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Artificial Intelligence: What It Is? Who benefits? A Critical Marxist Approach

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Picture on the cover: Sophia, a well-known "human-like" robot (Source: Wikipedia, https://upload.wikimedia.org/wikipedia/commons/1/1e/Sophia_at_the_AI_for_Good_Global_Summit_2018_%2827254369347%29_%28cropped%29.jpg)

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Artificial Intelligence: A Leviathan Monster Serving the Ruling Class

Theses on Artificial Intelligence and its application in the period of capitalist decay. A first approach from a Marxist viewpoint.

Resolution of the Revolutionary Communist International Tendency (RCIT), 7 May 2023

Preface: *The following set of theses does not claim to analyse all aspects of AI or to answer all questions raised by the application of such technology. It is only a first approach of the RCIT which needs further elaboration and analysis.*

* * * * *

1. Artificial Intelligence (AI) is a new form of modern technology which is rapidly spreading both in the sphere of capitalist production, social reproduction as well as consumption. It has potentially far-reaching consequences for the future of capitalism and for people's lives. Hence, it is imperative for socialists to have a correct understanding of the role and the dangers of AI in the current period of capitalist decay and to take a clear position on how to approach this technology.

What is AI: A brief technical definition

2. As a general technical definition of AI, we can say that its purpose is to replicate key features of what constitutes a human being respectively to imitate other forms of life (e.g. thinking, learning, problem-solving, biochemical functions of human organs). This can be the case both on macro (robots) as well as on micro (nanorobots) level. The method to achieve this is the programming of machines (computer, robot, or other devices) with intelligent software systems. Ultimately, the objective purpose of AI within the context of class society is to replace human beings by machines as much as possible.

3. Hence, AI is already applied to a wide range of fields and, given its relative infant stage, it has much more far-reaching potential. Without claiming completeness, here are several examples. It is used for the creation of all kinds of robots – in the field of industrial machinery, as autonomous vehicles, as pseudo-human beings (e.g. Sophia, the first "social" robot), police dogs (in New York), or as autonomous weapon systems (from killer machines to autonomous ships and drones). It is used for comprehensive surveillance systems (facial recognition, the "Green Pass" system which was tested during der COVID Counterrevolution, etc.). There are plans to apply AI in nanorobotic, e.g. as biological machines operating within human bodies to identify and destroy cancer cells, for manipulating industrial raw materials like coal and silicone, for environmental purpose against microplastics, etc. It can be applied in the field of the so-called *internet of things* which coordinates several single-purpose AI into a complex system. Finally, there is creative AI like ChatGPT and similar concepts. These are software which mimic human behaviour like creating texts, pictures, videos, music, etc. Such software is also essential to create comprehensive virtual realities like Zuckerberg's Metaverse.

On the concrete danger of AI

4. Such applications of AI create all kind of dangers which have in common that they massively expand the power of the ruling class to control and to destroy and, in addition, that they inherit the potential risk of getting out of social control. There is no doubt that the application of AI and robots will have dramatic consequences in workplaces. A study published by Goldman Sachs in March 2023 calculates that roughly two-thirds of current jobs in the U.S. and Europe are exposed to some degree of AI automation and that generative AI could substitute up to one-fourth of current work. According to the same study, the equivalent of 300 million full-time jobs is globally exposed to automation. Clearly, numerous jobs in many industries are at risk – from production to administration, from service to education. At the same time, AI is extremely energy intensive and will have negative consequences for the environment which is already close to collapse given the climate change caused by reckless rape of natural resources by capitalist monopolies.

5. Furthermore, the application of AI as autonomous weapon systems has, by definition, devastating consequences – even more so if such machines take autonomous decisions about the use of weapons of mass destruction etc. Things stands similar with the use of AI by the police or for comprehensive surveillance systems, i.e. as an instrument for what we have called *Chauvinist State Bonapartism*. As such it has been already applied in China and other countries in the period of COVID Counterrevolution (e.g. the "Green Pass" system in 2020-22). Nanobots can certainly be useful but also contain huge potential risks. It is unknown how complex dialectical systems like human bodies react to it. Furthermore, there is the danger of a scenario called "*Grey Goo*" by Eric Drexler (a pioneer of nanorobotics) and which means that plenty use of nanobots leads to unstoppable nanobots-pandemic that transforms everything organic into inorganic. Handing over administration of houses, hospitals, factories, transport system, nuclear power plants to AI – the "internet of things" – can result in catastrophes if the software gets damaged or hacked. Creative AI will not only endanger many jobs but also aids the plans of various monopoly capitalists to create virtual realities and to draw human beings into is as much as possible. In summary, AI is an instrument of *capitalist techno-totalitarianism*.

6. Finally, there are dangers which are not certain, given the underdeveloped stage of AI, but which should make us cautious given their far-reaching implications. It is a telling – and alarming – sign that a growing number of AI scientists are publicly warning about the potential dangers of this technology (among them are Geoffrey Hinton, the so-called 'Godfather of AI'; Eliezer Yudkowsky, who

is regarded as a founder of Artificial General Intelligence; Michael Osborne, a professor of machine learning at the University of Oxford; as well as the late Stephen Hawking). It should make one suspicious about AI if even leading developers of this technology with intimidate knowledge of its potential are warning the public! The whole purpose of AI research is to create machines which can think and decide like human beings, i.e. that they create a kind of "consciousness". It is disputed among experts if and to which degree this is possible. However, it is a dangerous concept in itself. Even if the creation of AI developing "consciousness" would be in the interest of humanity (a highly disputable assertion!), we are not living in the right time to aim for this. It is extremely dangerous to try for singularity in the framework of the capitalist class society. Already in its very primitive forms, AI is reproducing sexism, racism, and all other forms of oppression as it mirrors the society, we live in. Hence, such technology, developed in capitalist class society, would be a powerful instrument in the hands of oppressors and exploiters who have already driven the world to the edge of its complete destruction. Why on earth should one let those criminals play with even more powerful weapons?!

AI and the decay of capitalism

7. Many people (including self-proclaimed Marxists) discuss the advantages and disadvantages of AI primarily from a technical point of view and treat it as a kind of neutral technology. This is an extremely one-sided approach which can not but result in an analytical cul-de-sac. In fact, it is impossible to understand the social relevance of AI without situating it within the context of the socio-economic formation in which it evolves, i.e. within the capitalist class society trapped in the final epoch of its decay. The development of AI is a result of the ruling class desperate attempts to find a way out from its decline. At the same time, it reflects the degeneration of the system of class exploitation and will intensify its inner contradictions. In a certain way, AI embodies the fundamental principle of capitalism – the supremacy of dead labour over living labour.

8. The dream of bourgeois ideologists that AI could facilitate a new period of economic upswing of global capitalism is pure phantasy. Theoretically, the introduction of new technologies could only result in such a boom period if it would go hand in hand with the creation of the necessary political and economic conditions for an intensified period of capital accumulation (as it was the case after the defeat of the 1848 revolution or after World War II and the consequential re-division of the world). In itself, new technologies do not result in an economic boom of capitalism. As the RCIT has pointed out in past studies – and, more recently, even bourgeois economists have been forced to admit this –, the tremendous technical innovations of the past three decades (computer, industrial robots, internet, etc.) have not resulted in renewed economic growth but rather in stagnation and decline of labour productivity.

9. This is even more the case because AI has the purpose to replace as much labour force as possible (and, ideally, make it completely redundant). In itself, AI is dead labour. Hence, it does not create capitalist value – in contrast to living labour (it does only transmit already existing value which is embodied in AI by its previous development by labour force). In other words, AI will massively accelerate the tendency of capitalism towards its collapse as it

Books of the RCIT

Michael Pröbsting: The COVID-19 Global Counterrevolution

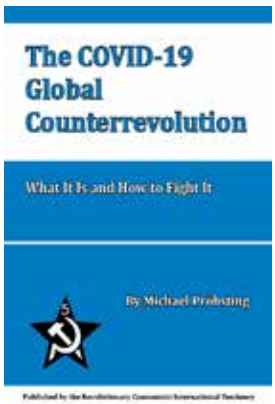
What It Is and How to Fight It. A Marxist analysis and strategy for the revolutionary struggle

In *The COVID-19 Global Counterrevolution* Michael Pröbsting analyses the dramatic events in spring 2020 which have opened a new historic era. A triple crisis has shocked the world. The Third Depression has begun, characterized by a devastating economic slump of the capitalist world economy which is certainly no less dramatic than the crisis which started in 1929.

In addition, there is a wave of anti-democratic attacks of a scale which has not been seen in the imperialist countries since 1945. This has triggered a global turn towards Chauvinist State Bonapartism and the creation of a monstrous Leviathan-like state machinery.

And finally, the world faces COVID-19 – a pandemic which endangers many lives and which is exploited by the ruling classes in order to spread fear, to deflect attention from the capitalist causes of the economic crisis and to justify the turn towards chauvinist state bonapartism.

The COVID-19 Global Counterrevolution also shows that large sectors of the reformist workers movement and the so-called left fail to understand the meaning of this triple crisis. Similar to the situation in 1914 after the beginning of World War I we can observe a gigantic wave of opportunist capitulation by many self-proclaimed socialists as they support or at least do not denounce the global lockdown and the suppression of democratic rights which the ruling classes are imposing in the name of combat against the pandemic.



The COVID-19 Global Counterrevolution offers a Marxist analysis of this historic crisis and elaborates a revolutionary perspective for the struggles ahead.

The book contains an introduction and 6 chapters plus an appendix (176 pages) and includes 5 figures and a diagram.

radically changes the organic composition of capital (increase of constant capital at the cost of variable capital). It thereby reduces the creation of capitalist value and, hence, the fundament for profit – the famous "*Historic Tendency of Capitalist Accumulation*" which Marx explained in the next-to-last chapter of *Capital* Vol. I. While AI will not facilitate a new period of economic growth, it will inevitably accelerate the process of monopolisation, i.e. the destruction of small capital by large capital and the further domination of the economy by a few powerful capitalist monopolies.

10. AI represents respectively facilitates an extreme form of capitalist alienation. It massively increases the already existing tendency of capitalism to alienate human beings from each other as well as from nature. It allows for isolation of humans both in workplaces as well as in their social life (home office, Metaverse, etc.) It increases the passivity of humans since they can seek refuge in virtual reality, i.e. combining the status of a virtual super-warrior with physical laziness completely disconnected from society and nature. Furthermore, AI takes social skills like communication away from humans. It is capitalist alienation ad infinitum. In short, AI accelerates the already existing tendency of capitalism for *de-socialisation of humans and dehumanization of society* ("*Entgesellschaftlichung der Menschen und Entmenschlichung der Gesellschaft*").

11. Does AI represent a development of productive forces? Yes, to a certain degree insofar as it helps to advance the production of goods. However, in the historic period of capitalist decay there exists a tendency of transformation of productive forces into destructive forces. As a result, we see widening spheres of civilization threats in the past 1-2 decades. The destruction of the climate with rapid strides due to "very efficient" means of production, the cul-de-sac of nuclear power – these are just some examples of this tendency inherent to decaying capitalism. Its extreme destructive potential in warfare, surveillance, the ruin of industries, the social isolation of human beings, etc. – all this means that AI represents much more destructive than productive forces.

12. Drawing on Marx's fundamental critique of commodity fetishism in chapter 1 of *Capital* Vol. I, revolutionary communists warn against any fetishism of productive forces under the rule of capitalism. While capitalism has been – and continues to be – capable of driving forward technical advances, it develops an increasing tendency to nurture technologies which have little or none benefit for the society but rather undermine or endanger the existence of humanity. Technologies which make industrial production more effective or transport faster but, at the same time, deplete the ozone layer; nuclear power plants which are a permanent risk for the population and which produce highly dangerous waste; genetic modified crops which undermine sustainable agriculture and which have devastating consequences for bio-diversity and health; and now Artificial Intelligence – all these are examples for the inherent tendency of decaying capitalism to create destructive forces. The task of Marxists is not to blindly cheer the development of new technologies under capitalism but to differentiate between those which are useful for the humanity's future and those which are rather destructive or have unknown consequences and, therefore, must be opposed.

Marxist approach and tactics

13. Marxists have no reason to welcome the development of AI. On the contrary, the RCIT opposes it as it is, first and foremost, a dangerous instrument in the hands of our enemy – a Leviathan monster serving the imperialist monopolies and powers. This becomes clear if we summarise the fundamental driving forces for the development of AI by the monopoly capitalists. These are a) the desire of capitalists to raise productivity by replacing living labour with dead labour; b) the desire of the ruling class, living in a historic period of capitalist decay, to increase its control of a crisis-ridden society full of explosive contradictions; c) the wish of a sector of the monopoly bourgeoisie to avoid a collapse of civilization by eliminating a part of humanity respectively by creating new forms of "social" life with the help of AI which would require the existence of a much smaller proportion of human beings. Such new forms of "social" life might exist on the earth or on another planet.

