

MARX AND TECHNOLOGY

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Karl Marx had spent more than three decades (1849-1883) in England, the land of the Industrial Revolution. Steeped in philosophy and political economy, Marx became more and more aware of the exploitative nature of capitalism. He was committed to the discovery of an alternative to capitalism which would be in keeping with the worth and dignity of human persons. Marx's attention was drawn to technology as technology in the hands of capitalists led to greater exploitation of workers. Marx was certainly a pioneer in the philosophy of technology. His painstaking analysis of the relation between the machinery and the worker and a host of other revelations concerning the use of machinery in the capitalist system are impressive. This article is an attempt to understand Marx's philosophy of technology.

1. The Development of Machinery

Marx begins his analysis of machinery and modern industry¹ by quoting John Stuart Mill who says in his *Principles of Political Economy*: "It is questionable if all the mechanical inventions yet made have lightened the day's toil of any human being."² That is not the aim of the capitalist application of machinery. Machinery is intended to cheapen commodities by lengthening that portion of the working day, which the labourer gives, without an equivalent, to the capitalist. It is a means for producing surplus value. In manufacture or cottage-industry, the revolution in the mode of production begins with the labour power, whereas in modern industry it begins with the instruments of labour. Marx's first enquiry is, what is the difference between a machine and the tools of handicraft?

Some call a tool a simple machine, and a machine a complex tool. They do not see an essential difference between the two and give the name of machine to the lever, the screw, the wedge and so on. In fact, every machine is a combination of these simple powers. For Marx, from the economic standpoint this explanation is worthless because it lacks the historical element. Another explanation of the difference between tool

and machine is that man is the motive power of a tool and in the case of a machine the motive power is something different from man; such as an animal, water, wind and so on. According to this explanation, a plough drawn by oxen would be a machine, while a circular loom, which worked by a single labourer, weaved 96,000 picks per minute (at the time of Marx in England) would be a mere tool. This loom, though worked by hand, would be a machine if worked by steam.

Marx goes on to say that fully developed machinery consists of three essentially different parts: the motor mechanism, the transforming mechanism, and finally the tool or working machine. The motor mechanism puts the whole in motion. It either generates its own motive power like the steam engine or it receives its impulse from some already existing natural force like the windmill from wind. The transmitting mechanism, composed of fly-wheels, shafting, pullies, gears and so on regulates the motion, changes its form where necessary and divides and distributes it among the working machines. The motor mechanism and the transmitting mechanism put the working machines in motion. The working machines as such is that part of the machinery with which the Industrial Revolution of the 18th century began.

We find the working machine proper under altered forms, the tools used by the handicraftsman or manufacturing worker. Instead of being human implements, they are mechanical implements. The entire machine is either only an altered mechanical edition of the old handicraft tool, as for example, the power-loom or the working parts fitted in the frame of the machine are old acquaintances like saws in sawing machine and knives in a chopping machine. The machine, which is the starting point of the Industrial Revolution, supersedes the worker, who handles a single tool, by a mechanism operating with a number of similar tools, and set in motion by a single motive power.

2. The Effects of Machinery on the Labourer

A. Appropriation of Supplementary Labour-Power by Capital

The machinery does not require muscular power. It becomes a means of employing labourers of slight muscular strength and those with incomplete bodily development, but whose limbs are supple. The labour of women and children is the first thing needed by capitalists who use

machinery. Machinery, the mighty substitute for labour and labourers became a means for increasing the number of wage labourers by enrolling every member of the worker's family without distinction of age or sex. Compulsory work for the capitalist robbed children of their play and the worker of his free labour at home within moderate limits for the support of the family. "The value of labour-power was determined, not only by the labour-time necessary to maintain the individual adult labourer, but also by that necessary to maintain his family. Machinery, by throwing every member of that family on to the labour market, spreads the value of the man's labour-power over his whole family. It thus depreciates his labour-power. To purchase the labour power of a family of four workers may, perhaps, cost more than it formerly did to purchase the labour power of the head of the family, but in return four days labour takes the place of one, and their price falls in proportion to the excess of the surplus-labour of four over the surplus-labour of one. In order that the family may live, four people must now, not only labour, but expend surplus-labour for the capitalist. Thus we see, that machinery, while augmenting the human material that forms the principle object of capital's exploiting power, at the same time raises the degree of exploitation."³

