“Australia’s most important resource is not minerals or wool — it is people — people must come before technology.”*

A simple but profound statement. It is profound because it affirms that a principle other than greed for profit or the commercial compulsions of the market should govern society; because it rejects the throwing of hundreds of thousands of people on industrial and social scrapheaps; because it could well become a battle-cry in every industry throughout the land.

For marxists, such a statement has a wealth of meaning.

Marxism is not a theory of technology or a technological determinism, though some passages in the classics have such overtones, but the causes and effects of technological change in capitalist society are central questions for marxists — particularly the specifics of today when the pace of change is faster than ever, and the effects or potential effects far-reaching.

I propose to examine these aspects of the process:

---

* From full-page newspaper advertisements setting out policy on technological change, inserted by the Policy Co-ordinating Council of the Australian Bank Employees’ Union and the Commonwealth Bank Officers’ Association, November 15, 1978.
1. Its concurrence with the world capitalist economic crisis and the new stage of internationalisation of capital.
2. Its extent and depth.
3. Its occurrence at the beginnings of an energy, resources and ecological crisis.

* * *

1. Capitalism is an economic system which, unlike systems preceding it, has an inherent tendency to revolutionise the productive forces. This is because capitalism's motive force is private profit: individual capitalists, competing in the market, can make a higher profit than others if they can reduce their costs of production below the average. Speed up, a longer working day, below average wages, absence of union organisation, better organisation of production and distribution, etc. can all play a part in this, and have done so.

But the most important means (particularly today when some of these avenues are largely blocked by the strength of the labor movement) is the introduction of new equipment reducing the labor content of each commodity turned out, or, put in another way, increasing the productivity of labor. The first in the field makes extra profit. But others are bound to follow suit or go to the wall in competition. This is so particularly because, in addition to reducing the cost per unit, the new facilities usually turn out a much larger number of units, so that supply increases in relation to the demand, putting additional price and profitability pressure on those retaining the old methods.

The first in the field makes extra profit. But others are bound to follow suit or go to the wall in competition. This is so particularly because, in addition to reducing the cost per unit, the new facilities usually turn out a much larger number of units, so that supply increases in relation to the demand, putting additional price and profitability pressure on those retaining the old methods.

When the new equipment becomes standard, the extra profit is not longer to be made by anybody, and a new average rate of profit becomes established. It is now lower than previously because the value creating factor — living labor — is generally a smaller proportion of the total capital employed.

This is, of course, a very simplified account of what actually occurs, and there is considerable discussion in marxist circles today about the "law of value" and "the falling tendency of the rate of profit". I will refer to some aspects of these later, but for the moment want to stress the dynamics of the process. It is neither smooth nor steady. It takes place in bursts, and lies at the bottom of the boom-bust (or, euphemistically, "business") cycles which characterise capitalism.

Technological change goes on all the time; but it becomes a matter of life or death for the capitalist when markets are glutted, as at present. Some go to the wall; some old production facilities are taken over by survivors and/or dismantled; the goods in over-supply are gradually sold or destroyed, and a spate of investment in new equipment gets under way between the competing survivors. This means jobs for the unemployed in industries making equipment. They now have wages to spend, so consumer goods production can also expand and a new boom gets under way. But it also prepares the way for a new crash because, production expanding without plan, it eventually exceeds the purchasing power of the workers who receive in wages only a portion of the total new value they create.

From the point of view of a general understanding of the dynamics of the process it doesn't matter at what point of the cycle one begins. But from the practical, political point of view it matters a great deal, as do all the concrete surrounding circumstances.

From the beginning, capitalism needed and created a world market, so that "cost of production" of a given commodity was never purely national. It was its lower costs — or higher productivity of labor — which made 19th century Britain the "workshop of the world" and gave it "the heavy artillery with which it batters down all Chinese walls" (Communist Manifesto), excluding its goods both from feudal countries and other capitalist countries, though tariff and other barriers were continually being set up to exclude them and allow indigenous industry to develop. (It was behind tariff barriers that Australian manufacturing industry developed, especially after the two world wars.)

Today, the internationalisation of production and the market, especially per medium of the multinational corporations, is ever so much more advanced, generating great pressures on the industries of each
country to fit into a new "international division of labor" adapted to the requirements of the multinational corporations and the new technology controlled by them.

Such new phenomena as the "global car", assembled from components made with the very latest techniques in many countries, is an example of the kind of almost irresistible economic pressures to which the car industry in separate countries is subjected — with politics, skulduggery and inter-nation and inter-multinational corporation rivalry also coming into it.