14. For Marxists, the problem with AI is not that it "rationalizes" the process of production or communication, etc. The problem is rather: a) that the ruling class utilizes AI to destroy large segments of jobs, to dramatically expand surveillance, to make warfare much more "effective" etc.; b) that the ruling class is determined to hand over crucial discretionary competences to AI – from autonomous vehicles to autonomous weapon systems, from the administration of the world of work to the administration of the social system; c) that the ruling class wants to use AI for the transformation of social life – resulting in a further social isolation of human beings and their "dehumanization", taking away from them social and cognitive skills.

15. What should be the tactic of socialists regarding AI? To put it short, the RCIT advocates a tactic which can be summarised in the formula: "*oppose and obstruct*". We oppose the development of AI, its implementation in workplaces and social media or further research. We call for a stop of the application of new AI technologies. We support its sabotage where it is already applied. Of course, we are realists, and we know that as long as the ruling class is in power, it will use AI to the widest-possible degree (even if it involves massive risks for itself when it gets out of control). However, socialists must draw a line of intransigent opposition against the decisions of the ruling class and their reactionary and hazardous policy. The Marxists' tactic of "*oppose and obstruct*" can not exist in isolation but must be part of the policy of class struggle in defence of the interests of the workers and oppressed. It is part of our program for international socialist revolution.

16. Given the massive and devastating social consequences of AI, one can expect widespread outrage and resentment by large sectors of the working class and the popular masses. It is likely that there will be a wave of "Luddism", i.e. the desire to stop and destroy complex AI. No doubt, such popular opposition will be confused, mixing progressive ideas with petty-bourgeois utopianism (we saw similar developments in the context of mass protests in the period of the COVID Counterrevolution). While large sectors of the petty-bourgeois left will give a sniff at such "backward" masses, authentic Marxists have no reason to follow such muddleheads who are pulled by the nose ring by the ruling class. In fact, history has repeatedly seen mass movement which objectively have played a progressive role despite a subjectively backward ideological consciousness – from the uprisings of "barbarians" and slaves in the time of the Roman Empire or the Chinese "Middle Kingdom" to various religious heretic movements in the Middle Ages, indigenous people fighting colonialism, and Islamist rebellions against imperialist invaders in modern days.

17. The task of socialists is a) to support such popular opposition against AI; b) to explain the link between AI and capitalism and that the main task is to fight against and to overthrow those who control AI – the imperialist monopolies and powers; c) to transform spontaneous outrage into class-conscious struggle against the ruling class.

18. One can expect that there will be also strong opposition against AI among the middle class since their jobs will be severely affected by this technology. Socialists are prepared to collaborate with such forces as long as their protest serves the class struggle. However, the focus of revolutionaries must be the organising of workers and oppressed.

19. Does this mean that AI has no place in a future socialist society? This will have to be discussed and decided once the organized working class has overthrown capitalism and taken power in their own hands. Surely, in those areas where AI can help humanity to build a free society, it might be useful as a subordinated technology. As a general principle, we can say that socialists support technology which makes human beings more sovereign, more part of the collective; at the same time, we oppose every technology which limit or even endanger the freedom and independence of human beings, and which make them more isolated. Hence, contrary to the illusions of the middle-class left, socialism is not capitalist consume but more and cheaper. No, socialism – in the Marxist understanding – is a completely different mode of production and consumption which allows humans to lead an active, social, sustainable and manifold life in a healthy relation to nature.

International Secretariat of the RCIT

Why ChatGPT and similar technologies are more dangerous than you might think

How socialists should approach deep-learning A.I.

Article by Medina Avdagić, Revolutionary Communist International Tendency, May 2023

The novel *Erewhon* by Samuel Butler was published in 1872, fascinating readers with a quite humorous satire on a world under control of machines. Hence, it was probably the first book in the genre of fiction to deal with the idea of *Artificial Intelligence*. Revolutionaries like Karl Marx, who was 54-years old at that time, would not need to deal with real-life implications of Artificial Intelligence. Socialists today are not spared from those questions … unfortunately.

The public announcement by OpenAI that ChatGPT shall be accessible for all to test and improve its quality, has opened a broad discussion about the usability and dangers of specific forms of Artificial Intelligence. *Examples, Capabilities* and *Disclaimers* are visible at freegpt. one to inform the user what to expect. Since the launch of the website, one can imagine the huge amount of people who already tried it, feeding it with information. Hence, all the articles written on experiences by users of the new chatbot. In general, users are surprised how humanlike the chatbot appears in its answers. The reason for its efficiency is a quite well-developed implementation of so-called deep-learning A.I. – contrary to machine-learning A.I. Both forms have their dangers, but this article will limit itself to briefly explain the differences and then focus on the deep-learning system.

Deep-learning makes all the difference

Machine-learning is quite simple to understand as it is operating in the way most people believe technology works: massive amounts of qualified data are processed by an algorithm which makes predictions based on said qualified data. This makes it labor intense as data first needs it be qualified to be used by the algorithm, i.e., it needs to be structured in a way that makes it accessible for the algorithm.

However, deep-learning algorithms can operate with data which is not structured before in a way that simple machine-learning algorithms can't. For example, it does not need a set of explanations from us what the difference is between a hamster and a cat. While simple machine-learning algorithms would need some categories beforehand, deep-learning A.I. (as an evolved form from the simple machine-learning) needs enough random information about hamsters and cats to find its way to differentiate them. Deep-learning systems imitate the functioning of our brains as a complex neural network and, unsurprisingly, it means that this A.I. is learning very similar to us humans. It also shows similar errors respectively similar weaknesses to the early stages of human learning.

For example, like children under 6 years old, it does not understand irony (yet). Furthermore, ChatGPT is prone to what is called "hallucinations" or, as "AI-Godfather" Geoffrey Hinton put it more precisely, *confabulations*. [1]

This means that like humans, ChatGPT mixes up information it receives and creates statements which are not true (and sometimes completely ridiculous) based on wrong associations. It is like mixing up a story from one friend with a similar story from another friend to something that has not happened that way to either one of them. It might get very ridiculous with a confabulation like announcing somebody to be of royalty. But again, children who learn to understand and develop their own categorizations are prone to similar wrong conclusions.

Finally, the deep-learning A.I. can learn in either a supervised, an unsupervised or a reinforced setting. Supervised learning means that labeled datasets are used for making predictions, while unsupervised learning means that the A.I. finds patterns without labeled datasets. Reinforcement in learning means that A.I. is learning to become more accurate based on feedback it receives.

ChatGPT in this regard is a deep-learning system which uses *Reinforcement Learning with Human Feedback (RLHF)*. [2]

The reason for the hype around ChatGPT is not so much its direct implications as they happen *now* but rather the potential it embodies. While it is simply a text based and text producing program, it can and inevitably will be used way beyond the means of entertainment. The fact that it is a deep-learning software utilizing RLHF has three important effects. First, it collects and processes data willingly provided by probably millions of people. It is therefore de-facto fed and trained by the masses. Second, it is learning from its experience and improves at rapid pace. Its intelligence is nurtured by the fast-learning process. Third, the efficiency of the learning process is applicable to similar software. It is contagious, so to speak.

Why ChatGPT is of interest for the Pentagon (and no, not as a fun chatbot)

Revolutionaries need to apply a certain approach to technology, especially to *Artificial Intelligence*. We need to think in the categories of implications for class struggle, not individualistic consumerism, or even specific social challenges. It is not mainly about the pros and cons of A.I. used by students to avoid writing their homework and not even about protecting artists (although such discussions are more than legitimate).

The danger that ChatGPT embodies in regard of anti-capitalist class struggle is multifold. [3] First and foremost, it is of high interest for the military. "*During a Q&A session, the National Geospatial-Intelligence Agency's associate director for capabilities, Phillip Chudoba, was asked how his office might leverage AI. […] Stripping away the jargon, Chudoba's vision is clear: using the predictive text capabilities of ChatGPT (or something like it) to aid human analysts in interpreting the world. The National Geospatial-Intelligence Agency, or NGA, a relatively obscure outfit compared to its three-letter siblings, is the nation's premier handler of geospatial intelligence, often*

referred to as GEOINT. This practice involves crunching a great multitude of geographic information — maps, satellite photos, weather data, and the like — to give the military and spy agencies an accurate picture of what's happening on Earth. […] Steven Aftergood, a scholar of government secrecy and longtime intelligence community observer with the Federation of American Scientists, explained why Chudoba's plan makes sense for the agency. "NGA is swamped with worldwide geospatial information on a daily basis that is more than an army of human analysts could deal with," he told The Intercept. "To the extent that the initial data evaluation process can be automated or assigned to quasi-intelligent machines, humans could be freed up to deal with matters of particular urgency. But what is suggested here is that AI could do more than that and that it could identify issues that human analysts would miss." Aftergood said he doubted an interest in ChatGPT had anything to do with its highly popular chatbot abilities, but in the underlying machine learning model's potential to sift through massive datasets and draw inferences." [4]

OpenAI might declare in their user agreements that any use for military purpose is not allowed. However, there is no way that this American capitalist corporation (or any other) can truly keep their technology away from the U.S. military. Just think of the time when Google employees stopped the collaboration between Pentagon and Google on *Project Maven* by public protest. First, Google kept their collaboration but put it "*outside of Project Maven*" and second, both Amazon and Microsoft stepped in instead. [5]

Tech company Oracle (known for the same-named software) was deeply enmeshed from its very beginning with the Central Intelligence Agency (C.I.A.). Even the name originated from the C.I.A. project called "Oracle". [6] There are many other examples…and this time around we are talking about even more sophisticated systems. The additional danger of deep-learning A.I. is its potency for rapid and unpredictable development, something quite frightening in the hands of the bourgeois military apparatus.

Socialists approach

When we look at revolutionary situations in the past, we see a decisive moment that makes or breaks a revolution in the persuasion of at least parts of the soldiers. Soldiers, mobilized to quell the rebellion who then turn their guns away from the fighting masses towards the oppressors… they truly dub a rebellion *revolution*. There is no such chance with guns controlled by Artificial Intelligence.

The RCIT has stated, that the correct approach for socialists towards those technologies must be *Oppose and Obstruct*. First, deep-learning A.I. (like ChatGPT) marks a certain evolutionary step of Artificial Intelligence that is notably different to the ones before. It learns faster and is more capable of unsupervised complex learning.

Many doubt that any bigger danger might occur in near future, but there we can see the problem with bourgeois science respectively technological experts. Bourgeois scientist and technology experts mostly understand developments in a limited, gradual, and non-contradictory manner. To give an example. when they calculate the risks of climate change, they declare certain marks like 1.5-degree Celsius increase in global temperature as risk factors and calculate their simulations on such basis. But nature is a deeply complex system that does not obey to the mechanic understanding of bourgeois science. Already now, the pattern of jet streams is altered, causing storms, droughts, and floods in a dangerous way. Reaching the 1.5-degree Celsius mark happens much faster than they have calculated because global warming has exponential influences. With the very same simple "scientific" mind, they declare the limitations of Artificial Intelligence. Why on earth should we trust them?

In case of climate change and Artificial Intelligence, bourgeois experts *believe* in the capitalist system to be capable of avoiding catastrophic developments. They do so because of the ideologic pressure and the material interests, even if the whole history of capitalism and the reality of today's world have proven them wrong. Socialists, however, reject the idea of reforming the beast!

ChatGPT will be (or maybe is already) used in a dangerous way in the military. It provides a breakthrough in deep-learning algorithms which develop at a rapid pace, and which are not based on the society of workers and oppressed. It offers nothing to our class or humanity worth the dangers it embodies.

