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The Gifts of the Chip?
The Regulation of Occupational Health and Safety in the Post-Industrial Age

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Josephine Savarese
Faculty of Law, McGill University, Montreal
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Abstract

In the face of the extensive changes resulting from the Post-Industrial Age, many are questioning "the gifts of the chip," or, more specifically, the ability of computer technologies to deliver the comfort predicted. The objective of this thesis is to examine the law's response to computer technology concerning occupational health and safety. This inquiry is necessary due to the dramatic changes that have occurred in the workforce, altering the profile of workplace health.

The thesis begins with a reference to The Gift of Stones, a fictional account of the difficulties that stone workers experienced when the Bronze Age arrived. Modern labourers face parallel struggles due to the arrival of the Post-Industrial Age characterized by technological innovation and restructuring. The legitimacy and effectiveness of occupational health and safety law is challenged by changes to social institutions and by computer related work injuries.

In many jurisdictions, the state has responded to these changes by enacting ergonomic standards that seek to minimize the harmful effects of computer use. The thesis examines the trend towards ergonomic standards with particular focus on Canadian initiatives. In conclusion, it argues that ergonomic regulations are an important means of promoting safer computer practices. Additionally, ergonomic standards provide a mechanism for continued state regulation of occupational health and safety. The challenge for rule makers is ensuring that the standards are a component of comprehensive legal reforms.

Résumé

À cause des changements considérables qui ont résultés de l'âge postindustriel, beaucoup de personnes doutent les avantages de l'ordinateur et, plus spécifiquement, la capacité de la technologie informatique à fournir les aises prévues. Le but de cette thèse est d'examiner la réponse juridique à la question de la santé et la sécurité au travail dans le monde de l'informatique. Cette étude est nécessaire à cause des changements remarquables qui se sont produits au niveau de la main d'oeuvre, donnant ainsi plus de visibilité à la question de la santé dans le lieu de travail.

Le début de cette thèse se réfère à *Le don de la pierre*, un récit fictif sur les difficultés qu'ont connues les tailleurs de pierre avec l'avènement de l'âge du bronze. Les ouvriers modernes font face à des luttes similaires avec l'arrivée de l'âge postindustriel, qui est caractérisé par l'innovation technologique et la restructuration. La légitimité et l'efficacité du droit de la santé et de la sécurité au travail sont mises en cause par des changements aux institutions sociales et par les accidents de travail causés par l'utilisation des ordinateurs.

L'État a répondu à ces changements en promulguant des normes dans le domaine de l'ergonomie qui cherche à réduire les effets nuisibles de l'utilisation des ordinateurs. Cette thèse examine la tendance à la promulgation de ces normes, notamment des initiatives en Saskatchewan et en Colombie-Britannique. En conclusion, la thèse propose que les règlements dans le domaine de l'ergonomie soient un moyen important de promouvoir des habitudes saines dans l'utilisation des ordinateurs. De plus, ces règlements constituent un mécanisme de régulation continue par l'État de la question de la santé et de la sécurité au travail. Le défi pour le législateur est d'assurer que ces normes ne sont qu'un aspect des aménagements légaux compréhensifs plutôt que la direction principale de la politique.

Acknowledgements

I am indebted to my supervisor, Professor Colleen Sheppard, for her direction during the course of this thesis. My thanks to her for the guidance she provided. A similar note of thanks goes to my classmates in the Institute of Comparative Law. Their intellectual stimulation enhanced this project.

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A note of appreciation goes to my father, Thomas G. Savarese (1923-1992) for his contribution to this project. Finally, I acknowledge with particular love and gratitude the support and encouragement of my mother, Lena Griffith Savarese, who helped with this thesis in ways that are deeply appreciated and too numerous to mention.

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Chapter I: The Gifts of the Chip?

A. Statement of the Thesis Objective

In the face of the extensive changes resulting from the Post-Industrial Age,[1] many are questioning "the gifts of the chip," or, more specifically, the ability of computer technologies to facilitate the wealth and ease that many commentators predicted.[2] There is extensive documentation on the detrimental health implications of computer use, refuting former claims of heightened safety.[3] The central objective of this thesis is to examine the law's response to computer technology concerning occupational health and safety. The dramatic changes that have occurred in the workforce, altering the profile of workplace health, ensure that this analysis is necessary and timely.[4] According to Mogenson, "The widespread use of VDTs has precipitated the development of serious safety and health problems in the office workplace."[5] In addition to analyzing traditional occupational health and safety law, the thesis highlights ergonomic regulations and innovations in a variety of jurisdictions, with particular emphasis on Canadian achievements.

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[1] Many terms describe current economic and social arrangements, including the "New Economy" and the "Post-Market Era." This thesis uses the "Post-Industrial Age."

[2] Alvin Toffler was a leading promoter of technology. See The Third Wave (New York: William Morrow and Company, 1980).

[3] Vernon L. Mogensen, Office Politics: Computers, Labour, and the Fight for Safety and Health (New Brunswick, New Jersey, Rutgers University Press, 1996) at 1. Mogensen states that "optimistic predictions have not panned out for most full-time VDT workers, the bulk of whom are unorganized women in low-paid, dead end jobs."