Machinery also changes completely the contract between the labourer and the capitalists, which formally fixes their mutual relations. Taking the exchange of commodities as basis, Marx's first assumption was that capitalist and labourer meet as free persons, as independent owners of commodities, one with money and means of production, the other labour-power. But now the capitalist buys children and youth under age. Previously, the worker sold his own labour-power as a free agent. Now he sells his wife and children; he has become a slave-dealer. The capitalist's greed for exploitation is the cause of employment of children. In spite of legislation in Great Britain children sold to act as live chimney-sweeping machines exceeded 2000 when Marx was in England.

Children and women faced physical deterioration as machinery subjected them to the exploitation of the capital. The mortality rate of the children of the workers was enormous during the first few years of their life. The cause of the death-rates was principally due to the employment of the mothers away from their homes, and to the neglect and maltreatment consequent on her absence. There arose natural

estrangement between mother and children, as a consequence intentional starving and poisoning of the children. The revolution in the mode of cultivation had led to the introduction of the industrial system. Immorality was on the rise as women were away from their home; children were left pining at home. Marx says that the moral degradation caused by the capitalistic exploitation of women and children has been thoroughly depicted by F. Engels in his *Lage der Arbeitenden Klasse England*. By the excessive addition of women and children to the ranks of the workers, machinery at last breaks down the resistance which male operatives in the manufacturing period continued to oppose to the despotism of capital.

B. Prolongation of the Working Day

If machinery increases the productiveness of labour i.e. shortens the working-time required in the productiveness of a commodity, it becomes in the hands of capital the most powerful means for lengthening the working day beyond human endurance. In the form of machinery, the tools of labour become automatic, moving and working independent of the worker. The automaton, as capital in the person of the capitalist is endowed with intelligence and will. It is animated by the longing to reduce to a minimum the resistance offered by man. This resistance is lessened by the apparent lightness of machine work, and by the more docile character of the women and children employed on it. The productiveness of machinery is inversely proportional to the value transferred by it to the product. The longer the life of the machine, the greater is the quantity of the products over which the value transmitted by the machine is spread, and less is the portion of that value added to each single commodity. The active lifetime of a machine is dependent on the length of the working-day or on the duration of the labour process multiplied by the number of days for which the process is carried on.

In the lengthening the working day the exploitation of double the number of workers demands, not only a doubling of the constant capital which is invested in machinery and buildings, but also of that which is invested in raw material. The lengthening of the working day allows production on a large scale without any change in the amount of capital invested in machinery and buildings. There is not only an increase in surplus value, but the outlay to obtain it diminishes. This takes place with every lengthening of the working day. On the one hand, the

development of the factory system fixed a constantly increasing portion of the capital in a form in which its value is capable of continual self-expansion. On the other hand, it loses both use-value and exchange-value whenever it loses contact with living labour. Marx quotes a cotton magnate in support of his view: “When a labourer lays down his spade, he renders useless, for that period, a capital worth eighteen pence. When one of our people leaves the mill, he renders useless a capital that has cost £100,000.”⁴ Thus the increased use of machinery makes a constant increase in lengthening the working day desirable.

Machinery produces relative surplus value not only by directly depreciating the labour-power, and by indirectly cheapening the same through cheapening the goods that enter into its reproduction; but also by converting the labour employed by the owner of that machinery into a labour of a higher degree and greater efficacy, by raising the social value of the article produced above its individual value. This enables the capitalist to replace the value of a day’s labour power by a smaller portion of the value of a day’s product. When the use of machinery is a monopoly, the profits are exceptional, and the capitalist, by prolonging the working day increases the magnitude of profit. A remarkable phenomenon in the history of modern industry is that machinery sweeps away every moral and natural restriction on the length of the working day. “Hence, too the economic paradox that the most powerful instrument for shortening labour-time, becomes the most unflinching means for placing every moment of the labourer’s time and that of his family, at the disposal of the capitalist for the purpose of expanding the value of his capital.”⁵

