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**JOB REDESIGN AND NEW PRODUCTION  
CONCEPTS IN AUSTRALIAN INDUSTRY:**

**A RE-EVALUATION OF THE  
1970s AND 1980s**

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***JOB REDESIGN AND NEW PRODUCTION CONCEPTS***

***IN AUSTRALIAN INDUSTRY:***

***A RE-EVALUATION OF THE 1970s AND 1980s***

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## **INTRODUCTION**

For many observers the decades of the 1970s and 1980s have constituted a revolution in the ways in which work is organised. Rapid technological change based increasingly upon computerised technology and new philosophies of work organisation are cited as evidence of a new approach by employers to the management of employees. An increasingly influential interpretation views such changes optimistically as a break from a historical tradition of deskilled, authoritarian and dehumanised employment towards a future of increased skill and employee autonomy. This paper seeks to review such developments and outline how Australian employers have sought to adapt to a changing environment through the introduction of new technologies and forms of work organisation. It begins by examining the decline of the post-war model of scientific management and the rise during the early 1970s of job redesign experimentation. The rest of the paper considers work reorganisation developments during the 1980s and early 1990s and critically examines claims that such changes constitute a fundamental break with traditional forms of work relations. As part of a forthcoming analysis of the history of Australian labour management due to be published in early 1995, the author would greatly appreciate any comments or suggestions readers may have in relation to this paper.

## **MECHANISATION AND THE LIMITATIONS OF SCIENTIFIC MANAGEMENT PRACTICE**

During the 1950s and 1960s scientific management practices had grown in popularity amongst Australian employers. While the application of scientific management was highly variable between different industries and firms and failed to constitute a dominant production paradigm, such techniques nevertheless demonstrated an attempt by some Australian employers to adopt a more systematic approach to the organisation of work and the control of labour productivity. By the 1970s however, the popularity of methods engineering and work study had begun to wane. In part this reflected the increasing capital intensity of production, problems of wage incentive administration, the limited development of an industrial engineering profession, as well as the rise of alternative visions of work organisation.

During the post-war decades, scientific management techniques such as work measurement and wage incentive schemes had been most commonly applied in labour-intensive, highly sub-divided and repetitive work settings. Prime examples included electrical appliance and vehicle assembly, textile mills, clothing manufacture and semi-

skilled metal fabrication.<sup>1</sup> By the later 1960s, increasing mechanisation of production highlighted the limitations of traditional scientific management practice. While methods study and work measurement sought to make workers behave in a more machine-like fashion, mechanisation sought to eliminate the need for labour altogether. In those industries where mechanisation was technologically viable and cost effective, the detailed administrative controls of work measurement and wage incentives became less relevant to the management of production. Since the mid-1950s management interest had been directed towards overseas discussion of the 'automated' factory of the future. Automation implied the elimination of human labour by machines via automatic feedback control which self-regulated the performance of production and handling systems independently of human intervention.<sup>2</sup> However, in practice the notion of the fully automated factory remained a dream. The ideal of automatic feedback control came closest to reality in industries such as oil refining and chemical manufacture where the nature of the product aided material flow and large, foreign-owned firms were able to absorb the cost of extensive capital investment through their size, market position, and access to overseas expertise. An early example of this was Australian Oil Refining's Kurnell refinery built in 1956, in which process control instrumentation led to near automatic control over temperatures, pressures, rates of flow, and levels of oil products with a speed and accuracy beyond manual methods.<sup>3</sup>

In the production of discrete items, the leaders in mechanisation continued to be the large car manufacturers. By the mid 1960s, factories such as GM-H's Fisherman's Bend plant, and British Motor Corporation's Zetland plant in Sydney, employed some of the most up-to-date mechanised production techniques. These were based on the further development of the flow-line principle through an expansion in the use of automatic work feeding and material handling devices. Mechanised conveyors were introduced into new areas, particularly engine foundries and assemblies. In the press shops, new devices such as blank loaders, iron hand unloaders, turnover devices, and interpress conveyors further eliminated manual handling. Machining operations were also mechanised through the use of transfer machines. These consisted of a series of linked machines capable of

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- 1 Wright, C. (1993) "Taylorism Reconsidered: The Impact of Scientific Management Within the Australian Workplace", *Labour History*, 64, pp.39-44.
  - 2 Amrine, H., Ritchey, J. & Hulley, O. (1975) *Manufacturing Organisation and Management*, New Jersey, Prentice-Hall, pp.98-101; Wild, R. (1975) *Work Organisation, A Study of Manual Work and Mass Production*, London, John Wiley & Sons, pp.5-13 & 31-33; Bright, J. (1958) *Automation and Management*, Boston, Harvard Uni., pp.3-6 & 13-21.
  - 3 Richards, J. (1963) *Inquiry into Recent Mechanisation and Other Technological Changes in Industry*, Sydney, p.197.

automatically carrying out the various boring, drilling, and milling operations necessary for turning a rough casting into a finished engine block or gearbox.<sup>4</sup>

The principles of mechanised flow production were also introduced into other industries. At the electrical manufacturers AWA, motor driven conveyors transferred television chassis and radio circuit boards along the assembly line, replacing manual handling and distributing work according to a pre-determined pace. Similar techniques were introduced by firms in the food processing and clothing industries.<sup>5</sup> The increased rate of mechanisation was also evident in the metal trades. In the larger engineering firms, greater use was made of mechanised material handling through fork lifts, and overhead, jib and floor-walking cranes. Automatic machine tools were also used on a wider scale. Mechanisation also made inroads in foundry work, through the use of mould and core making equipment, shot-blast machines, pneumatic rammers, and temperature-controlled electric furnaces.<sup>6</sup>

While the extent of mechanisation was highly variable between firms, such technological change highlighted the limitations of an emphasis upon labour productivity alone. As one leading scientific management exponent noted, by the mid-1960s factory labour costs contributed a small and declining proportion of the total retail price of consumer products. For many methods engineers the transition to a more lasting position within the management hierarchy required a broadening of applicability symbolised in the title 'industrial engineer'. Instead of being limited merely to minimising direct factory labour costs, exponents argued "the prime role of the work study specialist has now become the creation, design and analysis of management systems".<sup>7</sup>

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<sup>4</sup> 115 *Commonwealth Arbitration Reports* (hereafter *CAR*) 957; Richards, *op. cit.*, p.196; Transcript of Proceedings of CCAC, Vehicle Builders Employees Federation and GM-H (No.1357 of 1966), VBEF Records, Melbourne University Archives, pp.254-7, 636-643; "Statement by J.Lynch, Engineer in Charge Development Studies, GM-H", Transcript of GM-H Case (No. 824 of 1965), Industrial Registrar; Amrine et. al., *op. cit.*, p.93-100; Bright, *op. cit.*, pp.4-5 & pp.60-62;

<sup>5</sup> Anon. (1961) "Production with a Swing on AWA Carousels", *Australian Factory* (hereafter *AF*), Oct., pp.82-4; anon. (1962) "Chicken Factory is Mechanised", *AF*, Feb., pp.37-9; Knox, D. (1965) "Work Transportation in a Clothing Factory", *Industrial Engineer* (hereafter *IE*), Nov., pp.5-10.

<sup>6</sup> Interview Hal Porter, former Director W.D. Scott & Co., 24/11/87; Metal Trades Employers' Association and the Amalgamated Engineering Union (hereafter Work Value Inquiry) 121 *CAR* 623-5 & 633-4; "Statement by H. Palmer, Works Director, Perry Engineering Co. Ltd." & "Statement by H. Palmer, Works Director, Perry Engineering Co Ltd." & "Statement by J. John, Director, John & Hattersley Ltd.", Work Value Inquiry, Moulders Union Collection, Melbourne Uni. Archives.

<sup>7</sup> Anon. (1964) "The Future of Industrial Engineering", *IE*, March, p.21; anon. (1964) "The Architects of Change", *IE*, July, p.3; Cullen, S. (1965) "The Future of Industrial Engineering as

The leaders in the application of this broader vision of industrial engineering were the management consultants and advanced manufacturing industries such as vehicle assembly. For example, by the later 1960s consulting firms such as Scotts and PA placed less emphasis on individual worker output and more on the overall flow of production.<sup>8</sup> As one former consultant stated:

Method was still important of course, and targets were set, but not with the finicityness of the early industrial engineering, where you worried about ten thousandths of a minute and all that. In fact, in many industries foremen's estimates were quite good enough to set up reasonably good control systems. So the industrial engineer was more concerned with the flow of production and the broad methods used and the support services, maintenance, materials handling and so on.<sup>9</sup>

A similar trend was demonstrated in the automobile industry. Here, the industrial engineering function was absorbed into the broader field of production control and planning. For example at GM-H, methods and work standards was merely one function of the Technical Engineering Department, which also included, product planning, machine loading, equipment engineering, plant layout, project control, and tooling design and development.<sup>10</sup>

However, outside of these examples the transition from traditional work measurement and wage incentive administration to production control was rare and highlighted the broader failure of industrial engineering to develop as a viable professional specialism in its own right. Throughout the 1960s, the Institute of Industrial Engineers (IIE) had attempted to promote an industrial engineering profession and establish formal educational requirements. In spite of these efforts, tertiary education was limited mainly to the technical college level, and mainstream engineering bodies such as the

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a Management Tool", *IE*, March, pp.4-6; Harrison,C. (1962) "The Interpretation of Industrial Engineering", *IE*, July, pp.13-5.

<sup>8</sup> Interviews Colin Kennedy, Geoff Peterson, former Directors W.D. Scott & Co., 5/11/1987 & 20/1/1988, and Alf Paton, former Director PA Consultants (Aust) Ltd, 27/7/1988; Spence,J. (1965) "Industrial Engineering & Heavy Industry", *IE*, May, pp.7-11; "Programme Evaluation & Review Technique and Critical Path Analysis Conference" Davies Coop & Co. Ltd., 11/6/1964, Personnel Dept. records, Bradmill; Smith,J. (undated) "Managers of Change: PA Consulting in Australia - the First 25 Years" p.49; "APM Ltd. Maryvale, Maintenance Control Procedure No.1", May 1955, PA Consulting Group records.

<sup>9</sup> Interview Hal Porter, *op. cit.*

<sup>10</sup> McCamey,M. (1972) "Plant Level Relationships: The Shop Steward", *Journal of Industrial Relations* (hereafter *JIR*), 14(3), 273-4; "Statement by H.Atwell, Assistant Manager Die & Fixture Dept., GM-H", Transcripts of GM-H Case, *op. cit.*, Exhibit 5.