Footnotes

1 Geoffrey Hinton tells us why he's now scared of the tech he helped build. "I have suddenly switched my views on whether these things are going to be more intelligent than us." By Will Douglas Heaven, May 2, 2023 https://www.technologyreview.com/2023/05/02/1072528/geoffrey-hinton-google-why-scared-ai/

2 How does ChatGPT work? Here's the human-written answer for how ChatGPT works. By Harry Guinness, March 21, 2023. https://zapier.com/blog/how-does-chatgpt-work/

3 We have explained those various aspects in a recent statement on A.I.: RCIT: Artificial Intelligence: A Leviathan Monster Serving the Ruling Class. Theses on Artificial Intelligence and its application in the period of capitalist decay. A first approach from a Marxist viewpoint. Resolution of the Revolutionary Communist International Tendency (RCIT), 7 May 2023. https://www.thecommunists.net/theory/rcit-theses-on-artificial-intelligence/

4 Can the Pentagon Use ChatGPT? OpenAI Won't Answer. The AI company is silent on ChatGPT's use by a military intelligence agency despite an explicit ban in its ethics policy. Sam Biddle, The Intercept, May 8, 2023. https://theintercept.com/2023/05/08/chatgpt-ai-pentagon-military/

5 Project Maven: Amazon And Microsoft Scored $50 Million In Pentagon Surveillance Contracts After Google Quit. By Thomas Brewster, Forbes, September 8, 2021. https://www.forbes.com/sites/thomasbrewster/2021/09/08/project-maven-amazon-and-microsoft-get-50-million-in-pentagon-drone-surveillance-contracts-after-google/; see also: Project Maven to Deploy Computer Algorithms to War Zone by Year's End. By Cheryl Pellerin, DOD News, July 21, 2017. https://www.defense.gov/News/News-Stories/Article/Article/1254719/project-maven-to-deploy-computer-algorithms-to-war-zone-by-years-end/

6 Oracle's coziness with government goes back to its founding / Firm's growth sustained as niche established with federal, state agencies By Todd Wallack, Chronicle Staff Writer, May 20, 2002. https://www.sfgate.com/bayarea/article/Oracle-s-coziness-with-government-goes-back-to-2820370.php

Artificial Intelligence and the Marxist Understanding of Productive Forces

On the contradictory development of productive forces in the period of capitalist decay and their dialectical relationship with the relations of productions

By Michael Pröbsting, Revolutionary Communist International Tendency, 2 June 2023

Introduction

Every historic period has its big questions. These are issues which play a crucial role in thinking and public debates for a longer lapse of time and which become axes of socio-political development and of world politics. Among such big questions of the current age are issues like the class character of the rising powers of the East (China and Russia), the rivalry between Great Powers and the wars between these and smaller nations, etc. The approach of the ruling class to pandemics (like COVID) might be another one.

To these questions we can add from now on the nature of Artificial Intelligence (AI) and its consequences for humanity. There is no doubt that this issue will be one of the most important in the coming years if not decades.

The RCIT has already published a programmatic set of theses as well as an article on AI in which we present our first approach to this question. [1] To summarise our position in a few sentences, we consider AI not only and not primarily as a progress of productive forces but rather as a development of destructive forces. This technology represents a huge danger for the working class and the popular masses as it is a powerful instrument in the hands of the ruling class. It will massively increase the risks of arms race and warfare – even more so as it can easily get out of control. It will also expand the tools for surveillance of the population by the capitalist state machinery. Likewise, it will be used by capitalists to replace workers with machines. This is why we characterise AI as a *Leviathan Monster of the ruling class*.

In addition, we point to the fundamental problem of AI which has the purpose of replacing humans for making decisions. Furthermore, AI represents a comprehensive danger for humanity as it massively advances the tendencies – inherent to capitalism, particularly in its epoch of decay – towards isolation of humans and the dehumanisation of social relations. People are increasingly orientated towards virtual – instead of social – "reality", and in this way replace other humans in their interaction with machines.

This is why the RCIT does not consider AI as a means of progress but rather as a dangerous instrument of the ruling class. Socialists should take an approach to AI which we summarised in the formula "*oppose and obstruct*". This means that progressive activists should fight against the introduction of AI and combine such opposition with a perspective of revolutionary overthrow of capitalism and the creating of a global socialist society without exploitation and oppression.

In this pamphlet we shall discuss one important aspect of the question of AI from the point of view of Marxist theory: does AI represent another progress of productive force which should not be roundly condemned, and which could also play a useful role in building a socialist society? In order to clarify this question, it is necessary to elaborate in more detail the Marxist understanding of productive forces and how this is relevant for our approach to AI.

1. An example of pseudo-Marxist AI advocacy

As AI and its application is becoming a key issue of public debate, two camps are emerging. The larger faction is led by capitalist monopolies and their corporate-affiliated media and praises more or less uncritically the potential advantages of this new technology. This camp dominates the discourse both in Western countries as well as in China. Many liberal and progressive intellectuals (more often would-be intellectuals) are joining the enthusiasm of capitalist corporations about AI.

The other, smaller, faction is highly critical about AI and its potential and worries about its massive dangers for humanity. This camp does not have the support of capitalist states and monopolies and consists mostly of critical (petty-)bourgeois democratic forces. It includes a number of experts in AI and related sciences who are shocked about the risks of a wide-spread application of this technology. Similar to this sentiment, several prominent capitalists like Elon Musk have raised concerns too. However, Musk and his friends themselves accelerate the development and production of AI. They utilize warnings about its dangers only as a market strategy to create attention for their own investments.

A number of left-wing organisations have been cautious to take a position on AI until now. Others however have been bolder and express unreserved enthusiasm about AI as they uncritically view it as "*progress in the development of the productive forces*".

An example for such pseudo-Marxist AI advocates is Alan Woods' IMT – an self-proclaimed Trotskyist organisation known for its opportunist adaption to reformism (e.g. decades-long work within social democratic and populist parties; theory of peaceful and parliamentary transformation to socialism; support for the Great Russian chauvinist and pro-war Stalinist KPRF in Russia, etc.). [2] In a recently published article, this organisation expresses its enthusiasm about "*the amazing potential AI offers humanity*". It claims that that AI – which it praises "*as the most wondrous and general tool of human development yet devised*" – would be a "*revolutionary technology whose real potential is to harmonise and rationalise production and to enhance the creative powers of humanity*". [3]

According to the IMT, the only problem is that capitalism hinders AI to aid humanity with its progressive po-

tential. "*Marx explained that a given social system provides a framework for the development of the productive forces. But, at a certain stage, the productive forces outgrow the relations of production in which they must operate, and thus these relations of production become a fetter to further development. (…) AI, and other digital technologies such as the internet, represent means of production which are too advanced for capitalism to properly utilise. This is because capitalism is production for private profit. (…). Technology such as the internet and AI place a question mark over this process, because they employ automation to such a high degree.*"

However, once capitalism has been replaced by a socialist system, humanity could gain from the progressive potential of AI. "*In a socialist society this would not necessarily be a bad thing. The artist, for example, would have no fear of the powers of AI to produce 'artwork' at a moment's notice, since art would not be produced for profit, or as a means of living. Art would lose its fetishistic link to private property, and would be produced for its own sake, or rather, for the sake of society. It would be a genuine expression of the ideas and talents of people, and a way for them to communicate. As such, the generic works of AI would be no threat, instead they would be auxiliary tools for the artist.*" [4]

These quotes should be sufficient to show the IMT's naïve advocacy of AI which lacks any recognition of its gigantic dangers as instruments of the ruling class as well as its potential to replace humans for decision-making and to increase their social isolation.

Behind such an approach lies a methodology which has its roots in the Stalinist and social democratic distortion of Marxism which always took an uncritical view of all forms of productive forces. Or to put it differently, such revisionism is based on ideological adaption to what Marx called *commodity fetishism*, respectively one form of it – *technology fetishism*.

In the following chapters we will elaborate in more detail the Marxist approach and its fundamental differences to uncritical enthusiasm for AI as it is displayed by various revisionists.

2. What are productive forces?

One pillar of the AI enthusiasm of bourgeois and pseudo-Marxist ideologists is their one-sided and ultimately wrong understanding of the nature of productive forces. Fascinated with technical progress, they usually equate productive forces with production of commodities or with the accumulation of means of production.

In the Marxist theory, however, productive forces include labour forces ass well as the materials which they apply in the production process. Hence, productive forces are both means of production (such as machines), etc., goods and raw materials (including nature), as well as workers who operate the means of production and enter the social division of labour.

It is self-evident that the means of production and the worker are mutually dependent and, from the capitalist viewpoint, the purpose of applying the worker to the means of production lies in producing commodities which contain surplus value. Productive forces are not, then, simply a collection of material objects, but include also and above all people, their living conditions as well as nature, which is the object of labour. [5]

Such a comprehensive understanding of productive forces which does not reduce such to technology and means of production but retains a focus on the social and natural foundation of such technology, i.e. humans and nature, picks up the theoretical legacy of the Marxist classics. Marx himself emphasised repeatedly that the working class is the "*greatest productive power*".

„*An oppressed class is the vital condition for every society founded on the antagonism of classes. The emancipation of the oppressed class thus implies necessarily the creation of a new society. For the oppressed class to be able to emancipate itself it is necessary that the productive powers already acquired and the existing social relations should no longer be capable of existing side by side. Of all the instruments of production, the greatest productive power is the revolutionary class itself. The organisation of revolutionary elements as a class supposes the existence of all the productive forces which could be engendered in the bosom of the old society.*" [6]

In *Capital* Volume I, Marx also emphasized the intrinsic meaning of humans and nature as the basis of capitalist production. "*Capitalist production, therefore, develops technology, and the combining together of various processes into a social whole, only by sapping the original sources of all wealth — the soil and the labourer.*" [7]

Of the same tenor, Trotsky called the proletariat "*the most important productive force of modern society.*" [8] And in the famous "*Transitional Program*", published in 1938, he spoke about the "*stagnation of productive forces*". He did so while being fully aware of the fact that huge technological progress had taken place in the 1920s and 1930s (from airplanes and cars to radio). However, he stated that such progress did not translate in social progress for the vast majority of humanity – and this was the decisive question for him as a had a human-centred – and not technology-centred – approach to the question of productive forces. [9]

Nikolai Bukharin, a key theoretician of the Bolshevik Party, also shared such an approach to the character of productive forces. In one of his most important books published in the first years after the October Revolution 1917, he wrote: "*The aggregate labour power of society - a pure capitalist society, the proletariat - is one of the two components of the concept of the productive forces (for the productive forces are merely the sum total of the available means of production and labour power); and labour power, as the old economists repeatedly stressed, is the most important productive force.*" [10]

3. Commodity fetishism and technology fetishism

The uncritical approach of bourgeois and pseudo-Marxist ideologists to AI is no accident or simply a "wrong concept". It is based on their inability to see through the fog which Marx called "*commodity fetishism*" – a major ideological foundation of capitalism.

Basically, Marx understood by commodity fetishism that the social relations between humans appear as relations between things. Hence, the value of a commodity (including gold or money) lies supposedly in the nature of these things themselves while, in reality, it rather reflects the social labour objectified in such commodities under conditions of capitalist relations of production. From this follow various forms of such commodity fetishism like money

fetishism, capital fetishism, etc. [11]

"But it is different with commodities. There, the existence of the things qua commodities, and the value relation between the products of labour which stamps them as commodities, have absolutely no connection with their physical properties and with the material relations arising therefrom. There it is a definite social relation between men, that assumes, in their eyes, the fantastic form of a relation between things. In order, therefore, to find an analogy, we must have recourse to the mist-enveloped regions of the religious world. In that world the productions of the human brain appear as independent beings endowed with life, and entering into relation both with one another and the human race. So it is in the world of commodities with the products of men's hands. This I call the Fetishism which attaches itself to the products of labour, so soon as they are produced as commodities, and which is therefore inseparable from the production of commodities. This Fetishism of commodities has its origin, as the foregoing analysis has already shown, in the peculiar social character of the labour that produces them." [12]

A capitalist appears to be rich because he or she "works" as a CEO of a corporation, because of the ownership of shares at the stock market, because of getting a rent from financial or real estate assets, etc. But in reality, such wealth is not created by such managerial "work" nor by houses or by money. It is rather based on his or her position in the capitalist process of production and reproduction which allows to appropriate a share of surplus value produced by the workers in social production. Capitalists are not rich because of their "work" but because of their power to appropriate a share of the value produced by workers.

Such commodity fetishism is based on the alienated form of work in capitalism, i.e. on the separation of workers from their products of labour and the resulting reification of all human relations. It appears as if the workers would get paid for his labour while, in reality, he or she is only paid to reproduce his or her labour force. The difference between such wage and the exchange value of the commodity produced by the worker, is the surplus value which is appropriated by the capitalists. This "invisible" relationship between workers and capitalists resp. between workers and commodities is the basis for the mystified form of all kinds of phenomena in capitalist society.

It is because commodities appear to have their own value (independent of social labour), that people believe that machines create value – while in fact it is human labour. This is, by the way, the basis of the bourgeois illusion that an economy could be run on the basis of AI and robots.

It is because commodities appear to have their own value (independent of social labour), that bourgeois ideologists praise technological developments irrespectively if they result in human progress or if they result in expanding oppression of the popular masses and increasing destruction of the environment.

It is because commodities appear to have their own value (independent of social labour), that capitalists can sell all kind of useless stuff as absolutely necessary to people.

We shall note in passing that another form of fetishism in capitalism is state fetishism where the capitalist state appears to represent the people while, in reality, it is an instrument of the ruling class.

