TOM MANN ON TECHNOLOGICAL CHANGE, UNEMPLOYMENT, EDUCATION AND LEISURE: A TURN OF THE CENTURY LABOUR LEADER'S VIEWS ON SOME SUBJECTS OF CONTINUING CONCERN*

John Laurent

Technological change and employment effects are not new phenomena. This paper examines some responses to technological innovation in the work situation around the turn of the century, a period of rapid and unprecedented scientific and technological development. The views of Tom Mann, an articulate British trade unionist and labour leader, on a number of subjects relating to these developments are compared with some recent writing, and are found to anticipate much of what is currently being said on these same subjects. It is shown that Mann, together with a number of other trade union representatives, basically welcomed technological innovation as a means of reducing the physical drudgery and long hours commonly associated with nineteenth century working conditions, notwithstanding frequently found assumptions of Luddite attitudes. Some comparisons with and implications for today of these positive responses from workers in the past are suggested.

Keywords: unemployment, technological change, trade unions, innovation, leisure

INTRODUCTION

Conferences such as that on 'Work, Income and Leisure in the Years Ahead' held at Wollongong University last September reflect a growing community concern with these subjects.[1] Notwithstanding the confident pronouncements of some economists that advances in technology do not necessarily mean net job losses, the Australian public is very well aware of continuing high unemployment, and this at a time of economic recovery and growing productivity. May it not be just possible that technological change can adversely affect the

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overall job situation? After all, as Keith Windschuttle points out, when an employer introduces some form of 'labour saving' technology, the whole object of the exercise is usually to reduce the wages bill in order to increase profits or to remain competitive.[2] Barry Jones' widely read and discussed *Sleepers, Wake!* is one of a number of recent books produced out of this general area of debate, and Jones, too, agrees that there is no getting around it — technology is not just displacing but replacing people in the workplace.[3] This point of view has been supported by a number of case studies,[4] and an increasing number of writers seem to be essentially in agreement with the idea.[5]

But the idea is, of course, not new. The effects of automation and cybernation were discussed by Marx as long ago as 1867:

> As soon as a machine executes, without man's help, all the movements requisite to elaborate the raw material . . . we have an automatic system of machinery, and one that is susceptible of constant improvement in its details. Such improvements as the self-acting stop, that stops the power-loom so soon as the shuttle bobbin is emptied of weft, are quite modern inventions.[6]

Employment has always been affected in some way as a direct result of such innovations. Marx had some hard things to say about the "temporary inconvenience" suffered by British textile workers put out of work as a consequence of these kinds of changes,[7] and all the discussion of re-training etc. has not greatly changed the situation for 'displaced' workers even today.[8] Nonetheless, workers whose jobs are replaced by technology today are probably not as badly off (in Britain and Australia anyway) as their nineteenth-century counterparts, because now we have unemployment benefits, one of the various forms of social provision whose introduction can be directly attributed to the influence of writers like Marx via the socialist labour movement of the late nineteenth and early twentieth centuries. Marx and other labour movement writers were not opposed to technological advances *per se.* Indeed, the greater part of *Capital* (Vol.1) is really a hymn of praise to human mastery over nature through the application of science and technological knowhow, and history itself is seen as a pageant of material progress reaching its height in the machine age of Marx's own time of writing. But what Marx and later writers were most certainly opposed to were the gross inequities under which the benefits of this progress were distributed (Marx being aware that many of the inventions which made the Industrial Revolution possible were those of manual workers who often received little reward for their labours).[9]

Some people might still wish to extol the virtues of unbridled *laissez faire,* but many more would not,[10] and since most of us would now

regard at least some form of social welfare as a normal arm of government, it may be that the socialist and labour movement writers, to whom such a commonplace expectation is largely due, might still have something to say to us about social problems associated with technological change. This might more especially be expected when one considers that the late nineteenth and early twentieth centuries were an era of unprecedented scientific and technical advance — reflected, to take as an illustration, in the books of Jules Verne and H.G. Wells. The writings of a socialist author who had himself been directly involved in the work situation for a considerable part of his life during these years might prove particularly helpful. The British trade union leader Tom Mann would be one such author.

MANN AS A LABOUR LEADER

Mann is usually described as Britain's greatest industrial agitator,[11] but he was also a voluminous writer and vigorous controversialist who, throughout his long life, was prominent in a bewildering array of left-wing industrial and political initiatives ranging from secretaryship of Keir Hardie's Independent Labour Party (1894-6) to founder of the Victorian Socialist Party (1906) and acknowledged leader of the British Syndicalist Movement (1910-14). He was later a founder member of the British Communist Party. Socialist journals edited by Mann included the *Socialist* (Melbourne, 1906-9), *Industrial Syndicalist* (1910-11), and *Trade Unionist* (1916-19).[12]

Born in Foleshill, Warwickshire in 1856, Mann started his working life in a colliery at the age of ten, before taking up an engineering apprenticeship in Birmingham. He was no stranger, then, to the long hours of physical drudgery which so often characterised 'noble' labour of the time, and he thus embarked on reading and thinking about possible ways of changing conditions where those in employment slaved for inordinately long periods for subsistence wages, and those out of work (at least 10.7 percent of the workforce in 1879)[13] starved.