Association of Professional Engineers refused to recognise industrial engineering as a viable specialisation of the engineering profession. Such a situation contrasted markedly with North American and European industry where industrial engineering had achieved high academic and professional status and dealt with the broader design and control of production processes.<sup>11</sup>

The failure to develop a viable industrial engineering profession in Australia was to a large extent the result of management's preoccupation with scientific management as a means of wage incentive administration rather than as a source of broader production control.<sup>12</sup> However by the late 1960s, firms which had been leaders in the introduction of incentives were having increasing trouble maintaining their schemes. One of the first problems management faced was the sheer complexity of incentive payment schemes. In an effort to stave off worker discontent over declining wage differentials, many firms operated a variety of incentive schemes, covering not only direct production workers but also indirect and supervisory employees. This meant that in many large firms, a plethora of different incentive schemes operated, covering many hundreds of workers, some based on conventional work study, others on merit, attendance, or total factory production. Varied product ranges further exacerbated the complexity of incentives. Not only did the variety of schemes make administration difficult, it was also increasingly costly, requiring large clerical staffs to calculate bonus earnings.<sup>13</sup>

Beyond administrative difficulties, incentive schemes required continual maintenance if standards were not to become too 'loose' or 'tight'. Anomalous standards could result

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<sup>11</sup> Interview Harold Kaye, former Personnel Supervisor Bradford Cotton Mills and Standard Telephones & Cables Ltd., 27/1/1988 & Bob Rowland, former Head Methods Engineer, Bradford Cotton Mills, 16/2/1988; Taylor, G. (1964) "Technical Education - The Key To Productivity" *Factory & Plant*, Nov., p.37; Lloyd, B. & Wilkin, W. (1962) *The Education of Professional Engineers in Australia*, Melbourne, APEA, pp.209-211; anon. (1961) "Education and the Institute", *IE*, Dec., pp.17-19; Haynes, L. (1964) "The Education of the Industrial Engineer", *IE*, July, pp.7-9. The broader field of production engineering also suffered from a lack of recognition from professional engineering bodies during this period, see Carroll, B. (1987) *Australian Made: Success Stories in Australian Manufacturing Since 1937*, Melbourne, Institution of Production Engineers Australian Council, pp.141-3.

<sup>12</sup> Wright, *op. cit.*, pp.44-5.

<sup>13</sup> ILO (1951), *Payment By Results*, Geneva, pp.41-45; DLNS (1959), *Wage Incentives in Australian Industry: Principles and Cases*, Commonwealth of Australia, pp.12-13 & 63-65; Kangan, M. (1951) "Australian Experience with Wage Incentives", *Bulletin of Industrial Psychology & Personnel Practice*, 5(2), pp.5-6; "APM Fairfield Mill, Engineering Division - Outline of Bonus Plan", April 1955, PA Consulting Group records; "Bonus Review", Personnel Dept. Records Tubemakers; "Bonus Plan for Staff Not Directly Engaged in Production", Personnel Dept. Records Email (Orange); interviews Bob Stevenson, former Methods Engineer Email Ltd., 16/2/1987 & Bob Rowland, *op. cit.*

from errors of calculation in the initial study, improvements in worker performance due to increased experience (the so-called 'learning curve' effect), or through changes in production methods brought about by technological change. However, the sheer complexity of most incentive schemes, consisting of hundreds or even thousands of standards, undermined the ability of methods engineers to maintain such schemes.<sup>14</sup> As a former textile methods engineer recalled:

We had a retrograde step where changes were being made in the mill but we became in effect clerks, trying to update standards, massive volumes where every movement had been charted originally. There was no way of maintaining it, and we succumbed to adding a line at the bottom of a beautifully constructed standard saying, "Due to a change in the design of the machine add 10%", and it just prostituted the whole thing, it no longer became a viable standard. By the time you'd made a dozen alterations like that to it, you never quite remembered how the first one was written up. And so people were taking guesses as to how the thing should be put together, and frequently incorrect ones. What happened then was a department didn't make a standard that was set, managers would have trouble running departments because the girls had jacked up.<sup>15</sup>

While tight rates led to industrial conflict, loose standards resulted in ballooning bonus payments. One response was to place ceilings on maximum earnings. For example, by the late 1960s, textile firms such as Bradford Cotton had reduced the ceiling for maximum bonus from 150 per cent down to 120 per cent. While this limited excessive bonus, it also reduced worker incentive to increase output.<sup>16</sup>

In the face of such problems, many firms chose to discontinue their incentive schemes by absorbing bonus earnings within flat overaward payments. For example, at Rheem and Email, production incentives were replaced by set over-award allowances. Such 'buy-outs' of incentive schemes became commonplace as firms increasingly relied on closer supervision and mechanisation to ensure adequate output. Wage incentives continued in some areas of manufacturing, such as the clothing industry, where mechanisation of assembly operations was limited, and work pace continued to be dictated by the manual dexterity of workers. However in many companies, methods engineering and work study

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<sup>14</sup> Interviews Bob Stevenson, Hal Porter & Alf Paton, *op. cit.*; the problems of maintaining incentive schemes have been also noted by overseas writers, see Brown, W. (1973) *Piecework Bargaining*, London, Heinemann, pp.11-23.

<sup>15</sup> Interview Allan Villiers, former Methods Engineer, Bradford Cotton Mills, 30/11/87.

<sup>16</sup> Interview Allan Villiers, *op. cit.*; 24 *Industrial Information Bulletin* (hereafter *IIB*) pp.568-9.

departments declined in importance, becoming absorbed within general production management, or shifting to new areas such as quality control or materials handling.<sup>17</sup>

## NEW IDEAS: THE JOB REDESIGN INITIATIVES OF THE 1970s

The gradual demise of bureaucratic controls such as work measurement and related wage incentive schemes during the 1970s also coincided with the growth of new ideas and theories of work organisation which emphasised a greater role for employee participation. As Kelly has noted, experiments in job redesign had begun in British industry during the 1950s and reached a peak during the later 1960s.<sup>18</sup> Although the dissemination of job redesign in Australian industry lagged somewhat behind this trend, knowledge of such overseas experimentation was evident as early as 1960. In an address to the Institution of Production Engineers, John Linton, Head Methods Engineer of the electrical appliance company STC, highlighted overseas concepts of job enlargement and questioned the prevailing trend of an increasing division of labour and deskilling of jobs. As one of the early innovators in scientific management practice in Australian industry, Linton was well qualified to comment on the problems of work measurement and wage incentives, arguing that such techniques failed to adequately motivate employees, impeded quality and resulted in increasing overhead costs. The answer, he argued, was for decentralisation of management, delegation of authority and allowing employees greater discretion over their jobs. Not surprisingly such arguments were vigorously rebuked by consultants and other methods engineers as utopian and unrealistic.<sup>19</sup>

However, by the early 1970s such views had become increasingly fashionable as part of the broader advocacy for employee participation. The belief that the quality of work life had declined and that workers were becoming increasingly intolerant of deskilled and mundane tasks, resulted in a surge of interest in job redesign experimentation. Initiatives

<sup>17</sup> Interviews Hal Porter, Allan Villiers & Bob Stevenson *op. cit.*; "Production Bonus Abolished", *Sheet Metal Worker*, Oct. 1966, p.5 & "Rheem Aust. Pty. Ltd. - Rheem Production Allowance, 24/1/1967", ANU Archives E232/53; "Revision of the Orange Plant Direct Labour Incentive Scheme", 9/7/1965, Personnel Dept. Records Email (Orange); re the use of incentives in the clothing industry during the 1970s see 133 CAR 743 & Ellem, B. (1989), *In Women's Hands? A History of Clothing Trades Unionism in Australia*, New South Wales University Press, p.283.

<sup>18</sup> Kelly, J. (1982) *Scientific Management, Job Redesign and Work Performance*, London, Academic Press, pp.46-7.

<sup>19</sup> Linton, J. (1960) "'Make Every Man His Own Boss' - Is This the Best Incentive?", *AF*, May 2, pp.8-14; Stephens, J. (1960) "Consultant Doesn't Agree With 'Make Every Man His Own Boss'", *AF*, July 1, pp.6-7; interview Gordon Thomas, former Methods Engineer, Standard Telephones & Cables Ltd., 15/10/1987.

came from several sources. A number of the major innovations occurred within multinational subsidiaries. An example of this was the electrical manufacturer Philips, which imported the Dutch parent company's philosophy of work restructuring as well as plant managers versed in the practice of job redesign. Of more widespread impact was the role of Organisational Development (OD) consultants and government bodies such as the South Australian Government's Unit For Quality of Work Life. One of the central figures in this regard was the academic and consultant Fred Emery. Emery's background of research at the Tavistock Institute of Human Relations in London, had established him as one of the leading exponents of what came to be known as socio-technical systems theory. During the early 1970s, he and other OD consultants assisted many companies involved in job redesign by providing seminars and overseeing the introduction of socio-technical work re-organisation.<sup>20</sup>

At the heart of socio-technical theory was the belief that in order to improve organisational performance, both the technical and social elements of production needed to be considered. Such a view was contrasted with earlier theories of production planning which it was claimed placed undue emphasis on technical processes but ignored issues such as the inter-relation of workers and their occupational roles. As a result, socio-technical theorists argued alternative forms of work organisation could exist within a given technological context. The principle organisational form advocated by the socio-technical school was what were termed semi-autonomous work groups (SAWGs). The key distinguishing elements of this form of work organisation was that rather than workers being ascribed individual work roles with little autonomy over the work process, groups of multi-skilled employees would be formed, capable of performing a variety of tasks and exercising autonomy over issues such as the allocation of labour, employee selection and group leadership. Advocates of SAWGs believed that such work organisation would increase variety, discretion and responsibility, resulting in improved motivation, job satisfaction and hence productivity.<sup>21</sup>

During the early 1970s, experimentation with job redesign, and SAWGs in particular, received a great deal of attention in academic, government and management literature. Organisations involved in job redesign came from a variety of industries and backgrounds, including; electrical appliance assembly (Philips, Sunbeam), cosmetics (Avon), wood joinery (Fricker Carrington), aluminium smelting (Alcan), chemical

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<sup>20</sup> Dunphy,D., Andreatta,H. & Timms,L. (1976) "Redesigning the Work Organisation at Philips", *Work and People*, 2(1), pp.3-11; Gunzburg,D. (1975), (ed.) *Bringing Work To Life: The Australian Experience*, Melbourne, Chesire, p.viii.

