

tain wide discretionary powers which can be applied according to circumstances. Even those laws which have been repealed stand ready to be reintroduced should they be "required". The concept of a "consensus" within such a wide ranging and discretionarily applied legal framework is nonsense. No consensus is possible in New Zealand while such a legal framework exists.

THE EFFECTS OF TECHNOLOGICAL CHANGES ON WORK PATTERNS IN THE AUSTRALIAN ECONOMY

GEORGE WITTINGSLOW*

In the last year a growth industry has arisen — seminars and conference papers regarding technological change; mention the new fear word 'microprocessors' and one is guaranteed a large audience.

The sudden burst of activity has not clarified many issues. In the main, we have witnessed the presentation of set piece speeches where ideology and values have been presented without factual information or without a meaningful frame of reference. When facts are given, they are not presented in a manner which allows integration with other information.

Even if such a frame of reference did exist, there is still the problem of accuracy regarding the forecast. The protagonists know that time must pass before any checking can be made on their claims, and often the actions based on the claims are irreversible by the time such checks can be made.

In 1950 the Rand Corporation predicted that the effects of the computer revolution would lead to just 2 per cent of the American workforce (4 - 5 million) working by 1980 (Tyler 1979). The latest figures show a workforce of 95 million with more than 60 per cent of the population actively employed — the percentage in 1950 was 56 per cent. The demand for workers has risen through more holidays, longer vacations and a service economy not visualized thirty years ago.

The Rand predictors did note that the United States had the largest female workforce in the Western World, but expected this percentage to fall drastically. Today, Holland is the only OECD country with a female workforce of less than 30 per cent of its female population. (Benglson 1979)

In my allotted space I cannot hope to meet my complaints by presenting a detailed frame of reference and accurate predictions, but I shall try to cover as much as possible.

MAJOR UNSTATED ASSUMPTIONS

IDEOLOGY OF CHANGE

As a researcher in the field of organizational change it is quite eerie to read the important writings of two generations or more ago. Between 1880 and

* Dr George Wittingslow is Principal Lecturer in Psychology, Royal Melbourne Institute of Technology. This paper was originally presented at the ANZAAS Jubilee Congress, Adelaide, May 1980.

1940 the major topic was the belief in, or, the rejection of, Capitalism. Economic and social justifications were given for the system, e.g. Economic Darwinism, while others were given to support the ideas of Socialism of Communism. (Cole 1920) Today such topics are rarely discussed except by the far fringes of the left and right. Yet the language and arguments of those earlier days still appear in current writings in a new guise — for 'Capitalism' and 'Technological Change'.

Those who argue for the support of Technological Change refer to economic survival, viability, and management's right to manage, which restates the capitalism ethic in terms of profits for survival. The opponents of technological change refer to increased unemployment, lack of social responsibility by firms and indemocratic nature of the decision making process whereby workers' futures are treated with scant regard for years of long and loyal service.

The pity is that neither party listens to the other group's arguments. They assume the issue is either black or white with their party in the right. One case where the parties did discuss the topic in a meaningful manner occurred in Britain. Recently the Confederation of Shipbuilding and Engineering Unions and Lucas Aerospace agreed to jointly negotiate the development of alternative products — through joint union — management analysis — guaranteeing job security and building new factories. (TUC, 1979)

CHOICES OF TECHNOLOGY

The choice of a particular technology does not occur in a vacuum or in the pure and antiseptic economic environment as described by theoretical economists. The choices of technology are rooted in the fundamental social values of the particular society. Values and technology will differ from collectivist to individualistic societies. In the latter we would expect, for example, the production of small home-operated washing machines, in the former improved commercial laundries. (Cherns 1976) We need to understand the underlying 'pattern variables' (Cherns 1979) which determine social choices within a society, if we are to better anticipate the way in which technological possibilities will be exploited.

Such an approach seems full counter to a common belief in Australia that technology is independent of society. In fact, the technology is seen as determining the shape and function of social institutions. Much of this belief has come from a very poor understanding of the working condition in England during the beginnings of the period popularly called "The Industrial Revolution". (Clark, 1970). Many of the techniques and technologies of that time were known long before the advent of steam power; some technologies had been regulated by law for two centuries or more. For example, the size of lace looms had been restricted by law to four pieces of lace, yet lace weavers could weave six to eight pieces at the one time in the reign of James I. (Thomis 1970) The law had been passed to protect lace weavers jobs and to reduce industrial disputes.

The advent of the enclosures meant that many farm workers no longer held land rights. These folk were encouraged by local Poor Law Commissioners (Thomis 1970) to seek work in other parts of England. Other important factors

in the early conditions of the industrial revolution were the industrial disputes and riots of the 1790s and the thirty year long trade depression in England between 1800—1830.

Steam and water power were available, there were large numbers of unemployed workers on hand, the government no longer actively enforced regulations to protect workers' jobs and prices had fallen by half. In such a setting one can understand why England led the world in the introduction of new technology — social conditions allowed and encouraged it to occur.

Some time has been taken to stress the point that 'technological determinism' is a fallacy as many of the commentators in the field of work forecasting do not even consider this point. Instead, they place all the blame for disruption through technological change, e.g. increased unemployment, onto the owners and controllers of the technology (Managers and Technologists). This is rather curious, as many of the leading critics of technology and its effects are Scientists who see nothing wrong in 'pushing forward the frontiers of science' in atomic energy and computers, yet deny the use of atomic bombs, atomic power plants and microprocessors.