C. Intensification of Labour

In production as the use of machinery spreads and the number of workers habituated to machinery rises, the rapidity and the intensity of labour increase as a natural consequence. So lengthening of the working day went hand in hand with increasing intensity of factory labour. Where labour was repeated day after day with unvarying uniformity and lengthening of the working day became compatible with a lower degree of intensity. The shortening of the working day increased the degree of intensity of labour. When the workers revolted against the lengthening of the working day the English Parliament was compelled to shorten the working day. Consequently the capitalist lost the production of surplus

value he was used to getting by the prolongation of the working day. But the capitalist engaged himself in the production of relative surplus value by hastening on the further improvement of machinery. At the same time there was a change in the nature of relative surplus value. Generally, the mode of producing relative surplus value consists in raising the productive power of the worker, in order to enable him to produce more in a given time with the same expenditure of labour, "Labour time continues to transmit as before the same value to the total product, but this unchanged amount of exchange value of each single commodity sinks. Otherwise however, so soon as the compulsory shortening of the hours of labours takes place."⁶

Thus great impetus is given to the development of productive power and to economy in the means of production. This imposes on the workers increased expenditure of labour in a given time, heightens tension of labour power and condensation of labour to a degree that is attainable within the limits of the shortened working day. The condensation of a greater mass of labour into a given period is really greater quantity of labour. In addition to measure of extension, labour now acquires a measure of its intensity. "The denser hour of the ten hours working day contains more labour, i.e. expended labour power than the porous hour of the twelve hours' working day."⁷

Marx is interested in the question: How is the labour intensified? The first effect of shortening the working day is due to the law that the efficiency of labour power is inversely proportionate to the duration of its expenditure. What is lost by shortening the duration is gained by the increasing tension of labour power. The mere shortening of the working day increases to a great degree the regularity, uniformity, order, continuity and energy of labour. The shortening of the hours of labour creates the subjective conditions for the condensation of labour by enabling the worker to exert more strength in a given time. With the shortening of the working day, machinery becomes in the hands of capital the objective means, systematically employed for squeezing out more labour in a given time. This is done in two ways, by increasing the speed of the machinery and by giving the workers more machinery to tend. The shortening of the hours of labour called forth such an intensification of the labour as is injurious to the health of the worker and to his capacity for work.

3. The Factory

The body of the factory is machinery organized into a system. Machinery by annexing the labour of women and children augments the number of human beings who form the material for capitalistic exploitation. It confiscates the whole of the worker's disposable time by immoderate extension of the hours of labour and its progress, which allows for enormous increase of production in shorter periods, serves as a means of systematically getting more work done in a shorter time, of exploiting labour power more intensely. In the automatic factory, the collective labourer or social body of labour appears as the dominant subject, and the mechanical automaton as the object. In reality, the automaton itself is the subject, and the workers are merely conscious organs, coordinate with the unconscious organs of the automaton and together with them, subordinated to the central moving power. The central machine from which the motion comes can be described not only as an automaton, but as an autocrat.

Along with the tool, the skill of the worker in handling it passes to the machine. In the factory, there is a tendency to reduce to one and the same level every kind of work that has to be done by the minders of the machines. Though the old system of division of labour is thrown overboard by machinery, it is remoulded and established in a more hideous form of capital as a means of exploiting labour power. The life-long specialty of handling one and the same tool, now becomes the life-long specialty of serving one and the same machine. "Machinery is put to a wrong use, with the object of transforming the workman from his very childhood, into a part of a detail machine. In this way, not only are the expenses of his reproduction considerably lessened, but at the same time his helpless dependence upon the capitalist, is rendered complete. In handicrafts and manufacture, the workman makes use of a tool; in the factory, the machine makes use of him. There the movements of the instrument of labour proceed from him, here it is the movements of the machine that he must follow. In manufacture the workmen are parts of a living mechanism. In the factory we have a lifeless mechanism independent of the workmen who become its mere living appendage. The miserable routine of endless drudgery and toil in which the same mechanical process is gone through over and over again, is like the labour

of Sisyphus. The burden of labour, like the rock, keeps ever falling back on the worn-out labourer.”⁸