<sup>21</sup> Emery,F. & Emery,M. (1975) "Guts and Guidelines for Raising the Quality of Work Life", in Gunzburg (1975), *op. cit.*, pp.28-54; Emery,F. & Thorsrud,E. (1976) *Democracy At Work*, Centre for Continuing Education, ANU; Emery,F. (1978) *The Emergence of a New Paradigm of Work*, Centre for Continuing Education, ANU; Kelly, *op. cit.*, pp.111-6.

processing (ICI), cigarette manufacture (Philip Morris), and clerical and administrative work (Shell and the Australian Tax Office). However, the extent of application of job redesign should not be over-estimated. While the number of firms introducing job redesign clearly exceeded these published examples, this still represented a very small minority of Australian organisations. Further, job redesign experimentation was in many cases limited to certain departments or work processes within these firms. For example, at Avon work re-organisation was limited to a packing line employing forty workers.<sup>22</sup>

As was the case with employee participation more generally, job redesign consultants stressed the role of social and demographic changes resulting in growing employee dissatisfaction with the traditional organisation of work. However, the reasons underlying management's interest in job redesign tended to be more pragmatic. While most company policy statements stressed the creation of more rewarding and fulfilling work for employees, a primary goal underlying such experimentation was productivity improvement. This was particularly the case where manufacturers faced tariff cuts and strengthening product market competition. Problems of labour supply also prompted some firms to attempt to humanise the working environment. At Philips for example, labour turnover of over 120 per cent, high absenteeism and poor quality control were cited as reasons for re-thinking work organisation. The multi-faceted nature of management thinking underlying job redesign was also demonstrated at ICI's Botany plant, where SAWGs were seen as a means of increasing productivity without major capital expenditure, reducing staffing and also replacing a costly and increasingly unworkable wage incentive scheme.<sup>23</sup>

In practice, the implications of job redesign experimentation varied greatly. In some cases widespread shopfloor changes were introduced. At the Philips factory, job enlargement resulted in the re-organisation of subdivided process work along product lines with multi-skilled work groups now responsible for the completion of whole products or sub-assemblies. As a result, job-cycle times were lengthened and workers were allowed greater physical mobility and increased responsibility for product quality. Managerial hierarchies were also reduced. However there were also many failures. At Philip Morris,

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<sup>22</sup> Dunphy et. al. (1976), op. cit.; Andreatta, H. & Rumbold, B. (1974) "Organisational Development in Action: Job Design and Development", *Personnel Practice Bulletin* (hereafter *PPB*), 30(4), pp.342-356; Andreatta, H. & Rumbold, B. (1975) "Building Effective Work Teams", *Work and People*, 1(3), pp.3-9; Harper, C. & McCarroll, G. (1977) "Job Satisfaction: Learning By Doing", *Work and People*, 3(1), pp.19-24; Andreatta, A. (1974) "Job Enrichment Through Autonomous Groups", *PPB*, 30(1), pp.9-13; Bowes, L. (1975) "Worker Participation in Management: The South Australian Developments", *JIR*, 17(2), pp.125-130.

<sup>23</sup> Coombes, P. (1978) "Worker Participation Pushes Productivity and Profits", *Rydges*, September p.64; re ICI see O'Leary, D., Thompson, V., Hull, D. & Robson, P. (1977) *Worker Participation: Fact or Fallacy*, Centre For Urban Research and Action.

attempts at work-group formation and multi-skilling ran counter to traditional job demarcations, workers also had trouble reaching new production targets resulting in significant in-fighting, and supervisors experienced difficulties in maintaining group-work. After two years of experimentation, employees voted to discontinue the scheme. A similar pattern developed at ICI's Botany plant, where Chemical Workers' Union officials alarmed at the manipulative and divisive nature of SAWGs, sought to jointly regulate their operation, resulting in management curtailing its job redesign initiatives. At Luv Pet Foods, another innovator in job redesign, a change in corporate ownership resulted in the demise of Emery-inspired work changes.<sup>24</sup>

Even where changes in work organisation did occur, it is unclear to what extent this resulted in improvements in job satisfaction or productivity. Managers or consultants rarely attempted any systematic assessment of the impact of job redesign, and published accounts relied mostly on subjective statements from supervisors or selected employees. In many cases job redesign coincided with changed personnel practices. The establishment of ICI's Welvic plant for example, resulted not only in the introduction of SAWGs, but also more intensive selection and training procedures which in themselves may have explained improvements in efficiency.<sup>25</sup> Changes to payment systems may also have had an impact. A major problem here is the lack of information on the effects of SAWGS on remuneration. Where multi-skilling was introduced, wage rates (that is, the rate for the job) generally remained unaltered. However, in a number of cases the introduction of SAWGs did result in a move from individual to group incentive wage schemes which increased employee peer pressure to improve performance.<sup>26</sup>

The introduction of SAWGs also resulted in work intensification. At Philips for example, management cited increases in efficiency of between 30 and 60 per cent, reductions in absenteeism and improvements in quality and profits over a three year period as a result of their socio-technical job redesign. As the consultants noted, a fundamental principle of SAWGs involved re-organising production such that there were more job stations than

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<sup>24</sup> Dunphy et. al. (1976), *op. cit.*; Harper & McCarroll, *op. cit.*, pp.20-1; "Case Studies: SAWGs at Philip Morris", AA Series B146, item 75/9225; O'Leary et. al., *op. cit.*; re Luv Pet Foods see Yerbury, D. (1973) "Union/Management Relations at the Shop Floor", in Ford, G. & Murphy, T. (eds.) *Review of Industrial Relations in 1972*, Sydney, Law Book Co., pp.38 & 49.

<sup>25</sup> Andreatta, *op. cit.*, pp.11-2; Robinson & McCarroll, *op. cit.*, pp.34-5; O'Leary et. al., *op. cit.*, pp.18-9.

<sup>26</sup> Evidence of peer-group pressure appears in the Avon example and also at Sidchrome, see Andreatta & Rumbold (1975) *op. cit.*, p.4 & Coombes, *op. cit.*, pp.62 & 4. For details on the importance of wage incentives in many of the "classic" socio-technical experiments see Carey, A. (1979) "The Norwegian Experiments in Democracy At Work: A Critique and a Contribution to Reflexive Sociology", *Australian and New Zealand Journal of Sociology*, 15(1), pp.13-23 & Kelly, *op. cit.*, pp.133-7.

employees. Following the work reorganisation project, large numbers of workers were retrenched, the Company citing increased competition and reductions in tariff protection. At Sunbeam, the reorganisation of assembly lines towards team production allowed management to better 'balance' work flow and lessen disruptions such as absenteeism. Notably, in both of the above cases, industrial engineering staff played a central role in planning the reorganisation of production layout and methods, and assessing the quantity of necessary labour. Hence, as Kelly has argued of overseas examples of job redesign, a significant factor underlying productivity improvements under SAWGs has been the ability of management to intensify work and reduce the amount of labour required in production.<sup>27</sup>

Overall then, experimentation with job redesign in the early 1970s was limited in impact, not only in terms of the number of enterprises affected but also in the degree to which shopfloor practice was reconstructed. Despite the claims of consultants such as Emery that socio-technical work re-organisation would result in gains for both management and employees, there is little evidence within the Australian examples to support such a contention. The notion of worker 'autonomy' was strictly limited by management to low-level decision-making, and union attempts to regulate job redesign were rejected outright. In many cases management used SAWGs as a means of improving productivity by intensifying work and reducing labour. While socio-technical theory clearly differed from scientific management in its emphasis upon group working and employee accountability, it was also fundamentally similar as a strategy through which management sought to maximise labour productivity. Although a number of companies continued with job redesign initiatives during the later 1970s, in many cases the economic recession of 1974/5 signalled the end of such experimentation as labour turnover declined and firms cut-back expenditure in an effort to remain economically viable. However, as will be demonstrated, these ideas enjoyed a renaissance during the 1980s.

## **THE 1980s: CHANGING TECHNOLOGIES AND NEW PRODUCTION CONCEPTS**

As had been the case during the early 1970s, changes in the economic environment during the 1980s and 1990s resulted in a resurgence of interest amongst Australian employers in work reorganisation. Such developments formed part of a broader international trend, and have been argued by some observers as indicative of a more fundamental transformation of economic activity. Writers such as Piore and Sabel, Kern and Schumann, and in Australia, Mathews, have argued that the declining economic fortunes of advanced economies such as the United States during the late 1970s and

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<sup>27</sup> Dunphy et. al. (1976), *op. cit.*, pp.5 & 8; Andreatta & Rumbold (1974), *op. cit.*, p.346; Kelly, *op. cit.*, pp.121-44.

1980s represent a transitional phase in the movement away from a traditional 'Fordist' mass production system towards a new mode of production and consumption, what has been termed 'post-Fordism' or 'flexible specialisation'. Major reasons underlying such a change, they claim, include: increasing product market volatility and the need to respond quickly to changes in demand; the saturation of mass markets and the movement towards non-price competition in niche markets; and rapid technological change based upon computerisation. In order to compete and survive, employers are seen as shifting towards small-batch, flexible production of differentiated products. Unlike the Fordist/mass production system, which is viewed as being based upon deskilled labour and a low-trust strategy of labour relations, post-Fordist labour management involves high-trust relationships involving increased employee participation and multi-skilled, autonomous employees. Indeed, for Piore and Sabel, the shift towards 'flexible specialisation' will they argue, result in the revival of craft forms of production.<sup>28</sup> Such optimistic and generalised pronouncements have however encountered significant criticism. Doubts have been raised over the actual extent to which firms have adopted the post-Fordist model of change or indeed whether the earlier concept of Fordism was in fact a dominant mode of production. Further, where flexibility strategies have been adopted, a number of writers have noted that in many cases this has resulted in the increased casualisation of the workforce, the use of sub-contracting arrangements, the removal of job demarcations and a weakening of shopfloor trade unionism.<sup>29</sup>

Within Australian industry, by the late 1980s post-Fordist ideas had begun to influence government, employer and trade union thinking. Policies aimed at the renewal of manufacturing industry, micro-economic reform and award restructuring emphasised the need to change industrial practice towards niche markets, greater productive flexibility, and increased employee skills and participation.<sup>30</sup> While strong in rhetoric, it remains

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<sup>28</sup> Piore, M. & Sabel, C. (1984) *The Second Industrial Divide: Possibilities for Prosperity*, New York, Basic Books; Kern, H. & Schumann, M. (1984) "Work and Social Character: Old and New Contours", *Economic and Industrial Democracy*, 5, pp.51-71; Mathews, J. (1989a) *Tools of Change: New Technology and the Democratisation of Work*, Sydney, Pluto Press; Mathews, J. (1989b) "New Production Concepts", *Prometheus*, 7(1), pp.129-48.

<sup>29</sup> For an overview of post-Fordist debate see Thompson, P. (1989) *The Nature of Work: An Introduction to Debates on the Labour Process*, 2nd. edn., London, Macmillan, pp.214-229; Grint, K. (1991) *The Sociology of Work: An Introduction*, Cambridge, Polity Press, pp.294-306; Phillimore, A. (1989) "Flexible Specialisation, Work Organisation and Skills: Approaching the Second Industrial Divide", *New Technology, Work and Employment*, vol.4, no.2, pp.79-91; Pollert, A. (1991) *Farewell to Flexibility*, London, Basil Blackwell; Fieldes, D. & Bramble, T. (1992) "Post-Fordism: Historical Break or Utopian Fantasy?", *JIR*, 34(4), pp.562-79.

<sup>30</sup> Carmichael, L. (1989) "After the Revolution; (Micro) Chips With Everything", *Australian Left Review*, no.110, pp.23-8; Bramble, T. (1989) "Award Restructuring and the Australian Union Movement: A Critique", *Labour & Industry*, 2(3), pp.372-98; ACTU/TDC, (1987) *Australian Reconstructed*, AGPS, Canberra.

unclear to what extent workplace practices have changed. In the sections that follow, the relevance of the post-Fordist argument is analysed in respect to the organisation of work in the Australian manufacturing and service sectors.

