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Marxism and the Upheaval of the Proletariat in the Digital Age

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In *The Communist Manifesto,* Karl Marx and his collaborator Friedrich Engels outlined the social class structure of a capitalist society and defined the class division of the *bourgeoisie* and *proletariat*. While the bourgeoisie consists of the capitalist class that owns the bulk of society's wealth and means of production, the proletariat consists of the working class and owns only their labor power. As technology and industry evolves and develops at the intense rate at which it has been for the last fifty years, industries will inevitably replace the wage laborer with machines that are more efficient, productive, and cost-effective. Marx comments on this disparagement in the first section of the manifesto titled *The Bourgeoisie and the Proletariat:*

> "Modern Industry has converted the little workshop of the patriarchal master into the great factory of the industrial capitalist. Masses of [laborers], crowded into the factory, are [organized] like soldiers. As privates of the industrial army they are placed under the command of a perfect hierarchy of officers and sergeants. Not only are they slaves of the bourgeois class, and of the bourgeois State; they are daily and hourly enslaved by the machine, by the overlooker, and, above all, by the individual bourgeois manufacturer himself." (Marx & Engels, 1848)

Tasks that once required the "human touch" are now more easily achievable by machines. The question we should be asking ourselves revolves around a point that Marx himself made in his writings. He argues that ultimately, the proletariat - as the largest of the classes - becomes more and more powerful as they are discarded in the way of machines. If there is no preparation in place to handle the overhaul of the proletariat class, the workforce will continue to experience displacement until they are backed into a corner and

will be forced to revolt on a massive scale. Marx alludes to this revolution in the *Communist Manifesto* by stating the following:

> "They direct their attacks not against the bourgeois conditions of production, but against the instruments of production themselves; they destroy imported wares that compete with their [labor], they smash to pieces machinery, they set factories ablaze, they seek to restore by force the vanished status of the workman of the Middle Ages." (Marx & Engels, 1848)

The reality of the replacement of the wage worker becomes more apparent every year that technology and industry evolve. As a global society, what we need to figure out is how to avoid a proletariat revolution in protest of their mechanical counterparts. An article titled *A New Study Measures the Actual Impact of Robots on Jobs. It's Significant.* by Sara Brown at the MIT Sloan School of Management cites research conducted on the automotive industry within the context of robots replacing humans in the automotive industry. She reports that:

> "The researchers found that for every robot added per 1,000 workers in the U.S., wages decline by 0.42% and the employment-to-population ratio goes down by 0.2 percentage points — to date, this means the loss of about 400,000 jobs. The impact is more sizable within the areas where robots are deployed: adding one more robot in a commuting zone (geographic areas used for economic analysis) reduces employment by six workers in that area." (Brown, 2020)

As the current displacement exacerbates, it will likely lead to a revolution that will ultimately decenter society on a global scale. If the entire proletariat class finds itself unemployable, governmental entities would either need to plan to supplement the

livelihoods of those laborers with a universal basic income or be prepared to retaliate to a full-blown revolution. While in our modern age the human laborer still has function in the industrial environment, we are approaching a point where human labor within the industrial complex will be rendered obsolete.

The majority of main tasks that wage laborers conduct today is checking on and assuring the labor of machines. Once that level of observation is replaced by more capable and cost-effective machines, there will more or less no longer be a need for human labor in the production of goods. During the winter of 1857-8, Karl Marx wrote a series of notebooks primarily for the purposes of self-clarification. The volumes were published as *Foundations of a Critique of Political Economy* in 1939. Upon reading these works, many scholars noted that although his main themes and ideas remained consistent Marx's views and thoughts had evolved. In a passage titled the *Fragment on Machines* Marx noted that "[Labor] no longer appears so much to be included within the production process; rather, the human being comes to relate more as watchman and regulator to the production process itself" (Marx, 1857-8). This process, although gradual, will occur sooner than assumed. The following tablerepresents the frequency and relationship between humans and robots in industrial production over time:

