Marxism, Science and Technology

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Abstract: This paper discusses a relationship between humanities and science, specifically the relationship between Marxist philosophy and so called STEM disciplines and informatics. On the one hand social sciences and humanities are more than ever dependent on science, skills, pragmatic aims and applications of all sorts. On the other hand, there exists concrete form of scientific Marxism – such as Paul Cockshott's theory – which uses bit data tools showing how the same scientific approach can be used differently. Such uses of the technology and scientific achievements of the era shows specificities of Marxist philosophy. Althusser already described such specificities and Marxism as a new science, the science of history. The rupture with the interpretative philosophy is also to be found in scientific Marxism. This work also locates form of new primitivism and anti-scientific orientation of certain Marxism's – dangerous fatalism and technological determinism that blocks any positive approach to science and technology. At the same time, it also shows dangers of "moving with the flow" - technooptimism - blind for the political and economic hegemonies cloaked in scientific and technological progress. The former is explicated already in Walter Benjamin. Marxism and its epistemological break with philosophy on the one hand and science on the other, is finally reduced to distinction between Heidegger and Marx, distinction proposed by Alain Badiou who describes it as a difference between "poem" and "matheme."

Keywords: Marxism, Althusser, STEM, digital humanities, historical materialism, new primitivism

> "Communist militants must assimilate and use the principles of the theory: science and philosophy."[1]

Introduction. Science and philosophy today

The distinction between science and philosophy can be superficial. Is it even possible to distinguish (natural) sciences from humanities? There always exists certain social context that saturates science. Philosophy and other humanistic disciplines are related to scientific and technological achievements of its era. Scientific community supplies science with "know how". Thomas Kuhn described how research is always based upon one or more past scientific achievements, and that such achievements in "some particular scientific community acknowledges for a time as supplying the foundation for its further practice"[2]

1 Althusser 1971, p. 14.

2 Kuhn 1962, p. 10.

Scientific practice is related to social practices, behaviours, believes – former being (sometimes) the essential part of science, and indistinguishable from one another. The traditions which the historian describes under such rubrics as 'Ptolemaic astronomy' (or 'Copernican'), 'Aristotelian dynamics' (or 'Newtonian'), 'corpuscular optics' (or 'wave optics'), and so on are actual scientific practices from which "spring particular coherent traditions of scientific research"[3]. That scientific practice which Kuhn calls the "normal science" includes law, theory, application, and instrumentation of historical specificities – in short the "paradigm"[4].

Science and humanities are not so distant, since object of humanities' research are integral part of science. The objects of humanities' research and not some marginal elements or supplements, but (sometimes) unwritten laws and specificities of the scientific paradigm that play major role in forming the science.

On the other hand, social sciences and humanities are more than ever dependent on science, specifically technical and natural sciences. Humanities and social sciences today lean towards "STEM disciplines" – science, technology, engineering and mathematics. It is mostly because STEM become politically important. STEM is not neutral term that refers to few disciplines but it is used to refer also to education policies that push humanities and science in global toward applied sciences, skills oriented knowledge and "pragmatic" aims. Redirection towards skills and application is accompanied with marginalization of social sciences and humanities since such transformation is primarily focused on creating and maintaining flexible work force and adapting workers to turbulent labour markets. Learning outcomes are structured according to requirements of the global marketplace. New disciplines emerge such as digital humanities – offering a cohabitation of humanities and science.

Digital humanities combines humanistic disciplines, such as anthropology, history, linguistics, literary theory, philosophy, etc. with STEM fields, mostly informatics and mathematics. Digital humanities force the uses of big data tools. Big data is a format of collecting information that allows more approachable representation of large and complex data sets. In 2008 Lev Manovich, one of the most prominent scientist in this field, announced that we are entering the "Petabyte age", where our ability to handle massive data sets will be increased.[5]

Big data is unquestionably useful tool, however, it is fetishistic technologicaly-oriented model, where technology is transformed from a tool of analyses into its purpose. The true motif of this pragmatic turn lies in the political-economic determinations that marked a larger turn in the humanities. The transition is accompanied by increasing orientation toward entrepreneurial and pragmatic knowledge and empirical outcomes. Digital humanities are mostly founded from private corporate funds.[6] The research is being replaced by mere usage of technology in the hands of corporations. (For example, one of the most important annual conference in digital humanities is funded by Volkswagen Stiftung.[7]) At some point software studies and other fancy disciplines produce nothing more than lovely pictures (big data is usually graphically represented). That way big data function more as a symptom than a tool of the "Petabyte age".