### **(a) New Technologies and Computerisation**

A central theme of the post-Fordist argument is that new computer-based technologies require increased employee autonomy and skill. However, analysis of technological change in Australian manufacturing and service organisations during the 1980s highlights both the variable application of computerisation as well as differences in the implications for labour.

Within manufacturing the potential impact of computerisation might occur at a variety of levels. Computer-Aided Manufacture (CAM) involved the linking of programmable computers to manufacturing processes. The prime example of CAM was the development of computer numerical control technology in metal engineering. Such a technology involved automation of metal machining as set down on a computer program. When combined with multi-purpose tools, the ability to reprogram the machine could result in a highly flexible technology capable of producing a wide variety of products. Such automation could be extended through the use of robotic material handling devices and computer controlled material delivery, resulting in what was termed a Flexible Manufacturing System (FMS). With the addition of Computer-Aided Design (CAD) and computer-based planning systems, by the end of the 1980s, the 'factory of the future' was seen as being entirely computer-controlled from delivery of raw materials to the despatch of finished products, what has been termed Computer Integrated Manufacture.<sup>31</sup> However despite such prophecies, like earlier forms of technological change the extent of application of these new computer-based technologies in Australian manufacturing was highly variable and limited by factors of cost and market size.

In process industries the trend towards automatic control continued through the increasing use of computer-based production-control techniques. Examples included large firms in the oil-refining, food and drink processing, and chemical, paper, glass and steel industries.<sup>32</sup> For example, in the case of the steel industry, investment in continuous casting and a computerised network of process control during the 1980s, not only improved product quality and flexibility but also dramatically decreased the need for

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<sup>31</sup> Mathews (1989), *op. cit.*, pp.43-60.

<sup>32</sup> Committee of Inquiry Into Technological Change in Australia (1980) *Technological Change in Australia*, Vol.II, "Technological Change in Industry: Likely Technologies and Applications in Australia", Canberra, AGPS, pp.191, 214, 223-5 & 231-3.

labour. While such technologies radically reduced the size of the workforce, it has been argued by some observers that skill levels have increased amongst those employees still required to oversee production. In chemical production, while computerised controls automated most processes, control room operators were required to attend to alarms, interpret normal and abnormal operating conditions, and initiate start-up and shut-down procedures.<sup>33</sup>

Beyond process industries, batch and mass production were also affected by the new computerised technologies. Leaders in this field were the large US and Japanese car-makers which introduced CAD/CAM, robots and other labour-displacing technology as part of a broader rationalisation of the industry during the late 1970s and early 1980s. Initially applied in welding, spray painting and materials handling, by the later 1980s there was evidence of the spread of automated techniques to other areas of production. For example at Ford's Broadmeadows assembly plant, the introduction of a flexible manufacturing system for car door production resulted in such a high degree of automated control that only one operator was required to oversee production and assist with tooling changes for different models. Significant investments in CAD were also claimed to have reduced the human design factor by half.<sup>34</sup>

Industry rationalisation, tariff cuts and tightening product market competition during the 1980s also led other manufacturers in industries as varied as metal engineering, whitegoods, electrical appliance, textiles and clothing manufacture and newspaper printing to seek to automate elements of their production processes. An early leader in this regard was Kirby Engineering which pioneered FMS for vehicle component manufacturers.<sup>35</sup> In whitegoods, firms such as Email, Kelvinator and Hoover progressively automated production processes as a means of increasing productivity,

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<sup>33</sup> Kelly,D. (1988) "Towards Tripartism: Industrial Relations in the Steel Industry 1978 to 1987", *JIR*, 30(4), pp.514-5 & 529; McBeth,J. (1988) "Network Provides Quality Control", *Today's Computers (Business Review Weekly Supplement)*, September 23, pp.7 & 9; Field,L. (1991) *Training, Learning and Technoculture Within a Processing Plant*, Faculty of Education University of Technology Monograph, pp.16-7.

<sup>34</sup> Bramble,T. (1993a) "The Management of Workplace Industrial Relations: Strategic or Ad Hoc? A Case Study of the Australian Vehicle Industry Since 1950", Seminar Paper, School of Management, University of Southern Queensland, p.13; anon. (1989) "Quality Problems Along Road to New Technology", *Business Review Weekly* (hereafter *BRW*), February 24, pp.108-9; Norman,L. (1985) "Robots Lead the Materials Handling Revolution", *BRW*, Januray 18, pp.71, 73 & 76.

<sup>35</sup> Kavanagh,J. (1985) "Australia Adopts Automation...Just In Time", *BRW*, December 13, pp.40-2, 47-8 & 50.

expanding product range and reducing labour costs.<sup>36</sup> In textile manufacture, the movement towards greater capital intensity, begun during the later 1960s, continued as large firms such as Fibremakers and Bonds introduced computer controls which automated production and quality control and resulted in major reductions in labour. Large clothing manufacturers introduced computerised marking and cutting machines which dispensed with the need for large numbers of skilled, manual cutters. In some clothing factories, computer-controlled overhead conveyors were also introduced to increase the efficiency of materials handling between assembly operations.<sup>37</sup> Computerised technology also had a fundamental impact within newspaper printing with the replacement of traditional 'hot metal' process with 'cold type' computerised photocomposition.<sup>38</sup>

However, the extent of application of new computer-based technologies in manufacturing should not be over-estimated. Despite articles in management journals throughout the 1980s emphasising the advantages of robots, automation and CAM, Australian enterprises proved slow to introduce such technologies. For example, a mid-1980s survey of metal engineering firms found limited use of automated production, with only six per cent of firms extensively using advanced computerised technologies.<sup>39</sup> A variety of factors underlay such reticence. First, despite the potential for productivity improvement, automated production proved technically limited in many cases. In the vehicle industry, for example, even in relatively simple tasks such as spray painting and foundry work, the introduction of robots failed to deliver productivity and quality improvements due to inherent technical limitations.<sup>40</sup> Indeed, as Nettle notes, the increased complexity of much computerised manufacturing technology and the incremental nature of its introduction increased the likelihood of breakdowns and errors which in turn required

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<sup>36</sup> Harris, R. (1981) "Email Shows How to Beat Tariff Cuts", *BRW*, August 29, pp.26-7 & 52; Thomas, T. (1988) "The Appliance Industry Heats Up", *BRW*, June 10, pp.124 & 126-7.

<sup>37</sup> Martin, B. (1987) "New Opportunities For Textile Maker", *BRW*, November 13, pp.41 & 44; Gedeon, D. (1990) "Bonds Industries: At the Cutting Edge of High Technology", *The Australian*, February 7, pp.24-5; Ellem, B. (1992) *Before Award Restructuring: Change and Trade Unionism in the Clothing Industry From 1977*, School of Industrial Relations UNSW Working Paper No.89, pp.7 & 10-11.

<sup>38</sup> Reed, R. (1988) "From Hot Metal to Cold Type Printing Technology", in Willis, E. (ed.) *Technology and the Labour Process: Australian Case Studies*, Sydney, Allen & Unwin, pp.33-50.

<sup>39</sup> Frenkel, S. (1987) "Managing Through the Recession: An Analysis of Employee Relations in the Australian Engineering Industry", *Labour & Industry*, 1(1), p.43.

<sup>40</sup> Wilkinson, R. (1988) "Management Strategies in the Motor Vehicle Industry", Willis, *op cit*, pp.132-6.

increased maintenance.<sup>41</sup> Second, significant investment in robots and other computer-based innovations was financially risky. Although the price of such technology decreased over time, in many cases it still represented a significant investment, particularly given the potential for expensive maintenance and software programming and the uncertain and volatile economic environment most manufacturers faced. While the greater flexibility of CAM was seen as most applicable to small and medium-volume production, it was mostly larger manufacturers with the necessary financial resources which chose to invest in the new technologies and capital equipment.<sup>42</sup> Third, declining real wage levels throughout the 1980s made it easier for many manufacturers to stick with traditional, more labour-intensive technologies and to increase productivity by intensifying labour effort and reorganising the social, as opposed to the technical, relations of production.<sup>43</sup>

While technological change in much of manufacturing was incremental and built upon previous trends of mechanisation, within the service sector the impact of computerised technology resulted in more revolutionary changes. This was particularly the case in clerical and office work, banking and financial services, and sections of the retail industry.

As Pringle notes, the trends towards the automation of Australian offices had begun in the 1960s with the introduction of the dictaphone and the growth of typing pools. During the late 1970s and early 1980s the rapid spread of word-processing technology marked the next major innovation in office work. Word processors involved the application of computer technology to typing operations and represented a significant advance on typewriters in that text could be edited and corrected far more quickly and without the need to re-type unaltered text. Initially in the form of magnetic-tape or card typewriters, later innovations included micro-processor driven text editing, the addition of visual-display units (VDUs) and electronic keyboards, and the replacement of 'dedicated' word processing machines by multi-purpose micro-computers. Word processing technology was quickly taken up by management as a means of increasing office efficiency and reducing clerical labour costs. Leaders in the introduction of word-processing included large multinationals, insurance, banking and law firms.<sup>44</sup> However, studies of the

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<sup>41</sup> Nettle, C. (1990) "Management Control In Australia", PhD thesis, Department of Sociology, Macquarie University, pp.188-190.

<sup>42</sup> McPhersons Research and Development (1980) "Computer-Aided Manufacture in Australia", in Committee of Inquiry Into Technological Change, *op. cit.*, Vol.IV, pp.109-141.

<sup>43</sup> Burgess, J. (1990) *Another Productivity Paradox? The Accord and Recent Productivity Trends in Australian Manufacturing*, ACIRRT Working Paper No.3, July.

<sup>44</sup> Pringle, R. (1988) *Secretaries Talk*, pp.176-188; Lamberton, D. (1980) "The Word Processor Industry in Australia", in Report of the Committee on Inquiry Into Technological Change, *op. cit.*, vol.4, pp.38-107; Koch, D. (1982) "Processors Now Part of the Staff", *BRW*, July 17, pp.44 & 46; Lingane, D. (1984) "Memo Secretary: Re-Write Your Job Description", *BRW*, February 4,

application of word processing found evidence of labour displacement, increases in work loads and work rates, reductions in job variety and skill and little if any consultation in the introduction of such technology.<sup>45</sup>

Within financial services, computerisation in the form of electronic data processing (EDP) dated in the insurance industry from the early 1960s and had spread rapidly by the end of the decade. The major banks proved somewhat slower to introduce EDP given the branch nature of their organisation. However, by the late 1970s, with the linking of branch terminals to central computers via 'on-line' technology, computers spread rapidly amongst the major banks. As Game and Pringle have noted, such computerisation resulted in significant labour cost savings for the banks and major reductions in the staffing of bank branches as ledger machinists and exchange clerks were replaced by large, centralised EDP centres. Such centres continued a trend of clerical deskilling, employing large numbers of female keyboard operators to enter financial transactions on a continuous-shift basis.<sup>46</sup> During the 1980s, improvements in micro-computer technology, heightened competition following industry deregulation, and a desire by the banks to broaden their range of financial services, resulted in a greater emphasis on the direct linking of tellers to central computers via interactive terminals and the rapid introduction of new technologies such as automatic telling machines (ATMs) and, more recently, electronic funds transfer systems. These latter changes when combined with management's desire to improve customer service have been argued by some writers to have resulted in increased skill requirements for bank employees.<sup>47</sup>

In the retail sector the first moves towards automation occurred during the 1970s as large retail chains connected electronic cash registers to head office computers. This provided quicker and more accurate store performance and sales information, and also assisted in calculating stock levels. During the 1980s, developments in micro-computer and software technology accentuated such a trend. The introduction of computerised point-of-sale

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pp.49 & 51-4; Coffey, M. & Dunphy, D. (1982) "Towards the Paperless Office", *Work and People*, 8(3), pp.3-9.

