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TECHNOLOGICAL CHANGE

Report to the AMWSU 1980 National Conference

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"*I am reminded of the British electronics company that grew and grew and grew, until it had to move into smaller premises.*

— Barry Jones, MHR"

PREFACE

SINCE preparing my report during May 1980 for the AMWSU National Conference which was held at the end of June, the long awaited $1 million "Myers Committee" report on Technological Change became available.

A determined attempt is being made to have the trade union movement adopt the report which, with the statement of Prime Minister Malcolm Fraser, saying that "the Government would adopt the central conclusions of the report" would made a nice, cosy bi-partisan result like the report itself.

It is true that some recommendations are designed to sugar coat the pill. There are recommendations with regard to up-grading union registration, health and safety and creating some tri-partite bodies for monitoring the situation and conferring rights to information and consultation which, if taken alone, would abviously provide some steps of value.

But they are not taken alone, they are associated with an attempt to disarm the union movement in facing up to the social consequences of the new technology in our time.

They are also associated with eight recommendations (17-24) dealing with assistance from taxes on workers to pay for technological change; including the formation of a "venture corporation" amongst whose objectives would be to "provide risk capital which would not be available from other sources," but which "should aim at realising profits by sale of its equity to other owners or to an approved third party (or parties) after production is successfully established."

One could be forgiven for believing that the Rockfeller Tri-lateral Commission report No. 18 on industrial relations, which dealt with how "workers participation" can facilitate introduction of technology; was somehow transferred to a set of arguments and recommendations to suit Australian conditions.

A very skilful attempt is being made to portray all this as being in line with ACTU policy. Yet major aspects of ACTU policy are totally ignored. Especially where there is a need for social and economic adjustments to be made. At best a very selective and convenient interpretation of ACTU policy is adopted to support such a portrayal.

This is being argued on the grounds that the enquiry was into technology and not the economy. So we can accept recommendations for redundancy but not for full employment. We can accept recommendations for taxes on workers associated with new technology, but not for a shorter working week to spread the jobs and lighten the work load for everybody.

No doubt within the trade union movement the advocates of "the best way is to join them" will grasp at the report (or at least those recommendations which by themselves appear acceptable) as a means of facilitating the rest which should be rejected not only in words but in deeds.

"We simply don't live in a cosy bi-partisan world, except for a handful who choose to act as collaborators at the worker's expense. We live in a world where power is preferentially distributed in the hands of the biggest corporations who control the technology for their purposes, without regard to social consequences. The only purpose of their existence is the profit figure on the bottom line.

It is very much a matter of whether the trade union movement confines itself to demagogic pronouncement of words, whilst denying any action that can effectively produce a positive result in the direction of genuine social responsibility.

We are already experiencing more than enough of this kind of accommodation at the expense of workers' jobs and living standards associated with "wage indexation guide-lines".

It can only be concluded that the reasoning adopted in the analysis section of the report is an attempted rationalisation for pre-meditated conclusions.

For example — despite a contrary definition set out on page 8 — there is, on page 30, a devious separation of industrial rationalisation from technological change.

No examination of "rationalisation" is made which is clearly a function of technology and its potential economy of scale. The clear inference is that technology is being wrongly blamed for what at least is contributed to, if not totally caused by, "other" factors.

What is incredibly ignored in the analysis is that rationalisation is a direct product of the very potential of new technology and its economy of scale and scope. The corporate planners don't ignore it at all, they effect rationalisation as part and parcel of using the new technology. You don't put investment of new technologically advanced equipment into a plant you plan to shut down.

Of course any examination of industrial rationalisation, if it was made, must include complete closure of plants, concentration of product into selected enterprises, elimination of competition, global economics of scale, international complementation, free trade zones under military dictatorships, transfer pricing, transfer banking, the Euro-dollar market and the role of the International Monetary Fund.

But this would destroy the "cosy" character of the report, particularly on page 30, where it says: "The employee may be kept on until, for example, the decrease in price resulting from the cost saving technological change made possible an increase in production that absorbed the labour made surplus as a direct, first round effect of the technological change".

Obviously the "first round effect" can't be ignored but beyond that the market place will save us all. No lack of economic philosophy here. Friedman would be delighted. Multi-national corporations, including oil companies, will be overwhelmed by logic.

No wonder the recommendations only deal with the immediate effects of technological change and to look after the rest we are to rely upon faith, hope and charity, that in the long run the new technology itself can solve problems which so far it has not.

The OECD is quoted as arguing the need for all its affiliate countries to embrace technological change (perhaps that is the source of the rationale) but the increasing figures of unemployment from all OECD countries — now totalling 5.2 per cent of the workforce compared to some three per cent in 1973 — are ignored.

In Australia, also, overall unemployment continues to increase at a faster rate than the average for all OECD countries. Where the OECD average for 1964-73 was three per cent, Australia in that time came in at a low 1.8 per cent. In 1973 that situation reversed. The OECD average from 1974-79 was 4.9 per cent but Australia was above average with 5.1 per cent. And ALL predictions are that the situation is going to worsen into the forseeable future.

There is an attitude that more jobs will occur in new areas of production and services, particularly those related to producing the new technology. But production of the new technology will use the new technology and it is the glaring overall result that matters.

The very purpose of new technology is increased efficiency, i.e. its nett effect is to displace labor to achieve a greater output.

The report begins with confusion in the very first paragraph by trying to dismiss "concern" about unemployment having a relationship to technology in that this concern "has coincided with and has been heightened by the recession experienced during the 1970s by most developed countries."

"Recession" of a business cycle nature has been recurrent about every five years since the Second World War and was superimposed on a boom that lasted from 1946-74. However, the boom burst not because of "recession" but precisely because of growing structural dislocation and instability that flowed directly out of the new technology and the knowledge of the corporate board room decision makers that they could rationalise production and services to use its potential. Or alternatively they could be taken over in the stock markets by those who did.