Mann's earliest experience of the potential strength of trade union solidarity was when the Amalgamated Society of Engineers successfully agitated for a nine-hour day in 1871, which for him meant, as he later explained, that he was able to begin attending evening classes at mechanics' institutes.[14] From that time onwards he remained an advocate of the value of workers' education and for the need for reduced working hours for those in employment to be able to make use of the educational facilities then available. By 1884 Mann had completed his apprenticeship and moved to London, where he and a few workmates with 'a scientific turn of mind' started their own classes and discussion groups at a workingmen's club. By that time, also, he had subscribed to socialism, and in 1885 was asked to address

the Fabian Society on some of his ideas for a shorter working day.[15] The lecture probably served as the basis for his first publication, *What a Compulsory 8 Hour Working Day Means to the Workers,* the following year. This has been described by Richard Hyman as "arguably the most profoundly influential of all Mann's writings".[16]

MANN'S VIEWS ON TECHNOLOGY AND ARGUMENTS FOR A SHORTER WORKING DAY

Increased productivity has been an important factor in the general reduction of the normal working week in most industrialised economies from as much as 60 hours to 40 over the last century, as Ginneken has recently pointed out,[17] but this has not been without a fight on the part of workers. Tom Mann's pamphlet provided some of the first ammunition in this fight, and it is worth observing that much of his case is based on this productivity argument. The pamphlet is also clearly infused with Mann's enthusiasm for science and 'progress':

> Look, again, at the effect of increased scientific knowledge. By a better knowledge of chemistry and metallurgy tons of metal are now extracted from the ore with the labour of fewer men than must formerly have been employed to produce one hundredweight. What I am concerned about is, that in spite of our advanced methods of producing wealth, the workers as a class get only a subsistence wage, whilst an increasing number of them cannot get the barest necessities of life.[18]

Among the latter were those whose labour had been taken over by machinery. There were other factors contributing towards unemployment in Britain at the time certainly, including a downturn in trade attendant on, among other things, the growing industrialisation of Continental countries and the United States, the imposition of protective tariffs by foreign governments,and the investment of capital abroad.[19] But the adoption of new technologies was undoubtedly a major cause of job losses in some industries. Mann was not interested in arguing over whether this had or had not been the case; he had experienced unemployment himself, and seen fellow workers being put out of a job all around him, such as the iron puddlers, whose skills had been rendered redundant by improvements in smelting techniques since the 1870s.[20] Like Marx (Mann's pamphlet was published before the English translation of *Capital*), Mann was not opposed to advances in technology as such. On the contrary, his enthusiasm for science fueled his belief that science and technology, intelligently applied, held out the surest hope for the material progress of society as a whole. Mann was well aware that the increasing "ease and rapidity of wealth-production . . . is of course enriching

someone", and many of these beneficiaries, he goes on to argue, comprised a class "of which many perform but little really useful work while the bulk of them serve no function useful in any way to the community". But quite apart from this injustice, Mann was concerned about what he saw as a lack of rational organisation at the level of the workplace, where many were working long hours and others were altogether without a job. For this situation, Mann offers a solution though hardly an original one: why not share the work around? A reduction in the normal working day would make more places available for those unemployed, and, at the same time, such a move would have the added advantage of stimulating the economy through restoring purchasing power to thousands. Mann states the argument in straightforward terms:

> Let us examine a few figures in order to see clearly how this would affect us. We have something like 7,000,000 adult workers in the British Isles, working nominally under the nine hours system, leaving overtime out of consideration for the moment. Let us see how many hands would be put in employment if we struck off one hour per day from those in work. It is roughly estimated that of the above mentioned workers there are about 900,000 now out of work, representing a total population of 3½ or 4 millions of men, women and children who cannot get the barest necessities of life. Now strike off one hour per day from the 6,000,000 in work. The result would be an immediate demand for 750,000 additional workers to keep up production at its present rate, and remembering that these 750,000 would immediately begin to buy more food, clothing and general comforts, this of course would give an impetus to trade, and so add greatly to the comfort of the entire community.[21]

As explained, Mann regarded a reduced working day as a logical corollary to the vastly increased productive capacity of modern industrial society, made possible by the applications of science and technology. He repeated some of his views on what he believed should be the blessings of science for the whole community in an article in the *Nineteenth Century* in May 1890.[22] His article is written in the wake of a wave of strikes that must have been alarming this journal's respectable readership (the most notable of these strikes — the 1889 Dockers' Strike — had been led by Mann himself), and he was keen to press the advantage. According to Mann, there were thinking people who recognised that "this constant rebellion on the part of the workers is due to the fact that their demand for the necessaries of human existence is denied them whilst their power to produce these necessaries is abundant"; and there was a situation in which "Men and women starve for want of work, while their fellows work fourteen hours a day for a wage that barely supplies them with the commonest of food", a situation which would not be expected to endure

indefinitely. "The furniture in tens of thousands of workmen's homes", he went on to argue, "is such that would disgrace any decent set of savages"; and this in a country "with a history of a thousand years, with machinery that enables us to make ten suites of furniture where our fathers made one, can weave a thousand yards of carpet where our fathers turned out ten, can turn out clothing and boots and shoes as if by magic".[23] In a similar vein, Mann wrote elsewhere the same year:

> We have abundance of raw material from Mother Earth, and the capacity of our workers is increasing each year, so that from the raw material we can with a less expenditure of energy create a greater number of commodities for the energy expended. That being so, we argue that there is no divinely ordained reason, no natural reason, why any man woman or child need be short of food or clothing, or the necessities of human existence.[24]