The type of technology is largely determined by the type of society and by the ownership of the power to command it. In our society, this means anyone who can raise the capital, with the proviso that only huge organizations or governments can afford to sponsor complex and expensive technology, for example, Pan Am and the Boeing 747 aircraft and the F111 fighter bomber sponsored by the U.S. Government. Thus the economic, social and political organization of a particular society strongly influences the nature of the technology which arises in that society.

This point is relevant to recall when I give my projections for jobs in the next five years; I, like other forecasters, will assume a continuity of present policies which can be easily altered with quite marked effects. For instance, a very recent report to the U.S. Department of Agriculture (Zwerdling 1979) questions the assertion that western agricultural methods are more efficient than ever before in terms of production per person. The present system is acknowledged to be very inefficient when measured in terms of output per acre and requires large power outputs. Broad acre farming has been shown to cause environmental damage and encourage new disasters with the widespread use of pesticides. The report notes these are agricultural systems which are very productive per acre, environmentally sound and energy conserving but they do require much more labour. On the face of this evidence one might naively expect Australia, as the most urbanised country in the world, to foster the suggested agricultural systems. In political terms, such a move in the longrun would benefit the seat winning potential of the present opposition. As well, the National Party members would exert pressure as the costs and restrictions on new broad acre techniques were introduced. Consequently, I have assumed a falling proportion of people in the farming sector, yet the technology and rationale is available to increase the size of the sector.

Another important technological choice we still face is the production of power for smaller communities into the twenty first century. Discussions with federal government advisors suggest we are already committed to a coal, gas, natural gas powered economy into the next century. In the U.S., they are still

considering the switching from petrochemical fuel to a decentralized solar economy. There, unlike here, the major power generating bodies are privately owned organizations run for private profit. Here the large energy suppliers are government owned bodies making money for the respective State Treasuries and providing cost incentives to large power users e.g. Aluminium Refineries, to come to their state (Age, 12, 4, 80). Strikes in the power industry revolve around new labour saving technologies, yet the decentralized solar system would provide work for an increasing number of people, and give control of power generation back to the local communities. A technological choice does exist for power generation, but whether one will consider the alternative(s) is a political decision.

The government has always created subtle effects on the choice of technology by the policy decisions it makes. In the U.S.A. the health schemes have become very costly, as the latest microcircuitry is applied in the design of highly sophisticated equipment which hospitals purchase at great cost. The American solution has been to introduce staff ceilings in hospitals, and to keep recurrent costs to a minimum. This in turn has led to the situation where wards have been closed because of a lack of qualified paramedical staff. An example would go as follows — a hospital is informed of a new electronic hear monitoring machine which increases the chances of saving heart attack patients. The machine is purchased and housed in specially prepared accommodation for \$250,000. Then the hospital is told that the machine requires six technical and support staff to keep the equipment fully operational. As staff ceilings are set and the equipment has been purchased, six places previously held by nurses, cleaners, office staff, etc. are allocated to the heart monitor unit. When this happens a few times, the salary bill of the hospital continues to grow as technicians earn more than nurses, yet there are fewer staff to look after patients in the hospital beds.

Recent statements by the Australian Commonwealth Department of Health suggest the costs of the Medibank health scheme will be reduced, yet already hospitals have staff ceilings. If large public appeals such as the Children's Hospital Appeal continue to provide buildings and equipment, it is likely that Australian hospitals will face the American dilemma described above. Whether or not this will occur will not be decided by the hospital staff, but by the Australian Government.

If the funding bodies better realized the interaction between their policy decisions and effects within the community, they would recognize that the technology does not determine the systems but rather the opposite.

MANPOWER PLANNING

Many people believe the present unemployment figure would be much lower if Australia adopted an effective manpower planning scheme. Proponents of this argument do not state which of the manpower planning approaches they desire, and it is doubtful if they even realise there are different approaches with differing effects (Niland 1978).

Blaug (1967) noted that all the evidence indicates that we cannot yet forecast beyond three to four years with less than 10 per cent error, which is the accepted maximum level of error allowable in general economic

forecasting. So unreliable are manpower forecasts, that not one country has made a serious attempt to introduce comprehensive targets for manpower requirements (Niland 1978). Ahamad & Blaug (1973) evaluated ten major manpower forecasting exercises in eight countries and found considerable error in forecasts of employment by occupation. Errors in French forecasts ranged between 5 per cent and 60 per cent and Swedish results were similar.

The Manpower Services Commission in Britain decided after a long detailed project, that at a national level the labour market is too complicated to allow accurate and precise forecasting of the demand for labour: the time lags and uncertainties are too great. They concluded,

“no country has succeeded in making substantial headway on the basis of national manpower forecasts” (Manpower Services Commission 1976)

All this evidence suggests that Manpower Planning is not an easy answer to our problems of unemployment and the effects of technological change so the concept will not be considered further in this paper.

THE IMPORTANCE OF WORK TO THE INDIVIDUAL

One issue not discussed at any length in the technological change debate is the value of work to the individual worker. As said before, positions are taken, e.g. workers work not to work but are forced to *versus* unemployment destroys a person's value of themselves, but little evidence is offered.

Some writers mention the disillusionment of workers with the world of work (e.g. Braverman 1974, Brown 1977). One wonders where these people collect their data or whether it reflects their personal beliefs. In the most recently reported national survey in an OECD country (Barter 1978), 75 per cent of the British workers stated they enjoyed working. The percentage was higher among managers (81 per cent) than among skilled workers (73 per cent) and 66 per cent of the unskilled said they enjoyed work. The same survey found that a sizeable majority would not retire even if they had the opportunity to do so without any loss of pay; the age group with the highest percentage was those within five years of retirement (82 per cent).

