

DIALECTICAL TECHNOLOGY – HEGEL ON MEANS, TOOLS AND THE MACHINE

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The paper concerns G.W. F. Hegel's philosophy of technology. By assuming two methodological strategies – reading selected paragraphs of Hegel's texts where he speaks about technology and deducing the essence of technology as a concept – this paper describes the key ideas shaping the German idealist's philosophy of technology. Three main issues are discussed: 1. the role Hegel assigns to the instrumental action of man; 2. the relation between tool production and culture as objectivization of the human being; and 3. why technology is dialectical. The aim is therefore to show that Hegelian notions such as "mediation", "cunning of reason", and "dialectics", were meant by Hegel himself to be used to think about technology, which is necessary to develop their full potential in contemporary discussions about technological progress, and to thus fill the gap in philosophy of technology caused by misinterpretations of Hegel as a pure idealist with no interest in technology.

Keywords: Hegel – Dialectics – Machine – Cunning of Reason – Technology

Introduction. Georg Wilhelm Friedrich Hegel's philosophy still has a great influence on contemporary socio-political philosophy (Russel 2008; Popper 1995; Avineri 1972; Honneth 1995), logic and metaphysics (Carlson 2007), and aesthetics (Danto 1997). However, it is rarely indicated that Hegelian philosophy can also be relevant to the discussion about technological changes and challenges in the modern society (Habermas 1990). The lack of Hegel in contemporary philosophy of technology could be understandable if he did not write about technology at all, but he did, and echoes of his theses can be heard in the philosophy of Martin Heidegger (Heidegger 1977), in the Frankfurt School (Horkheimer, Adorno 2002; Marcuse 2007), in the concepts of György Lukács (Lukács 1975) and Jacques Derrida (1982). Hegel is present in the philosophy of technology even if this discipline does not mention him directly (see Dusek 2006: 54-59; 200). Some thinkers use Hegelian nomenclature and core ideas such as intersubjectivity, struggle for recognition, or mediation to explain particular problems important for contemporary philosophy of technology (Gertz 2018), but it is symptomatic that Hegel's philosophy is rather used *in* the philosophy of technology as a discipline and not treated *as* philosophy of technology per se. Christoph Hubig says that Hegelian philosophy of technology

is perceived as hidden philosophy (*verborgene Philosophie*), as the name of the German idealist is not mentioned at all, or very rarely, in the historical or philosophical dictionaries under „Technik” (Hubig 2000, 1).



The key goal of this article is to delineate Hegelian philosophy of technology and to demonstrate that for this thinker technology is an essential part of modern society. Hegel's philosophy is most often represented as completely disinterested in technology (see Rapp 1999: 180) because of its idealistic and not materialistic approach, and so my aim is to reconstruct Hegel's thoughts on technology and technological progress. I do not aim to debate these assumptions or present their critique, as it is first necessary to demystify Hegel's philosophy and to grant him his place as a philosopher of technology. Only by careful reading of Hegel is it possible to think about concepts which are often (mis)used

in our contemporary discussions on technological changes, such as dialectics or mediation, in a new, and arguably much more nuanced, manner (see Zwart 2017). Moreover, it is necessary to argue that, because of dialectical thinking employed in Hegel's philosophy as the ground for unfolding of concepts, the evaluation of technological progress is much more ambivalent. It is not so easy to say that technology is “good” or “bad” from the ethical, political or social point of view. Using Hegelian dialectics to explain the design process, it has to be said that design is a sublation (*Aufhebung*) of one artefact by another, but with constant preserving of some previous elements. This kind of thinking, which does not assume that negativity of the artefact means negativity of the progress, is very emancipating in our thinking about technology. We do not need to take the “positive” or “negative” position in the discussion about progress, but we can see that each artefact has its dialectical ontology.