THE CASE BEFORE THE 1892-4 LABOUR COMMISSION

Mann's faith in the benefits accruing from scientific progress (science had by this time become more closely linked with industry, although much more so on the Continent than in Britain) also shows clearly in a paper tabled before a Royal Commission on Labour which sat in 1892-4, and to which Mann and six other trade unionists had been appointed. His paper, entitled, 'State and municipal control of industry', similarly argues that applied science and technology could do much to alleviate the conditions against which workers were rebelling, but that this required a more ordered and rational, a more collective, economic regime:—

> It is . . . held that the progress of science, metallurgical, mechanical and chemical is impeded by the sectionalised methods of conducting trade that obtain today, and that, therefore, the standard of life is very much lower than it would be with more perfect industrial organisation, such as might be obtained under collective control. The baneful tendency of modern commercialism [is that] the collective good is lost sight of in the intensity of the sectional struggle for existence.[25]

Evidence given before the Commission by representatives from various unions indicates that many workers were ready to agree with Mann on these potential benefits of science and technology, at least in principle. This was found to be so for a wide range of trades. The printing trades, especially, were experiencing the introduction of radically new techniques at the time, notably the linotype (automatic typesetting) machine invented by Mergenthaler in 1883.[26] But to a question on this matter put by A.J. Mundella MP, another member of the Commission, Samual Munro, secretary of the Belfast

Typographical Society, replied that his union "did not at all object to the machinery" and that his "own personal opinion is — and I think the opinion of the majority of our members — is that the machines will come, and that the effect will be beneficial to trade and to the cheapening of books".[27] With regard to the baking trade (earlier conditions in which had been so vehemently castigated by Marx),[28] a Mr Jenkins, representing the Amalgamated Union of Manchester Bakers, described himself as an 'advocate of machinery', and added: "It is one of those curious things in machinery that it would not reduce our number, but would help us, and do a good deal of the heavy work, and that is why I want it".[29] A Mr Moore, a representative of the building trades, and a Mr Brough, a mason, likewise considered that the introduction of machinery had afforded "great relief from mechanical drudgery and heavy manual labour".[30] A member of the Cork United Trades Council stated that "the artisans in that district did not offer any opposition to the introduction of machinery", and another witness maintained that any question as to the value of improvements in mechanical appliances was now "obsolete" (presumably referring to earlier Luddite attitudes).[31] Concerning the 'Chemical Building and Miscellaneous' trades, the Commissioners' final report noted: "Various witnesses denied that trade had suffered in consequence [of developments in technology]", and with respect to printing — "some representative of the printers asserted that as many or more men were now employed and that wages were higher".[32] The secretary of the Leeds Boot Manufacturers' Association (an employees' body) considered that manufacture in this trade was "20 or 30 years behind the United States", but where modern plant had been installed, as was the case with one particular firm in Leeds, "they are producing the goods cheaper than other firms in the town", and the men "have always plenty of work".[33] A member of the Sheffield Federated Trades Council, speaking for the 'Iron, Engineering, Hardware, Shipbuilding and Cognate Trades', insisted that "in no case do we object to machinery, because experience teaches us that the introduction and development of machinery as applied to the production of certain articles has been to the benefit of the nation".[34]

Not all witnesses were quite so sanguine, but where some had reservations it is interesting to notice that their suggestions relating to displacement of workers by mechanisation were substantially in line with those put forward by Mann in his *8 Hour* pamphlet. Mr Murray Davis, representing the Irish National Bakers' Federation, for example, thought that "when the machinery supersedes the men it is always necessary to have a reduction in the working hours"; and a compositor considered that the widespread introduction of new technology in his trade "should be accompanied by a curtailment of

the hours of labour".[35] This is not surprising. The arguments of Mann and others were by this time widely known in trade union circles,[36] and the first May Day demonstration in Hyde Park in 1890 — attended by some 200,000 supporters — had been essentially a demand for the eight-hour day. Mann repeated his arguments before the Commission, explaining to the economist Alfred Marshall that

> . . . thousands of those who are now workless in London, and who, in consequence, have no purchasing power, many of whom are dying, and therefore are no good to the community . . . would possess purchasing power, to the advantage of themselves and their families and that would be a step in the direction of more effective organisation by putting a stop to the excessive working hours of those who are now doing work.[37]

VIEWS ON LEISURE AND EDUCATION

Mann's advocacy of an eight-hour day took in some ideas on leisure as well. In his 1886 pamphlet, following the arguments above, he outlined what he saw as the value of a shorter working day to those already in employment. "How immensely it would add", he suggested, "to the leisure and therefore to the general intelligence of workers".[38] He elaborated on this in answer to a question from Alfred Marshall: "A man is actuated by the desire for intelligence all round, and I want these fellows to have a chance of getting that intelligence, believing that they will contribute most materially to the improvement of the present condition of things". "Therefore", Mann added, "I say let us have more leisure".[39] For Mann then, more leisure time meant not only that working people could pursue interests which made for more fulfilling and meaningful lives — in the sense discussed by recent writers like de Grazia and Jones[40] — but also that increased leisure implied added benefits to the community. As mentioned, Mann explains how he himself had benefited from attending evening classes in mechanics' institutes, and this had been made possible by his union's successful agitation for reduced working hours. He points out in an article in the *Industrial Syndicalist* and in his later *Memoirs* how some of these classes had been started by fellow workers under a scheme instituted by the then Science and Art Department.[41]