Mr. Lynch recently warned that "integration of the Australian vehicle and component industry into the world car concept would be essential .... " (Financial Review, November 10, 1978.)

So, today, in Australia, as well as other countries, the "normal" pressures for introduction of new technology merge with pressures from the "international market" to remove tariff barriers, to abandon whole industries or drastically curtail them to one or two more efficient operators, to move "offshore" to take advantage of low-paid, un-unionised labor, and to transfer capital into the energy and raw material resource areas where higher rates of profit are being obtained in very capital-intensive processes.

The Liberal and National Country Parties naturally bow to the pressures — or, rather, ally with them, though with an eye to the political costs, traditional sectional-class alliances, etc. with the crudest outcome in the resource-richest states of Queensland and Western Australia. (See L. Aarons, "The Conservative Crisis", Tribune, November 8, 1975.)

But the dominant centre-right in the trade unions and the Labor Party — traditionally champions of "Australian manufacturing" — are also succumbing on the grounds of "realism", and not even attempting to formulate an alternative perspective.

This places extra responsibility on the left, with corresponding opportunities for increasing its mass support. Solutions are not simple, economically or politically. Even were socialists to be running Australia tomorrow, it would not be self-evident what should be done with the car industry, whitegoods, ship-building, transport, etc. A lot of homework has to be done, and, indeed, is getting under way in a number of quarters, including the CPA. Nor is unity about a suitable approach easy to achieve politically, because all the changes are not felt equally by all sections of the workforce — some may even gain in a very narrow sense from the process.

But, to give into or go along with international market pressures really means giving into or going along with the multinational corporations who dominate in that market, with increasingly harmful consequences.

Big corporations don't care about the effects of asbestos and other substances on the workers they employ, and even hide the facts. They will destroy Jarrah forests for bauxite and put Perth's water supply in jeopardy. They will support any regime, however oppressive (e.g. The Shah of Persia's) if it suits their interests. They will charge into the uncharted nuclear future, destroy whole industries, and condemn millions to unemployment without compunction. How can anything good come from succumbing to market forces which express their dominance?

The guiding principle of an alternative is given in the banking unions' advertisement, which is along similar lines to the approach adopted earlier by the Telecom workers: putting people first, recognising them and their actual and potential skills as the main wealth of the country. This means putting people's needs before multinational corporation ones. It means putting social needs before private (profit) ones. It means identifying such interests as those of Australia as a nation. Not in isolation, but in co-operation with working class forces everywhere, with national liberation and other movements struggling for a new world economic order in which multinational corporations' interests do not dominate.

* * *

2. The present spate of technological innovation comes on top of an already high productivity of labor, giving rise to qualitative as well as quantitative effects.

This can be seen first of all in the universality of automation and computerisation. While not yet complete, nor
likely to be in the foreseeable future, this is now happening in areas which were formerly largely untouched — banking, secretarial work, medical diagnosis, warehousing, etc. In principle, computers could have been used in these fields earlier, but it was not an economic proposition until computers became more sophisticated and miniaturised, with a drastic reduction in cost. The fact that the new generation of computers came on stream at the same time as the economic crisis is largely contingent, but it certainly intensifies the problems.

Thus, some sections of the working class which formerly were, or felt themselves to be, privileged, have found both their status and their employment undermined. This and other changes in their work have brought them closer to the more traditional “labor movement” forces, reflected in the development of their union organisation and moves for amalgamation with the ACTU. This helps counterbalance the tendency to segmentation of the workforce which is such a feature of modern economies.

It also knocks on the head the fond hopes so often expressed in palmier days that expansion in the tertiary sector would more than make up for job losses in manufacturing.

The increasing integration of science and production (discussed further below), and further mechanisation up to automation and computerisation have complex consequences for the labor process. Contrary to some earlier predictions or hopes, however, it seems that the overall result is a general downgrading rather than upgrading of skills, though the latter also takes place.

Harry Braverman in *Labor and Monopoly Capital* comments savagely:

> Since, with the development of technology and the application to it of the fundamental sciences, the labor processes of society have come to embody a greater amount of scientific knowledge, clearly the ‘average’ scientific, technical, and in that sense ‘skill’ content of these labor processes is much greater now than in the past. But this is nothing but a tautology. The question is precisely whether the scientific and ‘educated’ content of labor tends towards **averaging** or, on the contrary, towards **polarisation**. If the latter is the case, to then say that the ‘average’ skill has been raised is to adopt the logic of the statistician who, with one foot in the fire and the other in ice water, will tell you that ‘on the average’ he is perfectly comfortable. The mass of workers gain nothing from the fact that the decline in their control over the labor process is more than compensated for by the increasing command on the part of managers and engineers. On the contrary, not only does their skill fall in an absolute sense (in that they lost craft and traditional abilities without gaining new abilities adequate to compensate the loss), but it falls even more in a relative sense. The more science is incorporated into the labor process, the less the worker understands of the process; the more sophisticated an intellectual product the machine becomes, the less control and comprehension of the machine the worker has. In other words, the more the worker needs to know in order to remain a human being at work, the less does he or she know. This is the chasm which the notion of ‘average skill’ conceals. (page 425.)