Digital humanities offer a perfect example of such interdisciplinarity that, in some aspects, provides a picture of politically transformed and often damaged disciplines that are however motivated by, at the first sight, positive urge to push the knowledge in the direction of human needs. First of all, those needs are described through the applicability and unbiased understanding. One of the most influenced tools of digital humanities – big data – will be addressed later. However, it is important to provide a framework for different relationship between humanities and new tools, such as big data – since those tools today function not only as tools of divide (between humanities and science) but also as tools of connection, specially in the hands of socialists and Marxists.

Marxism and Science

Since its beginning, Marxism had a profound relationship with science. It is not a standard relationship between one scientific discipline and science in global. Althusser saw Marxism as an unprecedented revolution in the history of human knowledge. He claimed that Marx founded a new science, or as he calls it time and again, a 'scientific continent': the science of history[8]. It is not a new philosophy, writes Althusser but precisely the science of history, rupture with all 'interpretative' philosophy, something quite different - announced in the *Theses on Feuerbach*, and earlier in *The German Ideology*. "It is essential", says Marx in that work, "to get rid of all philosophical fancies and turn to the study of positive reality, to tear aside the veil of philosophy and at last see reality for what it is."[9] It is "real history of concrete men", "history of the material life of men", where science is seen as "the real itself."[10] It is Marx who "replaced ideological theories with a scientific theory" which means that domain "previously

3 Ibid., p. 11.

4 Ibid., p. 11.

5 Manovich 2013, p. 9

6 Cvek 2014

7 See https://www.volkswagenstiftung.de/digitalhumanities.html

8 Althusser 1971, p. 37.

9 Ibid., p. 37.

10 Ibid., pp. 37-38.

monopolized by philosophies of history" is now organized in a theoretical system of scientific concepts[11].

Marxist-Leninist theory functions both as science and philosophy, since it stresses the difference between the two, and finds the way to transcendent such difference. This means that historical materialism invents scientific understanding of the history, it functions as first scientific history, while on the other hand dialectical materialism allows philosophical understanding of determined materialistic course of history. Although some leftist deviations tended to suppress science while focusing on philosophy,[12] Marxism succeed in transcending the difference. After Marx, Lenin established philosophy and what have been repressed for a long time – politics. Politics combines science and philosophy – historical materialism and dialectical materialism.

Marxism today also have a profound relationship with science. Often, it is unconsciousness relationship – naturalised relationship with science, positive or negative, and not elaborated in Althusser manner. Is there a pattern of such relationship as digital humanities offers a pattern and conscious elaboration of the domination of science over the philosophy of historical and dialectical materialism? How contemporary Left interprets the role of science and technology in its political and economic program? Is there a problem of the communist fidelity to the proletarian position that often involves an unambiguous rejection of technology and science as already "polluted" by capitalism? The same rejection of science often turns out to be a return to "kind of prelapsarian substantial unity,"[13] as in case of Evo Morales, current president of Bolivia. Morales spoke about Mother Earth's illness and importance to reject the fruits of the industrial revolution "which gave birth to the capitalist system"[14]. Morales, in his blueprint of future society expresses serious doubts that science and technology can accompany socialist and communist society.[15]

The industrial revolution already marked political and economic fall. However, can we say that the problem of the modern civilization lies in the technological and scientific progress? Modern times elevated our lives, live expectancy today is higher, technology certainly made our live easier.

Existing essentialist view of "destructive science" forces us to rethink again the relationship of science and Marxism, or more precisely the relationship between science and capitalist mode of production founded

11 Ibid., p. 39.

12 Ibid., p. 13.

13 Žižek 2009, p. 96.