Such largely self-help endeavours were really all that were available in the way of science education for work people at the time (apart from occasional philanthropic ventures such as Henry Solly's Artisan's Institute and the City and Guilds of London Institute)[42] under the tenacious influence of *laissez-faire,* and while Mann fully endorsed these efforts, he never tired of trying to impress on his readers the need for improved educational facilities for the workers. At the same time the Labour Commission was sitting, Mann published

An Appeal to the Yorkshire Textile Workers, his election manifesto as the ILP's candidate in the Colne Valley in the 1895 General Election. In this he argued for "perfectly free elementary, secondary and technical schools . . . with popular control"[43] which was, of course, largely established eventually. Some months before, Mann had told a group of university extension students at a summer meeting at Oxford that "it is by education England's difficulties will be solved", but that much needed to be done towards developing "the requisite mental capacity that will enable the various sections or classes . . . that are responsible to tackle these great industrial problems with the view of finally and effectively solving them". It was probably true, Mann conceded, that "many workmen and workwomen exhibit an apathy and indifference to educational work", but:

> Can you be surprised at that? Can you be surprised that there is some indifference when you find now here in the middle of England men working seven days a week of twelve hours a day under the most unhealthy conditions? Can you expect them to come and exhibit a keen and lively interest in ordinary education?[44]

(The economic value to the community of improvements in general education had been argued by, for example, J.S. Mill, who had greatly impressed Mann.)[45]

Mann most fully outlined his thinking on technical education in another *Industrial Syndicalist* article.[46] There was little doubt, he argued, that that venerable British institution, the apprenticeship system, was rapidly breaking down, and that the rule-of-thumb methods were no longer adequate to the demands of modern manufacture. If this meant that "with the advance of mechanical and chemical processes, the proportion of men classed as skilled becomes smaller year by year", then so be it. The old divisions between 'skilled' and 'unskilled', enshrined in exclusive and arcane trade and craft societies, tended to work against the overall interests of workers. Mann was among the first to notice this effect of the advance of technology (as Benson and Lloyd have recently pointed out),[47] and he was quick to recognise that the training in new techniques necessitated by the extension of the factory system required radical improvements in facilities for technical education. To "abolish the present system of apprenticeship and insist that every [worker] shall have the chance of selecting and learning such industry as shall lift him from the position of an untrained person" would not at all be a bad thing. It would ensure a return to competitiveness for British industry, and add considerably to the workers' overall job satisfaction, especially if greater efficiency allowed increased leisure. Mann was not at all persuaded by the arguments of those wishing to see a return to the idyllic conditions of cottage industry. As he expressed it in his and his

colleagues' minority report at the end of the Industrial Commission's deliberations:

> The hundreds of thousands of families engaged in the manufacture of slop clothing, inferior shoes and slippers, cheap furniture and saddlery, and common chairs, nails, and cutlery, form one of the most oppressed and demoralised sections of the community.[48]

Whether Mann could be regarded as speaking for the majority of skilled workers on this matter of technical education is debatable, but it should be remembered that he was an engineer and a member of the ASE, the very aristocracy of skilled tradesmen, and was widely regarded by the members as a highly competent spokesman in their interests. In 1891 he had only narrowly missed election as General Secretary of the union.[49]

MANN IN AUSTRALIA

As labour historians will know, Mann spent some years (1902-10) in Australia and New Zealand, and his activities in connection with the Victorian Socialist Party and the Barrier miners' dispute of 1908-9 need not be considered here. But Mann's continued lecturing and writing while in Australia on what he saw as the potential benefits of science for all might not, perhaps, be so familiar to readers. His general position on this theme is contained in an address given to a packed audience in the Broken Hill trades hall on his taking up the job of organiser for the miners' unions. In a lengthy and enthusiastic report on his address, the *Barrier Truth,* the unions' own newspaper, noted that Mann "traced the development of man" and that:

> in examining the period in which we lived, he said the period was one of astounding accomplishments. We were now able to achieve what our fathers never dreamed of. The wonderful achievements of the human kind of this era had so far surpassed the efforts of previous eras that men were astonished at the accomplishments of civilization. The speaker rapidly sketched the great progress of transport and explained the recent conquering of transit through the air. So astounding and complete was the great productive work which gave comfort, leisure and art, that it was not scientific that there should be any discomfort or poverty. Men had triumphed over nature, or rather had understood the laws of nature they unlocked, and it had been opened to them. Yet, in spite of all this, even now we could find hundreds of thousands of men, women and children who suffered untold miseries from preventable poverty. These facts would not permit us to say all is well for all was not well. There was an ever growing power that was making men more godlike, yet ever increasing was the army of unemployed and suffering people.[50]

Mann had earlier adumbrated his point of view in *The Labour Movement in Both Hemispheres,*[51] and in *Socialism* he added his arguments for the necessity of co-operative action:

> Modern science teaches that man's powers over natural forces are constantly increasing, the only possible basis for industrialism that will admit of all sharing in these advantages [being] the Co-operative basis — working hours being regulated according to the efficiency of production and the standard desired by the community.[52]

In September 1904, Mann noted that a strong move for the eight hours day in Victoria at the time:

> has been put forward as a sound economic method of absorbing the unemployed dislodged from their occupations by the march of invention, and also as a means to enable the worker to share more equitably in the ever-increasing product of labour.[53]