[4] The implications of "New Economy" for occupational health and safety are varied and complex, see Michael Quinlan, 'Prevention in a Changing Labour Market', (Paper Presented to the Fourth International Congress on Medical-Legal Aspects of Work Injuries, Toronto, Canada: 6-9 June 1999) [unpublished]. Quinlan states at 14: "There is now a growing body of evidence that interconnected changes to labour markets and work organization in industrialised societies over the last 20 years are

B. Introduction

In The Gift of Stones, author Jim Crace describes the impact of technological change on a Stone Age community.[6] A villager's death by an arrow made of an unknown substance discovered to be bronze heralded the Bronze Age's arrival. The introduction of this material caused great hardship because local merchants refused stone implements in trade for "the sides of deer, the skins, the livestock, the cheeses, the baskets of emmer grain" the villagers required to survive.[7]

Before the arrival of the new era, the villagers' superior skill in shaping rock offered lives that were "measured, skilful, dull, secure."[8] Local doctrine claimed that "the gift of stones"-- the ability to create fine tools from flint -- guaranteed prosperity to the community.[9] The arrival of the Bronze Age shattered the *stoneys*' confidence in themselves and in their belief system.[10] A central character described the *stoneys'* confusion, stating:

> There was a question that they asked amongst themselves. The question was, Who found this out and why? Who first thought to mine for copper, tin, to measure it in hands and thumbs, to charge it in a pit with charcoal, to pour it in a mould? With what in mind? And why? It was quite clear how the first knappers got to work. You only need to throw a stone to see it break and view the sinews and the flesh within. An idle child with nothing else to do would soon find out that flint was sharp and hard. But bronze? It made no sense.[11]

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likely to present a major challenge to OHS in the 1990s and beyond." He calls for more research to explore these issues.

[5] Mogensen, *supra* footnote 3 at 1. VDT's are visual display terminals.

[6] Jim Crace, The Gift of Stones (London: Vintage, 1997).

[7] *Ibid* at 2.

[8] *Ibid* at 30.

[9] *Ibid* at 2.

[10] "Stoneys" is the term Crace uses to describe stoneworkers.

[11] *Ibid* at 161-162. The arrival of the Bronze Age also presented opportunities for positive change. In the transition period, the stoneworkers developed a kinder community. A villager states (at 163-164):

C. Overview of the Thesis

(i) Contemporary Workers and Technological Change

The Bronze Age's arrival, and the corresponding hardship for stone workers, foreshadowed the role that technological change would play in shaping human history. Over the millennia, laborers have adjusted to various developments that maximize reliance on automated labor.[12] Like the stone workers in Crace's fictional account, contemporary workers are recreating their destinies in times of uncertainty and unprecedented transformation. A post-industrial, knowledge based society has replaced the former one based on manufacturing and resource management.[13] The experiences of workers displaced by technological innovation are similar in every historic period, yet the pace and implications of change in the modern age exceed those of previous epochs.[14]

Every major study concludes that the information revolution is "producing deep and wide changes in our economic, social, and cultural institutions."[15] Advances in

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> And in the day what was there else to do but talk? The village seemed a shabby and friendly place at last. People did not shut themselves inside. They strolled. They lingered. They paused for chat and gossip and for news. They took an interest in each other's grieving, empty inside worlds and in the outside world as well. How could they not?

[12] Mervin Y. T. Chen and Thomas G. Regan, Work in the Changing Canadian Society (Toronto: Butterworths, 1985) at 214.
[13] W. Lambert 'Scot' Gardiner, The Ubiquitous Chip: The Human Impact of Human Technology (Hudson Heights: Quebec, Canada, 1987) at 19.
[14] Armine Yalnizyan, T. Ran Ide and Arthur J. Cordell, the authors of Shifting Time: Social Policy and the Future of Work (Toronto: Between the Lines, 1994) comment at 86: "If a revolution can be defined as a very large change in a very short time, then technology emerges as a major revolutionary force."
[15] David Johnston, Sunny Handa, and Charles Morgan, Cyberlaw: What You Need to Know about Doing Business Online (Toronto: Stoddart Publishing Co. Limited, 1997) at 5.

communication and information technologies and globalization are the factors prompting the massive societal and organizational change that has touched every sector of the economy.[16] A greater number of American workers make computers than automobiles; higher numbers work in data processing than in petroleum refining.[17] Knowledge based industries employ over half of all workers.[18] Every division "from mining to manufacturing to the giving and receiving of services" is undergoing transformation into "extensions and expressions of management information systems."[19]

Chapter II identifies the changing profile of the labour force and documents the rise in computer related workplace injuries. The health conditions identified within the computerized office include stress, eyestrain and headaches, back, neck and shoulder pain, and repetitive strain injuries (RSI), a comprehensive label for a variety of injuries.[20] Tenner states that "the revenge effects" of computerization are physical for "what had promised to make work painless unexpectedly attacks muscles, tendons and

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[16] Menzies is an articulate spokesperson for this view. She states: "The massive restructuring is closely linked to some dramatic new developments in the so-called labour market: protracted high levels of unemployment even in times of economic growth and record-breaking profits; rising levels of underemployment; and a polarization of the workforce into the working rich and the working poor. Technological restructuring - notably in how it is being managed - is possibly the most important single factor behind these changes." Heather Menzies, Whose Brave New World? The Information Highway and the New Economy (Toronto: Between the Lines, 1996) at 9.

[17] Johnston et. al. *supra* footnote 15 at 240.