Thus a structural and technological crisis has been growing in the 1970s and the five yearly recessional cycle is now superimposed on top of this crisis, as are the resources and energy limitations aspects of the situation. All of which increasingly threatens to plunge us into deep depression.

Particularly as society with a growing army of unemployed

becomes less and less able to consume the volume of products and services that the new technology is capable of producing.

What if all advanced countries produce and try to export to each other as much as Japan and living standards of the under-developed world remain as brutally depressed as they are now?

The report (page 11) talks of technology always changing. Of course it is, but these $1 million expert advisers "fail" to see that there are clearly periods when technological change is much more rapid than at other periods and that the character of the technology in such periods is qualitatively different to the periods of relatively slower change that came before it, i.e. there are periods of intense technological revolution.

This "failure" underpins the further "failure" to recognise that in periods of very rapid and qualitatively more advanced technological change, dislocation and instability is greatly magnified and unless adequately countervailed by rapid economic and social change it leads to growing crisis.

It is this crucial area of necessary countervailing economic and social changes that the report fails to discuss and one must ask if this is because acceptance of such economic and social changes is not respectably palatable?

Technology itself cannot solve these questions. They require the action of socially conscious people who decide that such changes must be made and who take action to see that they are made.

To quote Professor Ted Wheelwright: "The calculations about efficiency and costs are, in social ways, quite spurious calculations. They relate only to private costs borne by employers. They do not refer to social costs. They do not refer to the costs of unemployment, the costs of bank robberies, the costs of mental breakdowns and the cost of youth unemployment. We, the community, pay for those, whilst the companies make the profits. To the extent that we, as taxpayers, pay the tax concessions on the new equipment, we have a system of socialism for the rich and private enterprise for the poor."

The report seems to be intended to have the effect of reducing the pressures for necessary economic and social adjustment and therefore contributes to the growing crisis and its effects; but the crisis (as of those similar crises previously in history) must create the forces capable of asserting their determination for change, despite such reports.

The principal form of adapting the trade union movement to the interests of capital in the 1980s will be through collaboration on the introduction of technology and rationalisation, while the New Right of the movement de-emphasises mass action on forcing social and economic change.

AMWSU policy recognises the inevitability of technological change but takes a firm stand on its social consequences.

In particular we assert the need for rapid economic and social changes to coincide with the rapidity of technological and structural change.

We advocate action at all levels of the trade union movement up to and including the national and international political economy, with particular emphasis upon intervention by the workers themselves at job and industry levels on all effects of technological change.

We include in our action programs complete opposition to socially harmful technologies and applications and temporary obstruction as a quite legitimate tactic where social consequences are ignored in the application of even socially useful technologies.

Furthermore we extend this call to assert some socially useful applications of technology as alternatives to those determined by the boards of corporations, particularly where this applies to product technology and "built in" deterioration.

In this regard we advise the workers to intervene in their own interests with action that at least complements any representation made on their behalf in any negotiations with employers or in tripartite bodies. It is a question of genuine democracy in industry.

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NATIONAL CONFERENCE REPORT 1980

TECHNOLOGICAL CHANGE

Report by L. Carmichael
Assistant National Secretary

Introduction

That we are currently in a protracted period of rapid technological change is now self-evident, although at the outset of this period for many in the trade union movement it was not so self-evident and for some it was ignored or even denied.

Technological change can be studied as a particular phenomenon "in itself" and it is essential for our understanding that its features are clearly catalogued. But its net results and effects cannot be understood in isolation from the historical context within which it takes place.

History, particularly the history of capitalism (the economic system with which we have to contend) is witness to the constancy of technological change. However, there are periods when this change is much more rapid than during other periods.

Each period of rapid technological change is associated with other changes. A reformation of capital and structural dislocation in application bringing instability and crisis. It is also associated with cultural, social and political changes as well as economic. It postulates new and extremely demanding efforts to maintain and extend those democratic gains previously achieved in society.

It is very much a question of how technology is controlled, by whom and for what purposes. A matter of recognition of how the democratisation process develops and the historical potential for its development.

Capitalism has seen four major periods of rapid technological change.

1. **The origin of manufacture** i.e. production of commodities for the market place through the organisation of many people in a

systematic division of manual labour in workhouses. The principal form of capital organising and servicing this development was merchant capital seeking products for the markets that had been opened up by better transport and navigation technology.

This undermined and finally destroyed the craftsmen's guilds or alternatively transformed them into forms of "manufactories".

It was followed by a long period of comparatively slower development and a primitive accumulation of capital in the process, based on nation states, piracy, slave trading, convictism with forced labour and transportation for colonial settlement. A mass reserve army of pitiable unemployed labour was created out of the peasantry that was forcibly displaced from the land.

2. The industrial revolution of the late 18th early 19th centuries, the main features of which are generally well-known with its steam motive power, mechanics and machinery inventions. It created renewed dislocation, instability and crisis that was burdened onto the ordinary people.

Industrial capital became dominant but principally of a private family character and continued to express its power through specific "nation states".

It was followed by a comparatively lengthy period of slower development during which greater numbers of people were employed in industry. The industrialised countries of western Europe and northern America conquered the rest of the world dividing it into colonial empires correlating to themselves resources, strategic bases and markets.

It was a period of trade union origin and growth. Of workers' collision with anti-combination laws and brutal suppression. It produced the notorious "Victorian" era culture and social values.

3. The Electrical and Managerial Revolution of the late 19th and early 20th centuries, electric power generation, the electric motor, the telegraph, radio, the aeroplane, the internal combustion engine, the moving production line, Taylorism in the organisation of labour in production, so-called "scientific management", piece work systems and the stop watch.

The potential new economies of scale could only be realised in greater concentrations of capital and investment. The joint stock corporation provided the answer and emerged as the dominant form of capital.