Factory work exhausts the nervous system to the uttermost. It does away with the many-sided play of the muscles, and snatches away every bit of freedom on bodily and intellectual activity. The lightening of labour becomes a sort of torture since the machine does not free the labourer from work, but deprives the work of all interest. It is no more the worker who employs the instruments of labour, but the instruments of labour employ the worker. “The separation of the intellectual powers of production from the manual labour and the conversion of those powers into the might of capital over labour is finally completed by modern industry erected on the foundation of machinery. The special skills of each individual insignificant factory operative vanishes as an infinitesimal quantity before the science, the gigantic physical forces, and the mass of labour that are embodied in the factory mechanism and, together with that mechanism, constitute the power of the master.”⁹

The material conditions under which factory labour is carried on are detrimental to the workers. All the sense organs are injured in an equal degree by the artificial rise in the temperature, by the dust-laden atmosphere, by the deafening noise. There is danger to life and limb among the thickly crowded machinery. Marx accuses the factory system in the hands of the capitalist of robbery: “Economy of the social means of production, matured and forced as in a hothouse by the factory system, is turned in the hands of capital, into systematic robbery of what is necessary for the life of the workman while he is at work, robbery of space, light, air and of protection to his person against the dangerous and unwholesome accompaniments of the productive process, not to mention the robbery of appliances for the comfort of the workman.”¹⁰

4. The Conflict between Worker and Machine

The conflict between the capitalist and the wage labourer goes back to the very origin of capital. With the introduction of machinery the worker fought against the instrument of labour itself, the material embodiment of capital. He revolted against this particular form of the means of production, as it is the material basis of the capitalist mode of production. It took very long for the workers to learn to distinguish

between machinery and its employment by capital, and to fight not against the material instruments of production, but against the mode in which they are used. When the instrument of labour takes the form of a machine, it becomes a competitor to the worker. The self-expansion of capital through machinery is directly proportional to the number of the worker whose means of livelihood are destroyed by that machinery. The entire system of capitalistic production is based on the fact that the worker sells his labour-power as a commodity. Division of labour specializes this labour power by reducing it to skill in handling a particular tool. As soon as the handling of this tool becomes the work of a machine, the exchange value along with the use-value of the worker's labour power disappear making the worker unsaleable. That section of the working-class rendered superfluous by machinery floods the labour market and reduces the price of labour power below its value.

“When the machinery seizes on an industry by degrees, it produces chronic misery among the operatives who compete with it. Where the transition is rapid, the effect is acute and felt by great masses. History discloses no tragedy more horrible than the gradual extinction of the English hand-loom weavers, an extinction that was spread over several decades, and finally sealed in 1838. Many of them died of starvation, many with families vegetated for a long time on 2½ d. a day. On the other hand the English cotton machinery produced an acute effect in India. The Governor General reported in 1834-35: ‘The misery hardly finds a parallel in the history of commerce. The bones of the cotton-weavers are bleaching the plains of India.’”¹¹ Machinery is continually introduced in new fields of production. So the character of independence and estrangement, which the capitalist mode of production as a whole gives to the instruments of labour and to the product as against the worker, is destroyed by the means of machinery into an antagonism. Thus, with the advent of machinery the worker for the first time violently revolts against the instrument of labour. The instrument of labour strikes down the worker. This direct antagonism between the machinery and the worker comes out most strongly, whenever newly introduced machinery competes with handicrafts or manufacturers. But even in modern industry the constant improvement of machinery and the development of the automatic system has analogous effect.