Those who write of a leisure dominated world (e.g. Parker) mainly judge work's value in terms of pay and condition, but overlook the positive latent functions of employment. At least five positive latent functions have been identified (Merton 1957);

- (i) *employment imposes a time structure on the working day,*
- (ii) *implies regularly shared experiences and contacts with people outside the immediate family,*
- (iii) *provides a link with goals and purposes which transcend his own,*
- (iv) *defines aspects of personal status and identity,*
- (v) *employment enforces activity*

Whether we like it or not, employment provides some definition of one's position in society, status and identity. People may resent their particular job and try to change it, but this differs from having NO defined position.

Work is the organ in our society which presents the opportunity for actions whose consequences are visible and for the daily exercise of competence and skill. Where work is designed to minimize the person's individual initiative, con-

siderable ingenuity is invested in varying the performance to demonstrate what the individual can personally achieve.

THE EFFECTS OF UNEMPLOYMENT

In 1979 Professor Marie Jahoda gave a noted address to the British Psychological Society on unemployment (Jahoda 1979). Her published work in 1933 was one of the first major milestones in the area.

Jahoda was the first writer to refer to the fact that workers saw unemployment very differently from having leisure time.

'The unemployed decreased their attendance at clubs and voluntary organizations, their use of the free library, their reading habits. Their sense of time disintegrated; having nothing to do meant they were less Punctual for meals and for other arrangements' (Jahoda 1933)

Budgeting, so much more necessary than before, was progressively abandoned. Whole family relations continued in established patterns longer than other relations and activities, there was some evidence that they, too, deteriorated and family quarrels increased. The apparently obvious fact that unemployment was widespread and not the fault of the individual became less and less obvious to those who looked for work, especially when the unemployed person was given a changed position within his family (Komarovskiy 1940). Often his wife compared him unfavourably with those who worked, and tended to blame him rather than the economic events of the world at large.

Jahoda referred to the correlational studies which attempted to link anti-social behaviour with unemployment. Carr-Saunders (1959), in his sample found that 31 per cent of delinquents were unemployed while only 1 per cent of the control group were out of work; Sainsbury (1955) found a higher suicide rate and Jaco (1960) a higher incidence of psychiatric treatment. Unlike Windshuttle (1979), she quite properly noted that these studies did not establish causality, as the unemployment may have been due to the instability and anti-social behaviour of those surveyed.

Comparing the 1930s and 1970s Jahoda noted that the physical depression is relative rather than absolute. Another difference is the increased level of education in the population. In the past, jobholders have been more educated than job seekers, but in 1974 both British (Harrison 1976) and the U.S.A. found that there were no significant differences between both groups. While better education has been assumed to result in a more safely anchored self-esteem, it has also raised the level of career aspiration. No-one has reported a study on the effect of longer education, so it so impossible to say whether people will handle unemployment any better now than half a century ago.

DIFFUSION OF IDEAS IN AUSTRALIA

The work of Schon (1971) is often quoted to illustrate how quickly ideas diffuse and are applied as innovations. It is assumed on this basis that overseas changes in technology will sweep across Australia and lead to massive unemployment. The assumption is simplistic and unlikely to occur. Schon's examples do show a sharply decreasing time for world application, but he and

others overlook the cost of the innovations discussed. A transistor can be immediately applied in almost any society and its cost is very low; the same cannot be said for the steam engine and the automobile which are quoted as examples of longer diffusion periods.

It was recently claimed (Hopgood 1978) that Australian industry is relatively slow to adopt new technologies requiring high or medium capital investment. It is quick, however, to adopt new technologies requiring little capital investment. It was found that once an idea was adopted the technique was quickly diffused within that industry. Among the factors which were perceived as delaying the application of technological change were:—

- *the low levels of research undertaken by industry,*
- *lack of training in management,*
- *the small size of industry, of the market and individual companies,*
- *the small effect of government purchasing power,*
- *the lack of specialization by industry,*
- *our remoteness from advanced countries,*
- *the tariff protection of "older" technologies.*

All the above factors indicate that major changes are unlikely to occur quickly in Australia. The most discussed examples of technological change are either small cheap innovations, e.g. microprocessors, or in one of the few organizations where the above description does not apply — Telecom Australia. As Australia's largest employer it has the financial backing, management training and size of market to apply the latest technologies. It is not surprising then that the best known recent example of union management confrontation over the effects of labour saving technology should have occurred in Telecom.

All the evidence suggests that the great majority of Australian workers will not be directly affected by technological change within their own workplace in the next five years.

MICROELECTRONICS AND COMPUTERS

One cannot discuss the effects of technological change without mentioning the effects of micro computers such as word processors. Since the release of the BBC documentary, 'Now the Chips are Down', public anxiety has risen over the future of jobs for the present and future generations.

So far, the fears have not been realised. Manufacturers may make sweeping claims, but there has been little actual support for the statements. If one looks at the world of the office a definite pattern is discernable. During the 1940s similar claims were made by equipment manufacturers. Butler Cox (Lester, 1978) estimated that office productivity rose only 4 per cent in the period of greatest implementation of the equipment (1960-1970) yet manual production increased by 83 per cent in the same decade. Overlapping that period, the percentage of the workforce employed in offices increased from 21 per cent to 27 per cent (1966-1976) to meet the demands.