There were wars between the come lately "havenot" industrialised nation states, seeking a re-division of the colonial world which had long been completely over-run by the "have" nation states.

Except for short periods, these changes created dislocation, instability and crisis, lasting from the 1890s to the 1940s, expressed at its deepest points in depressions, Fascism and two world wars.

But it also produced the national liberation movements, a growing power of workers trade unions, workers political parties

and the anti-war movements of the people. In some cases it created a political break in the system and the emergence of countries based upon socialist objectives.

Then there was a comparatively long period of 28 years, from 1946-74, we have come to call the "long boom". A period of growth, partly brought by the peoples; terrible sacrifices of the 30s and 40s. Also partly by policies of "intervention" in the economy and social development which became credited to the Keynesian school (whose theories were able to work whilst they were able to work). Nevertheless the concepts of "intervention" began to take root, despite their limitations.

Throughout this third period beginning in the late 19th century, mass education for the first time in human history was created and it developed very significantly during the "long boom".

The general cultural experience produced new and challenging mass expectations of "democratic" government and of industry with regard to work environment, social environment and the ecological environment. These expectations embraced workers, women, blacks, migrants and many middle class. The concepts of industrial democracy and community action began to take root also.

Anchored by social conformism, "intervention" at the national level was confined to the demand side of the economy. Only fragments of effort were exerted toward democratic ownership and control where privatised power remained supreme and prepared its way to reassert itself against all elements of intervention at the earliest opportunity.

However, during the "long boom" new instruments of production of a dramatically new character were germinating with incredibly greater potential economies of scale, but requiring vastly greater concentrations of capital to focus them into combustion. The multi-national corporation emerged as dominant to serve this purpose. In some industry sectors like oil and chemicals, they evolved step by step, learning the techniques over a period. In most sectors however they were launched by deliberate intent during the late 1960s. Picking up the "techniques", "experience" and "benefits" learnt from those who had shown they way in oil.

4. The modern technological revolution started in the late 1950s, gathering pace in the 60s and bursting forth in the 70s. It is continuing and will do so for some time yet to come.

The new technology, where it is able to be harnessed by those corporations that moved quickly into it, provided enormous advantages over their competitors. Finance capital organised the change in the late 1960s, binding corporations together into economic empires (replacing the previously existing colonial empires), exercising dominant control over governments, whilst being less and less accountable to governments.

Ownership and control of the new technology is exercised by these "empires" but its application is diversified into a new global distribution of production to enhance corporate power by

exploiting "Free Trade Zones", "Complementation", "Competing mendicant nations and localities", "De-stabilisation programmes", "Anti-union legislation", "Military and political coups and dictatorships".

The Euro dollar "stateless capital" market has been created; which, with the assistance of governments, syphons off vast volumes of wealth by means of transfer pricing and transfer banking now estimated to exceed $1,000 billion, thus creating falsified pictures of national productivity, creating inflation, national indebtedness and currency crisis. The international monetary funds acts as an instrument to dominate by indebtedness enforcing wage controls, reduce social welfare and create unemployment. All in the name of accumulative investment for the "benefits" that will come from the new technology.

Government fiscal and budget policies are geared into the overall purpose. Reducing taxes on companies whilst increasing them on the people to pay for research and development, which becomes the private property of companies. To provide new infrastructures at cheap cost to the corporations. To facilitate the biggest companies to increase prices up to double the average rate of inflation and thus exploit the whole nation and to cut social welfare spending and government employment so that government budgeting predominates in the direction of the "private sector".

To pave the way for domination over governments, the empires of multi-national corporate capital, in conjunction with large scale comprador capital moved decisively to quasi control over political parties, the military, police and security forces that had traditionally expressed the "needs" of nationally based capital. This applied in Australia with the Liberal Party over the period starting from Gorton's unchallenged elevation to the emergence of Fraser and his "program". It applied to the Labor Party Government between 1973-75. The de-stabilisation that took place, forcing the issue whilst Labor was still in office and the continuing attempts by Labor to seek office whilst again trying to avoid de-stabilisation.

The overall outcome is that declared profits are exploding, even where they are understated by up to 40 per cent. The accumulation of capital for investment is proceeding but so is the crisis and as the investment is intended for the new technology the crisis will continue to deepen.

Highly organised capital create institutions and foundations like the Rockefeller Tri Lateral Commission which harness social analysis to rationalise attempts to turn back the clock on the peoples' expectations of peace, social liberation, democracy and industry. The arms race is regenerated, social regression is enforced on welfare, women and race. Powerful new forms of population and thought control are developed, deep and sinister situations are created and manipulated. Desperate attacks are attempted against the working class and the unions.

The Friedman School of political economy provided the

theory for re-establishing supremacy of the "market place" where the most powerful would rule; armed for robbery on an enormous scale. Every vestige of democratic social intervention and accountability came under attack.

Every field of social life comes under scrutiny for deliberate and considered regression, including mass entertainment, sport and the fine arts. Every attempt is made to harness everything to serve the market place syndrome.

The impact of dislocation, instability and crisis since 1974 was initially disorienting and confusing for the people. Privatised selfishness was "sold" by the media on a huge scale. Time, experience and the effectiveness of genuine democratic forces were the essential factors to begin producing a renewed movement in all of its dimensions, including amongst the working class and the unions.

A vital part of this was the need of an adequate core analysis of the new situation and its various features. The elaboration of strategies to meet it and organisation of forces to get it moving.

Divisions amongst progressive forces and a conservative resistance to such study and coming to grips with the new situation have retarded renewal of the overall movement for progress.

There are now signs that renewal is beginning to occur. It will do so and develop to the extent that there is the deepest possible understanding of the situation.

But there is need for concrete study. For metal workers this obviously means a concrete study of the metal industry.

This report concentrates upon some of the technological aspects of the matter but other dimensions must also be more concretely explored and added to the debate for all rounded effectiveness.