	PAST	PRESENT	FUTURE
HUMANS	1	0.50	0
ROBOTS	0	0.50	1

Regarding the scale of time, **Past** refers to the time before the industrial revolution where no machines were utilized in the mass production of goods. **Present** refers to when robotics and machines were beginning to be introduced to the industrial complex. **Future**

refers to the moment when manual laborers can be completely replaced by fully automated robots within the mass production of goods. The number of humans and robots is expressed on a scale of from **0 - 1** where **0** represents a complete absence of humans or robots, **0.50** is a mix of humans and robots and **1** is all robots or all humans. The rate at which technology has advanced between **Past** and **Present** is nothing short of astounding. However, the time in between **Present** and **Future** may be sooner than anticipated. Efforts should be made to gradually transition from **0.05** to **1** to provide the proletariat as well as the relevant industries enough time to adjust to the revolutionary changes to our industrial complex. This paper highlights three industries that currently and will eventually experience large scale displacement of wage laborers: the automotive industry, agriculture, and the transportation industry that distributes these commercial goods.

An industry that clearly demonstrates the early years of this shift in production is automotive production. A crucial aspect of the automotive industry was the advent of the assembly line. Introduced by Henry Ford in the early 20th century, the moving assembly line transformed industrial production forever. It not only increased the rate of product volume, but also at a lower unit cost. In the early 20th century, manual labor was still very necessary to produce goods even with the assistance of the assembly line. Now, a century later, many of the manual and repetitive tasks required in the assembly of motor vehicles have been replaced with other machinery that completes the task more efficiently and at a higher quality. While evidence shows that introducing robots to complete menial tasks negatively impacts the security of the proletariat workforce, it should also be noted that there are still jobs for people at factories that require more complex detail and skill that at this point, can still only be done by a human laborer. Without a doubt, technology greatly

improves the productivity of industry. However, the proletariat workforce is justifiably concerned that their jobs will be overhauled by machines in the future. Although intimidating, more robotics in factories not only supports and increases business, but also introduces new opportunities, roles, and areas of occupation for the wage laborer. Truthfully, we still have time to figure out what can be done to ensure a mutually beneficial symbiosis between man and machine. While it is true that the impact of robotics on our industries does have a displacing effect for many wage laborers in factories, that effect is neither immediate nor rapid. Additionally, when new areas of work open while others close, means that proletariat workers are now able to put more work into more meaningful positions and jobs that makes them not only more employable, but more valuable. This benefits not only the employers but the workers as well - furthermore increasing their safety and quality of life. The jobs, while not as numerous or easily attainable, will likely contribute to an overall positive development of our society.

Another industry that is introducing more technology and robotics into everyday work is agriculture. Agriculture has been a staple of humanity since the transition from hunter-gatherers to settlements thousands of years ago. Marx discussed his thoughts on agriculture within the context of nature and how the industry affects the land upon which that society lives. Citing the persistent ancient agrarian laws of England, Marx ultimately believed that it would be necessary for the two worlds of industry and agriculture to merge for a collective society to flourish. In his work *Das Kapital,* Marx elaborates on his theories of how agriculture within a capitalist society should function and be comprehended:

> "...all progress in capitalistic agriculture is a progress in the art, not only of robbing the [laborer], but of robbing the soil; all progress in increasing the fertility of the soil

> for a given time, is a progress towards ruining the lasting sources of that fertility. The more a country starts its development on the foundation of modern industry, like the United States, for example, the more rapid is this process of destruction. 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 [laborer]." (Marx, 1867)

Robotics applied to the industry of agriculture assists farmers in completing various types of tasks and gathering information that is valuable to the operations and overall success of the farm as well as the maintaining environmentally conscious agricultural methods. Recently, innovations within farming technology and the agricultural industry have begun to be implemented in farming - specifically within the area of field operations. In a journal article titled *Agricultural Robotics for Field Operations* published by the National Library of Medicine's National Center for Biotechnology Information, the authors discuss new technologies that are being developed and tested and how these new technologies will further assist farmers and their businesses. While we are not yet at the point where robotics and machines can fully replace field workers, these new systems will be the beginning of the robotic revolution within the agricultural industry.