<sup>45</sup> Butler, D. (1988) "Secretarial Skills and Office Technology", in Willis, *op. cit.*, pp.20-32; Collins, M. (1988) *The Impact of New Office Technology on Clerical Workers in Queensland*, Employee Participation Research Report No.13, Department of Industrial Relations, Canberra, AGPS.

<sup>46</sup> Game, A. & Pringle, R. (1983) *Gender At Work*, Sydney, George Allen & Unwin, pp.43-4; Griffin, G. (1982) "Managing Technological Change: Industrial Relations in the Banking and Insurance Industries", *JIR*, 24(1), pp.56-60.

<sup>47</sup> Manning, H. (1985) "The Banking Labour Process", *Journal of Australian Political Economy*, June, pp.51-4; Manning, H. (1990) "Award Restructuring in the Australian Banking Industry", *JIR*, 32(3), pp.341-3;

(POS) equipment and electronic ordering by large department stores linked retail more closely with warehousing and distribution. In supermarkets, a major innovation was the introduction of product bar-codes and related laser-scanning technology. Check-out operators now passed products over a laser-scanner which automatically 'read' the product bar-code, calculated the price of each product, the change the customer should receive, and linked the information into the store's stock ordering system. Major advantages claimed for the new technology included quicker speed of sale, reduced likelihood of sales error, cost savings in price labelling, greater inventory control, and quicker and more accurate sales information. Critics argued such technology further deskilled check-out work and provided a further means of managerial surveillance. By the early 1990s the distinction between retail and financial services was becoming increasingly blurred through the growing use of electronic-funds-transfer terminals at the point of sale (EFT-POS) in supermarkets, petrol stations, department and convenience stores.<sup>48</sup>

Overall, the implications for employees of such computer-based technological change have varied significantly. Labour displacement has been a central theme in many instances. This was particularly apparent in manufacturing, where computerised production and quality control has resulted in significant reductions in the production workforce. In some cases, such as chemicals, steel and some sections of metal engineering, there is evidence of increased employee skill requirements. Some writers have also argued that in retail banking, the trend towards interactive on-line terminals and improved customer service has also resulted in upskilling. However, there is also much evidence to suggest management sought to reduce labour costs and increase their control over work effort and employee-customer interaction. Such a trend was pronounced with the growth of centralised word processing pools and EDP centres and the introduction of laser scanning in supermarkets. In other areas of the retail sector, such as the multinational fast-food chains, the deskilling implications of technological change have been particularly apparent. The industry leader in this respect has been McDonald's, which has utilised an extreme division of labour more commonly associated with assembly-line manufacturing, with highly standardised job procedures, cooking times determined by pre-set buzzers and computer surveillance of service time.<sup>49</sup> While it is

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<sup>48</sup> Game & Pringle, *op. cit.*, pp.65-6; Lansbury, R. (1982) "Technological Change and Employee Participation in the Retail Industry", *Work and People*, 8(3), pp.21-6; Thomas, T. (1981) "Supermarkets Gear To Win the Scanning Revolution", *BRW*, July 4, pp.32, 33 & 35; Speary, C. (1984) "The Computerisation of Australian Retailing", *The Australian*, November 6, pp.33 & 35; Kavanagh, J. (1985) "Barcode Scanning About to Take Off", *BRW*, May 3, p.68; Skjellerup, R. (1990) "Scanning Keeps a Check on Supermarket Costs", *IE*, June, pp.17-8; Carter, S. (1986) *Industrial Relations and Industrial Democracy in the Retail Industry*, Canberra, AGPS, pp.16-20; Mathews, *op. cit.*, pp.63-6.

<sup>49</sup> For details of the McDonald's system see Reeder, E. (1988) "The Fast Food Industry", in Willis, E. (ed.) *op. cit.*, pp.147-9; Dunford, R. (1992) *Organisational Behaviour: An*

clear that technological change has critically affected employees' skills and the degree of control they have over their work, perhaps more important has been the way in which management have chosen to organise the social relations of production around such technology.

## (b) The Japanese Model: Just-In-Time and 'Lean Production'

While Australian industry has historically been dominated by British and later American production thinking, by the 1980s a growing number of employers were looking to the competitive success of Japanese industry and the organisational principles that were believed to underlie such success. The first of the new production concepts to be widely publicised in Australian industry during the 1980s was Just-In-Time (JIT). The JIT concept was first developed by Japanese car manufacturers such as Toyota during the 1960s as a means of improving product quality and productivity. At its heart, JIT involved moving away from the traditional system of long production runs for a potential future demand, to a system where work was done only when needed. Hence, instead of reacting to through-put from 'upstream' in the production process, employees now worked in response to signals 'downstream' in the process requesting a particular part or sub-assembly (the so-called 'Kanban' ticket system). As a result, unlike a traditional 'just-in-case' production system, which was based on production-push, JIT was seen more as a market-pull system with parts supplied just-in-time to be assembled and products manufactured just-in-time to be sold. As Sayer has argued, JIT aimed to improve productivity by maximising the flow-line nature of manufacturing and minimising the degree to which labour, raw materials or capital were inactive in production.<sup>50</sup>

Such a change in the logic of production also involved other changes. First, JIT required the reduction of inventories and buffer stocks to a bare minimum, what has been termed by some writers 'lean production'.<sup>51</sup> By removing such reserves, not only were storage and interest costs reduced, but sources of inefficiency and productivity improvement could be more easily identified. Second, the reduction of inventories and the increased responsiveness of production under JIT forced a greater emphasis on the need for

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*Organisational Analysis Perspective*, Sydney, Addison-Wesley, p.57; Davison, G. (1993) *The Unforgiving Minute: How Australia Learned to Tell the Time*, Melbourne, Oxford University Press, p.134.

<sup>50</sup> Sayer, A. (1986) "New Developments in Manufacturing : The Just-In-Time System", *Capital & Class*, No.30, pp.51-9.

<sup>51</sup> The concept of "lean production" is elaborated in more detail with respect to the vehicle industry in Womack, J., Jones, D. & Roos, D. (1990) *The Machine That Changed the World*, New York, Rawson Associates.

quality. As a result, related concepts such as Total Quality Control (TQC) were introduced utilising statistical quality control techniques and the responsibility for quality control was devolved to shopfloor employees. Third, reduced inventories also required much closer relations between manufacturers and suppliers, in terms of the timing and quality of materials and sub-assemblies, and increased dependency relationships between these two groups. Fourth, given the increased vulnerability of JIT production to disruption, advocates argued that greater emphasis should be given to employee co-operation and involvement. One example of this included the introduction of Quality Circles (QCs), where groups of workers were encouraged to meet in a regular forum to analyse and suggest improvements to their work process. Fifth, in line with the notion of flow production and flexibility, JIT commonly resulted in the grouping together of different machine processes in close proximity in what has been termed 'group technology'. Finally, unlike traditional Western production which sought 100 per cent productivity from the outset, the JIT philosophy emphasised the notion of continual incremental productivity improvement over a period of years. Hence rather than representing simply a strategy of inventory reduction, JIT can be seen as a process of "learning-by-doing".<sup>52</sup>

JIT arrived in Australia during the early 1980s as part of a broader drive to improve the efficiency of manufacturing industry. A prime mover in the dissemination of JIT in Australia was the Technology Transfer Council (TTC), a technology consultancy established by the Federal Government and employer organisations such as the Metal Trades Industry Association and the Confederation of Australian Industry. During the early 1980s the TTC familiarised itself with the JIT philosophy through reference to American publications, a study tour of Japanese companies and the presentation of seminars by experienced overseas personnel. During the mid-1980s, the NSW and Victorian state governments commissioned the TTC to conduct pilot JIT studies in which approximately 60 enterprises were involved.<sup>53</sup> Despite initial opposition, metal trades unions such as the Amalgamated Metal Workers Union and the ASE also advocated the introduction of JIT and were involved in the initial pilot projects as well as later developments.<sup>54</sup> During the later 1980s, the TTC continued to disseminate the

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<sup>52</sup> Sayer, *ibid*; Schonberger, J. (1982) *Japanese Manufacturing Techniques: Nine Hidden Lessons in Simplicity*, Free Press; Baker, R. (1985) "Just-In-Time Production - Much More Than Materials Management, *IE*, 26(1), pp.3-8.

<sup>53</sup> Zappala, J. (1987) "Just-In-Time Techniques in NSW Manufacturing Industry: A Question of Strategy?", BEd(Hons) thesis, Department of Industrial Relations, University of Sydney, pp.38-40; Jureidini, R. (1991) "Just-In-Time and Power Relations in the Manufacturing Chain", *Labour & Industry*, 4(1), pp.31-2; Sohal, A. (1991) "Just-In-Time: Victorian Data", *Labour & Industry*, 4(1), pp.43-7.

<sup>54</sup> Zappala, *op. cit.*, pp.42-75; Ogden, M. (1986) "Industrial Democracy and New Management Techniques in the Australian Metal Industry", *Journal of Australian Political Economy*, 20, pp.37-43.

techniques of JIT/TQC under the title of Value-Added Management (VAM). In response to such advocacy a number of metal industry firms introduced these techniques. Examples included Hoover, Email, Kelvinator and Metal Manufactures. In a review of seven metal industry firms introducing such techniques, Bramble noted the introduction of group technology, Kanban scheduling systems, reduced inventories, increased product diversity, and an emphasis on shopfloor quality control.<sup>55</sup>

Beyond the metal industry, the other major area of JIT innovation was the vehicle industry. Early innovators included Ford Australia's plastic plant, which introduced a Kanban ticketing system as early as 1983, and Mitsubishi's Adelaide assembly plant. By the later 1980s all of the major vehicle assembly companies had introduced vendor audits, closer long-term relations with component suppliers, standard industry-wide quality programs, and significant reductions in inventory and stock holding.<sup>56</sup> The introduction of JIT amongst the large car assemblers also resulted in the dissemination of similar practices amongst many of the vehicle component suppliers. A good example of this was Borg-Warner, which supplied axle assemblies to major car companies such as Ford, GM-H and Nissan.<sup>57</sup>

How then was labour affected by these new production concepts? While some observers have argued that JIT/TQC and VAM highlight the possibilities of a more humanistic, post-Fordist form of labour management based upon highly skilled work teams,<sup>58</sup> there is much evidence to suggest countervailing trends. Like earlier forms of work organisation, the emphasis within the JIT philosophy upon ever decreasing production inputs and ever increasing productive performance highlights the potential for work intensification. Despite claims that such systems represent a fundamental break with more traditional

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<sup>55</sup> Brentnall, T. (1986) "Saving Factory Time and Space", *BRW*, Jan. 17, pp.50-1; Roberts, P. (1986) "How Adding Value Beats Reinventing the Wheel", *Australian Financial Review*, August 19, p.16; Martin, B. (1987) "Making Connections With the Future", *BRW*, April 10, pp.101 & 105; Bramble, T. (1988) "The Flexibility Debate: Industrial Relations and New Management Production Practices", *Labour & Industry*, 1(2), pp.199-200.