[18] *Ibid*, Occupations fall into four groups - services, goods, data and knowledge. "Data" workers include clerical workers, sales workers and bookkeepers that deal with the production of data. "Knowledge" workers are scientists, engineers, managers and writers. They are highly skilled persons who deal with the development and interpretation of information. Canadian Policy Research Networks, Inc., Impact of Information and Communication Technologies on Work and Employment in Canada (Discussion Paper No. W/O) by Gordon Betcherman and Kathryn McMullen, (Canadian Policy Research Networks, Inc.: Ottawa, Ontario February 1998) at 11 quoting Osberg, Wolff and Baumol, 1989.

[19] Menzies *supra* footnote 16 at 7-8.

[20] *Ibid.*

vertebrae."[21] Along with immediate health concerns, other more subtle consequences proceed from the altered working arrangements wrought by information and computer technologies. Because the changes are complex, they are difficult to capture and articulate. Until recently, "researchers and policy-makers failed to appreciate the profound effects that labour and product markets could exert on OHS [occupational health and safety]."[22] This situation is changing yet there is an "urgent need" for more work outlining the health consequences of labour market reorganization.[23] The breadth of transformation means that contemporary laborers who turn to the legal systems designed to protect them often find that these models have limited application to the modern workplace.

(a) Occupational Health and Safety in Canada

In Canada, provincial occupational health and safety laws are the main vehicles for promoting well being in the workplace. Occupational health and safety legislation establishes standards and guidelines that promote the welfare of Canadian workers. Throughout the 1970's and 1980's, legislation giving workers "the formal legal right to participate in work environment matters" became commonplace in most Canadian provinces.[24] The goal of the legislation was the prevention of work-related accidents and disease through the establishment of an "internal responsibility system."[25] A

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[21] *Ibid.*
[22] Quinlan *supra* footnote 4 at 5.
[23] *Ibid* at 2.
[24] Robert Sass, "The Implications of Work Organization for Occupational Health Policy: The Case of Canada" (1989) 19:1 *International Journal of Health Services* 157 at 157.
[25] Innis Christie, Geoffrey England and Brent Cotter, Employment Law in Canada, Second Edition (Toronto: Butterworths, 1993) at 328-364.

secondary function was outlining industry standards and penalizing those who failed to comply with the regulations.[26] Because occupational health and safety laws provide the framework for Canadian ergonomic initiatives, **Chapter III** outlines these laws and comments on their relevance in the present era.[27]

Many theorists argue that the labour force reorganization of the last decade creates barriers to the achievement of occupational health and safety goals. Johnston, Handa and Morgan comment on the dissonance between the law and modern business practice: "The existing legal framework is still largely based on assumptions and corporate models from the Taylorist era. Unsurprisingly, therefore, both corporate and labour law is experiencing tension as business processes undergo radical change."[28] British sociologist Norma Daykin argues for "a new perspective on occupational health" that would reflect industrial and economic reform and build on theoretical developments of the last decades.[29] She recommends the adoption of policies and procedures that address chronic health conditions and occupational stress without overlooking industrial accidents and acute health problems. She states "Changes in the economy, in the labour process and in patterns of employment have raised new questions about occupational health for the 1990s."[30] Canadian researchers voice similar concerns.[31]

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[26] *Ibid.*

[27] Chapter III outlines the major principles in the law and discusses the policy influences that work against the achievement of health and safety objectives.

[28] Johnston *supra* footnote 15 at 57.

[29] Norma Daykin, "Health and Work in the 1990s: Towards a New Perspective" in Pamela Abbott and Geoff Payne, eds., New Directions in the Sociology of Health: Explorations in Sociology No. 36 (London: The Falmer Press, 1993) at 1.

[30] *Ibid.* Balka expresses parallel concerns, particularly in relation to women. She states: "In the last decade there has been an increase in research concerned with both women's occupational health and

(b) Ergonomic Standards

The introduction of ergonomic standards aimed at preventing computer related workplace injury is a common response to the calls for legislative renewal.[32] The desire to diminish harm and disease in the workplace prompts governments to place "ergonomic" issues at the forefront of workplace health and safety concerns.[33] The ergonomic approach seeks to ensure that the workplace corresponds to the worker, unlike the more traditional approach where the worker adapts to the workplace.[34] Ergonomic principles are an effective way to "reduce worker suffering, improve products, and reduce costs."[35] A counter argument posits that ergonomic improvements are inadequate unless complemented by changes in job design and the work environment.[36]

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safety, and the effects of technology on women workers, but the intersection between these two topics has been left largely unexplored." Ellen Balka, "Technology as a Factor in Women's Occupational Stress: The Case of Telephone Operators" in Karen Messing, Barbara Neis and Lucie Dumais, Invisible: Issues in Women's Occupational Health (Charlottetown, P.E.I.: gynergy books, 1995) at 76. Balka's point is important to the health impacts of computer use. Statistics Canada has determined that the percentage of females using computers exceeded that of males in every age category. It is not surprising that women incur higher numbers of repetitive strain injuries, according to Gillian Wansborough, "Repetition Just One of Reasons for RSI, Study Says" (21 July 1998) 34:26 *Medical Post* at 2.

[31] Institute for Work and Health, Creating Healthier Work Environments: A Critical Review of the Health Impacts of Workplace Organizational Change Interventions (Working Paper #39) by Michael Polanyi, Joan Eakin, John Frank, Harry Shannon and Terrence J. Sullivan (Toronto: Institute for Work and Health, 1997).