14 Ibid., p. 96.

15 See http://www.worldfuturefund.org/Projects/Indicators/motherearthbolivia.html

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on the exploitation of subordinated class. Certainly there are different forms of Marxism from Hegelian tradition – around the Frankfurt school, to historical materialism, which is particularly active in France (Althusserian school) and finally the group of analytical Marxism - which attests to the influence of Marxism in Anglo-American culture.[16] There are different accompanied views on the subject of science and technology. However, there is one Marxist theory that truly recalls initial Marx stance on this issue. Such view, at the same time, transcends problems present in neo-primitivism and Evo Morales's view.

Paul Cockshott's scientific Marxism

British Marxist Paul Cockshott rethinks the role of the science and technology, specially STEM disciplines which he sees as tool of progressive thinking. Cockshott claims that "the new information technology permits a direct transition to communist mode of calculation". The new communist relations of production will abolish class differences and allow technical and humanitarian progress to resume.

Before elaboration of such view, in order to arrive to the question on how Marxism and STEM can combine, it is important to pose initial question: "What communism stands for today?" What would be the minimal steps for introducing new form of economy and new form of society? Paul Cockshott & Allin Cottrell in their Marxist study *Towards a New Socialism* advocated an abolition of wage system. Following Marx, they write:

> "Equal pay is a moral statement. It says that one person is worth as much as any other. It says, 'Citizens, you are equal in the eyes of society; you may do different things but you are no longer divided into upper and lower classes.' Talk of equality of educational opportunity is hollow so long as hard economic reality reminds you that society considers you inferior. Beyond what it buys, pay is a symbol of social status; and a leveling of pay will produce a revolution in self-esteem. Increased comfort and security for the mass of working class people would be accompanied by a rise in their expectations for themselves and their children."[17]

The real-existing socialisms failed in such transition. The history of socialisms did not result with the transition to communism. Paul Cockshott in an article "Big Data and Super-Computers" analyses such inability of 20th century socialism to progress to communism and shows how it is

16 Bidet & Kouvelakis 2008, pp. 369-370.

17 Cockshott & Cottrell 1993, p. 30.

a result of the essential failure of socialist countries, first of all USSR, to progress from economic to social change. During Khrushcev's era communism downplayed social change and identified communism with achieving exponential growth. It is well known that USSR communism was seen in terms of "quantity of output", electrification, which was "the pivot of the economic construction" of that society. Already in 1990 USSR was "doing better than the leading European capitalist countries."[18] Not only electrification but also food production was doing better, at the same time it did not create a context for transition to communism. At the same time, Cockshott sees development of informational technologies as new possibility for such change.

Today's technical and scientific advances allow us to remove old objections to communist economics.[19] Von-Mises and Hayek believed that only market can control production. Von-Mises saw that "only money provides a rational basis for comparing costs" and that "calculation in terms of labour time is impractical."[20] It is because of the millions of equations that would needed to be solved. However equations today must only be extrapolated from the Net. Similarly, Hayek claimed that only market can solve problem of dispersed information. But to work out the labour content of every good only requires the solution of millions of equations – which is today possible. In 1960s computers were not powerful enough, while it is also notable that in USSR no particular attention was paid to information technology as an enabling technology for communism.[21]

Internet allows "real-time cybernetic planning", big-data "allows concentration of the information needed for planning", super-computers "can solve the millions of equations in seconds" and electronic payment cards "allow replacement of cash with non transferable labour credits."[22] Such technological advancements resolve the problem of social transition as fundamental problem of communism.

Paul Cockshott with Karen Renaud showed practical uses of big data and the Internet in extending democracy and handling economic decisions. They demonstrated how digital technology can be applied in national budgeting. In their paper they presented a system which allows maximal participation, using a ubiquitous input mechanism, the mobile phone, to support decision-making.[23] The current situation is that governments are reluctant to conduct plebiscites due to the expenses

18 Cockshott 2017.

19 Ibid.

20 Ibid.

21 Ibid.

22 Ibid.

23 Cockshott, Paul & Karen Renaud, 2010.

inherent in the traditional voting model. However, technology surpasses financial obstacle. The plebiscites Cockshott and Renaud focused on generally have yes/no alternatives such as: • Should smoking in public be banned? • Should the UK get out of the Afghan war? • Should Scotland be independent?[24] In short, Cockshott's view replaces prejudices on science and technology, and allows positive Marxist answer to the question of how science can assist to introduce new form of a society.