<sup>56</sup> Mathews, J. (1991) *Ford Australia Plastics Plant: Transition to Teamwork Through Quality Enhancement*, UNSW Studies in Organisational Analysis and Innovation No.3, IRRC, UNSW, pp.23-7; Kriegler, R. & Wooden, M. (1985) "Japanese Management Practices in Australia: The Case of Mitsubishi", *Work and People*, 11(1), pp.3-8; Wilkinson, *op. cit.*, pp.129-132.

<sup>57</sup> Jureidini, *op. cit.*, pp.28 & 32-4; Jackson, A. & Dore, J. (1989) "Productivity Improvements in BTR Nylax Ltd." in EPAC (ed.) *Improving Productivity*, Discussion Paper No.89/12, Canberra, AGPS, pp.5-6; Lansbury, R., Sandkull, B. & Hammarstrom, O. (1992) "Industrial Relations and Productivity: Evidence From Sweden and Australia", *Economic and Industrial Democracy*, 13, pp.308-22.

<sup>58</sup> See for example Mathews (1989), *op. cit.*, pp.79-85.

'Taylorist' production systems, overseas studies of Japanese vehicle production have emphasised the key role played by industrial engineers in production planning, particularly in reducing buffer stocks, labour requirements and working time.<sup>59</sup> In a review of the importation of Japanese production techniques in the US vehicle industry, Parker and Slaughter have argued that zero-inventories and the drive for continual productivity improvement have resulted in a form of production they describe as "management by stress". Despite the emphasis on team-work and quality circles, they found employee participation was limited to small methods improvements while basic job design continued to be pre-determined by management planners. In a similar vein, Berggren has argued the US experience of so-called 'lean production' had been typified by unlimited performance demands, increased working hours, rising health and safety problems and a strict factory regime regarding personal conduct, appearance, discipline and attendance.<sup>60</sup>

In the Australian context, while the industrial engineering profession initially interpreted JIT as a threat to their traditional perspective, they also recognised that such techniques re-emphasised the need for management to take a more active approach to production planning. At Mitsubishi, for example, the introduction of JIT/flow-based production involved a strong emphasis on methods analysis, the elimination of unnecessary and irregular work movement, and the introduction of standard operating procedures in a manner clearly reminiscent of earlier methods engineering practice. In some cases, employers combined JIT techniques with more traditional scientific management techniques. A prime example of this occurred amongst the larger clothing manufacturers, where the labour intensive nature of garment machining ensured the survival of traditional scientific management techniques such as time and motion study and related wage incentive schemes. At Bonds, for example, JIT was introduced for small runs of fashion-oriented garments as an adjunct to traditional assembly techniques. In these situations industrial engineers established work layout via methods analysis, continued to measure work via time study and predetermined motion-time systems and replaced individual bonuses with group schemes.<sup>61</sup>

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<sup>59</sup> Dohse, K., Jurgens, U. & Malsch, T. (1985) "From "Fordism" to "Toyotism"? The Social Organisation of the Labor Process in the Japanese Automobile Industry", *Politics & Society*, 14, pp.126-8.

<sup>60</sup> Parker, M. & Slaughter, J. (1988) "Management By Stress", *Technology Review*, Oct., pp.36-44; Berggren, C. (1991) "Lean Production - the End of History?", Seminar paper presented at the Science and Technology Analysis Programme, University of Wollongong, pp.10-3.

<sup>61</sup> Seager, N. (1985) "Just In Time", *IE*, 26(2), pp.1-4; Longbottom, G. (1984) "The Japanese Connection: Japanese Methodology in Australian Industry", *HRM Australia*, August, pp.32 & 34; Wright, C (forthcoming) "Payment by Results in a Clothing Firm", in Wright C. & ACIRRT, *The Incidence and Nature of Incentive Payment Systems in Australian Industry*, DIR Research Monograph, Canberra.

In many cases it seems that the introduction of JIT resulted in increased job stress and work intensification. At Mitsubishi, the removal of buffer stocks and the drive towards improved flow production increased the need for employees to work at a constant pace in response to the needs of the production line. The devolution of quality control to the shopfloor also increased work content, in that employees were expected to undertake both production and inspection functions.<sup>62</sup> In the metal industry, the introduction of JIT and related 'group technology' resulted in reductions of operative and supervisory labour, as production was reorganised from an employee operating a single machine to a group of three employees overseeing a cell of eight to ten machines. While potentially a form of job enlargement, workers complained that such a system increased job stress in that the lack of buffer stocks removed employee control over the pace of work, and that reductions in manning meant they had to constantly attend to the needs of the different machines. The introduction of quality at source also meant faults could be more easily traced to individual workers. Interestingly despite such increases in work effort and responsibility, in a survey of metal employers using JIT, Zappala notes that only 21 per cent of employees received a pay increase or were upgraded in their job classification. Further, despite the alleged necessity for greater employee participation under JIT production, while the majority of firms had consulted employees in introducing their schemes, 48 per cent of firms sampled lacked any on-going means of participation.<sup>63</sup>

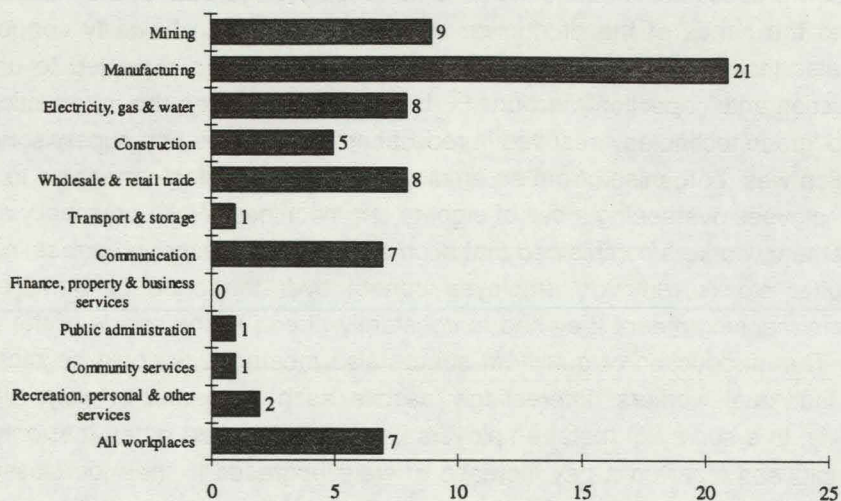
However, the significance of JIT as a specific management technique should not be overstated. By the later 1980s, despite widespread publicity of the potential productivity benefits, survey data suggests that outside of the vehicle and metal manufacturing industries, relatively few employers made use of JIT. As can be seen from Figure 8.1, the Australian Workplace Industrial Relations Survey (AWIRS) found relatively little use of JIT techniques by employers even within the manufacturing sector. Such figures were supported by an ABS survey in 1988 of 6,500 manufacturing establishments which found only 15 per cent using JIT and only another 10 per cent anticipating its use in the next five years. Further even within firms that had adopted JIT, industry analysts noted relatively few had implemented such practices in a widespread fashion. For example, in an analysis of the eighteen leading clothing manufacturers, Greig found only three firms which had introduced JIT in a wholesale manner, with another four firms adopting it in a piecemeal fashion. In this industry it was the demands of the large retail chains for more flexibility and quicker response that had resulted in the introduction of JIT techniques.<sup>64</sup>

<sup>62</sup> Kriegler & Wooden, *op. cit.*, pp.3-4; Wilkinson, *op. cit.*, p.131-2.

<sup>63</sup> Bramble (1988), *op. cit.*, pp.200-2; Zappala, *op. cit.*, pp.90-8, 111-4 & 121-2.

<sup>64</sup> Callus, R., Moorehead, A., Cully, M. & Buchanan, J. (1991) *Industrial Relations At Work: The Australian Workplace Industrial Relations Survey*, Canberra, AGPS, p.338; ABS (1989) *Manufacturing Technology Statistics, Australia, 30 June 1988, Summary*, 8123.0.; Greig, A. (1992) "Rhetoric and Reality in the Clothing Industry: The Case of Post-Fordism", *Australia & New Zealand Journal of Sociology*, 28(1), pp.56-8; Greig, A. (1990) "Technological Change and

Figure 8.1 Percentage of Workplaces With 'Just-In-Time'



SOURCE: Callus et. al., *op. cit.*, p.338

A variety of reasons underlay such limited application. For many manufacturers the shift to full-scale JIT production was considered too costly or not applicable. Relations with suppliers also proved problematic. In many cases the close links between producer and supplier that typified Japanese production were lacking. Many supplier companies resisted the JIT philosophy, fearing such a process merely shifted inventory costs and inflexibility upstream in the manufacturing process. Indeed, despite arguments as to the greater flexibility of JIT production, major applications were limited to high-volume assembly operations where customer demand was relatively stable and sufficient notice could be given to the supplier of the manufacturer's requirements.<sup>65</sup> The increased vulnerability of production under JIT may also have limited its use. Clearly this could work both ways. For example, while suppliers feared increasing inflexibility to the dictates of larger manufacturers, industrial disputation amongst supplier firms could also have a deleterious effect downstream. A good example of this occurred throughout the later 1980s in the vehicle industry where disputation amongst supplier companies resulted in production shut-downs amongst the major vehicle assemblers.<sup>66</sup>

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Innovation in the Clothing Industry: The Role of Retailing", *Labour & Industry*, 3(2&3), pp.330-353.

<sup>65</sup> Waugh, J. (1986) "Just In Time Short of Being Australia's Panacea", *BRW*, August 22, pp.87-90 & 93; Gray, T. (1990) "Just-In-Time Rival Claims Superiority", *BRW*, July 27, pp.62-3.

<sup>66</sup> Jureidini, *op. cit.*, pp.34-7; Noonan, G. (1985) "Unions Find Achilles Heel in Ford's Low Inventory System", *Australian Financial Review*, 11 Feb, p.5.

### (c) **Work Reorganisation in the 1990s: Quality Management and Team-working**

While the application of specific production techniques such as JIT was limited, Australian employers experimented with a number of closely related production and service philosophies during the late 1980s and early 1990s in an effort to increase efficiency and competitiveness. A key philosophy underlying much of this change has been the growth of what has been termed quality management.