[32] See Chapters III and IV of this thesis.

[33] Canadian Employment Safety and Health Guide, Chapter 27,005, Paragraph 27,010 (Don Mills, Ontario: CCH Canadian,1980) at 957.

[34] Terrence Stobbe, "Occupational Ergonomics and Injury Prevention", (July-September 1996) 11:3 Occupational Medicine: State of the Art Reviews 531 at 531. Stobbe of West Virginia University promotes ergonomic solutions in the modern workplace. He recommends further research into the risk factors that promote "cumulative trauma disorders."

[35] *Ibid.*

[36] M.J. Dainoff, Occupational Stress Factors in Video Display Terminal (VDT) Operation: A Review of Empirical Research (Cincinnati, Ohio: National Institute for Occupational Safety and Health, Division of Biomedical and Behavioral Science, 1982) The author concludes at 64 that job design and

Governments in Canada and elsewhere seek to eliminate injuries by enacting ergonomic regulations outlining the best practices relating to occupational computer use. The Province of Saskatchewan introduced regulations aimed at the reduction and prevention of "musculoskeletal injuries" in 1996.[37] A second province, British Columbia, enacted regulations in the spring of 1998.[38] The Institute for Work and Health, based in Ontario, is working with a wide range of organizations to develop comprehensive approaches to repetitive strain injury management. **Chapter IV** describes the regulations and guidelines from various jurisdictions, including Canada, and discusses their ability to promote health-producing strategies in the workplace. Additionally, the text summarizes non-regulatory initiatives introduced by the Institute for Work and Safety in Ontario. **Chapter V** outlines the factors that limit the effectiveness of ergonomic standards. While weaknesses in this approach are noted, the Chapter concludes that standards are an important step towards the elimination of contemporary workforce injuries. Additionally, they emphasize the state's continued commitment to workplace health promotion and reinforce the objectives of the occupational health and safety statutes. The text argues that regulations are an essential yet incomplete response to the promotion of health and safety in the contemporary workforce. Occupational health and safety statutes require extensive

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job demands are as influential in the development of physical symptoms as are the physical characteristics commonly connected to computer related injuries.

[37] Section 81, The Occupational Health and Safety Regulations, 1996, 1/96.

[38] British Columbia, Occupational Health and Safety Regulation, Reg. 296/97.

revision to achieve this objective.[39] The Chapter notes areas for future action.

Chapter VI summarizes the arguments presented in the thesis and highlights key themes and recommendations. It notes that while the "gifts of the chip" are uncertain, the Post-Industrial Age identifies the necessity of revitalizing social policies, including occupational health and safety laws.

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[39] Laurent Vogel, ('The TUTB Observatory on the Application of the European Directives: A Preliminary Assessment" (European Trade Union Technical Bureau for Health and Safety, Newsletter, March 1998); http://www.etuc.org/tutb/uk/pdf/tutbo8-2.pdf.) comments on the limitations of occupational health and safety laws:

> Aside from the fact that procedural duties (e.g., setting up health and safety committees, joining an occupational health service, etc.) tend to be based on size criteria which exclude vast numbers of workers, job insecurity damages health in specific ways that cannot be brought down simply to the physical factors of traditional occupational risks (safety of equipment, chemical, physical and biological agents). Much recent work has pointed out that the employer/worker relation which underpins casualised work itself represents an obstacle to improved health.

Chapter II: The Social and Economic Context for Occupational Health and Safety in the Contemporary Workforce

A. Introduction

Of the changes that have taken place in the Canadian labour market over the past few years, the massive introduction of computers is one of the most astounding. Computers have "revolutionized both white-collar and factory work."[40] In contrast to earlier technologies, which predominantly affected science and industry, modern ones influence our living and working styles and our thoughts.[41] Forester and Morrison identify computers as the most significant technological development of the century.[42] Consequently, "the current Information Technology Revolution" may modify society in ways that equal or exceed the developments wrought by the Industrial Revolution.[43] The full consequences of the changes are continually unfolding.[44]

This chapter outlines the labour force changes of the last decades, including the rise in office based computer work, and the dramatic changes in the nature and content of work that result from automation. It provides an overview of the illnesses and injuries common in the modern workplace, focusing particular attention on repetitive strain

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[40] Harvey J. Krahn and Graham S. Lowe, Work, Industry and Canadian Society, 2nd Edition (Scarborough, Ontario: Nelson Canada, 1993) at 351.
[41] T. Forester, (ed.) The Information Technology Revolution (Oxford: Blackwell, 1985) at xii, quoted in Ian McLouglin and Jon Clark, Technological Change at Work, Second Edition (Buckingham: Open University Press, 1994) at 8.
[42] Tom Forester and Perry Morrison, Computer Ethics: Cautionary Tales and Ethical Dilemmas in Computing (Cambridge, Massachusetts: The MIT Press, 1994) at 1.
[43] *Ibid.*
[44] *Ibid.* Forester and Morrison state at 1: "We are still trying to understand the full implications of the computerization that has already taken place in key areas of society such as the workplace."

injuries, given the attention the injuries receive in the contemporary occupational health and safety literature.