Taking into account the early manuscripts from Jena period of 1802 – 1805 (Habermas 1973) and the mature *The Phenomenology of Spirit*, *The Science of Logic* and *The Philosophy of Right* as a ground for the analysis,¹ it is possible to investigate Hegelian philosophy of technology. Furthermore, it is necessary to indi-

¹ I should mention here that I treat Hegelian philosophy as the one philosophy. It means that I try not to divide on young and mature Hegel. Even if I agree that there are in time the differences in Hegelian interests and he changed many elements of his preliminary thought in comparison to later system, it is still in my opinion the intellectual evolution, not the radical turn.

cate the dialectical nature of Hegelian concepts, with the material effect of this “work of concepts” in the field of ethics, politics and society. It is so, because for understanding Hegelian philosophy of technology it is necessary to understand the notion of mediation, which is at the heart of dialectics.

Technology. It is important to elucidate here the notions of Spirit (*Geist*) and technology. The Spirit is the real subject of history that reveals itself through and in nature, history, culture, law, and religion. The Spirit can be understood as consciousness and knowledge that is goal-oriented and in this sense it can be treated as the common achievements of mankind throughout history. Each step of human development should be perceived as progress of Spirit in its self-knowing and self-understanding. Therefore, all history is a work of Spirit, in the sense of an activity that is revealing – *wirken* (Heidegger 1977, 199). The Spirit as a subject defines itself by its contradictory relation to objectivity; however – the negative relation based only on the difference is not the real truth. Hegel, introducing dialectics in his philosophy, explains that only in the mediation and sublation of the opposition between subject and object is it possible to see the unity of the notion which is the truth.

In Hegelian understanding of technology, it is necessary to consider three aspects of this notion.

First of all, for the German thinker technology has a more “technical” sense than it is understood nowadays. It is an instrumental, teleological action of man. By technical means, it is possible to fulfil different aims, and using technological means is understood as rational and effective. Such meaning of technology as “technics” is much wider than modern „technology” associated with highly developed artefacts. It emphasizes that each activity is technical if it is focused on fulfilling the purpose, because each purpose needs means to be realized.

Secondly, Hegelian understanding of technology is rooted in Greek *techne*, which means “to fit together the woodwork of a... house” (Roochnik 1996, 19). *Techne* means possessing a form of expertise (Angier 2006, 3). It is knowledge of how to create artefacts, but, more importantly, it is a revealing of truth (Heidegger 1977). Hegel assumes that each craftsman is able to produce things, but it is more important that by this action he is also able to reveal the Spirit – human culture. “It is this *human activity*, composed of *artifact-mediated actions*, each directed at the realization of some *project* or other, which I take to be the substance of Hegel’s philosophy – Spirit. Hegel abstracts the norms of these activities from their instantiation in the material world – as indeed we have to in order to discuss and think them – but it is real human activity which always remains the true subject” (Blunden 2016, 2).

Thirdly, it is significant that both the above meanings of technology can be integrated into work or labour (*das Werk, die Arbeit*). Work, as it was mentioned above, is understood by Hegel as the process of revealing the truth, and it is therefore a much wider notion than labour. Moreover, work means not only the activity, but also the result such as “work of art”. Labour, on the contrary, is the kind of work that is socially defined. It is determined by the field of praxis.² Of course, there are many paragraphs, in which this difference is not clear, so some thinkers decide to employ their specific interpretations. This is the case for György Lukács, who focuses on the concept of labour, because it can be easily combined with Marxian reading of Hegel (Lukács 1975).

Moreover, methodologically, when we analyse Hegelian philosophy, two different reading strategies are possible. One is connected to the analysis of the concrete meaning of the text, where the philosopher explains what technology “does” (Hubig 2000). This kind of reading is very fruitful, especially for the precise research of such notions as work and labour, tool and machine (see Lukács 1975, Ross 2008). However, it is also possible to read paragraphs about technology beyond their concrete meaning, to understand the essence of technology as thought by Hegel. The second strategy is grounded in transcendental philosophy of technology. “The presuppositions that are brought to light in this way are not empirically observable but ‘transcendental’; that is, they overstep or transcend (cannot be found in) empirical reality, but nevertheless must be presupposed in order to understand reality” (Verbeek 2005, 7). Using both these strategies, it is possible to see not only different moments in Hegelian system where German thinker speaks about technology, but also his assumptions about technological progress in history.