While all these are different forms of fetishism, they have a common basis: the mystification of social relations of exploitation and oppression by giving attributes to commodities, technology, state, etc. which are supposedly contained in their material, physical form.

As Marx wrote in the *Grundrisse*: "*The crude materialism of the economists who regard as the natural properties of things what are social relations of production among people, and qualities which things obtain because they are subsumed under these relations, is at the same time just as crude an idealism, even fetishism, since it imputes social relations to things as inherent characteristics, and thus mystifies them.*" [13]

Such mystification also applies to science as it is taught at bourgeois universities and applied by capitalist corporations. Here we have a form of fetishism which views sciences as "neutral" and "objective" and which ignores the crucial facts that scientists are under material pressure to provide results which their bosses wish for, and which would enable them to make career; likewise they ignore the fact that most scientists lack the ability to think dialectically but approach scientific problems rather from a mechanistic perspective.

Abram Deborin, the leading Marxist philosopher in the USSR in the 1920s before the Stalinist clampdown, once stated that without the method of materialist dialectic, science is doomed to take a bourgeois-empiricist character. Hence, he wrote: „*Materialist dialectic as comprehensive method must infuse all concrete and empiric sciences since it is, so to say, the algebra science which inserts the inner relationship to the concrete substance.*" [14]

The Hungarian Marxist philosopher György Lukács did already draw attention to this problem in his major work "*History and Class Consciousness*". "*But this tendency in capitalism goes even further. The fetishistic character of economic forms, the reification of all human relations, the constant expansion and extension of the division of labour which subjects the process of production to an abstract, rational analysis, without regard to the human potentialities and abilities of the immediate producers, all these things transform the phenomena of society and with them the way in which they are perceived. In this way arise the 'isolated' facts, 'isolated' complexes of facts, separate, specialist disciplines (economics, law, etc.) whose very appearance seems to have done much to pave the way for such scientific methods. It thus appears extraordinarily 'scientific' to think out the tendencies implicit in the facts themselves and to promote this activity to the status of science.* (…) "*The historical character of the 'facts' which science seems to have grasped with such 'purity' makes itself felt in an even more devastating manner. As the products of historical evolution they are involved in continuous change. But in addition they are also precisely in their objective structure the products of a definite historical epoch, namely capitalism. Thus when 'science' maintains that the manner in which data immediately present themselves is an adequate foundation of scientific conceptualisation and that the actual form of these data is the appropriate starting point for the formation of scientific concepts, it thereby takes its stand simply and dogmatically on the basis of capitalist society, It uncritically accepts the nature of the object as it is given and the laws of that society as the unalterable foundation of 'science'.*" [15]

It is such an adaptation to all forms of fetishism which make the opportunist left uncritical and unsuspicious towards bourgeois-progressive governments at the top of capitalist states, towards the capitalist state imposing a policy of Lockdown and Green Passes as an instrument of health policy (and also towards scientists paid by the capitalist state or corporations which approve such measures), … or towards new technologies such as AI.

We have called such an ideology "*social-bonapartism*" since it combines "socialist" rhetoric with lack of opposition or even outright support for a strong capitalist state (often with extraordinary powers) or for the application of technologies which massively empower monopolies and the state apparatus. [16]

Hence, we see that the enthusiastic approach of the IMT towards AI, quoted at the beginning of this essay, does not come out of the blue. It draws on the lack of mistrust towards capitalist state and monopolies embodied in the ideology of social-bonapartism.

4. The relationship between productive forces and the relations of productions

As we noted in our above-mentioned theses on AI, "*many people (including self-proclaimed Marxists) discuss the advantages and disadvantages of AI primarily from a technical point of view and treat it as a kind of neutral technology.*" Such an approach is the result of the fact that many socialists have a theoretical wrong understanding of the relationship between productive forces and the relations of production.

Basically, such revisionist "Marxists" consider that productive forces have a neutral and objectively revolutionary character. As the productive forces increasingly expand, they clash with the relations of production as the latter become a conservative fetter. Hence, they view the contradiction between productive forces and the relations of production as one between a revolutionary (productive forces) and a conservative factor (relations of production). While advocates of such an approach readily admit that the relations of production also influence the development of the productive forces, they limit such impact only to the possibility to slow down or even to temporarily halt the expansion of the productive forces.

An example for such a one-sided and mechanistic approach is Stalin well-known essay "*Dialectical and Historical Materialism*" published in 1938. "*[Another] feature of production is that its changes and development always begin with changes and development of the productive forces, and in the first place, with changes and development of the instruments of production. Productive forces are therefore the most mobile and revolutionary element of productions First the productive forces of society change and develop, and then, depending on these changes and in conformity with them, men's relations of production, their economic relations, change. This, however, does not mean that the relations of production do not influence the development of the productive forces and that the latter are not dependent on the former. While their development is dependent on the development of the productive forces, the relations of production in their turn react upon the development of the productive forces, accelerating or retarding it. In this connection it should be noted that the relations of production cannot for too long a time lag behind and be in a state of contradiction to the growth of the productive forces, inasmuch as the productive forces can develop in full measure only when the relations of production correspond to the character, the state of the productive forces and allow full scope for their development. Therefore, however much the relations of production may lag behind the*

development of the productive forces, they must, sooner or later, come into correspondence with – and actually do come into correspondence with – the level of development of the productive forces, the character of the productive forces. Otherwise we would have a fundamental violation of the unity of the productive forces and the relations of production within the system of production, a disruption of production as a whole, a crisis of production, a destruction of productive forces." [17]

Such a point of view has been upheld by Stalinist ideologues long after the death of the dictator. In a standard work on Marxist philosophy, a group of Soviet scholars presented the role of technology in the late 20th century as a beaming picture of technological progress and automation developed under capitalist conditions.

„*Scientific advances and their technological application by the middle of the 20th century created the preconditions for a new grandiose leap in the development of the productive forces, for the contemporary scientific and technological revolution, which combines revolutionary changes in science and in technology. This revolution introduces the age of automated production and leads to a fundamental change in man's place in production by creating in the course of its development the actual technical preconditions for realisation of Marx's prevision. The working machine and motor made it possible to transfer from man to technical devices the function of immediate influence on the object of labour. But man still retained control of the machine and the process of production. Thanks to computer techniques, the machine is today taking over the function of controlling production as well. The direct process of material production can now be carried out automatically, without human participation. This raises the productive forces to a qualitatively new level. At the moment we are still at the beginning of this process, but its prospects are already fairly clear—development is moving from partial to full automation, when there will be not merely a tool, or even a system of machines, between man and nature, but an automated production process.*" [18]

It would be completely mistaken to imagine that it is only Stalinism which advocates such a fetishist understanding of the productive forces. Social democratic ideologists basically have shared such an approach as do various "left-wing" academics. [19] And in the last decade several self-proclaimed "Marxist" ideologists take AI and other new technologies as confirmation of such an approach. As examples for the latter we might refer to Aaron Bastani's decadent Manifesto for a "*fully automated luxury communism*" which is based on "*the forward march of automation and, ultimately, artificial intelligence*". [20] Nick Srnicek and Alex Williams concept of a "*post-capitalist world without work*" is another example for such a trend. [21]

Kohei Saito, a Marxist scholar from Japan, whose works on Ecosocialism have recently gained popularity in Japan and internationally, elaborates a well-founded defence of Marx's approach to productive forces which was free of technology fetishism but rather focused on the development of humanity's social progress. In a new book he correctly points out that many self-proclaimed Marxists fetishize the productive forces in the form as they develop under the capitalist property relations. "*The traditional view fetishizes the productive forces developed under capitalism, regarding them as if they were neutral forces that can be taken over by the proletariat and utilized for establishing a socialist society. What is missing here is an analysis of the real material transformation of the labour process under capitalist relations of production that 'corresponds to' the capitalist mode of production.*" [22]

Two other renown Marxist theoreticians who intensively dealt with the relationship of capitalism and environment – Fred Magdoff and John Bellamy Foster – remarked in a

similar spirit: "*Where technology is concerned, capitalism is far from neutral. It invariably favors those particular technologies that enlarge profits, accumulation, and economic growth. Indeed, it has a history of promoting those technologies that are most destructive of the environment: fossil fuel dependency, toxic synthetic chemicals (arising in particular from petrochemical production), nuclear energy, large dams, etc. In its headlong rush to expand, capitalism systematically gives rise to technologies that produce waste in vast quantities—as long as the costs can be externalized on nature and society and not on corporations themselves. Given that the technological objective is to feed growth, the tendency is to choose those technologies that maximize the overall throughput of resources and energy in the interest of higher overall economic output.*" [23]

A fundamental problem with the technology-fetishist approach is its ignorance of the fundamental fact that the relationship between productive forces and the relations of productions is dialectical – i.e. it is not only the first which determines the latter but also, vice versa, the latter shapes the former.

As the ruling class has great interest in warfare to expand its spheres of influence, it makes sure that technological developments take place in fields which are relevant to improve its military power. Since oil corporations had no interest in losing their business, they suppressed for decades technological innovation which could have replaced fuel-driven automobiles. Since humanity is dominated by imperialist powers and monopolies, huge resources are invested to develop high-definition television, ever-faster smartphones, etc. instead of developing technologies which could substantially improve the living conditions of the popular masses in the semi-colonial countries of the Global South.

Or, to give one more example: a growing number of members of the ruling elite in Western countries is eager to achieve the prolongation of their lives. Hence, they finance massive research in molecular biology and genetic modification to extend their lifetime so that they can vegetate as geriatrics. At the same time, the majority of humanity suffers from well-known diseases which could easily be cured if the necessary financial means would be made available.

Advocates of a "productive forces fetishist" approach often refer to the well-known passage of Marx in the *1859 Preface* to his *Contribution to the Critique of Political Economy*. "*In the social production of their existence, men inevitably enter into definite relations, which are independent of their will, namely relations of production appropriate to a given stage in the development of their material forces of production. The totality of these relations of production constitutes the economic structure of society, the real foundation, on which arises a legal and political superstructure and to which correspond definite forms of social consciousness. The mode of production of material life conditions the general process of social, political and intellectual life. It is not the consciousness of men that determines their existence, but their social existence that determines their consciousness. At a certain stage of development, the material productive forces of society come into conflict with the existing relations of production or – this merely expresses the same thing in legal terms – with the property relations within the framework of which they have operated hitherto. From forms of development of the productive forces these relations turn into their fetters. Then begins an era of social revolution. The changes in the economic foundation lead sooner or later to the transformation of the whole immense superstructure.*" [24]

However, all what Marx did in his *1859 Preface* (and other relevant works) was to present a rough and general outline of the most fundamental tendencies in the historical development. No less but no more. Unfortunately, various revisionists take such a general outline as the concrete characterization of the relationship between productive forces and the relations of productions and end up in such one-sided mechanistic views as quoted above.

In contrast to the pro-capitalist fetishists, Marx had a much more dialectical approach to the relationship between productive forces and the relations of productions as he fully recognised how the latter rebound on the productive forces – in particular on the oppressed classes as well as nature (see also his above-mentioned quote on the negative consequences of capitalist production for "*the soil and the labourer*").

"*We are still concerned here only with the way in which the capital realization process is its devaluation process. Out of place here would be the question how, while it has the tendency to heighten the productive forces boundlessly, it also and equally makes one-sided, limits etc. the main force of production, the human being himself, and has the tendency in general to restrict the forces of production.*" [25]

"*Capitalist production, by collecting the population in great centres, and causing an ever-increasing preponderance of town population. (…) [I]t disturbs the circulation of matter between man and the soil, i.e., prevents the return to the soil of its elements consumed by man in the form of food and clothing; it therefore violates the conditions necessary to lasting fertility of the soil.*" [26]

Does this mean that we deny the primary role of the productive forces in relation to the relations of production, that we reject the thesis the productive forces are the driving force in relation to the relations of production? Not at all. We think that those who claim so make an error in an idealist direction.

However, we reject a mechanistic understanding of such a relationship. In fact, both – productive forces and relations of production – influence and shape each other. Most importantly, of course, is the role of the class struggle – as Marx and Engels emphasized in the Communist Manifesto. It is only in the last instance that the productive forces are the more determining, more historical driving force in relation to the relations of production.

The Marxist classics took such a dialectical approach on various issues. Let us give two examples – and analogies at the same time. Engels explained in his famous letter to Joseph Bloch that the relationship between basis and superstructure must not be understood as a one-sided relationship where the superstructure is only a passive reflection of the economic relations at the basis. No, he insisted that it is a reciprocal relationship where the basis is only "in the last instance" the determining factor.