After settlement of the dispute with BHP, Mann was able to tell an enthusiastic audience assembled in the hall of the Port Pirie Mechanics' Institute that a plan he had submitted to the company's management for reducing the number of shifts worked per week from seven to six, thus enabling the reabsorption of 200 former employees put out of work by technical improvements in ore refining processes, was likely to be adopted. In this address Mann repeated his assurance that "The worker under present conditions was producing wealth more rapidly than the world had ever known before", and that this had been made possible, again, by "The thinkers and workers of the world [having] invoked the aid of science" and having learned "to work with Nature in her different moods". All that remained was to see that "The most scientific production of wealth must go hand in hand with the most righteous distribution of that wealth . . . all classes . . . shared in the production, but by no means so in the consumption".[54]

SOME VIEWS ON SCIENCE AND INDUSTRY

When a member of the Labour Commission, Mann had also expressed opinions on the general socialists objective of more efficient organisation of industry on a collective basis, which included the adoption and implementation of improved techniques, and this is notable as being one of the first occasions on which the concept of public organisation of science and technology had been outlined before a parliamentary body in Britain. As mentioned, although science had by the late nineteenth century become more closely linked with industry on the Continent (primarily through educational

agencies, including the first polytechnics in Germany), this was far from usual in Britain.[55] Tentative overtures in this direction, principally in the form of the Science and Art Department's system of annual science examinations, were all that really passed for public interest in the matter at the time in an atmosphere of recalcitrant *laissez-faire,* and this is what Mann wished to see changed. "I do not believe that the present system of conducting trade is favourable to an early and ready application of knowledge as it is developed", he maintained, and went on to explain that:

> unless there happen to be firms sufficiently alive to the importance of their facing the difficulties and risks they may have to run in experimenting, then the knowledge is not applied. It so happens that in conducting trade as it is conducted today, there is very much knowledge possessed now by the nation which is certainly not put into actual practice in the conduct of trade and commerce.[56]

To the question "Do you not think that [a situation where the community were to own all the instruments of production] would make the community very slow to move, very slow to adopt improvements, very slow to introduce new inventions?", Mann replied:

> I certainly should think not. If the community were made up as I can conceive it being made up in the future of persons who desire to make progress in every becoming direction, they would know it was advisable to have a margin of their life for experimental purposes, and that in the long run would mean that that would pay exceedingly well, and a loss on a given expenditure would count as nothing as compared to the knowledge to be obtained by the experiments made. I do not think it would reduce or detract from the inventive genius. I think it would stimulate it.[57]

In a later article on innovation in the engineering industry in Britain and America, Mann gave a more specific illustration of what he meant. In contrast to Britain at the time (1899), American industry was more remarkable, Mann felt, for at least some sense of co-operative spirit between employers and skilled workers, which possibly owed something to a less strongly entrenched class system. Thus American employers and managers were less reluctant to ask workmen for their opinion on technical problems, with the result "that the love of experimenting . . . characterized a large percentage of American employers".[58] The machine tool industry, especially, had made remarkable progress, and this could be directly attributed to the willingness of employers to listen to the workmen:

> The most effective tool, that is the tool that will turn out the greatest possible product with the least expenditure of energy — this is what the

> world is calling for, and it is precisely this that the Americans have been preparing themselves to supply. From Providence, Rhode Island; Fitchburg, Mass., and other tool-making centres, there is a continued importation of tools and machinery that formerly came from Manchester, Leeds, or some other portion of Britain. . . . it is no doubt the case that in Britain all sections are relatively slow to move as compared with the United States. Statesmen, employers and workers alike are terribly slow at getting out of old ruts. Political power has been used to 'keep the masses in their place', to emphasize social distinctions . . . after six centuries of this, it is not very surprising that we find so little co-ordination for national efficiency.[59]

THE CONTINUING RELEVANCE OF AN EARLY LABOUR LEADER'S VIEWPOINT

Surely few people would find any quarrel with such arguments today, but it is remarkable how long it was before British industry took to attain some of the efficiency Mann was referring to, following the country's early lead in the Industrial Revolution (at a time when less co-ordinated effort could suffice). Entrenched attitudes, it appears, blinkered industrialists from recognising the advantages of more co-ordinated effort,[60] and it required the insights and agitations of people like Mann to eventually get the message across. Similarly, with all the current resistance from employers to the 35 hour week in this country, it is worth considering that virtually all moves for a reduction in the working week in the past have met with determined opposition. Marx describes the struggle for a statutory ten hour day in England in the 1850s, in the face of impassioned arguments that industry could not continue profitably under such conditions — notwithstanding increasing mechanisation;[61] and no doubt similar voices were raised against the nine hour day eventually won by the engineers during Mann's apprenticeship years. On reading Mann's arguments for an eight hour day, one is struck by their prescience. A recent study by Moir has suggested that reducing the working day by one hour could immediately create 150,000 new jobs in Australia,[62] and similar results have been obtained from like studies in the United Kingdom, the Netherlands, Belgium, France and the Federal Republic of Germany.[63] And an increasing number of economists agree (as Mann had argued) that a reduction in working hours "may well cause fundamental changes in, for example, consumption behaviour, since people with more free time tend to consume more".[64]