Body and labour. For Hegel, the ability to control the necessities defined by external nature and achieving freedom as the sublation of needs is crucial for the human being in the historical process. That is why Hegel is perceived as the philosopher of emancipation and his approach is so important for political philosophy. However, according to this thinker, there is some cost that man needs to pay for freedom. It is because of dialectics, where, as it was mentioned above, each sublation is a reserving as well. But each purpose – freedom too – needs means for its fulfilment.

² In the paper I try to differentiate between “work” and “labour” by assuming that “work” could be applied to each conscious, cognitive action of man. “Labour” is socially defined and means action of man, but in the particular socio-political and historical context. Sometimes, when it is not defined by the context, I use a phrase “work or labour” to emphasize that the statement could be applied to both of these actions.

Axel Honneth in *The Struggle for Recognition* states that “Hegel has the practical side of the individual formative process begin with the subject’s instrumental experience of itself. He sees this as inherent in the internal connection of labour, tools, and products” (Honneth 1995, 35). The instrumental activity of self-consciousness is understood as work or labour. The first moment for the conscious subject is to realize that it is able to do something with external objects. Hegel says that epistemological practice is the first work of consciousness. It is the work of naming and using language to distinguish objects of perception in the area of interest of human will. In this manner “I” starts to see its own activity and creates its own memory by labelling things. However, such kind of work is only mechanical – passive, receptive, determined by external conditions of perceived things, which are the real impulse for the process of naming and remembering them.

The action takes place in labour, meant as volitional transformation of things (Hegel 1983, 103; Höhle 1988). The necessity to satisfy the subjective needs is the beginning of instrumentalization process, because labour is connected to tool use.

Transformation of the human body is the beginning of Hegelian technological dialectics. This is precisely explained in the famous master-bondsman dialectics. Bondsman as the middle term between master’s needs and external nature plays the role of a tool. His work is necessary for the master, but bondsman being conscious of his desires is able to hold them in check. Bondsman emancipates himself through work because “(...) to be able to transform the natural given in relation to a nonnatural idea is to possess a technique” (Kojève 1980, 48).³

The analysis of the bondsman’s labour explains that culture begins with distancing of the human being from nature. Freedom can be possible only through the process of work, that is, of using material means of teleological action, even if, in the end – through the dialectical, technological process of changes – the Spirit recognizes itself in nature, without negating it.

The logic of means and tools. The mediational character of the means explains how the German thinker understands tools and their role in teleological action. “Through a means the purpose unites with objectivity and in objectivity unites with itself. (...) Purpose is in need of a means for its realization, because it is finite – in need of a means, that is to say, of a middle term that has at the same time the

³ „The specific character of the master-servant relation is that it appears to be unmediated. In fact this is not the case, because by the splitting of each subject into needs and labor, the two subjects find the resources to mediate their relation. But such a relation between persons is unthinkable; intersubjectivity is invariably *mediated*, whether by land and tools, by shared laws, customs, language or other norms, or collaboration in a shared project” (Blunden 2016, 1). Interestingly, Blunden mentions Lev Vygotsky’s educational psychology as his own inspiration for such mediated theory of intersubjectivity.

shape of an external existence indifferent towards the purpose itself and its realization” (Hegel 2010, 659). Hegel states that the ontological status of the means is mediational – between the subjective purpose and objective materiality. The subject needs to choose the means rationally, so they must take into account the effectiveness in realization of the purpose. The means are treated here instrumentally, but in fact, Hegel accentuates that means are much more important than purposes which they serve. He claims also that “(...) the purpose posits itself in a mediate connection with the object, and between itself and this object inserts another object, [which] may be regarded as the cunning of reason” (Hegel 2010, 663).

First of all, the tool gives the human being a possibility to spare human being. It means that does not need to be confronted with the direct contact with external nature. Unmediated contact with nature is being exposed to its violence. Mediation eliminates this violence. It is explained by Hegel as the necessity of the teleological activity to accomplish purposes indirectly (see Siemek 1998). The teleological action is determined only by freedom of subjective aims. On the other hand the mechanism is a way of forming “relations” with other objects because of the external movement that motivates them to come into contact with each other. This contact, indeed, has no visible influence on an object (here it can be understood as a subject too). In mechanical relations we observe that different objects are different because they are particularized (Hegel 2010, 632 – 644). Chemism, to mention another kind of relation, is the attitude of the objects to each other on the ground of their innerdetermination. One object needs to be connected with the other one, because of its own characteristics (Hegel 2010, 645 – 650). These two levels of objectivity, especially the mechanical description of objects, which has a great influence on Hegel’s social and political philosophy (Ross 2008), is the extreme pole for the idea of freedom.