„*According to the materialistic conception of history, the production and reproduction of real life constitutes in the last instance the determining factor of history. Neither Marx nor I ever maintained more. Now when someone comes along and distorts this to mean that the economic factor is the sole determining factor, he is converting the former proposition into a meaningless, abstract and absurd phrase. The economic situation is the basis but the various factors of the superstructure – the political forms*

Table 1. Global Internet Penetration Rate, 1997-2017 [34]

Internet Users Per 100 Inhabitants

1997	2002	2006	2010	2014	2017
11	42	54	66	76	81

Figure 1. Global Industrial Robot Density, 2000–2020 [35]

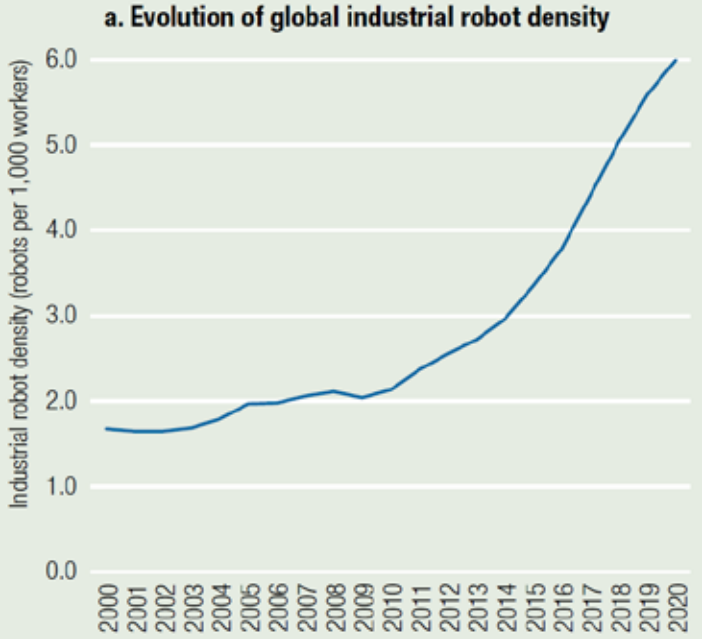
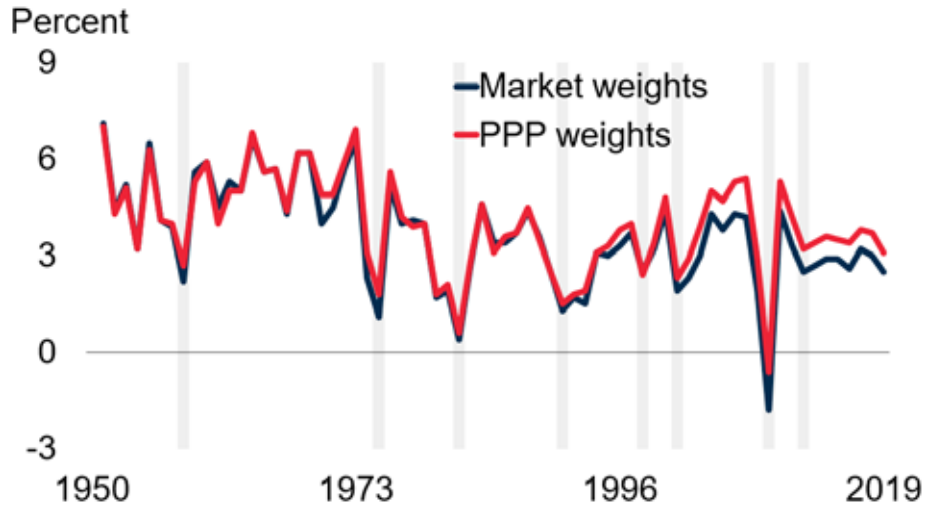


Table 2. Industrial Growth Rates, Selected Countries and Regions, 1950–2014 [36]

(Percent, average per annum)

Groups	*1950-73*	*1973-90*	*1990-2007*	*2007-14*
Germany, Japan & United States	7.9	2.4	2.2	0.3
European periphery	8.9	3.3	2.8	0.0
Asia	8.5	5.8	4.2	4.1
Latin America & the Caribbean	5.7	2.7	2.2	1.0
Middle East & North Africa	6.2	6.1	4.5	3.2
Sub-Saharan Africa	5.5	3.5	3.9	4.1

Figure 2. World Output Growth 1960-2019 [37]



of the class struggles and its results – constitutions, etc., established by victorious classes after hard-won battles – legal forms, and even the reflexes of all these real struggles in the brain of the participants, political, jural, philosophical theories, religious conceptions and their further development into systematic dogmas – all these exercise an influence upon the course of historical struggles, and in many cases determine for the most part their form. There is a reciprocity between all these factors in which, finally, through the endless array of contingencies (i.e., of things and events whose inner connection with one another is so remote, or so incapable of proof, that we may neglect it, regarding it as nonexistent) the economic movement asserts itself as necessary. Were this not the case, the application of the history to any given historical period would be easier than the solution of a simple equation of the first degree. We ourselves make our own history, but, first of all, under very definite presuppositions and conditions. Among these are the economic, which are finally decisive. But there are also the political, etc." [27]

It is the same with the relationship between being and consciousness where the latter is not merely a passive reflection of the objective conditions but rather an active force which intervenes and shapes reality. It is only in the last instance that being is the determining factor in relation to consciousness.

Another important aspect in the relationship between productive forces and the relations of productions is the fact that such relationship evolves and changes in the course of a historic epoch. In the early stages when a new historical social formation has emerged, the relations of productions are rather favourable for the growth of the productive forces. However, later, the same relations of productions increasingly become a fetter for the productive forces and the larger the contradiction between the two becomes, the more the relations of productions deform and distort the productive forces and, ultimately, provoke their decline.

The naïve advocates of AI under the disguise of "Marxism" completely ignore the fact that we are living in a period of capitalist decay where the contradiction between productive forces and the relations of productions is increasingly intensifying. Trotsky wrote in the *Transitional Program* about the "stagnation of the productive forces" and that "*the objective prerequisites for the proletarian revolution have not only 'ripened'; they have begun to get somewhat rotten*". This was said in 1938 – how much more is this relevant today as we are living in a historic period of catastrophes and climate crisis?!

Another consequence of this process is the tendency of the transformation of productive forces into destructive forces. We will deal with this issue in the following chapter.

5. Transformation of productive forces into destructive forces

Such an increasing contradiction between the productive forces and the relations of production must have consequences for the development of the productive forces itself. A plant which is caged in a box can not sprout indefinitely – at some point it is forced either to stop growing, to extend sideways or downwards or to die back.

Hence, the historically outdated property relations necessarily hinder the further development of productive forces – think about long-living bulbs or smart phones which are not produced because that would be less profitable, to name only two well-known examples. Or take the example that the capitalist state pushes scientists to develop new technologies which have an extraordinary power of destruction (e.g. bio-chemical weapons, hypersonic missiles) or which focus on surveillance of the population.

Marx and Engels emphasised this train of thoughts from early on. In *The German Ideology*, they stated: "*It produced a mass of productive forces, for which private property became just as much a fetter as the guild had been for manufacture and the small, rural workshop for the developing handicrafts. These productive forces receive under the system of private property a one-sided development only, and for the majority they become destructive forces.*" [28]

And at another point, they wrote in the same book: „*We have shown that at the present time individuals must abolish private property, because the productive forces and forms of intercourse have developed so far that, under the domination of private property, they have become destructive forces, and because the contradiction between the classes has reached its extreme limit.*" [29]

Modern history has provided us with numerous examples for the accuracy of the Marxist thesis of the increasing tendency of the transformation of productive forces into destructive forces. Think about modern means of warfare; nuclear power plants which are a permanent risk for the population, and which produce highly dangerous waste; about cars, aeroplanes and factories designed in such a way that deplete the ozone layer; about genetic modified crops which undermine sustainable agriculture and which have devastating consequences for bio-diversity and health.

Hence, the latest development of modern technology, Artificial Intelligence, is just another example for such a transformation of productive forces into destructive forces. It should be taken as a serious warning that dozens of leading AI experts have recently signed the following statement: "*Mitigating the risk of extinction from AI should be a global priority alongside other societal-scale risks such as pandemics and nuclear war.*" [30]

6. Consequences of AI for the capitalist economy

At this point, we shall briefly discuss the consequences of the widespread application of AI for the capitalist economy. Various monopoly capitalists and their economics experts are optimistic that AI will provoke a new stimulus for a period of accelerated economic growth.

It is certainly true that, in the first period, those corporations which apply such technology initially will gain an advantage to their competitors as they will be able to produce cheaper but sell their commodities at the average market price. However, as soon as the application of AI has become more widespread, such advantage disappears.

The fundamental problem of capitalism – something which is a closed book to bourgeois economists – is the fact that it is only living labour which creates value and, hence, surplus value. Dead labour, i.e. machines (like AI), do not create value. Such machines only transmit already existing value which is embodied in AI by its previous development by labour force. However, it is only such surplus value which allows capitalists to make profit.

Table 3. Growth in Labour Productivity in Advanced Economies, 1970-2018 [38]

	GDP per hour worked, percentage change at annual rate			
	1970-96	*1996-2004*	*2004-14*	*2014-18*
United States	1,52	2,50	1,12	0,7
United Kingdom	2,56	2,45	0,45	0,6
Italy	2,65	0,64	0,04	0,0
Germany	2,90	1,68	0,86	0,7
France	3,09	2,02	0,71	0,7
Japan	3,33	1,94	0,87	0,9
Korea	6,95	5,19	3,58	1,8

Figure 3. World Per Capita Output Growth 1960-2019 [39]

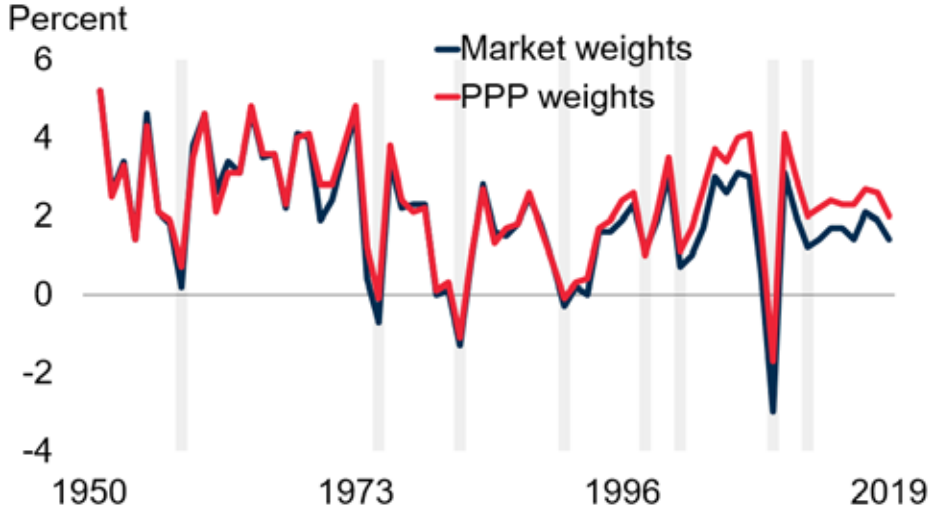
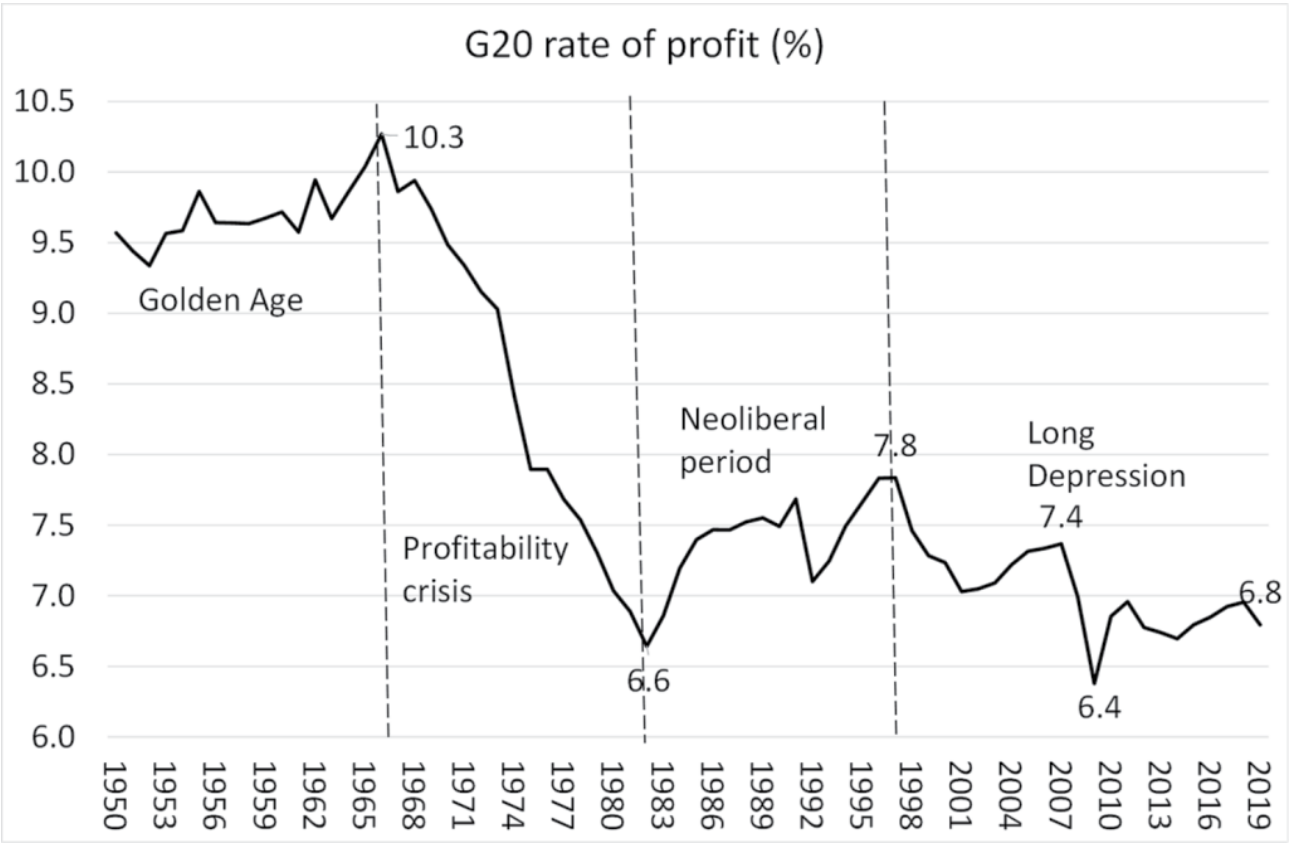