As Allan notes, many of the basic concepts of quality management, such as statistical quality control techniques, had been established in the United States by 1940. While rarely applied by American employers at this time, quality control techniques were vigorously embraced by Japanese industry during the post-Second World War period where they were subsequently refined and developed. By the 1980s, Western interest in Japanese production techniques ensured international diffusion of the ideas of quality management. As was the case overseas, private management consultancies played a central role in the dissemination of quality management in Australia. The two principal groups were Enterprise Australia (EA) and the Australian Organisation for Quality Control (AOQC). EA was a business-funded organisation formed during the 1970s to promote the benefits of free enterprise. During the early 1980s, through an association with the American arm of the Nashua Corporation, EA sought to increase industry awareness of quality management techniques eventually taking on an active consultancy role itself. By contrast the AOQC was a quasi-professional body of quality control specialists formed during the late 1960s. While initially ineffective in promoting quality techniques, during the 1980s it succeeded in persuading both State and Federal Governments of the need for improved quality assurance standards in government contracts, before embarking on training and consultancy in quality management. During the later 1980s, the Federal Government also played an important role in the dissemination of quality management, providing subsidies to companies which implemented quality management techniques and financial assistance in the formation in 1990 of a peak quality management body, the Australian Quality Council.<sup>67</sup>

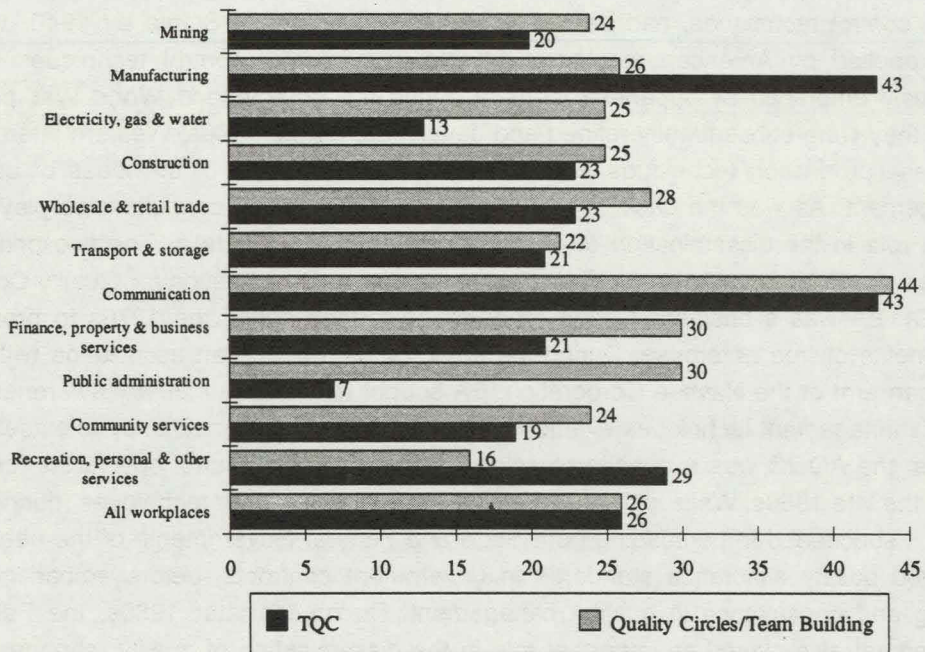
Early quality management initiatives followed the TQC philosophy of increasing shopfloor responsibility for quality control through the development of QCs and training employees in statistical quality control techniques. In line with JIT practices, employers in the vehicle and metal manufacturing industries were strong supporters of the TQC approach, with firms such as Mitsubishi, Nissan, Ford, Repco, CIG, and Sunbeam introducing QC-type arrangements during the 1980s. The TQC approach was also adopted by large firms in

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<sup>67</sup> Allan, C. (1991) "The Role of Diffusion Agents in the Transfer of Quality Management in Australia", BComm Honours thesis, Division of Commerce and Administration, Griffith University, Chapters 3 & 4.

the aluminium and steel industries, such as Comalco and BHP.<sup>68</sup> Unlike JIT, survey data suggests that TQC and QCs enjoyed a wider applicability beyond just larger manufacturers. As can be seen from Figure 8.2, the AWIRS found 26 per cent of all workplaces had implemented TQC and QCs in the five years prior to the survey. While far from a majority of workplaces, the survey findings do suggest a broader interest in quality management practices across industries.

Figure 8.2 Percentage of Workplaces Using Quality Management Techniques



SOURCE: Callus et. al., *op. cit.*, p.338

The implications of TQC for workers were mixed. In a number of instances, the introduction of QCs did result in greater opportunities for employee involvement and an increased management recognition of the skills of shopfloor employees. On the other hand, QCs were also commonly short-term initiatives which management disbanded after a period of experimentation. For example, in a detailed study of the implementation of

<sup>68</sup> Kriegler & Wooden, *op. cit.*; Teicher (1990), *op. cit.*; Bramble (1993a), *op. cit.*; Wells, C. (1982) "Quality Circles - Features of an Australian Program", *Work and People*, 8(3), pp.12-8; Banks, M. (1992) "Worker Participation - A Tool For Industrial Change?", BEc Honours thesis, University of Sydney, Stace, D. & Blackstock, L. (1992) "On A Roll: Business Turnaround at ..... Rolled Products", Centre For Corporate Change, AGSM, UNSW, pp.4-5; BHP Steel (1989) "Winning Performance", BHP Steel, Slab and Plate Products Division.

QCs at the pharmaceutical and food divisions of the UK multinational Reckitt and Coleman, Dunford and McGraw note that a lack of management commitment to suggested changes, production pressures, supervisor resistance and increasing divisions between circle participants and other employees resulted in the demise of formal QC arrangements after several years of activity. Similarly in the auto industry, Wilkinson argues that the cost of QC programs, the formality of procedure, and the slowness in developing quality improvement presentations and then implementing suggestions, resulted in a waning of employer interest in QCs. Other studies highlight the lack of management commitment to shopfloor involvement and limited employment security as additional factors undermining the QC approach.<sup>69</sup>

While shopfloor initiatives such as QCs had a variable effect on productivity enhancement, a number of organisations continued to develop and refine forms of work organisation based upon teamworking and multiskilling as part of award restructuring and enterprise bargaining negotiations. Within the manufacturing sector, prime examples have included Ford, ICI, Email and Alcan which faced with increasing product market pressures and tariff reductions, have implemented work reorganisation as part of broader corporate survival strategies.<sup>70</sup> Interestingly, many of these changes bear a striking resemblance to the job redesign experimentation of the early 1970s. At Alcan's Granville plant, management introduced self-managing teams in 1991 as part of a broader Continuous Improvement Program. Teams consisted of multi-skilled employees who were delegated responsibility not only for quality, through-put and utilisation of the plant but also the allocation of work, as well as having input into the hiring and firing of team members. Importantly, management carefully hand-picked team-leaders and other employees involved as a means of ensuring compatibility and avoiding 'bad apples'. Further, as was the case with earlier examples of SAWGs, management placed specific limitations over the extent of worker autonomy. For example, while teams had some freedom in how quality checks were carried out, there was no discretion over what type of quality checks would be undertaken. Despite these limitations, management's success in changing the culture of the workplace was evident in the strength of employee peer pressure (internal disciplining of team members for output restriction) and the acceptance

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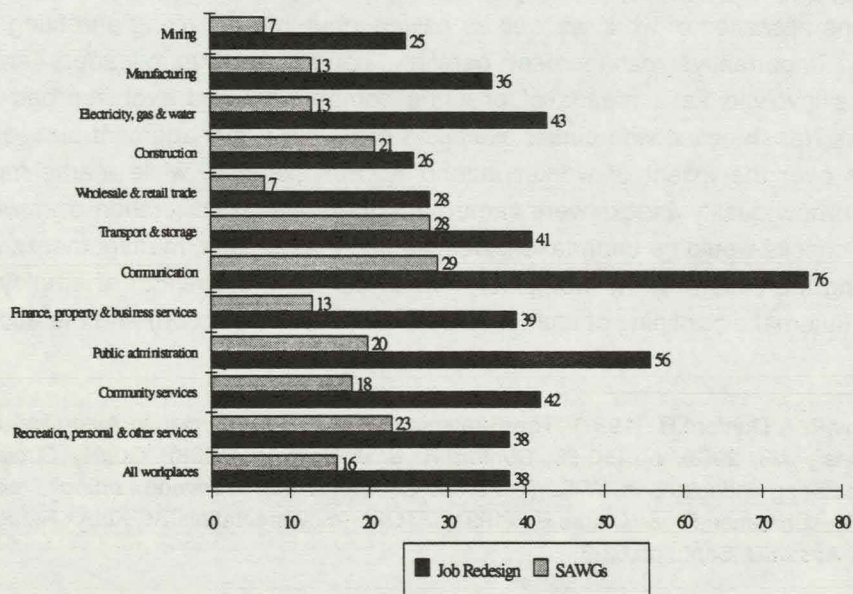
<sup>69</sup> McGraw, P. & Dunford, R. (1987) "The Strategic Use of Quality Circles in Australian Industrial Relations", *JIR*, 29(2), pp.150-68; Dunford, R. & McGraw, P. (1988) "Quality Circles in the Manufacturing Industry", in Willis (ed.), *op. cit.*, pp.81-95; Wilkinson, *op. cit.*, pp.136-40; Sloan, T., Chapman, R. & Clarke, P. (1991) "TQM Implementation at Kirby Refrigeration", *Quality Australia*, Sept., pp.52-3.

<sup>70</sup> Mathews (1991), *op. cit.*; Meador, T. (1992) *ICI Australia: The Botany Experience*, UNSW Studies in Organisational Analysis and Innovation, No.8, IRRIC, UNSW; NIS (1992) "Companies Turn to Teams to Boost Production", *Inside Enterprise Bargaining*, 3; Dunphy, D. & Berggren, C. (1992) *Industrial Renewal at Alcan Sheet Division, Granville*, AGSM Centre For Corporate Change.

of increased workloads for little clear monetary reward.<sup>71</sup> While both media and academics have been fulsome in their praise of these 'co-operative' attempts at industrial renewal, it remains to be seen whether such work reorganisation will be a lasting phenomenon. Clearly, an important factor underlying these changes is that unlike the early 1970s experimentation, contemporary work reorganisation has occurred against a background of high unemployment, job losses, threatened plant closure and strong trade union support for such reforms.

Once again in assessing the impact of these practices one needs to distinguish individual cases from general industry experience. In large enterprises such as ICI and Ford, job redesign experimentation has been limited to specific workplaces rather than organisation-wide reforms. Further, the AWIRS data highlights that while interest in the broad notion of job redesign has been wide-ranging (perhaps reflecting on-going award restructuring negotiations with trade unions), the application of specific practices such as SAWGs, has been far more limited. As can be seen in Figure 8.3, concepts of job redesign were most commonly applied amongst large, public-sector employers in industries such as communication and public administration. However, the extent of application of specific forms of job redesign such as SAWGs has remained far smaller.