Secondly, using a tool could hide determinacy of “I”, as to hide the sphere of desires motivating specific action. By using tools, “I” fulfills its desires by mediation, which is much more effective than direct action. It is because of the necessary “desire held in check”, which is described in *The Phenomenology of Spirit* as labour (Hegel 1977, 118). Refraining from the natural needs and vehement satisfaction is the source of independent self-consciousness which is able to control itself and the world of objects it possesses. Kenneth R. Westphal explains this higher ontological position of the bondsman in the necessary process of labour as the discovery of creative skills: “The Bondsman triumphs over the independence of particulars by learning how to use them as raw materials and to make them into artifacts” (Westphal 2011, 79).

Thirdly, through labour with the use of tools, “I” allows them to be made use of, which saves “I” in its own condition without any loss. “I” can be understood as the tool or be replaced by the tool. Hegel is convinced that freedom begins with “free time”, so different means have to work instead of man.

These three effects of master-bondsman dialectics explain how the cunning of reason is implemented into instrumental action by Hegel and how all culture could be perceived as a technological (in the sense of *techne*) artefact. Moreover, the cunning of reason used in the context of technological action indicates that this concept is not created by Hegel *ad hoc* to the philosophy of history, as it is sometimes interpreted (Dray 1964), but is essential for his philosophical approach.

To be clear here, the cunning of reason is mainly exposed by Hegel and his commentators in the context of a great man who fulfills the universal aims of history by particular passions. Parkinson explains it as two levels of history – one is connected with the Spirit (*Geist*) of nation and world; the second is the level of concrete heroes who are motivated to action by own interests, purposes and emotions. “The ‘cunning of reason’ operates at the interface between these two levels” (Parkinson 1989, 289). It means that particular passions fulfill particular ends, but it does not mean that they do not serve the development of human culture. On the contrary, without this element of particularity it is not possible to make changes in history. The role of the philosopher is to see how the Idea is developed in time. “To illustrate: Caesar knew that the Roman republic was finished, but he did not see that its collapse was part of the necessary development of the Idea” (Ibidem, 293).

A similar perspective should be applied to technology to see how different artefacts had to be changed in history and what these changes meant for the human condition and culture.

Culture as production of tools. Hegel shows that a tool is the cunning because it has a very peculiar ontology that can hide “I” and all subjective needs behind itself. The tool has to be noticed as an object which is situated in the middle, between determined nature and free activity of the subject. Because of this ontological status of “being in between” Hegel explains the separation of the human subject from nature. “In the tool and in the plowed and cultivated field, I possess a possibility, a content as something universal. Thus the tool [as] means is of greater value than the goal of desire, which goal is particular; the tool encompasses all such particularities” (Hegel 1983, 103). The tool is not a particular object, since its ontology is universal and “of greater value” than any desires, needs, or aims that can be imagined. Hegel explains that the tool is more durable than the human being and, in this sense, it is much more important than the accidental, passing human purposes.

Culture, history, art, religion can create the spiritual heritage of humanity, only because of the material duration of things the humanity made. In *The Science of Logic* Hegel even emphasizes this very special ontological status of tools, saying: “To this extent the means is higher than the finite purposes of external purposiveness: the plough is more honorable than are immediately the enjoyments which it procures and which are the purposes. The tool lasts while the immediate enjoyments pass away and are forgotten. It is in their tools that human beings possess power

over external nature, even though with respect to their purposes they are subjected to it” (Hegel 2010, 663). Hegel analyses the influence of tools on the human culture by indicating labour as the first instrumental human action. Instrumental means of activity are responsible not only for producing artefacts, but also for creating social skills, making differences in the kinds of jobs, of human craftsmanship. Without material objects as tools, it is not possible to conserve the culture on any level of its development. In this meaning, the tool is universal, because learning how to use it is the understanding of culture as well.