Figure 4. G20 Rate of Profit, 1950-2019 [40]



Hence, as we noted in the above-mentioned RCIT-Theses on AI, the application of such new technology will not provoke a new period of growth but rather accelerate the tendency of the profit rate to fall. In other words, it will rather deepen the capitalist crisis and push the system closer towards its collapse.

Marx did already point to these fundamental problems of capitalism. Such he noted in the *Grundrisse*, his groundwork for *Capital*: "*Since this decline of profit is synonymous with a decline in the ratio of immediate labour to the amount of objectified labour which it reproduces and posits anew, capital will try everything to make up for the smallness of the proportion of living labour to the size of capital in general, and hence for the smallness of the proportion which surplus value, if expressed as profit, bears to the preposited capital. It will seek to do so by reducing the allotment made to necessary labour and by still more expanding the quantity of surplus labour with regard to the whole labour employed. Hence the highest development of productive power together with the greatest expansion of existing wealth will coincide with depreciation of capital, degradation of the labourer, and a most straightened exhaustion of his vital powers. These contradictions lead to explosions, cataclysms, crises, in which by momentaneous suspension of labour and annihilation of a great portion of capital the latter is violently reduced to the point where it can go on fully employing its productive powers without committing suicide. Yet, these regularly recurring catastrophes lead to their repetition on a higher scale, and finally to its violent overthrow*." [31]

And in chapter 24 of Volume I of *Capital* Marx outlines capitalism's destiny as follows: "*Along with the constantly diminishing number of the magnates of capital, who usurp and monopolise all advantages of this process of transformation, grows the mass of misery, oppression, slavery, degradation, exploitation; but with this too grows the revolt of the working class, a class always increasing in numbers, and disciplined, united, organised by the very mechanism of the process of capitalist production itself. The monopoly of capital becomes a fetter upon the mode of production, which has sprung up and flourished along with, and under it. Centralisation of the means of production and socialisation of labour at last reach a point where they become incompatible with their capitalist integument. Thus integument is burst asunder. The knell of capitalist private property sounds. The expropriators are expropriated. The capitalist mode of appropriation, the result of the capitalist mode of production, produces capitalist private property. This is the first negation of individual private property, as founded on the labour of the proprietor. But capitalist production begets, with the inexorability of a law of Nature, its own negation. It is the negation of negation. This does not re-establish private property for the producer, but gives him individual property based on the acquisitions of the capitalist era: i.e., on co-operation and the possession in common of the land and of the means of production*." [32]

Such a Marxist insight is not only an "abstract" thesis but one which can be observed in the reality of capitalist economy with help of official statistics. In fact, we did already see in past decades that the massive introduction of new technologies (computer, industrial robots, internet, etc.) did not result in the acceleration of economic growth. It did not even increase the growth rates of labour productivity. In other words, the capitalist world economy has experienced a long-term period of stagnation and decline – of course, with cyclical ups and downs – since the 1970s and, particularly, since 2008 despite the widespread introduction of modern technologies. We did already point to this in other works and will limit ourselves to present a few statistical facts. [33]

In Table 1 and Figure 1 we see the massive growth of internet users as well as the increasing application of industrial robots in global economy.

However, such spread of modern technologies did not translate into acceleration of economic growth. In Figure 2 and Table 2 we show that growth rates of global Gross Domestic Product (GDP) respectively for industrial production did not increase since the mid-1970s but rather decline.

In Figure 3 and Table 3 we see the same trend for global labour productivity.

Finally, we reproduce a figure provided by Michael Roberts – a renown Marxist economist – which shows that such decline of output growth had its ultimate basis in the tendency of the profit rate to fall. (see Figure 4)

In summary, we see that the introduction of new technologies does not result in acceleration of growth if it takes place against the background of long-term decline of capitalist accumulation. In fact, a capitalist economy largely based on AI would produce only a small amount of surplus value and, at the same time, would provoke massive political and social instability given the fact that it would radically increase the masses of precarious workers and unemployed. To a certain degree, one can say that AI – as a non-value producing technology – pre-empts the end of capitalism.

7. The liberation of productive forces from the fetters of obsolete capitalist relations of production

Another mistaken interpretation of Marx's approach by "left-wing" AI advocates refers to his formulation of the liberation of productive forces from the fetters of obsolete capitalist relations of production (see the above-mentioned quote from the *1859 Preface*). These "Marxist" distorters of Marxism imagine that this statement would simply mean that the capitalist relations of production hinder the full potential of the productive forces (shaped under capitalism) to grow so that one has to transform the capitalist relations of production in order to allow the productive forces to resume their growth – in the same direction and with the same character as they did before under capitalist conditions.

In reality, Marx's idea of the liberation of productive forces from the fetters of obsolete capitalist relations of production means something very different. First, as we elaborated in chapter 2, the most important productive force are the labouring masses. Hence, the liberation of productive forces means, first and foremost, the liberation of the working class and the popular masses so that they develop their needs and skills without the shackles of capitalism.

Second, the liberation of productive forces from the fetters of obsolete capitalist relations of production simple means that the productive forces are no longer deformed, distorted and hindered in their development for the benefit for the whole society.

Furthermore, it would be mistaken to imagine the process of the liberation of productive forces from the fetters of private property relations as a *linear* process, i.e. that the

productive forces would continuously grow and, when they hit the limits imposed by the capitalist system, this provokes social and political explosions resulting in the removal of the obsolete relations of production and their replacement by a socialist society. Such a conception would be very undialectical and mechanistic.

In fact, the process of clash between the productive forces and the relations of production can have a *protracted* character without a decisive solution for a longer period. Or it can result in a collapse of the productive forces and a historical regression for a certain period.

There are various examples for such long periods of crisis or even decay. Take the epoch of death agony of the Roman Empire to be replaced by further centuries of short-lived empires, crises and wars; or, to name another example, China in the long period of rivalling kingdoms, devastating wars and misery starting from the late 2nd century till the late 6th century (the so-called era of the *Six Dynasties*). We find similar examples of long crisis periods in more recent history like Europe's agonizing epoch of late feudalism in the 14th to the 17th century characterized by major wars and devastating plagues; or China's "*century of humiliation*" starting in 1839 when it was raped by imperialist powers, corrupted officials and reactionary warlords.

And, finally, we shall refer to the current epoch of monopoly capitalism. It saw already a period of world wars, mass killings and economic collapse (1914-45); and currently, since the 2008, we are living in period characterized by civilization threats, wars and economic depression. [41]

8. Productive forces, alienation and way of life under capitalism

In the RCIT Theses on AI, we stated: "*AI represents respectively facilitates an extreme form of capitalist alienation. It massively increases the already existing tendency of capitalism to alienate human beings from each other as well as from nature. It allows for isolation of humans both in workplaces as well as in their social life (home office, Metaverse, etc.) It increases the passivity of humans since they can seek refuge in virtual reality, i.e. combining the status of a virtual super-warrior with physical laziness completely disconnected from society and nature. Furthermore, AI takes social skills like communication away from humans. It is capitalist alienation ad infinitum. In short, AI accelerates the already existing tendency of capitalism for de-socialisation of humans and dehumanization of society ("Entgesellschaftlichung der Menschen und Entmenschlichung der Gesellschaft").*"

Such an approach is based on Marx's understanding of the nature of productive forces and the role of production in the society. As we demonstrated above, the founders of scientific socialism emphasised that productive forces include not only technical means of production but also, and in particular, the producers, i.e. the working class.

Furthermore, they pointed to the close relationship of the different spheres of production and reproduction of capital, i.e. that production, distribution, exchange and consumption are all part of a totality.

„*The conclusion we reach is not that production, distribution, exchange and consumption are identical, but that they all form the members of a totality, distinctions within a unity. Production predominates not only over itself, in the antithetical definition of production, but over the other moments as well. The process always returns to production to begin anew. That exchange and consumption cannot be predominant is self-evident. Likewise, distribution as distribution of products; while as distribution of the agents of production it is itself a moment of production. A definite production thus determines a definite consumption, distribution and exchange as well as definite relations between these different moments. Admittedly, however, in its one-sided form, production is itself determined by the other moments. For example if the market, i.e. the sphere of exchange, expands, then production grows in quantity and the divisions between its different branches become deeper. A change in distribution changes production, e.g. concentration of capital, different distribution of the population between town and country, etc. Finally, the needs of consumption determine production. Mutual interaction takes place between the different moments. This the case with every organic whole.* " [42]

This is the economic basis for the fact that capitalism as a specific mode of production determines a specific mode of life. As Marx noted in the above-mentioned quote from the *1859 Preface* to his *Contribution to the Critique of Political Economy:* "*The mode of production of material life conditions the general process of social, political and intellectual life.*"

Hence, the alienation of humans – an intrinsic feature of capitalism – is rooted in the separation of the producers from the products of their labour, from their lack of control over the whole process of production. Such a process is the basis for commodity fetishism (as we explained above). At the same time, it is also the fundament for alienation *in all other sectors of social life* – from the spheres of consumption, interpersonal relationships as well as ideology. [43]

"*Hence the rule of the capitalist over the worker is the rule of things over man, of dead labour over the living, of the product over the producer. For the commodities that become the instruments of rule over the workers (merely as the instruments of the rule of capital itself) are mere consequences of the process of production; they are its products. Thus at the level of material production, of the lifeprocess in the realm of the social - for that is what the process of production is - we find the same situation that we find in religion at the ideological level, namely the inversion of subject into object and vice versa. Viewed historically this inversion is the indispensable transition without which wealth as such, i.e. the relentless productive forces of social labour, which alone can form the material base of a free human society, could not possibly be created by force at the expense of the majority. This antagonistic stage cannot be avoided, any more than it is possible for man to avoid the stage in which his spiritual energies are given a religious definition as powers independent of himself. What we are confronted by here is the alienation of man from his own labour.*" [44]

"*Here, as everywhere, the identity of nature and man appears in such a way that the restricted relation of men determines their restricted relation to one another, and their restricted attitude to one another determines men's restricted relation to nature.*" [45]

Hence, the process of increasing contradiction between the productive forces and the relations of production does not only result in increasing deformation and decay of productive forces but also in increasing deformation and decay of consumption and social life. Hence, we have, on one hand, a growing number of poor and victims of catastrophes caused by war and climate change, etc. and, on the other hand, societies in rich countries where all kinds of luxury products are invented to make people feel comfortable in their increasingly isolated lives.

I hope readers forgive me if I briefly recount an advertisement clip which I recently saw. In this clip, a woman sits in front of a computer screen. Aside to the keyboard is a bowl with cookies. Instead of taking the cookies with her hand, she has a robot arm on the desk which picks up a cooky and puts it in her hand. This symbolises the absurd application of the most modern achievements in robot technologies for the purpose of making humans even more passive.

AI could become an instrument to further deepen human's alienation not only from the products of their labour but also from the society as such. Concepts like home office, Metaverse, etc all point in the same direction.

