Capitalist Trap for Scientific Advances*

Prabhat Patnaik

There is a paradox at the core of the efflorescence of science that has occurred over the last millennium. In essence this efflorescence has the potential to increase human freedom immensely. It increases the capacity of man within the man-nature dialectic; scientific practice aims to go beyond the "given" not just in a once-for-all sense but as a perpetual movement through incessant self-questioning, so that this practice is potentially a collective act of liberation. But this promise of freedom remains significantly unfulfilled; and while its potential has not been realized, this efflorescence of science has been utilized to a great extent for domination by some over other human beings and other societies. The paradox lies in the fact that scientific practice that has the potential to increase human freedom has been utilized to increase domination, that is, to attenuate human freedom.

The roots of this paradox lie in the fact that the unleashing of scientific advance required an overthrow of the stranglehold over society of the church (which, it may be recalled, had forced Galileo to recant); and this overthrow could occur only as part of the transcendence of the feudal order, i.e. as part of the bourgeois revolution, of which the 1640 English Revolution was a prime example. The development of modern science in Europe therefore was inextricably linked from the very beginning with the development of capitalism; and this fact left its indelible imprint on the use to which scientific advances were put.

This bourgeois imprint also had major epistemic implications with which philosophers (like Akeel Bilgrami) have been concerned, namely the treatment of nature as "inert matter" and the attribution of a similar "inertness" to indigenous populations in far-flung areas of the world ("people with no history") which "justified" in European eyes the acquisition of "mastery" as much over nature as over such distant populations, and hence "justified" the phenomenon of imperialism.

Keenly aware of the fact that the freedom-enhancing role of science could be fully realized only through a transcendence of capitalism itself, the finest of scientists in the era when such transcendence had come on to the historical agenda, joined the struggle for socialism. This was not just essential for them as citizens, to prevent the abuse of science; it was also a moral imperative for them as scientists: struggling against the abuse of their own praxis that produced scientific advance, had paramount importance for them.

In the matter of struggling for socialism the example of Albert Einstein is well-known. He was not only an avowed socialist, but actively participated in political activities and meetings, because of which the American FBI had put a "tail" on him and kept a dossier on him which is now open to the public; in fact because of his socialist convictions he was not given security clearance for taking part in the Manhattan project that developed the atom bomb. Likewise in Britain, the finest scientists in the twentieth century were part of the Left, from J.D. Bernal to Joseph Needham, J.B.S. Haldane, Hyman Levy, G.H. Hardy, Dorothy Hodgkin and many others.

With the onset of neo-liberalism however there has been a fundamental change. There has been a "commoditization" of science, under which the responsibility of funding research has shifted from the state to private, mainly corporate, donors. This has meant that the freedom of the scientist to express political opinions that underscore the need for transcending capitalism has got greatly curtailed. If a scientist wants to engage in a research project then he or she has to be sufficiently acceptable to private donors; and it does not help the scientist if he or she is known to hold socialist beliefs. Even university appointments are determined by the ability of the scientist to attract funds from donors. The same political constraints therefore apply even in a sphere where until recently the academics had the freedom to profess diverse beliefs. Commoditization of science in other words produces, as a necessary consequence, a political conformism, and hence a social irresponsibility, on the part of the scientist. The "luxury" of internalizing the moral imperative of attempting to go beyond capitalism, in order to make one's scientific practice contribute towards human liberation, is denied to the scientist in the era of neo-liberalism; and this in turn implies the adoption of scientific advances without adequate discussion of consequences.

An obvious example of such thoughtless adoption that is occurring today before our very eyes relates to Artificial Intelligence. It has of course several implications which I shall not go into; my concern is only with one implication, namely the creation of massive unemployment, to which the recent strike by the Hollywood script writers drew attention. Any measure that substitutes human labour by a mechanical device is potentially liberating: it can reduce the drudgery of work, or alternatively raise the magnitude of output with the same deployment of labour as before, and hence the availability of goods and services for the population. But under capitalism, every such substitution of human labour by a mechanical device adds to human misery.

Consider an example. Suppose an innovation doubles labour productivity. Under capitalism, each capitalist would use the innovation for retrenching half the work-force that was being employed earlier. This very fact would increase the relative size of the reserve army of labour, because of which those who continue to remain employed would experience no increase in their real wage. There would therefore be a halving of the wage-bill and an increase in the magnitude of surplus, if the earlier level of output keeps getting produced. But because of the shift from wages to surplus at the earlier level of output, there would be a fall in demand (since a larger proportion of wages is consumed than of surplus) and hence the earlier level of output will not be produced and there would be an additional degree of unemployment, this time because of insufficient demand, over and above the unemployment generated because of the original doubling of labour productivity.

The English economist David Ricardo had not cognized this additional unemployment because of the deficiency of demand. He had assumed Say's Law, that is, that there is never any deficiency of aggregate demand, and that not only are all wages consumed but all surplus in excess of the part that is consumed is automatically invested. From this assumption he had drawn the conclusion that the shift from wages to surplus, while it would lower total consumption out of the earlier output, would raise investment, but leave the earlier output unchanged to start with; and this raising of the share of investment would raise the output growth rate and hence the employment growth rate. The use of machinery therefore, while it may reduce

employment immediately, would raise its rate of growth, so that employment exceeds after some time what it would otherwise have been.

Say's Law however has no validity whatsoever. Investment under capitalism is determined by the expected growth of the market and not by the magnitude of surplus (unless there are untapped colonial markets that can be accessed or the state is ever willing to intervene to overcome a deficiency of aggregate demand). The reason why technological change did not historically cause mass unemployment within the metropolis was two-fold: first, colonial markets were available on tap, because of which much of the unemployment generated by technological change was shifted to the colonies (in the form of deindustrialization); that is, there was export of unemployment from the metropolis. Second, whatever local unemployment was generated by technological change did not linger, because the unemployed migrated abroad. Through the "long nineteenth century" (up to the first world war) fifty million Europeans migrated to the temperate regions of white settlement like Canada, the United States, South Africa, Australia and New Zealand.

Today however an entirely different situation prevails. It is not just that colonialism does not exist, but third world markets are inadequate to counter any deficiency of aggregate demand in the metropolis. Likewise, the state cannot counter a deficiency of aggregate demand as it can neither increase its fiscal deficit beyond the FRBM Act limit, nor tax the rich for increasing its expenditure (taxing the working people to increase its expenditure scarcely increases aggregate demand). It follows therefore that mechanization, including the use of Artificial Intelligence, in the context of capitalism today will inevitably generate massive unemployment.

Consider what would happen in a socialist economy by contrast. Any mechanization, including the use of Artificial Intelligence, will reduce the drudgery of work without reducing employment, output and hence the wage-bill of the workers, all of which are centrally determined. This fundamental difference between the two systems explains why the benign use of Artificial Intelligence is conditional only upon a transcendence of capitalism.

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