B. Work in the Contemporary World

A Statistics Canada study in 1995 discovered that approximately half of all workers (48 per cent) were working with or on computers, three times the figure of 1985.[45] Managers and professionals were common users with three quarters of the men and approximately two thirds of the women in the management group using computer technology.[46] The most extensive use of information and communication technologies occurred within two occupational categories -- knowledge workers and clerical workers.[47] The study also revealed that approximately three hundred thousand Canadians were teleworking from their homes.[48] According to the workers surveyed, the changes were predominantly positive.[49] Other studies argue, however, that workforce change detrimentally effects labourers. In Whose Brave New World? Menzies describes the plight of Canadian workers, stating:

> The computer's simplification and control of work have made possible the replacement of full-time staff with part-time, temporary McJobs in every economic sector, from goods' production to the provision of public, commercial, and personal services. More and more people are being marginalized in these computer defined, computer-controlled jobs, if they are not being excluded altogether.[50]

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[45] Graham S. Lowe, "Computers in the Workplace" (Summer 1997) Perspectives, (Statistics Canada, Catalogue No. 75-001-XPE) at 30.
[46] *Ibid.*
[47] Canadian Policy Research Networks, Inc., Impact of Information and Communication Technologies on Work and Employment in Canada (Discussion Paper No. W/O) by Gordon Betcherman and Kathryn McMullen, (Canadian Policy Research Networks, Inc.: Ottawa, Ontario February 1998) at 14 quoting General Social Survey (Statistics Canada, 1994).
[48] *Ibid.*
[49] *Ibid* at 14 quoting Graham S. Lowe. Lowe discovered that skill requirements increased in these job categories making the work more interesting.
[50] Heather Menzies (1996) *supra* footnote 16 at 9-10.

Rifkin concentrates on the restructuring and eradication of countless jobs due to the move to a world where machines outnumber humans in the workplace.[51] The approximately 800 million unemployed or underemployed workers in the world are casualties of the technological innovation sweeping commercial sectors throughout the world.[52] The computerization of the workforce is now in full force after a fitful and slow beginning. These changes grip the world in the "third great industrial revolution."[53] The implications of the trends are profound: "Already, millions of workers have been permanently eliminated from the economic process, and whole job categories have shrunk, been restructured or disappeared."[54] In contrast to earlier periods, where the decline in one way of life led to the creation of another, no economic sector is emerging to assimilate workers made redundant by restructuring.[55]

Some researchers claim that technological change has had a neutral impact on employment growth with job creation roughly equaling job elimination.[56] There is almost unanimous agreement that automation dramatically alters the nature and content of jobs. Robotics, computerization and the "high tech" office overflowing

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[51] Jeremy Rifkin The End of Work: The Decline of the Global Labour Force and the Dawn of the Post-Market Era (New York: G.P. Putnam's Sons, 1996) at *xv*.
[52] *Ibid.*
[53] *Ibid* at 60.
[54] *Ibid* at *xv*.
[55] *Ibid* at 35. Betcherman and McMullen supra footnotes 18 at 12 cite the emergence of new employment fields associated with the "information highway of Internet sites, web-masters, multimedia producers, and chip manufacturers." Rifkin *supra* footnote 51 is dismissive at 33, stating the numbers of workers made redundant by the information superhighway will outstrip the jobs created.
[56] Morley Gunderson and Leon Muszynski with Jennifer Keck, Women and Labour Market Poverty

with personal computers, facsimile machines, and electronic mail result in a dramatically transformed workplace.[57]

(i) The Effects of Technological Change

The consequences of technological change are varied and difficult to measure.[58] Originally, businesses made "superficial contact" through the introduction of personal computers.[59] In the present "transformative stage," information and communication technologies have deeply permeated the business world, instigating change in job demands and corporate structures.[60] Technology has modified production and has altered the workplace, the nature of work experience, and the labour market.[61] The effects of technological change are difficult to isolate from related developments like globalization, deregulation, and revised management approaches.[62] The patterns of change are subtle and unclear. In recent years, automation has shifted from "the level of isolated pieces of automated equipment to integrated systems of automation, triggering fundamental organizational restructuring."[63] This inclination promises to accelerate with systems like the Internet facilitating global communication.

(Ottawa: Canadian Advisory Council on the Status of Women, June 1990) at 117. Heather Menzies (1996) refutes this claim, *supra* footnote 16 at 6.

[57] *Ibid.* Importantly, economic and employment results are determined by the interaction between technology and organizational change, rather than the introduction of new machines. Betcherman and McMullen *supra* footnote 18 at 5.

[58] Betcherman and McMullen, *ibid* at 1.

[59] *Ibid* at 4.

[60] *Ibid.*

[61] *Ibid* at 1.

[62] *Ibid* at 1.

[63] Heather Menzies, Fast Forward and Out of Control: How Technology is Changing Your Life (Toronto: Macmillan, 1989) at *x*.