Manufacturers, such as Xerox and Siemens, see a vast growth in automation to handle the office work of the 1980s, but they forget that most of this work has been generated by their own systems. The net effect of the increased infor-

mation has been to increase the possibility of management taking no decisions but at a much dearer cost.

Some manufacturers have attempted to overcome the information indigestion complaint by proposing the setting up of 'cells', to assess the usage of present and future generations of equipment. Cell formation requires a thorough going reorganization whose cost is claimed to be met by increased productivity and cheaper future equipment. British appraisals of the approach note that the consultants are unable to differentiate between activity and productive activity, and this leads to bottle-necks elsewhere in the organization.

In a recent biting speech, Butler Cox claimed that a good management systems expert could design and complement systems which radically increased office productivity without any hard technology, while consultants, attached to manufacturers, built systems to quickly handle information in a manner similar to the pharaohs but at a much greater cost.

Many claims are made of the effects of microprocessors but few are actually documented. One such rare example, (Lester 1978) reported how a British insurance broker shifted to a cheaper wage town (Ipswich), installed word processors and improved productivity per worker — it cost \$25,000 to save a \$6,000 job in one section, and overall the firm spent \$10,000 per worker in a marginally cheaper wage area 100 miles away from its major clients. As the researcher notes, the firm asked 'how' but never 'why'.

The claims of the microelectronics industry are easier to understand if one studies the effects on its own areas or those closely associated e.g. watches, desk calculators and television sets. The Japanese and British manufacturers cut their workforces by over half between 1972-6 and in the British Telecommunications industry the workforce was cut from 91,000 (1971) to 57,000 (1977) (Webb 1979).

Sweet (1979) attempted to measure the effect of word processors in N.S.W., after noting the wide variations between Windschuttle's (1979) claim that 20,000 had lost jobs already and the Department of Employment and Youth Affairs estimate of 4,350 — 7,000 positions by 1981 (1979). Sweet quickly rejected Windschuttle's alarmist figure, as this would have represented a loss of a third of the typist positions in Sydney. He concluded that the estimate by Employment and Youth Affairs was more believable as it was based on surveys of users of word processor.

In his conclusions, Sweet noted that while the demand for word processor operators doubled in his year of study, they still constituted a very small fraction of all positions for typists/stenographers. He also noted that only the highly proficient typists were suitable for training as operators, yet the machine automates most functions which delineate between highly skilled typists and the rest. In a very real sense the word processor deskills the skilled typist.

In the last month the bank unions have threatened to hold up or prevent the use of automated money dispensers. They see microprocessors reducing the long term number of bank employees. This I see as the major potential effect of microprocessors — they will prevent the continued growth of labour as service industries grow, but they are unlikely to lead to displacement of presently employed workers.

CHARACTERISTICS OF THE AUSTRALIAN WORKFORCE

DEMOGRAPHIC FACTORS

On the figures from the Borrie Report — which is still the most reliable indicator of our nation's population, Juveniles (1-14 years old) comprised 28.8 per cent of our population in 1971, while the Retired and Aged group was 8.3 per cent. In 1986 the Juvenile groups will have decreased to 24.3 per cent (down 4.5 per cent), and the Aged group will have risen to 9.3 per cent (up 1 per cent). The absolute numbers in the Juvenile group have decreased in the past five years and are only predicted to reach 1976 levels by 1986.

In 1976 41.9 per cent of the population were employed in the labour force while 21 per cent did not seek employment, although they were capable of job openings. Borrie (1964) predicts the labour force will rise to 48.8 per cent (up 6.9 per cent) by 1986 with 17.6 per cent staying at home (down 3.4 per cent). The percentage of employed men is predicted to remain static, but the percentage of employed women is expected to rise 7.3 per cent from 29.5 per cent to 36.8 per cent. These predictions should quieten the fears of those who accept the so called "Californian" scenario of an increasingly geriatric and pensioned population being supported by a shrinking tax paying base of "productive" people (Newton 1980).

TRAINING AND EDUCATION

Educationally, the workforce has never been higher trained. A generation ago those who were not coping well with school or were not motivated or whose financial circumstances demanded it, left school at the age of fourteen and found jobs which provided on-the-job training or apprenticeship training. Students who completed ten or eleven years of schooling could expect to fill the upper echelons of white collar employment, while those desiring professional training completed twelve years of schooling before entering a tertiary institution.

Today over half of the students are still at school on their sixteenth birthday, and most students complete eleven years of schooling before seeking a job. At the tertiary level, the position has changed even more radically. In the six years between 1971 and 1977 the number of people holding first degrees in the Australian workforce doubled (Karmel 1978), and is expected to quadruple the 1977 figure by the end of the century when graduates are expected to total a million.

Already graduates are being forced to seek and accept jobs lower down the job hierarchy than they would have expected when they entered their tertiary institution, e.g. the Commonwealth Government now recruits graduates as clerks Class 1 where they receive the same commencing salary as non-graduates. Such moves give rise to an apparent under-employment of graduates, as they appear over-qualified for their jobs.

The unemployment of highly qualified workers has already led to complaints from employers and workers where the graduates see their job aspirations frustrated by the realities of the labour market. While employers do not find dissatisfied workers attractive, they continue to ask for increasingly higher

qualifications when recruiting. This process of 'credentialism' is very clear if one looks at entry requirements for the public services, banks, and nursing.

As a result of growing 'credentialism', the least educated and qualified suffer the most in the race for jobs. Unemployment is concentrated among early school leavers, unskilled and unqualified people, those without experience, women and migrants.