Figure 8.3 Percentage of Workplaces Introducing Job Redesign or SAWGs



SOURCE: Callus et al., *op. cit.*, p.338

<sup>71</sup> Dunphy & Berggren, *ibid*, pp.24-51.

More recently, concepts of teamworking and work reorganisation have been further promoted through the dissemination of management philosophies such as Total Quality Management (TQM). As the latest in a long line of productivity-enhancing techniques, TQM seeks to increase managerial and employee commitment to quality improvement and the needs of customers. Hence, in addition to shopfloor initiatives such as QCs and teamworking, the TQM approach emphasises a 'top-down' process of quality improvement and the involvement of all employees (including middle management and supervisory levels) in improving organisational performance.<sup>72</sup>

The actual extent to which TQM has been applied in Australian industry is difficult to determine. In part this relates to its relative newness as well as the fact that it represents a more general and inexact philosophy of quality and productivity improvement, as opposed to stipulating specific techniques of work reorganisation. Available evidence suggests a quite widespread take-up of the TQM message. One recent survey of three hundred large Australian organisations found 28 per cent had introduced some form of quality or customer service initiative in the previous three years.<sup>73</sup> Not surprisingly, many documented cases of TQM in the manufacturing sector have grown out of previous 'change' strategies such as JIT/TQC and teamworking. The recent Federal Government funded 'Best Practice' program has also assisted the dissemination of quality management and teamworking ideas.<sup>74</sup>

The generality of the TQM approach has also resulted in its application beyond manufacturing within larger service-sector organisations in banking, retail, the hospitality industries, as well as many recently 'corporatised' public instrumentalities. The introduction of TQM in these industries has resulted in a strong emphasis upon improved customer service as a means of differentiating an enterprise from its competitors and hence enhancing organisational performance. While some writers have argued that the drive for improved customer service requires more highly skilled, autonomous employees, Australian evidence on this point appears mixed. Examples of the teamwork approach to service provision have included the insurance company Colonial Mutual Life

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<sup>72</sup> Hill, S. (1991) "How Do You Manage a Flexible Firm? The Total Quality Model", *Work, Employment & Society*, 5(3), pp.397-415; Dawson, P. & Palmer, G. (1993) "Total Quality Management in Australian and New Zealand Companies: Some Emerging Themes and Issues", *International Journal of Employment Studies*, 1(1), pp.115-36.

<sup>73</sup> Waldersee, R. & Blackstock, L. (1993) *Organisational Change in Australia: What's Really Happening?*, Centre For Corporate Change, AGSM, pp.4-5.

<sup>74</sup> Chapman, R., Clarke, P. & Sloan, T. (1991) "TQM at White Wings - A Case Study", *Quality Australia*, April, pp.17-23; Sloan, T., Chapman, R. & Clarke, P. (1991) "TQM Implementation at Kirby Refrigeration", *Quality Australia*, September, pp.52-4; Allan, *op. cit.*, chapter 5.

Assurance and the NSW State Library. There is also evidence that service organisations such as airlines and banks have increased expenditure on employee training as a means of improving customer service.<sup>75</sup> However, at the same time, tighter management controls and deskilling techniques are also evident in many organisations. For example, in fast-food outlets such as McDonald's and many bank and insurance organisations, the drive to improve customer service has been based upon increased managerial surveillance of the quality of employee service through customer questionnaires or random staff visits and the use of scripted responses to customer enquiries.<sup>76</sup>

Studies of the organisational effects of TQM are similarly mixed. Like earlier initiatives such as SAWGs and JIT/TQC, TQM 'success stories' litter the pages of Australian management and quality journals. Despite claims of improvements in productivity, quality, cost reduction, and job satisfaction, most cases lack detailed or long-term analysis and many are aimed more at the advocacy of the latest management fashion.<sup>77</sup> In one of the few academic analyses of the implementation of quality management in Australian industry, Fisher notes that while such techniques may have led to improvements in labour productivity measures in three organisations studied, they had a minimal effect upon overall company performance compared to factors such as product rationalisation, financial controls or broader economic fluctuations.<sup>78</sup>

## WORK RELATIONS: A POST-FORDIST TRANSFORMATION?

During the 1970s and 1980s the nature of work relations within Australian enterprises underwent a variety of changes. In the manufacturing sector, the post-war growth in

<sup>75</sup> James,D. (1989) "Total Service", BRW, September, pp.50-54; Dunoon,D. & Mathews,J. (1991) *Westpac: Restructuring of Retail Branches*, UNSW Studies in Organisational Analysis and Innovation, No.1, IRRIC, UNSW, pp.6-10; Mathews,J. (1991) *Colonial Mutual Life Australia: Service Quality Through Self-Managing Teamwork*, UNSW Studies in Organisational Analysis and Innovation, No.5, IRRIC, UNSW; Stace,D. & Dunphy,D. (1991) *Beyond Acquisition to Access*, Centre For Corporate Change, AGSM.

<sup>76</sup> Reeders, *op.cit.*, p.148; Fyfe,G. & Curran,B. (1993) "Computer-Aided Telemarketing in an Insurance Company", in Mathews,J. (ed.) *Technology, Work and Organisation: Case Studies*, UNSW Studies in Organisational Analysis and Innovation, No.9, pp.47-9; "Questions Survey Customers May Ask - and Some Answers", internal ANZ Bank memo.

<sup>77</sup> anon (1991) "Changing the Corporate Culture...and Winning", *Quality Australia*, January, p.39; Chapman et. al., *op. cit.*; Sloan et. al., *op. cit.*; Purdie-Smith,J. (1991) "Some Practical Considerations About TQM at CSR's Readymix Group", *Quality Australia*, December, pp.18-9; Skellerjup,R. (1991) "Teamwork Delivers Award-Winning Quality", *IE*, October, pp.9-10.

<sup>78</sup> Fisher,T. (1990) "Quality Management and Productivity - A Preliminary Study", *Australian Journal of Management*, 15(1), pp.107-28.

scientific management practice had begun to wane by the early 1970s as administrative controls such as wage incentives proved increasingly unworkable. In response to product market pressures and overseas management fashions, Australian employers experimented with a variety of techniques and models of work reorganisation. These included the socio-technical job redesign initiatives of the early 1970s, Japanese production practices such as JIT/TQC during the 1980s, and more recently the ideas of teamworking and quality management. Such social reorganisation also occurred within the context of rapid technological change, in particular through the increased use of computerisation. For post-Fordist writers, such changes are seen as symptomatic of a broader change in employment which will result in increasingly democratic and more highly skilled work. However, an analysis of the ways in which Australian employers have sought to organise work during the 1970s and 1980s suggests a number of limitations with such post-Fordist thinking.

A major short-coming of much post-Fordist analysis is its generalised and 'broad-brush' approach which ignores the diversity and contradictory nature of work organisation within capitalist employment. Just as concepts such as Fordism, mass production and Taylorism ignore the diversity of management practice in the post-war period, so terms such as post-Fordism over-simplify the complexity of work relations in more recent years.<sup>79</sup> In terms of Australian management, such complexity can be demonstrated both in terms of the extent of application of work reorganisation, the historical continuities between past and present practice, as well as the variable implications for labour.

First, the actual extent of application of work reorganisation must be questioned. Just as earlier precedents such as scientific management were far from universally applied and limited to specific contexts, so much of the experimentation of the 1970s and 1980s was introduced by a minority of Australian employers. As was the case historically, such innovators typically consisted of subsidiaries of foreign multinational corporations, which had both the financial resources and the technical expertise necessary to introduce new forms of work organisation. The dissemination of new practices was further assisted by management consultants and the state; however, rarely did such experimentation extend to encompass a majority of Australian organisations. In some cases this related to the applicability of techniques. JIT, for example, was limited mostly to high-volume assembly settings such as the vehicle and larger metal manufacturers. While recent, more generalised philosophies such as teamworking, TQM and customer focus appear to have enjoyed a broader application within the service sector, it remains to be seen whether such ideas will result in widespread changes to workplace practice.

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<sup>79</sup> Pollert, A. (1988) "Dismantling Flexibility", *Capital and Class*, No.34, pp.57-8; Williams, K., Haslam, C. & Williams, J. (1992) "Ford Versus 'Fordism': The Beginning of Mass Production?", *Work, Employment & Society*, 6(4), pp.517-555.

Second, despite post-Fordist claims that the new production concepts of the 1980s represented a fundamental break with previous management practices, there is evidence of significant continuity. In the case of JIT and other 'lean production' practices, the elimination of unproductive work, the potential for increased managerial surveillance and the drive to maximise production flow, hark back to the goals of work study and methods engineering. Similarly, the current vogue for concepts such as team-working and multi-skilling are directly comparable with the 1970s interest in socio-technical theory and SAWGs. Indeed, many of the enterprises currently feted as path-breakers in the development of best practice techniques such as ICI, Alcan, Colonial Mutual Insurance, Sunbeam, Australia Post and the Australian Taxation Office, were the same organisations involved in OD and job redesign experimentation during the 1970s. While the impact of current job redesign experimentation may prove more significant than historical precedents, as was highlighted in the case of employee participation techniques, more recent initiatives could also be interpreted as a recycling of previous ideas and practice.

Third, despite optimistic claims of upskilling and increased employee decision-making, analysis of case-studies and survey data suggests that while some employees have gained in these areas through new technologies and work reorganisation, there are also many instances where the converse has been the case. This has been particularly pronounced in areas of manufacturing, retail, fast-food, office work and financial services. Where improvements in skill have occurred these have typically been in work settings where employees have traditionally enjoyed significant autonomy (metal trades, process industries). Further, within manufacturing, and more recently the service sector, any improvements in skill and autonomy have occurred within a context of job redundancies and significant labour displacement. As a result the implications for labour have been contradictory within industries and indeed, within enterprises.

Overall, despite the grandiose claims of post-Fordist theorists, it appears questionable whether the application of new technologies and work reorganisation within Australian industry have resulted in a fundamental break with previous management practice. Within a context of heightened product market competition, tariff reductions, deregulation, and privatisation, Australian employers have sought to improve labour productivity through a variety of means. Such contemporary developments reflect the broader historical desire of employers to maximise the flexibility of labour in the pursuit of profit.

## ACIRRT

The Australian Centre for Industrial Relations Research and Teaching (ACIRRT) at the University of Sydney was established as a Key Centre of Teaching and Research in 1989 through a grant from the Commonwealth Department of Employment, Education and Training. The Centre is closely linked with the University's Department of Industrial Relations, which has a long and distinguished history of teaching and research in this area.

ACIRRT's main brief is to improve the quality of industrial relations teaching and research in Australia. This goal will be pursued through a range of activities including a national review of industrial relations teaching, conferences and seminars, research projects conducted by members of ACIRRT and scholars from other institutions, secondments of staff, and publications.

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