These technological developments are also key for various projects of the ruling class aiming at the forced manipulation of nature. Examples for this are forms of bioengineering which shall satisfy the decadent desire of the rich for immortality. [46]

Another example is the appalling plan of Elon Musk to implant chip in a human brain. "*With the help of a surgical robot, a piece of the skull is replaced with a Neuralink disk, and its wispy wires are strategically inserted into the brain, an early demonstration showed. The disk registers nerve activity, relaying the information via a common Bluetooth wireless signal to a device such as a smartphone, according to Musk.*" Musk's statement – "*It could be under your hair and you wouldn't know*" – is not at all comforting but rather very disturbing! [47]

Currently, there seem to exist two trends within the ruling class concerning the question how to apply AI and with which purpose. One camp strives to replace living labour force with machines. The other camp rather wants to combine humans with machines in order to make them more productive. Needless to say, that both are threatening for the working class, in fact, for the future of all humanity.

In fact, all these are examples which demonstrate the grotesque threats which humanity is facing from the small elite of billionaires. These examples point to the tendencies of decaying capitalism to create a world of *Techno-Totalitarism* where relations to things replace human relationships, where people see beautiful picture in the virtual world instead of real experience in nature and where a small elite expands surveillance, control and manipulation of the popular masses via the latest technological "achievements".

Charles Thorpe, a radical academic at the University of California, has published a remarkable book "*Necroculture*" which critically analysis these developments of capitalism in the present age. He warns against "*contemporary capitalist technoscience*" and notes: "*The subsumption of life by capital is culturally expressed in fetishistic interest in artificial things—technology and consumer products—to the exclusion and detriment of the living world of nature and human relationships. Obsessed with commodities and technological applications, necroculture treats with indifference the ongoing degradation of the richness of human life and the diversity of the natural world. It combines apocalyptic resignation and apocalyptic longing. It is increasingly evident that the wasteful and exploitative consumer-capitalist way of life must come to an end.*" [48]

He relates these to the intrinsic feature of this social formation – the alienation of labour and the rule of dead capital over living labour. "*Artificial life and a dead planet are twin expressions of a world built on the basis of alienated labor. The alienation of one's own living activity produces an alienated relationship with the broader world of the living. The degradation of labor is implicated in the degradation of life. The imposition of capital's framework of value devalues the particularities and qualitative potentiality of the individual human being. The broader living world of nature is also deprived of value, as that which cannot be rendered in cash terms no longer has value; hence, much of the Earth becomes a sink for pollution and other "externalities" of capitalist production. The standardization and disciplining of human productive activity is accompanied by the standardization and control of the reproductive processes of natural organisms. The living is reified, then, symbolically in terms of the way in which it is valued—quality being reduced to quantity—and practically, as both human activity and nature more broadly are degraded, standardized, and routinized, becoming increasingly thing-like.*" [49]

In other words, the decline of productive forces, while not excluding technical innovations, results inevitable in a decline of social life and inter-personal relationships as well as the degradation of Earth. The more productive forces become destructive forces, the more broken social relationships become between humans. AI – representing the domination of dead labour over living labour – could be a key element to deepen, i.e. worsen, this process.

9. Conclusions

We conclude our pamphlet by reemphasising that the AI under control of the capitalist class represents a massive danger for the oppressed classes. Such danger is *not* that AI calculates faster than humans or that it creates machines which are stronger (computer have done so already in the past). The dangers are rather:

1) that AI *expands the power of the ruling class and its system of Chauvinist State Bonapartism*;

2) that AI results in further *de-socialisation of humans and dehumanization of society* ("*Entgesellschaftlichung der Menschen und Entmenschlichung der Gesellschaft*");

3) that AI replaces humans as decision-makers and make them losing control of society.

4) that AI is extraordinary energy-intensive and has massive negative consequences for environment.

Hence, it is crucial for socialists:

a) to support workers and popular opposition against AI;

b) to explain the link between AI and capitalism and that the main task is to fight against and to overthrow those who control AI – the imperialist monopolies and powers;

c) to transform spontaneous outrage into class-conscious struggle against the ruling class.

Humanity will be free of the dangers which AI represents only if it gets rid of capitalism and establishes a socialist society. Then, society will discuss and decide which technologies it will keep and which not, which technologies it wants to develop further and, if so, in which direction.

Ernest Mandel, a great Marxist thinker of the second half of the 20th centuries (irrespective of his political deficiencies), once noted very appropriate: "*From the moment on where one drops the illusionary axiom that 'the current technology is the only possible one', one can formulate the following priorities: one has to create the socio-economic, socio-intellectual and socio-moral conditions to encourage all research and technological innovations which can restore the ecological equilibrium,*

against those which want to further worsen it irrespective of the consequences for private costs. Priority should be given to the development of a different technology which orients completely towards the harmonic development of the individuum and the conservation of the natural resources – and not the maximation of private profit. In other words: the criteria of investment must be the combination of long-term economic, social and natural costs; this means one has to orientate towards a socialist planned economy." [50]

Surely, one can not speculate in detail about future technologies after we have replaced the system of class oppression and exploitation with a free, socialist society. But it is clear to us that the direction must not be replacing humans as actors, must not be increasing passivity but rather increasing collective activity, exchange and decision-making. As we stated in the RCIT-Theses: "*As a general principle, we can say that socialists support technology which makes human beings more sovereign, more part of the collective; at the same time, we oppose every technology which limit or even endanger the freedom and independence of human beings, and which make them more isolated. Hence, contrary to the illusions of the middle-class left, socialism is not capitalist consume but more and cheaper. No, socialism – in the Marxist understanding – is a completely different mode of production and consumption which allows humans to lead an active, social, sustainable and manifold life in a healthy relation to nature.*"

Marx noted in one of his early works – the *Economic and Philosophic Manuscripts* – that authentic communism means the resolution of the conflict between humans and between humans and nature. "*Communism as the positive transcendence of private property as human self-estrangement, and therefore as the real appropriation of the human essence by and for man; communism therefore as the complete return of man to himself as a social (i.e., human) being – a return accomplished consciously and embracing the entire wealth of previous development. This communism, as fully developed naturalism, equals humanism, and as fully developed humanism equals naturalism; it is the genuine resolution of the conflict between man and nature and between man and man – the true resolution of the strife between existence and essence, between objectification and self-confirmation, between freedom and necessity, between the individual and the species. Communism is the riddle of history solved, and it knows itself to be this solution.*" [51]

Indeed, only such a communism means real freedom and self-determination!

Footnotes

1 RCIT: Artificial Intelligence: A Leviathan Monster Serving the Ruling Class. Theses on Artificial Intelligence and its application in the period of capitalist decay. A first approach from a Marxist viewpoint, 7 May 2023. https://www.thecommunists.net/theory/rcit-theses-on-artificial-intelligence/; Medina Avdagić: Why ChatGPT and similar technologies are more dangerous than you might think. How socialists should approach deep-learning A.I., https://www.thecommunists.net/theory/why-chatgpt-is-more-dangerous-than-you-think/

2 On the programmatic tradition of the IMT see e.g. the pamphlet by Michael Pröbsting: The Poverty of Neo-Imperialist Economism. Imperialism and the national question - a critique of Ted Grant and his school (CWI, ISA, IMT), January 2023, https://www.thecommunists.net/theory/grantism-imperialism-and-national-question/

3 This and the following quotes are from Daniel Morley: Artificial Intelligence: doomsday for humanity, or for capitalism? International Marxist Tendency, 05 May 2023, https://www.marxist.com/artificial-intelligence-doomsday-for-humanity-or-for-capitalism.htm

4 We shall give two more quotes from the same article which also reflect the unlimited enthusiasm of the IMT about AI. "*By feeding deep learning AI with such data, it would be more than capable of devising, alongside elected committees, a long term plan for the economy, which would maximise efficiency to finally meet the needs of humanity, so that no one need go hungry or homeless, or fear for their job. In this way, vast swathes of waste could be eliminated and the working week rapidly shortened. Not only would AI be enormously helpful in drawing up and adapting such a plan, it would have the benefit of helping the people involved in planning to see past whatever biases or limitations may exist in their thinking.*"

"*This is the potential of the latest in AI technology. We have at our fingertips the technology to bring harmony into production, to eliminate the wasteful excesses, greed, irrationality and shortsightedness of the capitalist system. We could use it to give all of humanity not only the things they need to live well, but the power to create artwork, or to redesign and improve their own home, workplace or neighbourhood. It will make the building of a socialist society free from all scarcity and class distinctions faster and more painless.*"

5 For a more extensive discussion of the nature of productive forces see e.g. Michael Pröbsting: Die widersprüchliche Entwicklung der Produktivkräfte im Kapitalismus. Die Frage des Fortschritts im Kapitalismus vom Standpunkt der marxistischen Theorie aus betrachtet, in: Revolutionärer Marxismus Nr. 37 (2007), https://www.thecommunists.net/theory/archive-documents-from-the-lrci-and-lfi/#anker_26; an English-language summary of this essay is reproduced as an appendix ("*What are productive forces?*") to the chapter "*Imperialism, Globalization and the Decline of Capitalism*" which was published in the book by Richard Brenner, Michael Pröbsting, Keith Spencer: The Credit Crunch - A Marxist Analysis, London 2008, https://www.thecommunists.net/theory/archive-documents-from-the-lrci-and-lfi/#anker_24. See also Michail Mtschedlow: Der Marxismus-Leninismus über die Wechselbeziehung von Natur und Gesellschaft, in: Marx-Engels-Jahrbuch 10, Dietz Verlag, Berlin 1987, pp. 9-30; Carl-Erich Vollgraf: Marx über die sukzessive Untergrabung des Stoffwechsels der Gesellschaft bei entfalteter kapitalistischer Massenproduktion, in: Beiträge zur Marx-Engels-Forschung. Neue Folge 2014/15. Hamburg 2016. S. 106-132. Concerning empirical studies of the development of productive forces with a focus on the working class see e.g. the extraordinary detailed historical studies of the late Jürgen Kuczynski in the 40 volumes of his *Geschichte der Lage der Arbeiter unter dem Kapitalismus* (Akademie-Verlag, Berlin 1961-72). Kuczynski was a famous German economy historian in the Stalinist tradition, who wrote numerous books about the history of capitalism and the working class. He was a kind of German version of Eric Hobsbawn.

6 Karl Marx: The Poverty of Philosophy. Answer to the 'Philosophy of Poverty' by M. Proudhon; in: MECW Vol. 6, p. 211. Likewise, Marx called humans the "*main productive force*" in the *Grundrisse*, his groundwork to "*Capital*". (Karl Marx: Grundrisse. Foundations of the Critique of Political Economy (Rough Draft), Translated with a Foreword by Martin Nicolaus, Penguin Books, London 1993, p. 422)

7 Karl Marx: Capital. A Critique of Political Economy Vol. I; in: MECW Vol. 35, pp. 507-508

8 Leo Trotzki: Nation und Wirtschaft (1915), in: Leo Trotzki: Europa im Krieg, Arbeiterpresse Verlag, Essen 1998, p. 232 (our translation)

9 "*Mankind's productive forces stagnate. Already new inventions and improvements fail to raise the level of material wealth.*" (Leon Trotsky: The Death Agony of Capitalism and the Tasks of the Fourth International: The Mobilization of the Masses around Transitional Demands to Prepare the Conquest of Power (The Transitional Program); in: Documents of the Fourth International. The Formative Years (1933-40), New York 1973, p. 180)

10 Nikolai Bukharin: The Economics of the Transition Period (1920), in: Nikolai Bukharin: The Politics and Economics of the Transition Period, Edited by Kenneth J Tarbuck, Routledge, Abingdon 2003, p. 95

11 For an excellent presentation of Marx's theory of commodity fetishism see e.g. the book *Essays on Marx's Theory of Value* by the great Russian Marxist scholar Isaak Ilich Rubin (written in 1928 and published in English language by Black Rose Books, New York 1973; see particularly chapter 1, pp. 5-60). I. I. Rubin was one of many Marxists who were murdered by Stalin in the late 1930s during the period of the Moscow show trials. See also the interesting essay by Fredy Perlman: Essay on Commodity Fetishism, in: The Machine and its Discontents - A Fredy Perlman Anthology, in: Theory and Practice and Active Distribution, 2018, pp. 102-139

12 Karl Marx: Capital, Vol. I, in: MECW Vol. 35, p. 83

13 Karl Marx: Grundrisse. Foundations of the Critique of Political Economy, p. 687

14 Abram Deborin: Materialistische Dialektik und Erkenntnis (1925); in: Abram Deborin: Dialektik und Erkenntnis (1929); quoted in: Predrag Vranicki: Geschichte des Marxismus, Vol. 2, p. 582 (our translation)