COMPUTERS DATA BANKS NETWORKS

The central factor in the modern technological revolution is the mass storage and retrieval of information and the exercise of stored intelligence and control by means of computers and these are now constructed and applied in a wide variety of forms.

The origin of computers did not come out of some mystical infinite. For hundreds of years scientists had been experimenting with all manner of calculators to remove the time consuming drudgery of mathematical calculations in their work. It had long been known that digital calculators would, if they could be created, be much more accurate than analogue calculators, which could only produce approximations (slide rules, logarithms, mechanical and electronic slide rules, etc., etc.).

Theory of digital logic was given an enormous boost with Booles algebra laid out in the 1860s, which showed that

everything could be reduced to complexes of a few simple logic patterns. He described these logic patterns and the theory from which the complexes could be built to recreate an "abstract" of any body of information or phenomena.

Alongside of this, programming for textile looms by use of punched cards emerged in the Industrial Revolution at the turn of the 18th century and was carried to a high level of expertise by Holerith around 1889, who showed that any information could be coded and stored accordingly. This included numerics, the alphabet and other characters of information.

It was already envisaged that Holerith type punched card encoding of information would act as an input and output for computers, using punched card readers, sorters and printers, all of which were well established by the 1930s.

What was needed to launch all this was a system of extremely fast acting, reliable switches that only had to be on or off to accurately represent digital coding and for these to be arranged into Boolean algebraic logic patterns.

Electronic switching developed in the late 1930s, using the thermionic valves finally provided the answer after experiments with many other methods had proven too "slow" for the purpose. The first computer came in 1944. The first with a built in memory in 1949. The first commercial use in 1951 and the one that really launched I.B.M. into the firmament came in 1954. In the early 1960s came computers using transistors. In the 1960s, small scale integrated circuits, then medium scale integration, 1973 saw large scale integation and now we are witnessing the introduction of "very large scale integrated" chips, i.e. more than 100,000 components etched into a sliver of silicon about 3cm square.

A close interaction of computer hardware and software development has fed and continues to feed an escalating curve of expansion in capacity, speed and intensity.

Hardware development, through the integrated "chip" has allowed micro miniaturisation, along with energy reduction and yet also provide massive capacity expansion in the processing and memory units.

Peripheral hardware for computers has also gone through revolutionary development. Incredibly fast printers using laser beams, mass storage systems using magnetic discs (with magnetic "bubble" systems having even vastly greater capacities now within reach) video units for input, assembly and read outs. Microfische outputs and printers and development of mass information computer inputs direct from microfische that can be readily transferable in a postage envelope.

On the software side, expansion has been equally dramatic. Computer "languages" have arisen in capacity to allow ever more simpler input instructions. These are then automatically translated down to the myriad of necessary computer logic instructions. Direct voice and visual document input recognition is now being unfolded whilst simulated voice output is already well established on the market in the form of teaching machines

for spelling and for language translators. They are all transferable to production techniques.

Systems designs and programming already at high capacity is moving to exploit these new developments.

Computer installations exploit the availability of —

- Maxis — For extremely large scale operations
- Minis — For medium scale operations
- Micros — For small scale operations — numbers of them frequently under the control of maxi or mini computers.

Computer developments have also allowed and encouraged the development of "data banks": i.e. computer installations that maintain and expand the storage of data in particular fields of knowledge and information.

These data banks vendor their information on the market to users for whom it is more economical to tap such resources without having to maintain these systems themselves.

Some research institutions, libraries and other similar agencies have computerised and as a result of penetration of the market become virtual monopolies in particular fields such as the one on chemicals in the U.S.A. New such data banks are being created weekly.

Many of them are off-shoots of those four or five multi-national corporations that globally predominate in a field of production and who turn their research and development institutions into revenue earning data banks. Thus, by controlling this technology, they harness other and smaller companies to their profits. Frequently using public funds made available for such research and development.

The potential economy of scale for this market is in many cases global, consequently the pressure is also exerted for communications systems to be up-graded to meet this potential.

This is achieved by the space programs, satellites and now the new generation of space shuttles to put the satellites into orbit. The world will soon be totally ringed with satellites in "geo-physical orbit" for data transmission, inter-connected to new generation "optical fibre" land transmission lines, having enormous data transfer capacities.

Global transfer of information by satellite from data banks is already a reality and by using another computer installation as a "terminal" (whether of a maxi, mini or micro character) it is possible to obtain data and information in seconds from any part of the world.

Furthermore the data banks, or data processing centres also vendor software systems and programming that is resident in the data bank for user availability through such terminals.

Further still, some collective arrangements of data banks have grown where the entry access of them is through a marketing network. These "networks" combine a number of data banks vendoring differing areas of data information and software.

These networks are globally interlinked — Telecom and O.T.C. provide such a link into Australian terminals and networks by a connection called "Midas".

What emerges as a potential with this, is that design data and production information usable in the metal industry (or any other industry) can be produced using computers and vendored from any point of the globe with feedback for checking, maintenance and development.

The data can also include direction as to the machines, materials and their sources, operation processes, packaging and delivery.

The impact in industrial production will, in the future, be as dramatic as it is today in commerce, utilising micro computer controlled machines under higher control of localised mini computer installations, acting as a terminal for globally operating data banks.

As these developments unfold, the technological revolution will intensify, A period that must be expected to extend beyond the end of the 20th century.

THE METAL INDUSTRY

Computerisation of production and process control in the metal industry however will take greater investment to unfold than where the application is in commerce. Consequently the pressure for "concentration" of capital is intensive. This can be seen in heavy engineering, electrical white goods and auto production.

Costs of word processing machines for banks, insurance and other offices are around $15,000, whereas some engineering machinery is around $1 million and for multi-stage machines, even more.

Micro Processor Controlled Machines (numeric controlled)

Nevertheless the trend is already established and the metal industry will increasingly come under its impact. The lowest estimate is that 209,000 jobs in manufacturing have gone since 1974. Of these, about 65,000 are in the metal industry.