Machine. The universality of tools influences work, making it objective and abstract. Objectivity depends on practice and on abstracting from the interrelationship with the needs of an individual. Fulfilment of needs is possible only through exchange of means by individuals, so the need itself is much more abstract, due to the complexity of mediation. This abstractness, on the other hand is the beginning of the concept of the machine, because: “Man’s labor itself becomes entirely mechanical, belonging to a many-sided determinacy. But the more abstract [his labor] becomes, the more he himself is mere abstract activity. And consequently he is in a position to withdraw himself from labor to substitute for his own activity that of external nature. He needs more motion, and this he finds in external nature. In other words, pure motion is precisely the relation of the abstract forms of space and time – the abstract external activity, the *machine*” (Hegel 1983, 121).

This perspective on technology is dialectical in the sense that it is seen as the process of change, where on each step, the previous one can be observed. Hegel is convinced that in science there are no revolutions, but there is a logical and interwoven movement forward. According to Hegel, we can schematically write the dialectics of technological artefacts as going from the body to the machine: body → tool → machine. It means that the human being has a natural equipment of bodily abilities, which can be externalized by using tools. Tools mediate the relation between subject and nature and move away from the possibility to fulfill the needs immediately. Work done with the use of tools becomes more abstract and, as a result of such mediated activity, it is possible to create the machine as an object that works instead of the man.

Hegel shows how the pure activity of “I”, by instrumentalization of work, conservation of practice and “discovery” of motion, leads to an idea of the machine. It is understood as a substitute of an individual, so it needs to “hide” man from nature. This rhetoric of “hiding” in the context of being “cunning” is very interesting in the field of technology. Hegel assumes that man cannot use nature in an open manner, but has to use means of mediation – tools and machines. This dialectical attitude to nature opens the question whether man is able to understand, to exploit or simply to take advantage of nature without this whole equipment of things.

Hegel explains that the machine is much more cunning than the tool, because

of its independence in the process of labor. It means that a tool has to be used by someone; the machine, on the other hand, works with or without the control. The independence of the machine has a dialectical impact on human beings. The passiveness, which results from using the machine, has been changed in an activity dispersed throughout different machines, spheres, and places. In the *Jenaer Systementwürfe I*, Hegel clearly states that the cunning of reason, which man used in the relation with things and nature, has been converted into the cunning of nature over the human being (Hegel 1986, 228).

A similar, but more critical than ambivalent, attitude to the technological progress is expressed by Max Horkheimer and Theodor Adorno in *The Dialectic of Enlightenment*. Explaining how reason abandons the mythical thinking, Frankfurt philosophers reveal the dialectics of instrumentality. The paradigm figure for the cunning is Odysseus, who tries to realise his ends by fraud. "The formula for Odysseus' cunning is that detached, instrumental mind, by submissively embracing nature, renders to nature what is hers and thereby cheats her" (Horkheimer, Adorno 2002, 45). Horkheimer and Adorno assume that the human being willing to break the dependency from nature falls into instrumentality. The cunning, which is the essence of instrumentality, leads to a new mythology of reason, calculation, and effectiveness. "Odysseus discovered in words what in fully developed bourgeois society is called formalism: their perennial ability to designate is bought at the cost of distancing themselves from any particular content which fulfills them, so that they refer from a distance to all possible contents, both to nobody and to Odysseus himself" (ibidem, 47).

Alienation. Hegel presents the anxiety about technological changes in the modern society in his later lectures on philosophy of right. Analyzing the civil society and the necessity of the state as a guarantee of legality, personality, and peace, he takes up the problem of modernization on the ground of labour. The human being in comparison with animals is able to create needs, to multiply the means of their fulfilment and divide these needs into smaller ones, making them more abstract and particular (Hegel 1991, 228). Hegel argues that this abstractiveness of labor is the ground for technological mechanization. "Furthermore, the abstraction of production makes work increasingly mechanical, so that the human being is eventually able to step aside and let a machine take his place" (Hegel 1991, 233). This statement can be treated optimistically, as Hegelian awareness of the whole process of technological progress. However, his mature attitude to technology is ambivalent. Technology is the cunning of reason, but there remains a question of what control the subject has over this cunning.