15 György Lukács: History and Class Consciousness. Studies in Marxist Dialectics, Translated by Rodney Livingstone, The MIT Press, Cambridge 1972, pp. 6-7

16 The RCIT has published more than 100 pamphlets, essays, articles and statements plus a book on the COVID Counterrevolution which are all compiled at a special sub-page on our website: https://www.thecommunists.net/worldwide/global/collection-of-articles-on-the-2019-corona-virus/. In particular we refer readers to two RCIT Manifestos: COVID-19: A Cover for a Major Global Counterrevolutionary Offensive. We are at a turning point in the world situation as the ruling classes provoke a war-like atmosphere in order to legitimize the build-up of chauvinist state-bonapartist regimes, 21 March 2020, https://www.thecommunists.net/worldwide/global/covid-19-a-cover-for-a-major-global-counterrevolutionary-offensive/; "Green Pass" & Compulsory Vaccinations: A New Stage in the COVID Counterrevolution. Down with the chauvinist-bonapartist police & surveillance state – defend democratic rights! No to health policy in the service of the capitalist monopolies – expand the public health sector under workers and popular control! 29 July 2021, https://www.thecommunists.net/worldwide/global/green-pass-compulsory-vaccinations-a-new-stage-in-the-covid-counterrevolution/; In addition, we draw attention to our book by Michael Pröbsting: The COVID-19 Global Counterrevolution: What It Is and How to Fight It. A Marxist analysis and strategy for the revolutionary struggle, RCIT Books, April 2020, https://www.thecommunists.net/theory/the-covid-19-global-counter-revolution/. We have critically dealt with the Lockdown Left in a number of documents; see e.g. the pamphlet by Michael Pröbsting: COVID-19: The Current and Historical Roots of Bourgeois Lockdown "Socialism". Police State and Universal Basic Income are key elements of the new version of reformist "War Socialism" of 1914, 19 December 2020, https://www.thecommunists.net/theory/covid-19-the-current-and-historical-roots-of-bourgeois-lockdown-socialism/

17 J. V. Stalin: Dialectical and Historical Materialism (1938), Foreign Languages Publishing House, Moscow 1949, pp. 23-24

18 F. V. Konstantinov (Ed.): The Fundamentals of the Marxist-Leninist Philosophy, Progress Publishers, Moscow 1982, pp. 225-226. See also the entry on "*productive forces*" in the standard work on Marxist philosophy of Eastern German Stalinism (Georg Klaus and Manfred Buhr: Marxistisch-Leninistisches Wörterbuch der Philosophie, Vol.3, Rowohlt Taschenbuch Verlag, Hamburg 1972, p. 978)

19 See on this e.g. G. A. Cohen: Karl Marx's Theory of History. A Defence, Princeton University Press, Princeton 2001, pp. 134-171; for a critical discussion see e.g. Wal Suchting: "Productive Forces" and "Relations of Production" in Marx, in: Analyse & Kritik Vol. 4, No. 2 (1982), pp. 159-181

20 Aaron Bastani: Fully Automated Luxury Communism. A Manifesto, Verso, London 2019, p. 212

21 Nick Srnicek and Alex Williams: Inventing the Future: Postcapitalism and a World Without Work, Verso, London 2016; see also Florian Butollo and Sabine Nuss (Eds.): Marx and the Robots. Networked Production, AI and Human Labour, Pluto Press, London 2022

22 Kohei Saito: Marx in the Anthropocene. Towards the Idea of Degrowth Communism, University Printing House, Cambridge 2022, p. 154. In this context, we should point out that while we recognize Saito's contribution for a better understanding of Marx's work, we do not share his political conclusions which in our view adapt to the vulgar reformist conception of "Popular Frontism". Neither do we necessarily concur with all his interpretations of Marx's development of his critique of capitalism (or of Engels' role in it). In addition to the above-mentioned work, Saito has also published another interesting book on this issue: Karl Marx's Ecosocialism. Capitalism, Nature, and the Unfinished Critique of Political Economy, Monthly Review Press, New York 2017.

23 Fred Magdoff and John Bellamy Foster: What Every Environmentalist Needs to Know about Capitalism: A Citizen's Guide to Capitalism and the Environment, Monthly Review Press, New York 2011, pp. 33-34

24 Karl Marx: Contribution to the Critique of Political Economy, Preface (1859), in: MECW Vol. 29, p. 263

25 Karl Marx: Grundrisse. Foundations of the Critique of Political Economy, p. 422

26 Karl Marx: Capital, Vol. I, in: MECW Vol. 35, pp. 506-507

27 Friedrich Engels: Letter to Joseph Bloch (1890); in: MECW 49, pp. 34-35

28 Karl Marx and Friedrich Engels: The German Ideology, in: MECW Vol. 5, p. 73

29 Karl Marx and Friedrich Engels: The German Ideology, in: MECW Vol. 5, p. 439. See also: „*Finally, from the conception of history set forth by us we obtain these further conclusions: 1) In the development of productive forces there comes a stage when productive forces and means of intercourse are brought into being which, under the existing relations, only cause mischief, and are no longer productive but destructive forces (machinery and money); and connected with this a class is called forth which has to bear all the burdens of society without enjoying its advantages, which is ousted from society and forced into the sharpest contradiction to all other classes.*" (The German Ideology, p. 52) One has to note at this point that Marx and Engels at that time viewed the historical potential of capitalism as too

early exhausted as Trotsky pointed out in his essay "*Ninety Years of the Communist Manifesto*". However, this does no harm to the analytical logic of Marx's and Engels argument.

30 Statement on AI Risk. AI experts and public figures express their concern about AI risk. https://www.safe.ai/statement-on-ai-risk; see also Kevin Roose: A.I. Poses 'Risk of Extinction,' Industry Leaders Warn, New York Times, May 30, 2023, https://www.nytimes.com/2023/05/30/technology/ai-threat-warning.html; Agence France-Presse: AI poses 'extinction' risk comparable to nuclear war, pandemics, say experts, 30 May, 2023, https://www.scmp.com/news/world/article/3222359/ai-poses-extinction-risk-comparable-nuclear-war-pandemics-say-experts?module=more_top_stories_int&pgtype=homepage

31 Karl Marx: Grundrisse der Kritik der Politischen Ökonomie (Outlines of the Critique of Political Economy, 1857-58), MECW 29, p. 134

32 Karl Marx: Capital. A Critique of Political Economy, Volume I, in: MECW Vol. 35, pp. 750-751. For reasons unknown to me, the English translation of *Capital* has given the chapters different number than the German-language original. Hence chapter 24 in the German-language original version of Capital is chapter XXXII in the English-language translation. As I have pointed out elsewhere this is neither the only nor the worst example of problems in the English translations of the works of Marx, Engels and Lenin.

33 The RCIT has analysed the crisis of the capitalist world economy in much detail. The latest documents are compiled on a special sub-page on our website: https://www.thecommunists.net/worldwide/global/collection-of-articles-on-great-depression/. For a discussion of the long-term decline of capitalism see the book by Michael Pröbsting: Anti-Imperialism in the Age of Great Power Rivalry. The Factors behind the Accelerating Rivalry between the U.S., China, Russia, EU and Japan. A Critique of the Left's Analysis and an Outline of the Marxist Perspective, RCIT Books, Vienna 2019, Chapter I, https://www.thecommunists.net/theory/anti-imperialism-in-the-age-of-great-power-rivalry/; by the same author: The Catastrophic Failure of the Theory of "Catastrophism". On the Marxist Theory of Capitalist Breakdown and its Misinterpretation by the Partido Obrero (Argentina) and its "Coordinating Committee for the Refoundation of the Fourth International", RCIT Pamphlet, May 2018, https://www.thecommunists.net/theory/the-catastrophic-failure-of-the-theory-of-catastrophism/; World Perspectives 2018: A World Pregnant with Wars and Popular Uprisings. Theses on the World Situation, the Perspectives for Class Struggle and the Tasks of Revolutionaries, RCIT Books, Vienna 2018, https://www.thecommunists.net/theory/world-perspectives-2018/; The Great Robbery of the South. Continuity and Changes in the Super-Exploitation of the Semi-Colonial World by Monopoly Capital. Consequences for the Marxist Theory of Imperialism, RCIT Books, Vienna 2013, https://www.thecommunists.net/theory/great-robbery-of-the-south/; World economy – heading to a new upswing? (2009), in: Fifth International, Volume 3, No. 3, Autumn 2009, https://www.thecommunists.net/theory/world-economy-crisis-2009/; Imperialism, Globalization and the Decline of Capitalism (2008), in: Richard Brenner, Michael Pröbsting, Keith Spencer: The Credit Crunch - A Marxist Analysis, London 2008, https://www.thecommunists.net/theory/imperialism-and-globalization/; RCIT: Advancing Counterrevolution and Acceleration of Class Contradictions Mark the Opening of a New Political Phase. Theses on the World Situation, the Perspectives for Class Struggle and the Tasks of Revolutionaries (January 2016), Chapter II and III, in: Revolutionary Communism No. 46, http://www.thecommunists.net/theory/world-perspectives-2016/.

34 UNCTAD: Trade and Development Report 2016, New York and Geneva, 2016, p. 32

35 Wikipedia: Global Internet Usage, https://en.wikipedia.org/wiki/Global_Internet_usage

36 Ayhan Kose and Franziska Ohnsorge (Eds): A Decade since the Global Recession. Lessons and Challenges for Emerging and Developing Economies, World Bank 2019, p. 64

37 UNCTAD: Trade and Development Report 2016, New York and Geneva, 2016, p. 32

38 Ayhan Kose and Franziska Ohnsorge (Eds): A Decade since the Global Recession. Lessons and Challenges for Emerging and Developing Economies, World Bank 2019, p. 64

39 OECD Compendium of Productivity Indicators 2016, OECD Publishing, Paris 2016, p. 17 and OECD Compendium of Productivity Indicators 2019, OECD Publishing, Paris 2019, p. 18; we have used the figures from the attached Exel files. The figures for the years 2014-2018 are from the OECD Compendium edition 2019; the others from the OECD Compendium edition 2016.

40 Michael Roberts: Has globalisation ended? (2022), https://thenextrecession.wordpress.com/2022/04/27/has-globalisation-ended/

41 For a general discussion of the historic period which opened up in 2008 see e.g. chapter 14 in the above-mentioned book by Michael Pröbsting: The Great Robbery of the South

42 Karl Marx: Grundrisse. Foundations of the Critique of Political Economy, pp. 99-100

43 On Marx's elaboration of his theory of alienation see e.g. Ernest Mandel: The Formation of the Economic Thought of Karl Marx, Monthly Review Press, New York 1971, pp. 154-186; see also Peter Bollhagen: Gesetzmässigkeit und Gesellschaft. Zur Theorie gesellschaftlicher Gesetze, Verlag der Wissenschaften, Berlin 1967, pp. 145-175

44 Karl Marx: Results of the Immediate Process of Production, in: Capital. A Critique of Political Economy, Volume One, introduced by Ernest Mandel, Penguin Books, London 1993, p. 990

45 Karl Marx and Friedrich Engels: The German Ideology, in: MECW Vol. 5, pp. 19-20

46 For a discussion of ideological features of the decadent ruling elite and their desire for immortality see e.g. the essay by Almedina Gunić and Michael Pröbsting: On Some Ideological Features of the COVID Counterrevolution. Comments on an interesting interview with a German liberal historian, 14 November 2021, https://www.thecommunists.net/worldwide/global/on-some-ideological-features-of-the-covid-counterrevolution/

47 Al Jazeera: Elon Musk's Neuralink brain implant firm cleared for human trials, 26 May 2023, https://www.aljazeera.com/news/2023/5/26/elon-musks-neuralink-brain-implant-firm-cleared-for-human-trials

48 Charles Thorpe: Necroculture, Palgrave Macmillan, New York 2016, p. 3

49 Ibid, p. 80. He also notes: "*The reification of the living and the animation of the non-living tend toward the environmental degradation of Earth so that life is no longer self-sustaining. For equilibrium, sustenance, and the promise of a future, the technovisionaries encourage us to look instead to the powers of capital, expressed in technological miracles of geoengineering, life in outer space, or uploadable intelligence. The renewal of capital as self-replicating, productive, self-valorizing value takes over from the renewal of life. Or, rather, the renewal of capital becomes the precondition for the renewal of life.*" (pp. 81-82)

50 Ernest Mandel: Marx, Engels und die Ökologie, in: Ernest Mandel: Karl Marx – Die Aktualität seines Werkes, Frankfurt a. M.: isp-Verlag, 1984, p. 181 (our translation)

51 Karl Marx: Economic and Philosophic Manuscripts (1844), in: MECW Vol. 3, pp. 296-297