added the undoubtedly crucial role of education for human being. Cosimo di Bari aptly echoes the words of Neil Postman: Di Bari underlines that for Postman it is fundamental to give education a conservative role, as a set of traditional knowledge that must not be lost, and a subversive role, to avoid the ideological imprisonment of the person being educated ⁷. In essence, the intermingling of education and technology is very intense and can be observed from different perspectives. Many researchers study the relationship between teachers who use technology and users (people who are taught) ⁸. In fact, technology and education overlap in theory of knowledge, research (as rigorous description of reality), teaching, ethics, and politics.

Regarding the last two fields, namely ethics and politics, in 2022 it has been proposed by the author a model in three parts: i) in a cosmos that in its entirety must be recognized ⁹, technology is the soul of becoming of the human being; ii) a phenomenological description highlights that technology, and subsequent development, leads to lack of norms and reference points (technonihil or technomeden); iii) ethical effort leads to harmonization of technological advancement and norms and reference points for humanity ¹⁰.

In the educational context, the pupil-disciple pair, which underlies an ancestral search for guidance (so clear for example in the history of philosophy), becomes central. A primordial and humble gesture is the request to be guided. Chelsea Wolfe says in Moses: “Can you guide me? / 'Cause you're so strong / 'Cause I can't see nothing at all.” ¹¹

In the three parts mentioned above, it is very important to unravel and understand as best one can how technology is the soul of human being, how technology pushes human being in new scenarios with a consequent lack of reference points, how technology changes the natural law and how human being should deal with such change in modifying the positive law.

Conclusion

In this paper, the aim is an examination of the relationship between technology and the development of human thought from both a theoretical and practical point of view, emphasising the crucial aspect of education, which includes the transmission of technological knowledge and judgement about technology. In the first part of the work, an overview of the history of philosophy brings out the aspect of technology in the history of human thought. Particularly interesting is the thought of Kropotkin, in which the complete emancipation of the human being

⁶ Ferraris, Maurizio, «per non estinguerci basta seguire le nostre tracce, dalle caverne a internet. una riflessione su...», visited 3.9.2023, <http://www.dagospia.com/rubrica-29/cronache/consigli-utili-non-estinguerci-seguire-tracce-caverne-323327.htm>.

⁷ Cosimo Di Bari, «Attualità di Neil Postman: il modello ecologico tra sociologia, pedagogia e filosofia dell'educazione», Studi sulla formazione, 2012, <https://flore.unifi.it/handle/2158/654251>.

⁸ Daniel G. Krutka, Marie K. Heath, Ryan M. Smits, «Toward a Civics of Technology», Journal of Technology and Teacher Education 30, fasc. 2 (august 2022): 229–37.

⁹ Carlo Sini, «- 36. Logos e techne. Tecnologia e filosofia | Loescher Editore», L'ESCHER EDITORE, visited 25. 12. 2023, https://www.loescher.it/dettaglio/opera/O_3820/36--Logos-e-techne--Tecnologia-e-filosofia.

¹⁰ Scotognella, «Being, Technonihil and Ethics as a Three-Valued Model».

¹¹ Wolfe, Chelsea «Moses», visited 1.1.2024, <https://chelseawolfe.com/lyrics/moses/>.

is associated to an integral education that includes the transmission of theoretical and practical skills. In the second part, the study emphasises the importance of education and its simultaneously conservative and subversive action, borrowing the words of Neil Postman, in dealing with technology. It becomes crucial to judge technology when it creates new scenarios in society with consequent legal and value gaps. In this case, the educational task is crucial in understanding technological developments and regulating their dynamic processes over time.

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