While the long term effects of technology are unpredictable, the current context reveals a pattern of increasing contrasts between knowledge workers -- research scientists, engineers, lawyers, architects, publishers -- and others employed outside of information intensive industries.[64] The "high tech automated world of the 1990s" employs the former in prestigious positions.[65] Technological implementation has increased the demand for and has heightened the expectations placed upon those who are "already highly-skilled."[66] Knowledge workers enjoy prosperous lifestyles while others face insecurity and declining workplace prospects. According to Menzies:

> A homogenized global culture is being created with a social environment polarized between those who create and those who consume, those who initiate and those who follow orders (or oversee the automated execution of them), those who work with technological systems and those who work for them; between those who are fully engaged and enfranchised in the centre of the global economy and those on the margins.[67]

The uncertainty of globalization and the demand for greater flexibility threaten to unravel traditional workplace structures and call into question the efficacy of post-war paradigms. Yalnizyan labels the modern workforce "an employment lottery, a huge game of musical chairs with fewer decent-paying jobs for more and more players."[68] Information and communication technologies contribute to the creation of a workforce where some people function in "virtuous employment circles" while "more vicious ones" trap others.[69] Social inequality is becoming the norm, with the skilled and well

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[64] Rifkin *supra* footnote 51 at 175.
[65] *Ibid.*
[66] Betcherman and McMullen *supra* footnote 18 at 15
[67] Menzies *supra* footnote 63 at 6- 7.
[68] Armine Yalnizyan, "Securing Society: Creating Canadian Social Policy" in Yalnizyan, Ran Ide and Cordell *supra* footnote 14 at 20.
[69] Betherman and McMullen *supra* footnote 18 at 17.

qualified relishing the high wages and dynamic employment opportunities offered by the new economy.[70] Persons at the lower end of the educational strata believe that information technologies are dangers to employment and economic security.[71] In contrast to other sectors, "knowledge-technology-intensive" industries are experiencing growth in employment opportunities and in productivity.[72]

(ii) Important Workforce Trends

Several labour market developments have important and generally unexplored consequences for occupational health and safety.[73] First, the influx of women has dramatically altered the labour market landscape.[74] Other noteworthy trends are extensive, long lasting unemployment[75] and the polarization of working time.[76] Hours of paid work have expanded to exceed forty hours per week for middle and high-income workers.[77] Others spend fewer hours employed due to part-time, self-employed and contract work.[78] In 1994, part-time and temporary jobs grew at faster rates than full-time permanent jobs.[79] These conditions result from temporary cyclical shifts and "deeper structural forces" that will hold sway for many years.[80]

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[70] *Ibid* at 17.
[71] *Ibid* at 17.
[72] *Ibid* at 11.
[73] Quinlan *supra* footnote 4 at 5.
[74] *Ibid* at 5.
[75] Human Resources Development Canada, Report of the Advisory Group on Working Time and the Distribution of Work (Ottawa: Minister of Supply and Services Canada, December 1994) at 2.
[76] *Ibid* at 6.
[77] *Ibid.*
[78] *Ibid.*
[79] *Ibid* at 27.
[80] *Ibid* at 2.

Labour market reorganization has also altered the quality of working life. According to Fudge:

> The extension of flexible forms of work organization, which physically isolates workers from one another and has them competing against each other for employment and higher wages, further enhances the experience of fragmentation, competition and differences amongst workers.[81]

Non-standard workers lack the protection of legislation establishing thresholds on the conduct of work.[82] Regarding labour standards legislation, the law's failure to extend coverage to part-time and contract workers is a concern because it subjects many vulnerable workers to exploitation.[83] According to Quinlan, modern working arrangements also pose significant challenges to occupational health and safety laws. He states:

> . . the growth of contingent work has adverse effects on OHS by exacerbating disorganization at the workplace, attenuating management control systems and subjecting more workers to the unfettered market forces where OHS issues are subordinated. Although these changes affect broad categories of workers, the conjunction of particular market and job characteristics will mean an increased level of risk for already vulnerable groups, especially the young (including children) and women.[84]

The backdrop of uncertainty and competition that characterizes the modern labour market has ramifications for the internal work environment. Notwithstanding the rhetoric in favor of team management and enhanced worker control, there is evidence

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[81] Judy Fudge, Labour Law's Little Sister: The Employment Standards Act and the Feminization of Labour (Ottawa: Canadian Centre for Policy Alternatives, July 1991) at 13; According to Lowe and Northcott, the quality of working relationships has implications for an individual's ability to cope with workplace pressure. Graham S. Lowe and Herbert C. Northcott, Under Pressure: A Study of Job Stress (Toronto: Garamond Press) at 110.

[82] Fudge *ibid* at 9.

[83] Fudge *ibid* at 17.

[84] Quinlan *supra* footnote 4 at 14.

that the work environment is deteriorating.[85] Statistics Canada reports that 37% of Canadians surveyed believed that they were experiencing "excessive stress" due to job demands and strained relationships with colleagues and supervisors.[86] The tensions in the "new" workforce led the International Labour Organization to call stress "the twentieth century disease."[87]

In Collective Reflection on the Changing Workplace, a report by the Advisory Committee on the Changing Workforce, Alexandra Dagg, of the Union of Needle Trades, Industrial and Textile Employees (UNITE) states that few workers experience independence in the modern workforce.[88] Technological innovation and altered work arrangements frequently result in "less meaningful control over the pace and content of work" than was the case before their introduction.[89] Team management structures often heighten demands from co-workers and escalate work pressures. Jobs are increasingly repetitive even at the higher end of the employment echelon. Reduced training opportunities limit career development opportunities. The pace of work has intensified through "old fashioned speed-ups" and the eradication of "so-called buffer time."[90] Therefore, workplace illnesses like stress and repetitive strain injuries are