Machinery not only acts as a competitor who gets the better of the worker, but always makes him superfluous. It is also a power antagonistic to him, and as such capital makes use of it. It is the most powerful weapon for repressing strikes and revolts of the workers against the autocracy of capital. The steam engine was from the very first an antagonist of human power; it enabled the capitalist to turn a deaf ear to the growing claims of the workers who threatened the nascent factory system with a crisis. Marx quotes Nasmyth, the inventor of the steam hammer who gave the following evidence before the Trades Union Commission, with regard to the improvements made by him in machinery and introduced in consequence of the widespread long strikes of the engineers in 1851: "The characteristic feature of our modern mechanical improvements is the introduction of self-acting tool machinery. What every mechanical worker has now to do, and what every boy can do, is not to work himself but to superintend the beautiful labour of the machine, the whole class of workmen that depend exclusively on their skill, is now done away. Formerly, I employed four boys to every machine. Thanks to these new mechanical combinations I have reduced the number of grown-up men from 1500 to 750. The result was a considerable increase in my profits."¹²

5. Lack of Compensation for the Workers Displaced by Machinery

Marx observes that bourgeois political economists like James Mill, John Stuart Mill and others insist that all machinery that displaces workers, necessarily and at the same time, sets free an amount of capital sufficient to employ the same displaced workers. Marx argues to the contrary as follows: "Suppose a capitalist to employ 100 workmen, at 30 a year each, in a carpet factory. The variable capital annually laid out amounts, therefore to £3,000. Suppose, also, that he discharges 50 of his workmen, and employs the remaining 50 with machinery that costs him £1,500. To simplify matters, we take no account of building, coal, &c. Further suppose that the raw material annually consumed costs £3,000 both before and after the change. Is any capital set free by this metamorphosis? Before the change, the total sum of £6,000 consisted half of constant, and half of variable capital. After the change it consists of £4,500 constant (£3,000 raw material and £1,500 machinery) and

£1,500 variable capital. The variable capital instead of being one half, is only one quarter, of the total capital. Instead of being set free, a part of the capital is here locked up in such a way as to cease to be exchanged against labour power: variable has been changed into constant capital. Other things remaining unchanged, the capital of £6,000, can in future employ no more than 50 men. With each improvement in the machinery, it will employ fewer.”¹³

He makes it clear that it is not machinery as such, but machinery in the service of capital is to blame for displacing the workers. “It is an undoubted fact machinery as such, is not responsible for setting free the workmen from the means of subsistence. . . . Machinery, considered alone, shortens the hours of labour, but, when in the service of capital lengthens them; . . . in itself it lightens labour, but when employed by capital, heightens the intensity of labour; . . . in itself it is a victory of man over the force of Nature, but in the hands of capital, makes man the slave of those forces; . . . in itself it increases the wealth of the producers but in the hands of capital, makes them paupers.”¹⁴ For the bourgeois economist any employment of machinery, except by capital, is an impossibility. With him, exploitation of the worker by the machine is identical with exploitation of the machine by the worker.

6. The Impact of Modern Industry on Manufacture, Handicraft and Domestic Industry

A. Removal of Cooperation Based on Handicraft and on the Division of Labour

Machinery does away with cooperation based on handicrafts and with manufacturer based on the division of handicraft labour. “An example of the first sort is the mowing machine; it replaces cooperation between mowers. A striking example of the second kind is the needle-making machine. According to Adam Smith, 10 men, in his day, made in cooperation, over 48,000 needles a day. On the other hand a single needle-machine makes 145,000 needles in a working day of 11 hours. One woman or one girl superintends four such machines, and so produces near upon 600,000 needles in a day, and upwards of 3,000,000 in a week.”¹⁵

B. Adverse Impact of the Factory on Manufacture and Domestic Industries

The development of the factory system changes the character of production in all the other branches of industry. The principle of the factory system is of analyzing the process of production into its constituent phases, and of problem solving by application of mechanics, chemistry and other sciences. This principle of the factory becomes the determining principle everywhere. Machinery finds its way into the manufacturing industries. The organization of the manufacturing industries based on the old division of labour is destroyed and constant changes are made. Unlike in the manufacturing period, the division of labour is based on the cheap labour of women, children and unskilled labours. Cheap labour is found not only in the factories, but also in domestic industry which is converted into an outside department of the factory. Marx laments that the exploitation of cheap labour process is carried out flagrantly in modern manufacture than in the factory. It is because the technical foundation of the factory system which is the substitution of machines for muscular power, and the light character of the labour are absent in manufacture. Moreover women and children are exposed to poisonous and injurious substances.