It will proceed from computerisation and control of individual machines, including design machines through multi-stage automatic transfer machines to totally automated lines. A transition from segmented to integrated automation.

Some existing machinery can also be subject to conversion using servo and incremental motors and drives associated with attachable micro-computer control and programs.

Micro computer control (digital machines) will replace numerous electro mechanical timing devices, micro computer techniques are also invading all areas of metrology.

There will be redundancy of work associated with redundancy of pneumatic controls, hydraulic controls and electro mechanical controls, much of which is the traditional work of a maintenance fitter.

There is a need (like what we encouraged our members to do in the Tasmanian engineering annexe) to demand and exercise rights to programming and maintenance of the new equipment.

This in itself can raise "grey area" demarcation questions, issues of multi-skilling, including who does software. It exerts further pressure toward the meed for amalgamation through which effective intervention could become really possible.

In addition to current costs being a retardant factor in the metal working industries, there is a problem of cutting tools technology, with attendant problems of sharpening and maintenance. A conservative influence by comparison.

However, all new machinery, despite the growing complexity is becoming more reliable, with inbuilt programmable, self diagnostic capacities to instruct on maintenance procedures, such as the examples in use at Vickers Ruwolts in Victoria.

Furthermore, intensive research is being applied to the cutting tool area, both in the direction of reducing or eliminating the need, using other methods and by using new cutting tool materials and methods, such as spark eroders, and lasers in addition to better traditional methods.

Robots

A particular application of micro-computer and associated technology affecting the metal industry is with robots.

These come in three categories — fixed, movable and mobile. The cost of fixed and movable robots has already fallen quite substantially and is still falling.

In particular this is the case for the limited requirements of re-programmable robots that can be "fixed" into position between other machines for use in transfer operations or even limited processing operations. These now cost significantly less in one year than a worker they replace for all time.

Robots are already being utilised in metal industries in Australia. They are massively applied in Japan and are beginning to be massively applied in USA and Western Europe.

They are already used for some processes such as spray painting and spot welding, but the greatest impact will be as programmable transfer machines.

In this regard they are utilised on continuous production lines between processing machines and they are utilised as a central work transfer operation between a mumber of micro processor controller machine tools. Exchanging and manipulating parts to be machined in any pre-programmable sequence, seemingly at random.

This can apply for short production runs and for a complex of operations that may utilise each machine a number of times in any variety of sequence. The robot shifts the component machine to machine, turns it as needed, stacks it and transfers it to packaging if needed.

Assemblies of machine tools in this manner are known as "unmanned machine centres" (UMCs).

Intensive experiments are taking place with various configurations of UMCs in Japan, USA and Western Europe.

The Financial Review in January 1979 announced that Japan would be marketing what will be virtually workerless factories by 1984, using continuous production lines and/or UMCs.

The latest prediction is that the giant multi-national corporation, IBM, is about to enter robot production, along with micro computer giant Texas Instruments, using video camera "sight" capable of "self learning" programming for automatic complex assembly and manipulation of the most delicate of objects over a wide variety of size and form.

The giant Esso Company has ownership investments in a number of computer oriented industries that are gradually being integrated in this direction, including its micro computer company "Zilog". These companies are expected to "gel" their technology around 1984-85.

Digital Equipment is also considering entry into the robot market, which at present is dominated by Unimation (Unimates) and Cincinatti Machines. Also of significance is that General Motors have joined with Unimation to produce a new generation of robots that can "see".

According to the attached survey by Business Week of June 9, 1980, sales of robots are now "taking off". 1980 sales are expected to be three times that of 1978 and if the computer giants do join the market, sales in the USA will be 200,000 units, i.e. ten times greater by 1990 than a market would be without them. Even the 1985 figure without the giants is projected to be five times greater than for 1980. (However, my prediction is that it will be even greater).

Production lines and UMCs using robots will have "stand by" spare robots at the ready to replace any that break down. Whilst emergency by-pass lines are being installed around controlled processes that are fixed in position.

Maintenance work thus proceeds at a regular pace, despite the elimination of labour on the line or at the machines.

V.D.U. Graphics

Using computers in the metal industry for product design is increasingly taking the direction of setting up graphic shapes on a video terminal (e.g. the various elevations and plans of a component) and from there entering in the dimensions. The lot is automatically adjusted to scale and then transferable to machine control instructions that follow the shape and dimensions to great accuracy.

Recent developments of graphics systems using video displays connected to computers herald one of the biggest impacts to come in engineering design and production control. Large scale investment is being put to work in this field.

It is already possible to provide "simulated" 360 degree rotation of any abstract display in any direction once the basic parameters are entered, thus enabling any product or

component under design to be observed from any point of view, and make corrections where necessary to ensure its intended accuracy of form in all respects. This includes sectional design and dimensions as well as external form. Simulated three-dimensional and perspective displays are also provided. So are simulated stresses automatically applied and according to design parameters "tested" by simulation whilst on the screen.

It is the combination of correctness of shape plus accuracy of dimensions entered and finally adopted that then ables the design to be computer transferred directly to production machines without any further labour required, all the way to any stage including final packaging of the product as desired.

In other words this particular application of computers is the metal industry equivalent of the recent newspaper industry issue. In that industry the issue became one of more money for journalists using VDUs to displace printers in the industry. In the metal industry this equivalent is with the designers and draughtsmen using VDUs connected to unmanned machine centres (UMCs).

This obviously holds attendant problems in this direction and should postulate early consideration of how these should be approached.

Locally Resident Overall Computer Control

The trend is quite clearly in the direction of exercising overall management control of production by the use of a mini computer feeding instructions from design terminals or residual programs into the various micro computer controlled machines and robots.

This production management by a mini computer will include directions as to materials, where the sources of materials are, how the processing is to be done, quality control, packaging, despatch, billing and accounting. It would include "feedback" maintenance information and directions. It would "switch in" alternatively machines where break-downs occur.