This poses considerable problems for socialists because such a polarisation of skills and know-how, while not a “class” division in itself, could not but reinforce tendencies to hierarchical structures and the strengthening of bureaucratic and state control which, for a number of other reasons as well, have so far bedevilled societies where capitalism has been overthrown.

Other aspects of much new technology, including the opportunities it gives for surveillance, compilation of dossiers and monopolising information, act in the same direction.

Nevertheless, the potentialities for new solutions are also created. Greatly reduced hours of work can give not only more leisure and recreation in traditional forms, but also the possibility for continued learning throughout life (a trend already growing as seen in the increase in the number of “mature age” students) which, in turn, would help enable a sharing and rotation of responsibilities and occupations. We are
egalitarians here, too. Not in thinking that everyone has the same abilities or interests, but in wanting to ensure that all have equal opportunities to develop their talents and participate in creative work of their choice, as well as sharing the "shit work".

This would best be achieved by "workers' control" at all levels and particularly at the "workface" itself with small work groups mutually controlling and sharing, at least to a certain extent, jobs embodying varying levels of skill and knowledge.

Such possibilities extend to general social labor, including responsibility for helping with child care and upbringing, furthering the liberation of women and providing opportunities for socially meaningful work for the young and for the aged, now so often virtual outcasts in our society.

So putting people before profits, minerals and wool, not only means considering job opportunities, but also considering the nature of those jobs and of the control over the work process.

These are of course political and social issues, to be resolved by political and social struggle, the outcome of which is not pre-ordained. It could result in the unemployed being put into a ghetto, ignored and even vilified by the employed (as "dole bludgers", etc.), and in those privileged in knowledge and control forming an elite separated from the mass of workers. Or it could result in a new, socialist society.

The Law of Value

But the scope of the social consequences flowing from a high level of technological development go further yet, as we can see by asking an apparently unrelated question: if capital intensity is increased, even to the point of complete automation, dispensing with virtually all direct labor, how can any profit be made since, according to the labor theory of value, only labor can add new value in the production process?

At one level this is easy to answer. Outlining the process by which the rate of profit is averaged out between different industries with different capital intensities (different "organic compositions" of capital), different times of turnover etc, Marx pointed out that the working class as a whole is exploited by the capitalist class as a whole. This takes the form of the total surplus value produced being divided up among the capitalists not in accordance with the number of workers they employed or the money laid out in wages, but in accordance with the total capital they had invested.

Thus, if one branch of industry had one tenth of the total social capital invested in it, it would get one tenth of the total surplus value produced even if it employed only one hundredth of the workers.

Why would that be so? The reasoning was the same as in the initial form of the labor theory of value, based on the fact that in "simple commodity production" the equipment etc involved could be regarded as minimal in comparison with the labor. The theory says that the value of a commodity is equal to the number of hours of socially necessary labor time spent in its production.

In a society where there is no social plan because private ownership divides people, yet there is a social division of labor and universal exchange of the necessities of life in the form of commodities, there had to be, Marx said, a mechanism by which was established the necessary quantitative division of total social labor to give the "mix" of commodities required by society. The labor theory of value was the theoretical expression or "law" of this mechanism.

Similarly, where constant capital is, quantitatively, of as great or greater weight in production than variable capital, there has to be a mechanism by which both equipment etc and labor are distributed among different industries in the proportions required to provide the necessary mix of commodities. This mechanism was the "average rate of profit", set out by Marx in the third volume of Capital.

Monopoly, state intervention and other factors of course altered the situation in both the initial and modified forms of the "law of value". But one of Marx's strengths was that he could disclose the underlying necessary mechanism which was not dependent on the particular vagaries of such modifying influences. If some of his followers equate these highly abstract "laws" with a specific economic reality, that is their weakness, not Marx's.
But what if all production were to be automated? (Though this is highly unlikely, there is no doubt that development is in this direction, so the question is valid in the theoretical sense.)