YOUTH UNEMPLOYMENT

One often quoted reason for youth unemployment is unrealistic wage demands. Male youth earnings have hardly altered against average weekly earnings since 1972 (Blandly 1978) but female youth earnings have increased by 21% against the same measure. The female youth increase appears very high, but when one notes that equal pay was introduced after 1972, the increase of female youth rates, against female adult pay rates are small.

The real problem is that between 1972-1975 the pay relativities for skills were severely compressed, so that the least skilled and least experienced workers' pay has increased relatively to the more skilled and more experienced. Youth and adult female 'workers' are more likely to occupy the least skilled and experienced jobs. Employers who relied on cheap labour costs to run their businesses then looked for other means, often technological, to keep their costs down. Supermarkets were known and used in the grocery industry nearly 60 years ago, but until labour costs became dearer than the costs of establishing the supermarket system, large grocery chains did not consider the substitution of equipment for labour.

These facts lead to two conclusions:—

- *youth are as work orientated as their parents or grandparents,*
- *the only way the youth workers will be able to fulfill themselves in a work sense is for the economic recession to end. (Stricker and Sheehan 1978)*

HIDDEN UNEMPLOYMENT

Any indication of the size of the labour market are necessarily approximate and open to interpretation from varying points of view. One point not covered by any indicators is the number of people who have withdrawn from the labour force because they do not believe they can find a job (Henderson 1978).

Hidden unemployment has long been a field of study in the U.S.A. (Marshall & Perlman 1972), but has only become a field of interest in Australia in the past decade (Gregory & Sheehan 1975). Merrillees (1978) found substantial hidden unemployment among women in Australia, and Steinke pointed to the growing gap between actual and measured unemployment. The N.S.W. studies have shown the existence of hidden unemployment in non-metropolitan districts. (Eisenhauer 1979).

Hidden unemployment is excluded from the A.B.S. unemployment statistics, as the persons in this category desire to work but have not taken active steps to seek work. Essentially, the distinction between the unemployed and hidden unemployment is based on a distinction between subjectivity and objectivity.

The Hancock Committee (1973) states —

"...the test of willingness to work should not necessarily exclude those who do not take active steps to look for work in the belief that no jobs are available for them because of a general lack of demand or because of their lack of qualifications, sex, race or some such distinguishing element."

With a recession entering its fifth year, one would expect the number of discouraged job seekers to increase. This assumption is supported by the results of two relevant studies between November 1975 and May 1977 (A.B.S. 1977) the number of discouraged workers rose from 33,800 to 65,500.

Using a very rough rule of thumb measure, based on the work of Gregory and Sheehan (1975), it would appear that at least another 1 per cent of the Australian population would offer themselves for employment if they believed suitable positions were available — stated another way there are at least 500,000 Australians available for employment who are not presently employed.

DEVELOPMENTS IN THE WORK PLACE

INDUSTRIAL RELATIONS

As already noted much of the set statements regarding technological change are variations of the 'Capitalism' argument. Serious concern has been expressed in the U.S.A. (Raskin 1979), that there is a worldwide attempt by management and conservative governments to "take on" the union movement in the name of flexibility for economic survival. Management and business journals abound with articles which tell how union power has been decreased through particular applications of new technology, and how 'Industrial Democracy' has been introduced to keep unions out of industrial complexes. It is not surprising then that the union movement is less enthusiastic about changes to present work patterns.

The largest private employer in the world, General Motors, has openly recognised the above developments and has signed an agreement with the United Automobile Workers to introduce new technology and worker participation only after joint negotiations with the union. The same has occurred in Lucas Aerospace in Britain, in Sweden and in West Germany.

A report to President Carter commends the G.M./U.A.W. contract as a model for American industry to adopt; it is a move Australian industrial relations should seriously study.

PROMOTION OPPORTUNITIES

A new phenomenon is about to occur in the Australian workforce — most of the workers will be aged between 25-44. In the past this age group supplied the middle managers who were destined to take control of their organisation. Soon we will see very bitter battles fought for the few good jobs by the majority

of the workforce as this age group will increase by a third in the next decade. As a large number will possess tertiary qualifications, it will be harder to choose between them, yet they will expect to rise to positions above that of their father. How the rising expectations and the stagnant economy will interact is one of the hardest areas to predict in the next decade.

For those who are promoted, the rewards will meet their expectations, but those who fail will have to face another threat. Besides not gaining the promotion they believe they were promised, the unsuccessful candidates will face new job designs. As the 25-44 age group will constitute over 50 per cent of the workforce, it is only logical that any job redesign will affect them. A very recent survey by the Harvard Business School showed that few workers were dismissed when new technology was introduced, but many workers felt their job had been trivialised. The majority of workers interviewed felt they no longer knew why or what was happening in achieving the completion of the total task.

The facts suggest that any organization that introduces new technology faces a very serious problem when the new job designs 'deskill' workers who have higher job expectations than those of earlier generations. Whether there will be a comparatively simple morale problem or something more serious, forecasters are unable to say at the present moment in time.

The reduction in skill will not help the semi-literate in our society to find jobs. All forecasts agree that the majority of the unemployed will be semi-literate people who leave school at 15 or 16 to seek work. While the skill levels and challenge will be reduced, the workers will still need to be literate to understand the system. This will mean that as the new technologies replace the highly repetitious and dirty tasks, the displaced workers will not be able to seek the traditional role of assisting skilled workers. As a result, it will be even harder for unskilled workers to find jobs.