> "This progress, in parallel with the technological advancements and equipment in field machinery, has provided radical solutions to several challenges that modern farmers face. In crop production systems, one of the most significant issues is connected to human [labor]-intensive operations. These are, mainly, field tasks (such as sensitive fruits harvesting and intra-row weed control) that are more difficult to be executed by traditional field machinery, and human workers are

> employed. This has brought the increased need for autonomous tractors and robotic platforms to be used in the crop field operations, currently developed at research stage." (Fountas et al, 2020)

With robotic systems now being developed with the intention of assisting farmers and removing the necessity of hiring human laborers, the agricultural industry will soon join the automotive industry on the road to fully eliminating wage laborers. Marx and Engels did understand that eventually, industry and technology will render the proletariat obsolete. They also appeared to resent the industrial revolution's methods of production that resulted in much destruction and pollution of our natural world. In *The Fragment on Machines,* Marx directly addresses agriculture within the context of applying science and technology to the industry:

> "Agriculture…becomes merely the application of the science of material metabolism, its regulation for the greatest advantage of the entire body of society. Real wealth manifests itself, rather – and large industry reveals this – in the monstrous disproportion between the [labor] time applied, and its product, as well as in the qualitative imbalance between [labor], reduced to a pure abstraction, and the power of the production process it superintends." (Marx, 1857-8)

With technology progressing at such a rapid rate in the digital age, automation and robotics will eventually fully eliminate the need for wage laborers. If that happens too quickly, without a chance for current and future generations of wage laborers to adjust to the change, it is likely that a proletariat revolution is inevitable.

The automotive and agricultural industries are already demonstrating the beginnings of the transition from hired wage-laborers to fully automated robots. But what

about the distribution of those goods? It is reasonable to expect that after the robotic revolution fully saturates the industrial and production complex, the transportation sector will also become fully autonomous. Although the level of required technology to successfully and safely operate on a commercial level is in the early stages of research and development or does not yet exist, we are seeing encouraging progress relating to artificially intelligent drones, planes, and other electric vehicles. When the process of creating our cars and food is fully automated, the commercial methods of ground, air, and sea transportation of those goods will likely follow suit. With Autonomous Cargo Ships, Self-flying Aircraft, and Driverless Semi Trucks all in the research and experimental stages of development, it is not outside of the realm of possibilities that we could see these vehicles operating on reasonable scales sooner than we think. In a conference paper titled *A Review on Impacts of Autonomous Trucking on Freight Transportation Infrastructure,* Binaya Pudasaini investigates the very real implications of autonomous trucking. He asserts the following:

> "It is not well understood how the imminent use of autonomous trucks for freight transportation would change the serviceability of our existing freight infrastructure. For instance, it is not clear if the current highways are maintained well enough to support the early adoption of autonomous trucks; it is not clear if new facilities will be needed to support the novel technologies that would be driving the autonomous trucks; it is also not clear how these needs will evolve as autonomous trucking technologies." (Pudasaini, 2021).

Very recently, we have seen these concepts come into fruition. For example, Uber began successfully developing self-driving ride-share cars and Tesla has developed and

demonstrated the first fully autonomous freight truck - both intended for commercial use and real-world applications. Although the state of fully autonomous vehicles for transporting our goods on a grand scale is likely not to occur for some time, it is also not as distant in the future as we think.

With such an influx of technology and dramatic increase of mechanical utilization in the modern industrial landscape, there is no concise conclusion as to what end the role of machines will play in the industrial world of the digital age and after. What is now becoming clearer than ever is that the once coveted wage laborer of the 19th century that arose as a crucial element of the industrial complex, is now being rendered obsolete in the face of technological progress. The same symbiotic relationship between human and machine that we are currently witnessing in factories and farming will soon travel into the transportation of our commodities and goods. It is not too long after that when we begin to see the human element of shipping transportation also become obsolete. Pilots, truck drivers, and ship captains are also included in the proletariat, albeit not on the same scale. While there is likely not going to be a point in the future where every job on the planet is achievable by a robot, we are now seeing technology and robotics creep into nearly every level of industry.

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