To the objection that workers might be prepared to forego working time, but not pay, other recent studies have produced surprising results. In the US, for example, tentative calculations made in 1978, and based on the most desirable trade-off choice for different groups of employees, suggest that the average worker would be willing to

forego 4.7 per cent of earnings in exchange for this free time.[65] Presumably job security was also a consideration; nevertheless, this value put on free time is an interesting finding. In another survey, in West Germany in 1976, 56 per cent of respondents considered free-time activity more important than work.[66] Dunphy, in the 1972 Boyer Lectures, described similar responses in Australia. He quotes one factory worker's feelings about his job to illustrate the point: "Work to me is a void, and I begrudge every precious minute of my time it takes . . . I can't tell you much about my job because I think it would be misleading to try to make something out of nothing".[67] Leisure time, — time to pursue one's own interests — is important to people, and this importance has really only lately come to be recognised. Whether the majority of Australian blue-collar workers would be currently willing to sacrifice wages for increased leisure time does, admittedly, appear less certain. But in any case, as work-sharing experiments in Canada and Belgium have shown,[68] government subsidies either by way of direct compensation or through unemployment insurance schemes can minimise this need.

It is now a hundred years since Mann presented his views on the benefits of advanced technology to a meeting of the newly formed Fabian Society. Yet, to judge from books like that of Jones (and from reports such as that recently prepared by Mathews),[69] employers, trade unionists and academics still have much to learn from each other in this area. Most of us seem agreed that if Australia is to be competitive on world markets, we need to do much more in the way of promoting new technologies, even if this might mean initial job losses in some sectors before adjustments can be made in terms of shorter working weeks and job sharing. Everyone must ultimately benefit in the long term.

SUMMARY AND CONCLUSIONS

This paper has examined some views of an articulate trade unionist and labour leader on questions of continuing importance. It has tried to show that something might be learnt from people directly involved in the convulsions attendant on technological change during previous periods of history. Mann's arguments have been chosen as particularly pertinent, since his wider imagination enabled him to think about issues extending beyond the confines of the workplace.

It was seen that, notwithstanding common assumptions of Luddite-type attitudes towards technical developments on the part of work-people throughout the last century, Mann, together with numerous representatives from various unions, was fully supportive of the improved techniques made possible by scientific and technological developments. This positive response can be seen as partly reflecting

the high profile held by science and technology towards the end of the century.

Mann's euphoric vision of an ideal world made possible by science was shortly to be checked by the events of 1914-18, and our feelings about the scientific enterprise today are often tempered by the prospect of another Armageddon. It is nevertheless fair to say that we also recognise that we have much for which to be grateful. But any form of cultural change necessarily brings new sets of problems and issues. We are having to face the kinds of issues with which people like Tom Mann had to grapple in the past, and we surely do well to learn from whomever we can.

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2. K. Windschuttle, 'Technology and unemployment' in S. Hill and R. Johnston (eds), *Future Tense? Technology in Australia,* University of Queensland Press, St Lucia, 1983, pp. 68-86. See also, Jim Hagan and Ray Markey, 'Technological change and the unions', in this volume.
3. B. Jones, *Sleepers, Wake! Technology and the Future of Work,* Oxford University Press, Melbourne, 1982. Jones adds the rider (p. 44) that technological innovation can result in increasing employment in some areas complementary to large-scale production of goods and services.
4. See, for example, J. Mangan and L. Stokes, 'The determinants of labour demand in Australian manufacturing', *Applied Economics,* 16, 1984, pp. 449-59. These authors were able to attribute 21% of net job losses in the Australian manufacturing sector directly to technological change in 1977-78, and current work indicates that the figures will prove to have been greater still in 1982-83.
5. E.g., C.A. Tisdell, *Science and Technology Policy: Priorities of Governments,* Chapman and Hall, London, 1981, pp. 97-101; and P. Donaldson, *Economics of the Real World,* Harmondsworth, Penguin, 1976. Donaldson puts the case succinctly (p. 126): "Increasingly, technological change has made it possible for capital to be substituted for labour".
6. K. Marx, *Capital,* Progress Publishers, Moscow, 1983, Vol 1, p. 360.
7. *ibid.,* p. 407.
8. See Jones, *op.cit., passim.*
9. Marx, *op.cit.,* p. 329.
10. An integrative approach, incorporating classical, Marxist and Keynesian elements, can be found in R.T. Gill (ed.), *Economics,* Goodyear Publishing, Pacific Palisades, California, 1973. Keynes' insights, especially, even allowing for current re-assessment, have been immeasurably influential; and it is interesting to notice that in one of his first published writings, a 1908 review of a book on social conditions in West Ham (Keir Hardies' first constituency), Keynes observes: "Anyone who is interested in the effect which unbridled individualism and *laissez-faire* in such matters may have on the development of a community should turn to the account given in this volume of the doings of swarms of small builders, working with little or no capital for immediate profits, and unhindered by bye-laws or by an ordered scheme of development. In the matter of employment, also, West Ham has contrived to contain within its boundaries numerous examples of

two of the worst features of the industrial system — casual labour, such as docks create, for the men, supplemented by sweated home-work on the part of women". *Journal of the Statistical Society,* March 1908 in J.M. Keynes, *Collected Writings,* Cambridge University Press, Cambridge, 1983, vol. xi. Keynes had earlier been assisting a Liberal candidate in the 1906 General Election, concentrating largely on the party's social welfare policies (which eventually included the 1911 National Insurance Act, the first government administered unemployment benefits scheme) which were, of course, essentially a concession to socialism prompted by Labour's rapidly growing support. See H.V. Emy *Liberals, Radicals and Social Politics 1892-1914,* Cambridge University Press, Cambridge, 1973, pp. 130-41.