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[85] Ruth Milkman, "The New American Workplace: High Road or Low Road?" In Paul Thompson and Chris Warhurst, Workplaces of the Future (London: MacMillan Press, 1998) at 25.
[86] Quoted in P. Biggin, O. Buonastella, M. Endicott, "Justice for Injured Workers: The Struggle Continues" (1995) 11 *Journal of Law and Social Policy* 41 at 56.
[87] Quoted in David Johnston, Sunny Handa, and Charles Morgan *supra* footnote 15 at 52.
[88] Alexander Dagg, "New Realities" - The Intensifications and Casualisation of Work" in Collective Reflection, A Report by the Advisory Committee on the Changing Workforce (Ottawa: Human Resources Development Canada, July 7, 1997) at 78. http://www.reflexions.gc.ca/report/chap5_e.pdf
[89] *Ibid.*
[90] *Ibid* at 79.

increasing.[91] Dagg concludes "even 'fortunate' workers simply do not recognize their own experience in the management literature on 'the new world of work.'[92] Workplaces, she states, "are becoming meaner and leaner. Jobs are becoming more stressful and more insecure."[93] Most firms, even highly rated ones, offer few guarantees of ongoing employment in the prevailing cutthroat economic climate.[94]

(iii) Computer Monitoring and the Internal Working Environment

One way that employers control the workplace is through computer monitoring. Along with tracking E-mail and Internet use, software is available to monitor keystroke speed, accuracy, the speed of transactions, length of idle time during a day and items on the hard drive.[95] Recent research reveals that the number of Canadian firms scrutinizing telephone calls, E-mail, voice mail and computer use increased from 37% in the first year to 43% in the second year of the study.[96] Management exerts the prerogative to oversee employees' activities yet critics note that monitoring is a potential abuse of power and a factor in a "downward spiral of mistrust and control."[97] In the absence of adequate context, managers often misinterpret the information

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[91] *Ibid* at 79; Penney Kome, Wounded Workers: The Politics of Musculoskeletal Injuries (Toronto: University of Toronto Press, 1998) states at xiv: "The corporate focus of the 1990s on increasing profits has meant that more and more goods and services are being produced, but by fewer workers. Such a high level of productivity has costs. One such cost is the high unemployment rate: extraordinary numbers of skilled people are without paid work. Another cost, perhaps, is the soaring rate of [work-related musculoskeletal injuries]."

[92] Dagg, *ibid* at 79.

[93] *Ibid.*

[94] *Ibid.*

[95] Tracy Johnson, "Quit Watching Me!" Report on Business Magazine (The Globe and Mail) February 1999 at 61.

[96] *Ibid* at 58. This same study revealed that 16% of employers videotape their employees' performance, sometimes through cameras that are "as small as a dime".

obtained through monitoring. Information gains are subject to misuse when valued ahead of employee dignity. Monitoring encourages higher volume, poorer work at the expense of quality production.[98] The animosity that monitoring promotes can affect productivity and lead to higher levels of employment related stress. Personnel who experience monitoring report "higher workloads, fear of job loss and lack of job involvement."[99] Arguments against employee monitoring maintain that it is counterproductive in the knowledge based workforce where employees are an important resource that should be "consulted, tapped, and rewarded rather than monitored, confined and controlled."[100] Notwithstanding its detrimental impact, many analysts predict that monitoring will increase in upcoming years, particularly if the costs associated with it continue to decrease.[101]

(iv) Management Practice and Occupational Health and Safety

In Smart Workers, Smart Machines, Jarboe and Yudken state that automation and globalization are forcing firms to adopt less hierarchical and more inclusive management practices. The authors argue that policies that promote worker skill and enhance employee participation are becoming more commonplace because they increase organizational effectiveness. [102] They submit that corporations are revising

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[97] *Ibid* at 61, quoting Philip Agre, information studies professor at UCLA in California.
[98] *Ibid* at 62.
[99] *Ibid.* The example of AT&T is sited where computer monitoring is commonplace and over one quarter of employees is undergoing counseling for emotional problems connected to the workplace.
[100] Johnston et.al. *supra* footnote 15 at 43. Johnston et. al. note: "Computer monitoring of employee performance means that workers are reluctant to take the time to speak with customers, as this slows down the number of items a cashier can scan across an electronic grid, for instance, or the number of callers a customer service representative can respond to daily."At 51.
[101] Johnson *supra* footnote 96 at 62 quoting Agre.
[102] Kenan Patrick Jarboe and Joel Yudken, Smart Workers, Smart Machines: A Technology Policy for the 21st Century (Washington, DC: Work & Technology Institute, 1996) at 1. This strategy, it is

their human resource policies in favor of team management approaches that enhance worker control and well being. Alternatively, other analysts argue that corporate commitment to inclusive practices such as "employee involvement, quality circles, pay-for-knowledge, multi-skilling, and teamwork" exists only at a superficial level.[103] In fact, harsh features, including wage decreases, job insecurity, declining union power and membership, and wage polarization, characterize the modern workplace.[104]

(v) Workplace Health in the Post-Industrial Age

Extensive change has catapulted health issues to the forefront of discussions on the white-collar workplace.[105] Sass argues that automation will have negative implications for occupational health and safety programs. In his view, "technological advances and the idea of an ever-expanding economy" captivate government officials and blind them to the harshness of workplace existence.[106] Policy makers appear to be unaware that human rights violations are common in offices and factories because workers have few channels to mount 'political' resistance to their own disenfranchisement and dehumanization."[107] To address these omissions, Sass calls for statutes and policies that expand worker control in relation to occupational health and safety. [108] Sass argues for a structure "that increase workers' possibilities of sharing in the control of

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argued, "raises industrial productivity and competitiveness while generating well-paid, high skill jobs and decent wages for the vast majority."