7. Modern Industry and Agriculture

Marx draws our attention to the changes in agriculture affected by modern industry. Agricultural machines replace labourers. Modern industry in the field of agriculture annihilate the peasant, the bulwark of the old society and replaces him by the wage labourer. As a result, the desire for social changes, and the class antagonisms are brought to the same level in the villages as in the towns. The old-fashioned methods of agriculture are replaced by scientific ones. Capitalist production completely destroys the bond of union, which held together agriculture and manufacture. In agriculture as in manufacture, the transformation of production under the control of capital means destruction of the producers. The instrument of labour becomes the means of enslaving, exploiting and impoverishing the labourer. The social organization of labour process is turned into an organized mode of crushing the worker's individual vitality and freedom. The dispersion of the rural labourers

over large areas breaks their power of resistance while concentration increases that of the urban operatives. All progress in capitalist agriculture not only robs the labourer, but robs the soil as well. All progress in increasing the fertility of the soil for a given time is a progress toward ruining the lasting sources of that fertility. “The more a country starts its development on the foundations of modern industry, like the United States, for example, the more rapid is this process of destruction. Capitalist production 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.”¹⁶

To sum up, in Marx’s perception, the following are the effects of machinery on the labourer: appropriation of supplementary labour-power, prolongation of the working-day, intensification of labour, the inhuman conditions in the factory, the conflict between the worker and the machine, lack of compensation for the workers displaced by machinery, removal of cooperation based on handicraft and on the division of labour, adverse impact of the factory on manufacture and domestic industries and finally the negative impact of modern industry on agriculture especially robbing the soil of its fertility.

Marx’s critique of technology is a part of his critique of capitalism. The key to his critique of capitalism is his theory of surplus value that explains how capital grows by consuming living labour. Labour-power produces surplus value. The exploitation of the surplus value is the basis of capitalism. Labour power is provided by living human beings who have their own needs and aspiration. Capitalism separates labour and the satisfaction of human aspiration. For Marx, labour is the most essential characteristic of human life. Labour is physical commerce with nature. It is in labour man creates himself and nature which is the object of his activity. Marx depicts how alienation and dehumanization takes place in capitalism. Alienation means the subjugation of man by his own works. Alienation is the process in which man deprives himself of what he really is, of his own humanity. The worker’s own labour and its products become alien to him. Labour is treated as commodity, which means the worker himself has become a commodity. He is forced to sell himself at the market price. Paradoxically, the more wealth the worker produces, the poorer he gets. It is not only the product of the labour that is alienated from the

worker, but labour itself is alienated as it is not a means of self-determination but of dehumanization. He works for the sake of keeping himself and his family alive. Labour is no more a specifically human activity through which he realizes his essence as a human being, but a means to satisfy his biological needs. He is alienated from other human beings as well and social existence is impossible.

The commodification of the worker means that he is turned into a thing, deprived of a free and human existence. The capitalist is reduced to an abstract money-power. Marx writes in his *Economic and Philosophical Manuscript* "My power is as great as the power of money. The attributes and essential strength of money are those of myself, its owner. It is not my own personality, which decides what I am and what I can afford. I may be ugly, but I can buy the prettiest woman alive; consequently I am not ugly, since money destroys the repellent power of ugliness. I may be lame, but with money I can have a coach and six; therefore I am not lame. I may be bad, dishonest, ruthless and narrow-minded, but money ensures respect for itself and the possessor. Money is the supreme good, and a man who has it must be good also."¹⁷ Alienation of labour paralyses man's personal life, species life and community life. Capitalism, which breeds alienation, is interested exclusively in surplus value. "Capital cares nothing for the length of the life of labour-power. All that concerns it is simply and solely the maximum of labour-power that can be rendered fluent in a working day. It attains this end by shortening the extent of the labourer's life, as a greedy farmer snatches increased produce from the soil by robbing it of its fertility."¹⁸ Being forced to sell his labour-power the worker hardly has time to develop himself as a human being. He faces the tragic reality of technology, which is at the service of the capitalist.