Remote Data Bank Connections

Where it is of advantage a resident management mimi computer can be used as a terminal to receive design graphics, pre-programming, materials sources and information, processing parameters, marketing and maintenance programs from remote (even globally remote) data banks via satellites or land line communication links.

All this is now possible and being developed. It is applicable to "one off" (where it is economical to do so) to any size run up to years of continuous uninterrupted production.

Designing Labour Out of the Product

Computerisation of design and control, which will be central to an increasingly rapid change in metal industry technology will not be the exclusive factor.

Technology in materials and processes will add to the automation of control.

Enormous effort is being exerted in all industries to "design" labour "out" of the product so that the methods and material used supersede labour requirements wherever possible.

This is certainly the case with chemicals, plastics, die cast aluminium, glass filament, carbon fibre and so on. New generations of high impact plastics with low machining requirements are increasingly taking over where metals were previously used. This is especially the case in autos and electrical white goods, plumbing and other building materials and also in many machine and tool parts.

Insulation and packaging plastics also substantially contribute to this situation.

Micro computers also replace electro-mechanical timing devices in consumer products, e.g. 290 parts have been replaced in domestic sewing machines. A similar trend in washing machines, in watches and automobiles.

It is projected that up to 20% of all micro processes will be utilised in this manner.

There is an enormous job replacement capacity involved in this, both in production and maintenance. It is one of the vital aspects of labour being designed out of the product.

Rationalisation and Complementation

Whilst not directly the "hardware and software" of technology, rationalisation and complementation of production is a most effective management software function that distributes the hardware in particular patterns, the aim of which is to enable maximisation of application of technology associated to any achieveable economy of scale.

The very possibility of using some particular technologies directly depend upon whether such concentration of production can be achieved.

Pressures are exerted not least by competition to concentrate production. The way is prepared by corporate "take overs". It extends into new corporate structures and the imposition of new industrial relations management.

Rationalisation and/or complementation can be applied within an industry sector in Australia. In the metal industries this has been the case in electrical white goods and is taking place in heavy engineering. Whole enterprises are closing down whilst others are narrowing to no more than one or two products.

It can also be applied in Australia to an enterprise as a segment of a regional or global industry sector. In the metal industries this is proposed by the auto industry sector and auto components.

It is further applied across industry sectors as described in the AMWSU booklet "Australia Up-Rooted" where exports of mining products create balance of payments pressures for

imports of manufactured products and companies operating "off shore" to exploit such a situation.

A number of metal industries sectors have been affected by this. The most notable being electronic products and domestic appliance "shelf goods", the former almost wiped out and the latter virtually down to one company, Sunbeam.

Employment in white goods has been reduced to half of what it was ten years ago. In electronics about 20 per cent remain. Shelf goods about 20 per cent and automobile manufacturing about 70 per cent.

A study needs to be made to ascertain the effects in heavy engineering and to establish what other sectors are involved in rationalisation and complementation as a prelude for substantial application of technological hardware.

A loss of employment for metal workers on maintenance can occur in non metal industries sectors of production where they have also suffered from rationalisation and/or complementation — such as textile, footwear and rubber industries.

SUMMARY

In summary, the main features of the technological revolution as it affects the metal industry are:

(1) Multi stage-multi purpose machines with inbuilt programmable micro computer controls to meet the complexity of their own purpose, including maintenance information.

(2) Robots for transfer and many processing operations having programmable and re-programmable micro computer controls. Assembled in combinations for continuous production and UMCs.

(3) VDU "graphics design machines" with in-built micro computer controls.

(4) Resident mini computer management systems integrating "design VDUs", "robots", "micro processer controlled machines", materials sources and storage, accounting and marketing operations.

(5) Inter connection of the resident mini computer management system to data banks via satellite and land line communications systems.

(6) Maximum utilisation of new materials and processes that eliminate labour from the product.

(7) Rationalisation and/or complementation as a concentration of production to provide higher economies of scale to exploit new technological "hardware and software".

Multi-national Corporations, the Australian Government and Technology

In November 1979, a company called the "Technology Transfer Council" was registered in the ACT.

Directors include representatives of government departments, the MTIA and the VCM.

Its express purpose — with government money using workers taxes — is to apply technology in Australian industry. Enquiries show that this is heavily concentrated on the metal industry.

In a Government announcement May 16, 1980, Minister for Productivity, Kevin Newman, stated that six centres specialising in the "transfer of metals technology" in Australian industry will be open for business on June 2. Each centre to be staffed by expert liaison officers to help create a bridge between technology users and suppliers.

The four objectives stated by Newman are as follows:

- to increase the ease and rate of access of the metals manufacturing and user industries to the very latest technology;
- to make this technology available in a form readily and easily assimilated by industry;
- to increase the overall productivity, hence competitiveness of the metals industry;
- to determine the technological needs of industry.

It is understood from the MTIA press that this venture with public monetary assistance is directly connected to MTIA offices, at least in Sydney and Melbourne.

It must be assumed that close connections between the major high technology manufacturers, IBM, GE, Kawasaki, Mitsubishi, etc., etc., with the Australian Government will find their effective transmission belts, through the most rapid possible application of technology in the Australian metal industry.

Summary of Effects Upon Employment

1. Work associated with creating new technology will use the new technology. Final effect of job displacement can run as high as a 10 to 1 ratio.
2. Virtual elimination of employment for process and transfer operations in mass production.
3. Large reduction of skilled employment for machine tool utilisation.
4. Attempts at de-skilling of maintenance work by use of inbuilt computer "self diagnosis" and programmed instructions.
5. Who does the programming for individual machines, robotics and overall?
6. Increasing "grey area" demarcation issues and multi skilling problems.
7. Substantial and sometimes rapid changes in training and education where existing work will cease to exist or dramatically change.
8. The Government report leaked to the press setting the possibility of official unemployment as high as 700,000 by 1983 should not be taken lightly.