A recent investigation into crime in American cities found the drug rackets were manned by illiterate workers who could not obtain a legitimate job in their community. The report suggested that the U.S.A. government recognize crime as an industry so the government could better estimate how many people were truly unemployed, and how many were employed in crime which was estimated to earn income equivalent to 10 per cent of the G.N.P. Before we become complacent it is worth recalling that we have many of the same conditions as those which prevail in the U.S.A; long-term unemployment could legitimise drug selling for a substantial minority within our community.

SHIFTWORK

The growth of shiftwork has been spectacular since the second world war. The International Labour Organization has estimated that the number of workers working shiftwork has doubled in the past generation, until 25 per cent of workforces in some O.E.C.D. countries are shift workers. (Bengtsson 1979) Previously a blue collar occupation requirement, shift working has become quite common in more service industries, and it is not unusual to expect women office workers to work on a rotating shift roster.

The major reason for this form of work scheduling is the desire to more inten-

sively operate expensive equipment, and to use advantages of continuous process technologies.

After reviewing all the available evidence, Dunham (1977) concluded that shiftwork led to serious adjustment problems. Dunham concluded the majority of the problems were due to shift workers being "out of phase" with established physiological and social cyclical rhythms. His review was taken up by the International Labour Organization, as the organization had in part accepted the writings of some management consultants that workers chose shifts which suited their life style. As Brown (1975) clearly illustrated, this in part was true, but the choice did not overcome the problem that most leisure related "normal" community activities, opportunities and services, particularly those formally organized, favour the day worker.

Mahoney (1978) and Frost and Jamal (1979) found a high compatibility of hours was associated with more positive attitudes and behaviours in work and non work settings. These findings were supported when the four day week was investigated. Not only did society at large benefit from the higher involvement and commitment to the community of the day workers, but work also gained through lower labour turnover and higher work standards of the same group.

Maurice (1975) showed clear medical evidence that shift work had damaging effects on the health of the workers. Night shift workers were found to suffer two and a half times the incidence of serious nervous disorders compared to day workers, and 20 per cent of those over 40 years of age showed pathological effects.

It is ironic then that just as social scientists begin to investigate the effects of differing work modes, and discover the effects mentioned above, that the proponents of higher and more costly technologies should be arguing for a higher proportion of continuous process industries to recoup capital costs. If the expansion of shift working continues, one wonders at what cost to the workers, to the society at large, and to the employer through higher labour costs and labour turnovers.

PREDICTIONS OF JOB OPPORTUNITIES

I have not referred to any assumptions regarding Australia's future in the earlier part of this paper. This is because I believe the general picture for Australia in the next decade is quite clear and generally known. We are one of the few countries virtually self sufficient in both food and energy in the 1980s. Australia has substantial oil reserves and seemingly endless supplies of natural gas, coal and uranium. This, combined with our mineral wealth, agricultural riches, a small well educated population and a bustling industrial sector should make us one of the few countries to confidently face the next decade.

Against this background, I have made the following predictions regarding job openings.

GENERAL TRENDS

1. About two thirds of job openings in the occupations up to 1985 are expected to arise from replacement of attrition losses and only one third from

- employment growth. The bulk of the replacement demand will occur in less well-paid fields with a majority of female employees.
2. While there will be many more graduates in 1985 than today, we expect more widespread changes to stem from a sharp decline in the proportion of people with less than 12 years of schooling. The reduction in percentage of early school leavers will occur most in the less skilled occupations in which they have traditionally been concentrated.
 3. While unemployment is likely to increase in absolute numbers, the total number of workers in jobs will also continue to grow, so the percentage of unemployed to employed need not increase in the next five years.
 4. The decrease in the annual labour force growth rate will have two effects. On one hand it will increase the potential pool of unemployed, but it will also mean a slowing down of the G.N.P. growth rate. If a marked economic recovery does occur, it will happen through increased automation, not increased available labour.
 5. The annual man-hours per worker will decrease only marginally, by an average of 0.3 to 1 percent per annum. Over a five year period, this gradual decrease would equal three extra days of leisure a year. In the short-term it is anticipated that the reduction in hours will be taken in the form of longer vacations rather than a reduction in the weekly hours.
 6. The unemployment-prone groups such as youth, migrants or women, will bear the brunt of any increase in the numbers of unemployed, as the slow growth and persistent high unemployment levels will force graduates to seek jobs in fields in which they have been reluctant to enter in large numbers in the past.
 7. Sixty percent of all job openings are seen as occurring in the white-collar fields. The largest single group of job openings will occur among the clerical workers, a field now overwhelmingly made up of female employees. The next largest field will be the skilled service field which includes personal, health and protective services. The majority of the new positions will be created through attrition.
 8. Some occupation openings will grow almost entirely from the creation of new positions. For example, three quarters of the openings for engineering and science technicians will arise from employment growth.
 9. Employment growth will be a dominant element in occupations, concentrated in rapidly growing industries, and in fields heavily influenced by technological advance.
 10. The lower paid workers will find that the differential between their pay and that of the above average salary earners will widen, i.e. there will be a greater proportional gap between the skilled and unskilled workers in our community. Because the fields in which employment growth will most likely occur include many of the better paid occupations.
 11. The educational requirement for job entry will increase for blue collar and service workers as more and more better educated youth enter the workforce. The belief that it is better for young people to spend their time at school, instead of being unemployed on the dole, will ensure that 'credentialism' will increase.
 12. The authoritarian discipline exemplified in the automobile assembly line will