"The fulfillment of humanity is not, in Marx's view, a matter of attaining some final imagined perfection, but of freeing man forever from conditions that hamper his growth and make him the slave of his own works."¹⁹ Marx envisioned the cessation of alienation in socialism. "The working class has conquered nature; now it must conquer man" (Marx in the *People's Paper*, 18 March 1854.)²⁰ To conquer man is to create conditions wherein men control their labour forces and the results of their actions cannot turn against them. Socialism does not mean essentially

abolition of material poverty or the luxurious consumption of the bourgeoisie, but the abolition of alienation by doing away with the division of labour. The liberation of humanity does not mean simply the satisfaction of material needs but achieving a full and multifaceted life for all. Marx stood for the abolition of the division of labour, which not only crippled human beings physically and spiritually but also condemned them to a lifeless monotony and one-sidedness. The cardinal task of socialism is to enable everyone to develop their abilities to the fullest in the social context. For Marx, the essential difference between capitalism and socialism is that in the former human beings are degraded into things and in the latter they recover their subjectivity.

In the capitalist division of labour one is forced to do a particular activity from which there is hardly an escape. One is a hunter, a fisherman, a shepherd or a critic and must remain so for the sake of livelihood. Whereas in the socialist society none has a particular sphere of activity and one can specialize in what one wishes. As Marx would say, it is possible for one to do one thing today and another tomorrow, to hunt in the morning, to fish in the afternoon, to rear cattle in the evening, to criticize after supper without becoming hunter, fisherman, shepherd or critic. This sounds utopian. We do not find such a thing happening in socialist countries.

On the one hand, the credit goes to Marx, a pioneer, for undertaking a study of the relationship between capitalism and technology and of the dehumanizing effects of capitalist technology. His analysis exposes the inhuman nature of capitalist technology. We are drawn to appreciate Marx's concern for fellow human beings, especially the working class whose labour-power was bought by the capitalist to increase the surplus value toward accumulation of wealth. On the other hand, we may ask ourselves how valid would be Marx's expectation that in the socialist societies dehumanization of labour created by capitalism would cease to exist. There is hardly any evidence that the socialist societies have solved the problems of alienation of labour. With state ownership of the means of production, planning has been introduced. So the workers are no longer at the mercy of the capitalist bosses. They may enjoy job security, health care, education and other social benefits. But other thing like organization of labour process, technical division of labour, rigid

control of management and so on are like in capitalist countries. In other words, the basic causes of alienation, division of labour and wage-labour exist in socialist countries. Marx was optimistic that technology would cease to be a means of alienation in a socialist society. But this dream of Marx remains still utopian as we know from socialist experiments. Humankind is yet to learn how to handle technology responsibly. Humankind is yet to learn how to share the resources of the world equitably. Humankind is yet to learn what it means to be human.

ENDNOTES

¹Karl Marx, *Capital*, Vol. I, Progress Publishers, Moscow, 1986, Chapter XV.

²Marx writes in the footnote: “Mill should have said ‘of any human being not fed by other people’s labour,’ for, without doubt, machinery has greatly increased the number of well-to-do idlers.”

³*Capital*, Vol. I, p. 373.

⁴*Ibid.*, p. 379.

⁵*Ibid.*, p. 382.

⁶*Ibid.*, p. 384.

⁷*Ibid.*, p. 387.

⁸*Ibid.*, p. 389.

⁹*Ibid.*, p. 398.

¹⁰*Ibid.*, pp. 398-399.

¹¹*Ibid.*, p. 406.

¹²*Ibid.*, pp. 401-402.

¹³*Ibid.*, p. 411.

¹⁴*Ibid.*, pp. 413-414.

¹⁵*Ibid.*, p. 415-416.

¹⁶Bastian Wielenga, *Introduction to Marxism*, Centre for Social Action, New Delhi, 1977, pp. 77-78.

¹⁷Quoted from Leszek Kolakowski, *Main Currents of Marxism*, Vol. I, Oxford University Press, 1978, p. 139.

¹⁸*Capital*, Vol. I, p. 253.

¹⁹Leszek Kolakowski, *Main Currents of Marxism*, Vol. I, p. 265

²⁰*Ibid.*, p. 284.