New technology in its widest forms knit together into a weft and warp throughout society, all adding to the totality of effect upon industry and employment.

The jet aeroplane, large scale dieselisation (in locomotion, civic engineering and mining), containerisation in transport and other factors have added their accumulating dimensions from the seeds of the technological revolution in the 1950s.

Other new and very dramatic developments are yet to come. They will include biological engineering.

This will begin to be utilised during the 1980s with the ability to divide and recombine the genetic twin helix. It will start at the micro biological level and extend higher and higher to complexes of cells and life.

Already the corporations have moved for monopoly control in this unbelievably enormous new field. The Shell Oil Company in particular is involved.

The new technology will also have a big impact in the home. It is now a foregone conclusion that a micro computer installation will connect the phone to TV sets for a wide variety of purposes, with attendant effects upon postage, transport, etc. Such an installation will become virtually obligatory. Without it, many services now available will no longer be so.

Britain and France are already transmitting information from the Post Office and a variety of data banks for home utilisation, rail timetables, telephone numbers, theatre bookings, etc., etc., etc., and etc.

The availability of this will extend to learning anything in the home, for designing in the home for production and so on and on. In some countries companies have already been formed to vendor in this manner. Obviously the supermarket can use this for direct ordering from home to warehouse.

Virtually workerless factories, supermarkets, warehouses, banks and offices are a real probability within this decade, and with real proliferation in the next.

Experiments are in hand to provide a total chain from factory production into standard packages, pre-printed with prices, etc., into standard pallets and containers by delivery to enormous warehouses, stored and retrieved by computer control again for delivery this time to supermarkets where the very pallets become shelves for self-service and the products taken to automatic check outs where payment is by magnetic credit card, with an automatic check with the bank, automatic transfer from personal bank account to the supermarket bank account and hardly a person employed in the entire process.

Further experiments provide colour video shots of products on TV screens, with selection and ordering from the home direct to warehouses, where packaging is automated for "pick up". Again with credit cards, automatic banking, but eliminating the supermarket link in the chain altogether.

The Social Issues

Technology holds the potential for progress and it can certainly eliminate drudgery in work. It can raise productivity, it can provide better goods and services.

On the other hand it is in the hands of forces whose only interest is profit and privatised power. It is used to reduce skills, to reduce employment, to carry out production irrespective of its effects on the environment and to "build in" deliberate deterioration.

Even where technology can be a social advantage, its application can be anti-social.

Technology by itself cannot solve these social problems. This requires the intervention of socially conscious forces, i.e. the people who have to live in the world that is inherited.

Some technology is a direct social menace. Some require greater cost to make it safe for humanity than what it appears to save by its introduction, e.g. nuclear power.

The union movement must apprehend the modern technological revolution at all of its levels.

- Enhancement of power in the hands of the largest and most ruthless monopolies now the multi-national corporations, whose track record is plainly anti-social in industry and in the community, with the potential to exercise this power as never before in history.
- Proliferation of some technologies which are anti-social in themselves — with their effects on health, environment, or the very destruction of this planet.
- The effect of growing crisis arising from dislocation and instability expressed in unemployment, attacks on wages and conditions, social regression for women, blacks and migrants. The armaments race and the danger of war as some forces traditionally look to this as a solution to crisis.

The choices that current history is putting before us lies between allowing the corporations to create a society where fewer and fewer are able to work and earn an income whilst paying more and more taxes to keep more and more totally unemployed. A situation that will lead to a massive crisis greater even than the proportions of the 1930s and possibly a war worse than the 1940s.

Or alternatively the people, workers and the unions in particular, intervening in opposition to the corporations and asserting the right of all people to equitably participate in socially necessary labour and to have an adequate means of sharing the social product. Whilst at the same time effecting their own cultural revolution by means of creative recreation as they require it for themselves.

History both compels us to make the choice whilst holding out the potential for the latter. We have the capacity where the concentration of workers' power lies so long as that capacity is used whilst there is still time.

Union Reactions

Unions must be concerned for the social effects of their actions or inactions.

We cannot simply stand aside "waiting for something to turn up". We must directly intervene and fight for egalitarian values and action to serve these values.

A program is required and a strategy to achieve it. It is not enough to have a policy, although a policy is essential.

A shorter work week, a new technical training policy, intervention on all managerial prerogatives, expanded social welfare, a worthwhile community education and creative recreation movement and increased trade union rights are vital components of such a program.

But a strategy essentially requires much greater organisation of the workers directly exercising their own self-action, on all matters that affect their lives in industry and the community. Thus we contribute to the growth of democracy in the very task of giving effect to a strategy.

Extension of democratic intervention in the national political economy must go to the supply side (ownership and control) of production as well as the demand side. This should be both a logical and essential outcome of the way that intervention is developed and practiced in industry and the community.

Within such a strategy tactics are required to totally oppose all socially harmful technology and temporarily oppose technology that is applied in a socially harmful manner, including the effect of creating unemployment.

The current, broad social intervention shorter work week campaign affords an opportunity to discuss modern technology and its social implications. To arouse awareness and support for a program of social progress. It must be presented in such a manner so that the movement deepens in the course of its unfolding.

It is significant that the presentation of a broader 7-point program in the course of the 35 hours campaign contributes to the solidarity and effectiveness of the campaign.

(1) 9 day fortnight based on 35 hours, rostered day off and control of overtime.
(2) Optional early retirement with decent pensions.
(3) Increase apprenticeships and cadetships for both male and female entrants.
(4) Exercise control on resources, wealth and profits for socially essential production and job creation programmes.
(5) No markets without production.
(6) Trade union rights in Asia to lift living standards to purchase the goods they produce.
(7) Public funds for community education, recreation and cultural activities.