Marx himself, in a remarkable example of prevision based on his general analysis, foresaw that a time would come when the development of the productive forces had reached a point where the main factor was no longer direct labor in the actual production process, but rather the general level of human knowledge and its application, and the force arising from social combination:

...to the degree that large industry develops, the creation of real wealth comes to depend less on labor time and on the amount of labor employed than on the power of the agencies set in motion during labor time, whose ‘powerful effectiveness’ is itself out of all proportion to the direct labor time spent on their production, but depends rather on the general state of science and on the progress of technology, or the application of this science to production .... (Grundrisse, pp. 704-5).

And

...direct labor and its quantity disappear as the determinant principle of production...compared to general scientific labor, technological application of natural sciences, on one side, and to the general productive forces arising from social combination in total production on the other side... (ibid, p. 700).*

This speaks against conceptions which narrow the definition of productive labor and “class”, but more importantly indicates that many “tertiary” and “service” areas, particularly those in which the state has increasingly intervened during this century and especially since the Second World War, are not accidental or just ideologically motivated, but are to one degree or another necessary for production itself. This also helps to explain why, despite accolades to Milton Friedman and Co. because of their opposition to government intervention, and the genuine wish (as I take it to be) of the Fraser and other governments to reduce theirs, it still continues or even increases.

There are, of course, still market forces. But these cannot make capitalism run efficiently even in the narrow economic sense, let alone solve problems of chronic unemployment, inflation, cultural degradation etc, or achieve ecological harmony or ensure a continuous supply in the future of relatively cheap energy.

Marx draws some further theoretical conclusions:

As soon as labor in the direct form has ceased to be the great well-spring of wealth, labor time ceases, and must cease to be its measure. (Grundrisse, p. 705.)

We have therefore, in a sense, the beginnings of the abolition of the labor measure of value as an economic regulator within capitalism itself, with all the tensions and contradictions that generates economically and socially for the system:

Capital thus works towards its own dissolution as the form dominating production. (ibid. p. 700.)

The problem arising from the current wave of automation and computerisation are an expression of the “dissolution” of capitalism; the energy crisis is another. Of course, the “dissolution” is not automatic or inevitable. Rather, more and more situations are created which, given active intervention and forward-looking vision by progressive social forces, can open up the possibilities of a transition towards socialism.

If labor time spent directly in production is no longer the measure of wealth, what is? According to Marx free time:

...real wealth is the developed productive power of all individuals. The measure of wealth is then (when the above changes have proceeded far enough — E.A.) not

* Braverman has this to say:

The scientific-technical revolution ... cannot be understood in terms of specific innovations — as in the case of the Industrial Revolution, which may be adequately characterised by a handful of key inventions — but must be understood rather in its totality as a mode of production into which science and exhaustive engineering investigations have been integrated as part of ordinary functioning. (Labor and Monopoly Capital, pp. 166-7.)
any longer, in any way, labor time, but rather disposable time. Labor time as the measure of value posits wealth itself as founded in poverty... (ibid, p. 708.)

"Universality" characterises the direction of development under capitalism, however uneven and distorted the actual development may be:

...creating the material elements for the development of the rich individuality which is as all-sided in its production as in its consumption, and the full development of activity itself, in which natural necessity in its direct form has disappeared because a historically created need has taken the place of a natural one. (ibid, p. 325.)

Thus the possibility and need today is to recognise that "the absolute elaboration of (humanity's) creative dispositions, without any preconditions other than antecedent historical evolution which makes the totality of this evolution — that is, the evolution of all human powers as such, unmeasured by any previously established yardstick — an end in itself" Marx, Pre-Capitalist Economic Formations, E. Hobsbawm ed., pp. 84-85).

These needs and possibilities are modified not only by capitalist and specifically MNC distortion, but also by the world situation in which the great majority of the world's population still suffers material deprivation, and where the energy crisis (etc) add a new economic factor. Nevertheless, "people before profits" and "social before private needs" is in various ways not only an approach attractive in itself, but also one becoming increasingly necessary to effectively grapple with today's problems in advanced economies.

***

3. The looming energy crisis is dealt with extensively in the article by Barry Commoner also published in this issue, and I only want to emphasise some aspects.

First, there is an energy crisis which, for the next 10 to 20 years is likely to be manifested in a continually rising price for energy, not an absolute shortage. In the longer term, the costs will escalate so rapidly as to be almost equivalent to an absolute shortage, unless a change is made to renewable sources as the major source of supply.