Leo Rauch in the *Introduction* to the English edition of the *Jenaer Realphilosophie II* writes that Hegel was a critic of modern society on the field of technology and that such critical statements are already present in his early writings. The proc-

ess of modernization through the use of technology instrumentalizes the human being by division of labour, pragmatic attitude towards resources and by unquestioning confidence in technological progress (Rauch 1983). Labour creates obstacles in the integration of human being with the external world, because of its technicization (Avineri 1972, 90). However, it is also possible to read Hegel's mature philosophy as the answer to all the problems related to alienation. As it was explained above, Hegel is conscious that technological progress is dialectical. On one hand, it gives man an opportunity to gain free time by mechanization of work. On the other hand, mechanization of labour is oppressive, because man becomes mere technical equipment, which accompanies the machine. That is why ethicality (*Sittlichkeit*) is so important for the German thinker. The intersubjectivity of social relations has to have the framework of ethicality, as taking into consideration the traditions, customs, culture, and social and political background of each individual decision. In this context, technology as pure artificiality is covered by the system of needs. It is the system of exchange of goods, but this exchange is dependent on the ethicality – corporations which organize the work of people. Different professions should create guilds that will be treated as “second family”, where people help each other because they work together and they look at their own manufacture as property belonging to all of them. Of course, this idea seems to be very communistic or romantic (Wendling 2009). It is something different, which should be seen in Hegelian solution to the problem of alienation in technological progress – it is ethics. Ethicality does not mean distinguishing between good and evil, but is more rooted in ethos – custom and tradition, the wider frame of human decisions and actions. Ethos depends on intersubjective relations with other people – we do not know ethos without contact with the other people. Ethics, in this sense, means considering the influence of technology on human life by observing changes in the habits, norms and relations, and evaluating whether these changes are accepted by the society or not. It means that artefacts cannot be good or bad – they can change as people are changing. It is important to understand the decisive role of modern society in creating the conditions of human life by the use of different artefacts. Technology should be implemented in the society with forethought on its effects on labour, culture and human relations.

Transcendental philosophy of technology. Hegel's philosophy of technology could be read directly from relevant quotations, which are numerous in both his early and mature writings. However, it is important to deduce the essence of technology, which Hegel presents only indirectly. The German thinker emphasizes that means and tools are the manifestation of the cunning of reason, which would mean that using them is the expression of human ability to trick nature – to replace the human being with an artefact. The cunning is differentiated by Hegel from craftiness (*Pfiffigkeit*), which means that it is the practice taken openly, with no secret (Hegel 1983, 104). The real cunning is the expression of reason and reason does not need to hide itself. However, the process of putting the middle term between subjective

needs and objective world – mediatisation – is the essence of technological thinking. To perceive, to know, to sense the external world, not by the bare human body, but through the technological artefacts, which makes the perceiving, knowing, and sensing stronger, better, and wider – this is the real purpose of technology (Ihde 1979). Mediation does not mean that the artefact is only “in between”, that it is simply a tool. Without mediation, the human being would not distance itself from nature, would not take the position of observer, who is able to separate himself from natural conditions and who can control his own needs, and, finally, would not understand its own position in the natural ecosystem of the Earth⁴, accepting all social and political consequences of these changes.

The process of mechanization of work and labour could be treated as being completed in the creation of the machine. It is the last possible artefact, which really could replace people in labour. However, as it was explained above, such mechanisation leads to alienation. The dialectics of technology could be understood as body → tool → machine, and if it were accomplished it should mean that people have no other possibility than to live in the estranged social and political relations. But Hegel does not say that the effect of technological changes is the destruction of the human being. On the contrary, mechanization means necessary cooperation and communication of people. Intersubjective relations are the guarantee that the machine would not mean exploitation and dehumanisation. That is why mature Hegel is so focused on philosophy of state and right. In the modern society it is a legal decision which is accepted or disapproved, and the role of the state is to shape boundaries where all tensions of civil society could be neutralised.

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⁴ Hub Zwart very inspiringly uses Hegel's and Pierre Teilhard de Chardin's dialectical method of thinking about terrestrial changes in nature and the Spirit (understood here also as the "Spirit" of technoscience) to the discussion about Anthropocene (Zwart 2017).

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