It must be shown that each of these points highlights essential dimensions of a strategy and that the unions pursue these dimensions concretely in the course of their daily actions. That they are pursued in industry and politically.

A strategy requires an integration of broad social intervention, with specific and concrete intervention at the industry sector level where the workers experience is daily concentrated.

This does not mean fragmentation of our movement, but it does provide the practical wherewithall for workers to generate their own self-action intervention, along with and as part of, a broad social intervention.

This requires organisation so that attention can be given to concrete analysis of technology, capital concentration and complementation production in each industry sector. It requires workshop debate about the specific effects upon the workers' lives and what should be done about it.

We need to win conviction that specific practices produce the general result. That workers action in the industry in which they are employed should relate to the expectations they have of all industry sectors with regard to industrial practices and conditions, effect on the environment, effect on the products to be presented to the consumer and what alternative forms of production would be of social advantage.

In other words, to generate "production consciousness" amongst workers, based on genuine social responsibility and to exercise intervention in industry accordingly so that industry as well as government is brought to meet expectations of their quality of life.

Summary of a Union Strategy

1. Increased study, discussion and debate about all the matters involved.
2. A more unified and cohesive program of economic, social and democratic demands seen to be starting at the job level and extending to the national economy.
3. Broadly based, more effective campaigns of intervention utilising more enhanced research, education and publicity activity that latches into the organisational apparatus, especially directed toward involvement at the work place.
4. Specific studies and activity at all industry sector levels, again with intensive involvement at the work place and closely related to the national campaign activity.
5. Adequate attention to the international dimensions on a regional and on a global basis. Increasingly involving these dimensions at the work place.
6. Intensification of discussion about the need for amalgamation of the metal unions for increased effectiveness in intervention, free of corrosive divisions and for the finding of organisational formulas to facilitate amalgamation.

AMWSU 1980 NATIONAL CONFERENCE DECISION

TECHNOLOGY AND INDUSTRIAL INTERVENTION

Conference draws attention of all members to the growing invasion of all aspects of production by new technology involving computerisation, new materials, rationalisation and international complementation.

Conference further draws attention to the impact that this is having upon employment and growing dislocation of the workforce.

Of more than 220,000 jobs lost in manufacturing, some 65,000 have been lost in metal sectors as a result of technological changes already applying and rationalisation that relates to this technology.

Conference believes that the technology now unfolding will greatly magnify this effect.

Furthermore, similar technology and rationalisation invading other industries including all white collar areas of employment, creates a situation where alternative employment is less and less available.

Technology itself cannot solve the issues raised by its application. Its utilisation is in the hands of the biggest and most ruthless of monopolies who are driven by an insatiable appetite for profit and the laws of the market place jungle. They will not voluntarily exercise any social responsibility for the actions they take, except declare their regrets.

Whilst on the one side there is the potential for human progress in providing a better work life and social existence, there is the increasing threat that many technologies are a direct menace to life and that the application of useful technology is frequently applied in an anti-social manner including the creation of growing mass unemployment.

To meet the challenge the trade union movement as a daily function in its work must decisively intervene and exercise social responsibility starting in the industries and extending into the community.

This intervention must also extend to overcoming the power and control of the corporations which is exercised over government so that the people's social expectations of industry and government are fully realised.

The role of government cannot be seen as a neutral factor in this growing crisis.

Conference declares that the trade union movement can express this intervention through the launching of positive mass campaigns such as the current campaign for a 35-hour working week and the conduct of these campaigns in such a manner that they highlight the principal social issues that confront us.

The union movement can also express this intervention by specific industry sector research organisation and activity, involving workers directly in the workplace starting with job

conditions and directly contesting managerial prerogatives on what is the best course for any industry to take and wherever necessary taking this contest into the community for support.

This contest must extend to the need for alternative work and wherever possible socially necessary production so that real needs of the people can be met by industry.

Workers at job level and in negotiations at industry and company level must obtain all necessary advance information about technological and structural changes. Industry does not exist for management alone.

Workers must realise that company planning proceeds years in advance and that any denial of this is either a statement of managerial incompetence or a lie, which in either case the workers must know and act about accordingly.

It is essential for the trade union movement to develop the demand that before any technological change or rationalisation takes place, the employer concerned, by government legislation, be compelled to fully disclose the details and likely impact that the proposed changes will have on the workforce involved, and the wide ranging consequences of the change.

Additionally, there should be continued pressures exerted by the trade union movement to compel employers to accept the social responsibilities that industry has to the people.

That the union formulate a set of guide-lines to be circulated to shop stewards of what steps to take when a new machine involving technological change hits the workshop floor, so that the full knowledge and implications are known to the workers.

There is a need for the union movement to increasingly fuse together the industry sector action and the mass campaigns so that each flows into and assists the other and there is also a need that terms of award and agreement negotiations increasingly reflect this fusion of working standards with industry and social intervention.

Conference welcomes the beginnings of this approach that have begun to be expressed by union organisation in some industry sectors and the work of the Trans National Co-operative, with which we are associated, in carefully developing intervention studies and project activity.

Conference also welcomes those segments of our union's work that have embraced the international dimensions of technology, rationalisation and complementation and the effects of these dimensions upon employment and living standards in Australia.

Conference also believes that the need for amalgamation of metal unions becomes an even greater necessity.

Increasing areas of demarcation are arising and reduced memberships are threatened, whilst on the other side, effective intervention requires more united and authorative union action that amalgamation of union resources can provide.

We call upon National Council to exert all efforts to have the ACTU policy for amalgamation of unions effected in all industries.

To further facilitate this work, Conference determines that the report on technology presented at the opening of Conference be reprinted for study by all active members and distributed to all unions. That it also be recast in the more popular "Australia Ripped Off" style for widespread discussion and that it be taken as a basis for a series of articles in the Metal Worker.

Conference directs National Council to ensure the continuous study of the subject and its ramifications with the further production and distribution of material.