11. R. Hyman, Introduction to T. Mann, *What a Compulsory 8 Hour Working Day Means to the Workers,* Pluto Press, London, 1972 reprint, p. 3.
12. See Hyman, *op.cit.;* and K. Coates, Preface to 1967 reprint of Mann's *Memoirs.* See also *Tom Mann 1856-1941,* Tom Mann Centre Trust, Coventry, 1982. I am indebted to Alan Bachelor, Warden of the Tom Mann Cottage, for sending me a copy of this booklet.
13. W. Ashworth, *An Economic History of England 1870-1939,* Methuen, London, 1960, p. 193. This figure is derived from trade union records of members unemployed, and hence is probably underestimated.
14. T. Mann, *Tom Mann's Memoirs,* Labour Publishing, London, 1923, pp. 30-1.
15. *ibid.,* p. 54.
16. Hyman, *op.cit.,* p. 3.
17. W. van Ginneken, 'Employment and the reduction of the work week: A comparison of seven European macro-economic models', *International Labour Review,* 123, 1984, pp. 35-52.
18. Mann, *op.cit.,* note 11, p. 17.
19. See J. Clapman, *An Economic History of Modern Britain,* Cambridge University Press, Cambridge, 1963, Vol. 2, pp. 248-51, 453-61; and A.G. Ford, 'Overseas lending and internal fluctuations: 1870-1914' in A.R. Hall (ed.), *The Export of Capital from Britain 1870-1914,* Methuen, London, 1968, pp. 84-102.
20. *Minutes of Evidence taken before the Royal Commission on Labour,* 16 November 1892, British Parliamentary Papers, C.-7063-I, 1893, p. 233.
21. Mann, *op.cit.,* note 11, pp. 19-20. Mann is over simplifying here for purposes of illustration; work/time exchange units are rarely exactly equivalent.
22. T. Mann, 'The development of the labour movement', *Nineteenth Century,* 28, 1890, pp. 709-20.
23. *ibid.,* pp. 711-2.
24. Cited in an article on Mann in *Labour Monthly,* April 1936.
25. T. Mann, 'State and municipal control of industry', Appendix to *Minutes of Evidence taken before the Royal Commission on Labour,* British Parliamentary Papers, C.-7063-IIIA, 1894, pp. 119-23.
26. See (for an Australian comparison) J. Hagan, *Printers and Politics: A History of the Australian Printing Unions 1850-1950,* Australian National University Press, Canberra, ACT, 1966, pp. 100-4; and R. Markey, *Labour and Politics in New South Wales, 1880-1900* (unpublished PhD thesis, University of Wollongong, 1983) pp. 70-8. Markey also discusses technological change in building and brickmaking, the metal trades, and in boot and shoe making.
27. *Minutes of Evidence taken before the Royal Commission on Labour,* British Parliamentary Papers, C.-6894-IX, 1893, p. 259.
28. Marx, *op.cit.,* pp. 237-41.
29. *Minutes of Evidence taken before the Royal Commission on Labour,* British Parliamentary Papers, C.-6894-IX, 1893, p. 353.
30. *Fifth and Final Report of the Royal Commission on Labour,* Secretary's Report on the work of the Office, and Summaries of Evidence, British Parliamentary Papers, C.-7421-I, 1894, p. 314.

31. *ibid.* But as Dunford has pointed out, even at its height the Luddite movement was directed not so much at the machines themselves as at the exploitive system under which they were employed. Machinery was simply the major available means whereby the interests of the employer could be threatened. See R. Dunford, 'Technology: the contingent nature of its impact', *Prometheus,* 1, 2, 1983, pp. 290-302.
32. *ibid.*
33. *Minutes of Evidence taken before the Royal Commission on Labour,* 4 February 1892, British Parliamentary Papers, C.-6795-VI, 1892, p. 103.
34. *Fifth and Final Report of the Royal Commission on Labour, op.cit.,* p. 116.
35. ibid., p. 314.
36. D. Torr, *Tom Mann and his Times, 1890-92,* History Group of the Communist Party of Great Britain, Pamphlet No. 26-7, Summer-Autumn 1962. p. 15.
37. *Minutes of Evidence taken before the Royal Commission on Labour,* 16 November 1892, *op.cit.,* p. 222. Interestingly, E.J. Hobsbawm has since argued that perhaps the two main factors which enabled Germany and the USA to industrialise rapidly during the late nineteenth and early twentieth centuries and to challenge Britain's earlier supremacy on world markets were that "The major technical advances of the second half of the nineteenth century were . . . essentially scientific" and "the discovery that the largest potential market was to be found in the rising incomes of the mass of the working citizens in economically developed countries" cited in K. Pavitt and M. Worboys, *Science, Technology and the Modern Industrial State,* Butterworths, London, 1977, p. 13.
38. Mann, *What a Compulsory 8 Hour Working Day Means to the Worker, op.cit.,* p. 20.
39. *Minutes of Evidence taken before the Royal Commission on Labour,* 16 November 1892, *op.cit.,* p. 222.
40. S. de Grazia, 'Leisure's future' in D.P. Lauda and R.D. Ryan (eds), *Advancing Technology: Its Impact on Society,* Wm. C. Brown, Dubuque, Iowa, 1975, pp. 161-8; B. Jones, *op.cit.*
41. *Industrial Syndicalist,* January 1911; T. Mann, *op.cit.,* pp. 14-5.
42. See C. More, *Skill and the English Working Class, 1870-1914,* Croom Helm, London, 1980, pp.198-220; and W.H. Brock, 'An experiment in technical education', *New Scientist,* 84, 1979, pp. 622-3. Solly's Institute was started in 1873, and the City and Guilds in 1879. It was not until 1890 that a Technical Instruction Act authorised county councils to finance the establishment of technical colleges with 'whisky money' (from increased liquor licence fees), and few of these were able to offer much more than tuition for Science and Art Department examinations by the early 1900s.
43. T. Mann, *An Appeal to the Yorkshire Textile Workers,* Labour Press, Manchester, 1893, p. 16.
44. *Oxford University Extension Gazette,* October 1892.
45. T. Mann, *The Socialists' Program,* Labour Press, Manchester, 1896, pp. 9-10; J.S. Mill, *Principles of Political Economy,* Routledge, London, 1891, pp. 498-510.
46. *Industrial Syndicalist,* October 1910.
47. I. Benson and J. Lloyd, *New Technology and Industrial Change: The Impact of the Scientific-Technical Revolution on Labour and Industry,* Kogan Page, London, 1983, p. 61. I am indebted to Sam Paltridge for this reference.