- be less acceptable than it was a generation ago, to a workforce where most will have 11 or 12 years of schooling.
13. While radical changes will occur in particular industries, an observer in 1985 even 1990 will notice little change in the occupational distribution in 1980 to that of their year.
 14. The raised level of job expectation will not be met by an economy where most positions will occur by attrition. More people will be disenchanting with the economy in 1985 than in 1980.
 15. In the past, new career occupations have a consistent pattern — low earnings and absence of job security. While some electronic industry positions will not meet this pattern, most of the created jobs will do so. This will lead to disillusionment by trainees towards any government inspired job creation programmes.
 16. The majority of the workers will be over thirty by 1985. These will be the employed — the minority of young will contain nearly all the unemployed.
 17. Shifts in national priorities will influence job opportunities. Pollution control will require an increased surveillance force, and will significantly increase expenditure on capital goods and for pollution control equipment.
 18. Although the federal government and health funds have criticized increased health costs, it is unlikely that investment in health services will fall. This will mean a large increase in job openings for non professional health therapists and aides of many kinds.
 19. Categories of occupations expected to require larger intakes include:
 - Computer programmers)
 - Draftsmen) both only in the short term
 - Electrical and Electronic Engineers
 - " " " Technicians
 - Personnel and industrial relations staff
 - Buyers and other managers for large chain stores
 - Heavy equipment operations and mechanics
 - Child-care workers
 - Nursery aides and orderlies
 - Police
 - Secretaries/Typists
 20. Categories of occupations expected to require less workers include:
 - Sales clerks and salesworkers
 - Bookkeepers
 - Keypunch operators
 - Assemblers
 - Quality control staff
 - Farm labourers and Share farmers
 - Private Secretaries and Stenographers
 - Printing trade apprentices
 21. Younger workers in particular, take positions which are in their local area. As growth areas are more easily identified, these people will shift to the growth areas allowing replacement to occur. This is the way in which population changes take place.
 22. The higher paying occupations are expected to grow more rapidly than the low-paying ones where some will actually decline through increased

automation e.g. stenographers, printing trade employees and farm labourers and share farmers.

23. Overseas and local evidence suggests that the typical unskilled blue and white collar worker will hold twelve different occupations during his or her working life. Only one person in five in this group can anticipate remaining in the same major occupational category for his or her entire working life.
24. Australian growth plans are built on an over-reliance on Japanese industry. This connection will threaten to pull us down with Japan as she enters the 1990s. Above all other factors, Japan's economic morale has been built on the Confucian work ethic which closely identifies the employee with his employers. Japanese workers pride themselves in not taking holidays and believe they can work until they are no longer useful when they will retire on a minimal pension. Technological change will force a re-evaluation of these beliefs which are likely to lead to industrial anarchy as younger workers and unemployed reject the traditional Japanese values.

PARTICULAR EFFECTS

As Moore and Hedge (1971) proved, while award hours have decreased, overtime has increased until workers were employed for longer hours at work in the 1970s than in the 1950s or 1960s. Wilensky argues that this phenomenon will become even more noticeable in the 1980s. He foresees an increasing uneven distribution of leisure, where the emerging structure of opportunities will see a growing minority working very long hours while increasing millions will be reluctantly forced to accept too much leisure. This will occur at a time when the proportion of non-working years in the life cycle will be increasing.

The projections of working age populations to 1990 are reasonably reliable, as all the people concerned are already alive. The projections indicate a continuing rise in the population of working age until 1990. The number of older retired people will rise quicker than the working age population.

The greater longevity of women will create welfare work opportunities. Nearly 80 per cent of men over 65 are married and live with their spouse, but only 39 percent of women are married and living with their husband. As the women grow older and more feeble there is a greater demand for home and institutional services. This manpower need is further accentuated, as many of the increasing number of women in the workforce would have previously provided free support if they were not employed. The net effect will be a marked increase in the number of paramedical and support staff needed by helping agencies.

Economists are likely to recall the 1960s as the last decade of controllable inflation. British inflation is presently 20 per cent p.a. and most European countries are following suit. Even the mighty German mark has had 8 per cent inflation rate in the past 12 months. It is apparent that the problems of the 1973/4 oil crisis were not as hard as first thought — the price of oil only increased at the rate of worldwide inflation. In the past six months the oil prices have risen at a rate higher than the rate of inflation and cutbacks in production have been promised. All this points to a worldwide inflation rate of more than 10 per cent which we presently enjoy.

The inflation rate will be used as an argument by the A.C.T.U. to demand full indexation. At even half the rate of inflation the salary and wage bills will become large enough to encourage more automation of production and retail systems which will displace workers in quite large numbers by 1985. This in turn will mean greater overseas ownership of Australian companies as they seek the cash to buy the new systems and machinery.

The initial impact of the above technological change will not be felt until the 1990s. W.D. Scott's prediction of \$14 million worth of investments in energy and energy intensive industries was made before the Esso—B.H.P. announcement of the \$1.2 billion investment programme in Bass Strait. These huge development schemes will generate large numbers of highly paid construction jobs as the developments are undertaken and finished. The biggest investments will occur in Western Australia and Victoria. Once complete however, the capital intensive projects will generate little work for the Australian workforce.

This writer believes the 30 hour 4 day week will be a fact of life within the next decade. Private bank employers are only one group demanding this change in working conditions as a pay-off for increased automation by the employers. Social pressure will stop a quick movement towards large retrenchments and the rest of the workers working 35 to 40 hours a week for much higher salaries. This will lead to a reduction in hours through productivity gains and non replacement of workers leaving the organizations.