Negative role of science and technology. Badiou, Heidegger and Marx

If Marx invention announced in the *Theses on Feuerbach* was, in the necessarily philosophical language a declaration of rupture with all 'interpretative' philosophy, something quite different from a new philosophy, if this was "radical suppression of philosophy", while the philosophy presented a hallucination and mystification; if everything which seems to happen in philosophy really happens outside it, in the only real history, the history of the material life of men, and if Marxism presents an "epistemological break"[25] what is the model of such science? Is it the "continent of Mathematics" starting with the Greeks (by Thales or those designated by that mythical name) and the continent of Physics (by Galileo and his successors)"?[26] Or is it a science like chemistry, or a science like biology, or the science of history?[27]

There exists new primitivism which suppresses the possibility to integrate science and Marxism. On the other hand, Paul Cockshott offers integrated model of science and Marxist philosophy. However, there is profound political problem with STEM disciplines and science as a whole. Science in capitalism is determined by capitalist mode of production. Science functions as an instrument of capital and determined by science.

Potentials of modern science is shadowed by its political and economic role. Although it seems that contemporary discourse can make no claim to totality, the computerization of society, which shifts emphasis from the ends of actions to their means, has made metanarratives (as a means of legitimizing knowledge) unnecessary and intolerable because technology is self-legitimating.[28] Since at least the end of the 1950's scientific knowledge present a dominant type of discourse. Knowledge is and will be produced in order to be sold and consumed since the goal is

24 Ibid., p. 1.

25 Alhusser 1971, p. 39.

26 Ibid., p. 40.

27 Ibid., p. 40.

28 Lyotard 1979.

exchange.[29] Knowledge ceases to be an end in itself, it loses its "use-value". Lyotard even argues that hegemony of the computers – brings certain logic, defines what the knowledge is, while the status of knowledge is altered as societies enter postindustrial age and culture enter postmodern age.

However, initial Marxist stance on this issue is affirmative. And Paul Cockshott's example shows how Marxism today can reproduce a scientific relation to history. Is it not initially the problem already exposed in philosophy? The role of science and technology is dominant theme of Heideggerian poetico-natural orientation, which lets-be presentation as non-veiling, as the authentic origin.[30] For Heidegger's poetico-natural philosophy – the epoch is ruled by an inaugural forgetting. Technology is detected as the main problem of modern times. Heidegger elevates the science and technology to the level of ontological inquiry. Heidegger sees technology as a way of revealing.

He proposes a Greek return in his deconstruction of metaphysics[31]. For Heidegger there is a typical "technological nihilism" and nostalgia related to "return to Gods."[32] It is questionable if the ontology as native figure of Western philosophy can be "the arrival of the poem in its attempt to name"[33]. Alain Badiou proposes such dichotomy as the difference between poem and matheme. In philosophy the conflict is already staged between Heidegger's critique of an epoch and Marx's philosophy of practice.

For Marx there is no nostalgia or nihilism. There is an importance of rupture and accompanied science of historical materialism that Marx proposes and its approach to science as annunciation of the end of philosophy and its realization in practice. In establishing such distinction Badiou founds a doctrine of what, for thought, both un-binds the Heideggerian connection between being and truth and institutes the subject, not as support or origin, but as fragment of the process of a truth.[34] There is a need to think about Nature and technology in different way. Nature is not a region of being, a register of being-in-totality. It is the appearing, the bursting forth of being itself, the coming-to of its presence, or rather, the 'stance of being'.[35]

29 Ibid., p. 45.

30 Badiou 2005, p. 125.

31 Badiou 1992-93.

32 Ibid. p. 56.

33 Badiou 2005, p. 125.

34 Ibid., p. 15.

35 Ibid., p. 123.

Benjamin and technological determinism

There is also another Marxist view – a critical one, but less essentialist. In his essay "Thesis on the Philosophy of history" Walter Benjamin writes:

> "Nothing has corrupted the German working class so much as the notion that it was moving with the current. It regarded technological developments as the fall of the stream with which it thought it was moving. From there it was but a step to the illusion that the factory work which was supposed to tend toward technological progress constituted a political achievement."[36]