It may be that this time is scores of years away, and therefore unlikely to readily motivate masses of people. But socialists must look ahead. And certainly a commercial, profit-measured approach cannot even begin to tackle such a problem in either short or long term because it lacks the dimension of social consideration, of planning for social needs — even within one country, let alone globally.

The fact that wealth depends on nature — on the land, the waters, the minerals, the flora and fauna — as well as on human labor, is evident enough. But, while recognising this, marxists have paid by far the greatest attention to the dynamics of social systems "under their own steam" as it were, with nature in the (sometimes very distant) background.

Even earlier societies sometimes qualitatively affected the ecology — from the periodical burnings off by Aborigines in Australia to the denudation of forests in China, the rising salinity and/or silting up of irrigation systems in the Middle East and (it has been said) the decline of Carthage because of the depredations of the goats.

Nevertheless, today’s situation is qualitatively different both in its scope and the rapidity with which ecological crises are likely to descend upon us. Who would have thought that a huge sea like the Mediterranean could be critically polluted or the Murray river system endangered in so short a time?

In the energy field it is in the next 10 or 20 years that the trend is likely to be settled (for example, with nuclear power and irremediable depletion of oil reserves), reducing the options for alternatives.

One very revealing fact in Commoner's article is that the oil companies had already, before the OPEC decision, arrived at the conclusion they would have to greatly increase prices to maintain their rate of profit for the future, in light of the costs of discovering, extracting, refining and transporting the volume of oil it was projected would be needed on the then existing trends (which haven’t changed much since).
No doubt this was in part pure greed. But it also represented a real response to the energy problem, especially the enormous capital expenditures required. The amount of "constant capital" required in some fields — e.g., with the present generation of computers — may be radically reduced, thus even "freeing" capital and boosting the rate of profit. But the energy field shows very much the opposite development, and it is hard to see this radically changing. Commoner discusses the likely economic effects of this and the escalating cost of energy which can at the most be delayed a short time by the opening up of new oil fields — even of "Middle East size" as the Mexican fields are said to be.

Even if the "law of value" were not declining in power as an economic regulator for the reasons adduced earlier, there is no means by which the depletion of a resource can be taken into account by purely economic and accounting criteria (in fact taxation measures tend to compensate mining companies the more generously the quicker they exhaust their mine). Direct social intervention is necessary with quite other than capitalist and profit considerations to the fore. The oil companies — now spreading their tentacles over the whole energy field — are incapable of doing this, as well as being unwilling.

Similarly, as Commoner also points out, the energy-intensity (as well as the capital- and labor-intensity) of every form of production, transport etc must be taken into account (not every piece of new technology is to be welcomed). And the only way, as he says, in which capitalism can take energy-intensity into account is by continually escalating the price and so intensifying social inequalities, because it won't hurt the rich.

As to the ecological consequences, the mining companies are fighting back strongly, and even going onto the offensive. A recent article says:

*The antagonism of the US mining industry to governmental regulations, especially those dealing with environmental controls, has reached such a pitch that one industry leader, Mr. Charles Barber, chairman of Asarco, a major minerals group, and vice-chairman of the American Mining Congress, has been driven to apocalyptic comment.*

"Unless something changes 10 or 20 years from now our mineral industry will have disappeared", he said.

*It is the cost of conforming to the regulations, especially at a time of depressed market prices for many minerals, which is the basis of industry complaints and fears that it will lose its competitiveness in the face of cheaper overseas products.* (Financial Review, November 15, 1978.)

The article reports that the Carter administration is bowing to the companies’ demands, on the grounds of "combating inflation". Could we expect the Fraser government, basing their whole strategy on inducing multinational capital to mine in Australia, to lag behind?

But, in focussing the opposition on the present government and the MNCs, we should not forget, either, Commoner's warning that social rather than commercial decision is, while necessary, "not (a) sufficient condition for maximising social welfare". Social decision must also be guided by a far-seeing policy, which is not notably present so far in countries where capitalism has been overthrown.

Battlelines are being drawn in what will be a continuing and intensifying struggle between capitalists and capitalist governments, and working class and other progressive social forces. It is a crucial struggle for humanity, in which the favorable outcome is profoundly revolutionary, socially as well as politically.

One does not expect that the majority of bank employees or the Telecom workers, in the steps of whose victory they follow, would be convinced socialists. But, being forced to face up to crucial issues as they proceed, they will, hopefully, develop their consciousness, which will be a crucial factor in the ongoing struggle. But, in another sense, the fact that they pose such radical measures arising directly from their own grassroots situation, shows how deep the issue of technological change goes.

This gives grounds for optimism about future developments, however great the difficulties. □