The manufacturing industry will face increased pressure by Asian manufacturers to open their markets to imports. This will occur at a time when the bottom half of the range of wage and salary earners will be struggling to survive in the highly inflationary conditions. The top third of the income earners will already possess their durable goods and two or more motor cars so durable goods will continue to fall as a percentage of the household disposable income (12 per cent in 1970, 9.5 per cent in 1979.)

The new rich of the 1980s will be the young married couples. Birth control methods and better work opportunities for women have led to the situation where many two income families are earning at least \$20,000 per annum. At the same time many wives of professional men are re-entering the workforce as their childbearing duties decrease.

These factors are leading us to a two class society based on household disposable income. The poor will have to struggle just to survive. Wives will accept part-time or any work to earn enough money to support the family. Home building demands will fall as the percentage of Australians owning or buying their own home falls. The inflation rate will make housing loans prohibitive — 15 per cent to 25 per cent interest will be common. Flat construction will boom as flat investment will become more profitable. The richer homes will spend their money on services such as holidays, overseas travel, dining out and dearer clothing. We will also see the return of the house cleaner although it is most likely to take the form of contract cleaners who will employ the wives of lower paid workers on part-time rates.

Some economists believe the scenario of increased flat construction will not occur — that families will save even more to buy their own home. Should this occur, the fate of the Australian manufacturing industries will be even more bleak, as this will mean much less disposable income will be available to our

chase durable goods.

The populations of Western Australia and Queensland will continue to grow at a faster rate than the other states. In Western Australia the population increase will come from young people moving to development projects, marrying, and raising a family. Some younger people will shift to Queensland but the main increase will come from retired couples shifting to South East Queensland. Victoria will slow down its loss of population to other states as the development projects are built in 1980s and 1990s, but will continue to lose older retired couples. South Australia will be the biggest net loser of population in the next decade.

A serious crisis will arise in the hospitals during the ten years. The huge costs of hospital maintenance and development will force strict staffing levels to continue. At the same time, the new microelectronic technology will be purchased for and by hospitals. The staff to maintain the new technology will take the place of nursing and support staff which in turn will close down wards through lack of staff. In the U.S.A. medical technicians are one of the most rapidly growing job areas.

The growth of part-time work will not help many adults to gain paid employment. The new systems need unskilled labour who will work for the lowest possible wages — school children fit this category perfectly and as well they are not members of trade unions (Sweet 1980). Since the introduction of late night shopping in 1971 in Victoria the percentage of full-time people employed in retail outlets has fallen from 70 per cent to 30 per cent. This represents 60,000 full-time jobs in Australia which have been turned into part-time work (Engel 1978).

There is one way to reduce unemployment which our leaders could try — re-education. In 1963 the West German government legislated to give every West German citizen, employed or unemployed, the right to return to an educational programme for as long as two years with a stipend related to his or her last wage. Germany now has between 1 and 2 per cent of its workforce constantly entering or leaving the programme. The law was amended in 1969 to include travel funds and family allowances (Bengtsson 1979). The programme was adopted by the French in 1970 and by the British in 1974 where the average stipend is \$70 per week.

If we could establish a meaningful philosophy for recurrent education then we too could provide such a programme. Certainly it would reduce our unemployment figure, and allow us to be more meaningful compared with other O.E.C.D. countries on unemployment statistics.

CONCLUSION

In this far ranging paper, I have attempted to draw together many threads in the field of effects of technological change. As far as I know this has not been attempted before.

In attempting my task I run the risk that people will emphasize sections or statements which suit their arguments or needs and reject the rest of the paper. Such behaviour is consistent with the traditional treatment of the highly

emotive topic of technological change.

Overall, I see an increase in the size of the Australian workforce in the next five years, but with an increasing unemployment figure as the growth of new positions fall behind the number of the people offering themselves for paid employment. The quoted unemployment figure will understate the total of people available for work by at least 1-2 per cent as hidden unemployment will increase as unemployment figures rise.

Industrially cheaper forms of automation will be introduced by the majority of firms, but only large multinationals will introduce the higher technological advances. This will further increase the difference in technology between large and small organizations.

Microelectronic technology will not lead to massive retrenchments in the next half decade. Rather the implementation will require the present staff levels to effectively set up and integrate the new technology. After 1985 more jobs will be lost through the technology and from 1980 few new staff increases will occur in industries applying microelectronics.

The service industries will continue to grow as the major employment sector in our economy — health care computer industry services, travel, holiday accommodation and law enforcement personnel. The industries to feel the major impact of technological change will be the retail, printing and assembly industries.

The development of huge mineral reserves will hide the effects of technological change until the late 1980s or early 1990s, when most schemes will be fully operational and only require a minimal operational staff.

The dream of a more egalitarian society will recede in the next decade. Those with good academic qualifications in the relevant areas will earn proportionally higher salaries, than those with average or minimal education and the trend will increase in the decade. With an increasing number of qualified women the phenomenon of the well off two salary family will become increasingly familiar especially to those in the leisure orientated industries.

The poorly educated youth will be further alienated and scenes such as those witnessed in Frankston and Bristol will increase as their frustration is turned on the police and other visible authority groups. This will mean more police and less understanding between the 'haves' and the 'have nots' in Australian society.

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FOOTNOTE

* Dr George Wittingstow is Principal Lecturer in Psychology, Royal Melbourne Institute of Technology. This paper was originally presented at the ANZAAS Jubilee Congress, Adelaide, May 1980.