The progress can be a powerful tool in the hand of socialists. However, as Benjamin writes on how parcel of Social Democracy shared what he called "vulgar-Marxist" view which define labour by relating it to technological development. Burdened with economic determinism this fraction of the party saw labour as a necessity of the progress, and progress as something natural, positive and undisputed. Such scientific progress sees labor as "the source of all wealth and all culture."[37] Why it is something problematic in defining labour as necessity of positive development? For Benjamin it is problematic since such concept of the nature of labor bypasses the question of "how its products might benefit the workers."[38]

Marx in *Capital,* on the chapter called "Machinery and Large Scale Industry" discusses the progress of machinery which he sees as, first of all, a class conflict, while development of production forces he described as accompanied by class antagonism. It would be possible Marx observes, "to write a whole history of the inventions made since 1830 for the sole purpose of providing capital with weapons against working class revolt."[39] For Marx, labour is not natural companion of a progress – on the contrary. Factory owners relentlessly transfer workers' skills into technological systems. Progress of machinery in the hands of capitalists does not aim to free worker from labour, but to instrumentalize machinery for the purpose of the capitalist in order to "depend less on labour time and on the amount of labour employed" than on "the general state of science and on the progress of technology."[40]

The same vulgar-Marxists notion of neutral progress is encountered later in Fascism. Both share the same vision of what Benjamin

36 Benjamin 1968, p. 258.

37 Ibid., p. 259.

38 Ibid., p. 259.

39 Marx 1976, p. 563.

40 Dyer-Witheford 1999, p. 5.

called the imperative of "the mastery of nature" as a tool in the hands of the few.[41] Marx also saw development of machinery as positive thing – as a form of reduction of necessarily labour time. Consensus on linear progress of technology accompanied by labour and working force as its natural companion is deathly weapon of today's ideology. Technological determinism is an illusion that technological progress constitutes political achievement. But what is political achievement? What can be characterized as such?

Conclusion

As we saw in Paul Cockshott example scientific progress can be powerful tool in the hands of political and economic progress, but also a tool of stagnation in political and economic sense. Such is the case of digital humanities – discipline that promotes uses of new technology, specially big data technology (used also by Cockshott). The aim of digital humanities, according to its promoters, is to invent new ways of research or to approach culture in "a radically new way."[42] Frederic Jameson diagnosed perpetual present responsible for status quo: "Capitalism itself lives in a perpetual present."[43] Inventing a fetish in the form of big data, or another representative tool, does constitute an epistemological frame for continuous present. The digital humanities' invention of new forms of representation must be seen not only as a fetishist gesture, but also a tendency of capital to generate new forms of profit. Digital humanities are orienting science toward entrepreneurial and pragmatic practical knowledge defined by "concrete," practical, empirical outcomes.

Digital humanities as other disciplines fall under the misconception of linear technological progress common to different political universes. Today's precariat workers are working more hours than the savages in primitive community.[44] However, a consensus on 'moving with the current' is live and strong.

Not only traditional and conservative, but also revolutionary theories are locked in the notions of political potential of new media as communicative channel that has the ability of creating a public sphere in which debate and political planning can take place. But is it not the Arab spring the ultimate example of how insisting on the public sphere as a topos of change – serves classical neoliberal ideological agenda? In other words, let them talk what ever they like, as long as they do not come to close in changing the way of production and reproduction of social life. (In other words truly revolutionary actions would be nationalization of banks, installation of self-management system, in short - discarding all elements of capitalist political economy.)

Although science in capitalism is determined by capitalist mode of production, and science functions as an instrument of capital, there is profound difference between science for itself a science as such – similarly to what Marx distinguishes as class as such and for itself.[45] In the same manner in which mass is a class as against capital, but not yet for itself, the science can be against capital but not immediately and naturally. As "the struggle of class against class is a political struggle",[46] the struggle of science against science is a political struggle. That means that Paul Cockshott's uses of big data is Marxist answer to essentialisation of science and politics – an answer to simplifications that differentiation between science and society. As science can be used against society, it can be used for society.

41 Benjamin 1968, p. 259.

42 Berry 2011.

43 Jameson 1976, p. xiv.

44 Pavelski 2013.

45 Marx 1999

46 Ibid p. 79

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