46. *Industrial Syndicalist,* October 1910.
47. I. Benson and J. Lloyd, *New Technology and Industrial Change: The Impact of the Scientific-Technical Revolution on Labour and Industry,* Kogan Page, London, 1983, p. 61. I am indebted to Sam Paltridge for this reference.

48. T. Mann, W. Abraham, M. Austin, and J. Mawdsley, 'Minority report' in *Fifth and Final Report of the Royal Commission on Labour, op.cit.,* p. 129.

49. Mann, *Tom Mann's Memoirs, op.cit.*, p. 116. Mann received 17,152 votes; the successful candidate, John Anderson, 18,102. A third candidate received 738 votes.
50. *Barrier Truth,* 9 October 1908.
51. T. Mann, *The Labour Movement in Both Hemispheres,* J.M. Miller, Melbourne, 1903, pp. 3-4.
52. T. Mann, *Socialism,* Tocsin Office Printers, Melbourne, 1905, p. 57.
53. T. Mann, 'The political and industrial situation in Australia', *Nineteenth Century,* 56, 1904, pp. 475-91 (477-8).
54. *Port Pirie Recorder,* 10 July 1909.
55. See K. Pavitt and M. Worboys, *op.cit,* pp. 13-21; and J.D. Bernal, *Science and Industry in the Nineteenth Century,* Routledge and Kegan Paul, London, 1953.
56. *Minutes of Evidence taken before the Royal Commission on Labour,* 16 November 1892, *op.cit.*, pp. 167-8.
57. *ibid.*, p. 168.
58. T. Mann, 'Engineering in Britain and America', *Fielden's Magazine,* September 1899.
59. *ibid.*
60. See A.L. Levine, *Industrial Retardation in Britain 1880-1914,* Basic Books, New York, 1967, pp. 68-73.
61. Marx, *op.cit.*, pp. 226-33. See also, T. Mann, *From Single Tax to Syndicalism,* Guy Bowman, London, 1913, pp. 18-9, 50.
62. Cited in M. Donaldson, 'Wealth, work and unemployment: strategies against inequity', paper presented at the conference, 'Work, Income and Leisure in the Years Ahead', University of Wollongong, 28-29 September 1984, p. 19.
63. van Ginnekan, *op.cit.* In *Unemployment and Politics: A Study in English Social Policy, 1886-1914,* Clarendon Press, Oxford,, 1972, Jose Harris notes that the industrialists and Liberal MPs William Mather and William Allen both reduced the working day to eight hours in their engineering works in the early 1890s in response to electoral pressure, but that this did not have the effect of creating extra employment. Just what the precise circumstances were would be difficult to determine, but Mather's account of his experiment to a Parliamentary Select Committee in 1895 is perhaps worth quoting: "It [the experiment] has proved that an eight hours day is the day in which a man works at his best and produces most because he feels continued zest in his work. It is natural to an honest and true man to love work. In all ranks of society, the honest, true, manly men love work. A man who does not love work . . . is not a fully-developed man, mentally and morally". If one were to keep one's job at Mr Mather's establishment, one evidently did not slacken. In this employer's view, it would appear, additional places need not be created while additional production could be squeezed out of those already on the payroll. *Minutes of Evidence taken before the Select Committee on Distress from Want of Employment,* British Parliamentary Papers, 365/1895,, p. 294.
64. van Ginnekan, *op.cit.*
65. W.W. Leontief, 'The distribution of work and income', *Scientific American,* 247, 1982, pp. 152-64. I am grateful to Paul Couchman for drawing my attention to this article.
66. Cited in A. Gorz, *Paths to Paradise: On the Liberation from Work,* Pluto Press, London, 1985, p. 33.
67. D. Dunphy, *The Challenge of Change,* Australian Broadcasting Corporation, Sydney, 1972, p. 30.
68. Australian Science and Technology Council (ASTEC), *Technological Change and Employment,* Australian Government Publishing Service, Canberra, 1983, p. 148.
69. J. Mathews, *Technology, Trade Unions and the Labour Process,* Working Papers in the Social Studies of Science, Deakin University, 1985.