[103] Milkman *supra* footnote 85 at 25.

[104] *Ibid* at 25. Modern labour market policies, according to Milkman, "portend a dark future of declining living standards, even 'thirdworldisation,' as global competition drives wages lower and undermines union power – pointing in precisely the opposite direction to the high-wage, high-skill, 'high road.'

[105] *Ibid.*

[106] Sass (1989) *supra* footnote 24 at 171.

[107] *Ibid.*

[108] *Ibid.*

the work environment and activates workers to reform their working conditions so as to improve their health and safety."[109] His calls for greater collaboration among staff and for the expansion of traditional conceptions of workplace health and safety have particular relevance in the modern work environment where uncertainty and diminished worker control are the norm.

While the current labour market landscape is discouraging, the future course of corporate and state policy is unpredictable. The enactment of the Factory Acts in the last century is illustrative of power of workers to mobilize the state to act on their behalf.[110] Arguably, similar achievements are possible in the modern environment if organized labour regroups into a grassroots "social movement" that has support from the local community.[111] At present, the well being of workers continues to be a state preoccupation. With broadly based support, it is possible that workers can influence change in their favor. The enactment of ergonomic standards demonstrates the potential for further state activity in relation to workplace health and safety.

C. The Health Context

It is irrefutable that computers and related technologies have altered employment. One ergonomics specialist suggests that workers highlight occupational health hazards in an

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[109] Sass 1989 *supra* footnote 24 at 171.

[110] For a detailed discussion, see: Eric Tucker, Administering Danger in the Workplace: The Law and Politics of Occupational Health and Safety Regulation in Ontario, 1850-1914 (Toronto: University of Toronto Press, 1990).

[111] Mogensen, *supra* footnote 3 at 152. See also: Gregory Mantsios, ed., A New Labor Movement for the New Century (New York: Monthly Review Press, 1998). Tucker, *ibid*, concludes, however, that Factory Act successes were equivocal; see his final conclusions in Administering Danger.

effort to articulate a variety of unspoken fears about the changing workplace.[112] New technologies upset traditional workplace arrangements about job descriptions, collective agreements and other long-standing practices. Technological innovation threatens the competence and authority of workers. Because they "constitute the only legitimate reasons in our society to reject the technology," health issues become a focus of contention during uncertain times.[113] According to Reid, Ewan and Lowy, theories on the ramifications of change at the institutional and societal level are of greater value than individual explanations for repetitive strain injuries (RSI's). In their view, the injuries flow from labour specialisation, automation, dehumanisation, and the acceleration of work rates.[114] Workplace injuries, like RSI, expose the negative effects of modern working conditions. Highlighting individual case studies is a useful strategy when it identifies the harm that results from reorganization and becomes a catalyst for more considerate human resource policies. Worker organizations promote change at the institutional rather than individual level. They often call for worker involvement in decision-making and job design to minimize the negative effects of technological change.[115]

(i) Computer Related Workplace Injuries

Over the years, a proliferation of studies explored a number of health issues relating to computer use -- from visual and musculoskeletal problems to stress related complaints,

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[112] Elizabeth A. Scalet, VDT Health and Safety: Issues and Solutions (Lawrence, Kansas: Ergosyst Systems, 1987) at 2.
[113] *Ibid.*
[114] *Ibid.*

skin problems, and negative reproductive results.[116] The reports verified the importance of documenting and preventing health and safety concerns. Health issues continue to be prominent in the present era. However, contemporary research downplays a number of concerns that were former focal points. Studies suggesting that the radiation emitted from computers caused miscarriages and malformed fetuses were prominent in the early eighties.[117] Contemporary analysts question without entirely dispelling these contentions.[118] The connections between radiation emission from video display terminals and abnormal pregnancies are matters of speculation and exploration.[119] New research holds that the strong magnetic fields from building wiring and other devices act with the low doses from computers to contribute to the likelihood of miscarriage.[120] Among legal scholars, the discriminatory implications of policies that seek to exclude women from toxic workplaces are of concern.[121] Owing to this controversy, reproductive problems are not a specific focus of the thesis.[122]

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[115] Janice Reid, Chrisine Ewan and Eva Lowy "Pilgrimage of Pain: The Illness Experiences of Women with Repetitive Strain Injury and the Search for Credibility", (1991) 32:5 *Soc. Sci. Med.* 601 at 602.

[116] For example, see: Canadian Labour Congress, Towards a More Humanized Technology: Exploring the Impact of Video Display Terminals on the Health and Working Conditions of Canadian Office Workers (Ottawa: Canadian Labour Congress, 1982); World Health Organization, Visual Display Terminals and Workers' Health, WHO Offset Publication No.99 (Geneva: World Health Organization, 1987); Working with Visual Display Units, Occupational Health and Safety Series, International Labour Office, Geneva, 1989.

[117] Marcy Cohen and Margaret White, Playing With Our Health: Hazards in the Automated Office (Vancouver: Press Gang Printers and Publishers, 1986) see Chapter II: "Radiation Hazards: Pregnant Women Beware" at 40 -65.

[118] Sheik Imhran, Help! My Computer is Killing Me: Preventing Aches and Pains in the Computer Workplace (Dallas, Texas: Taylor Publishing Company, 1996) writes at viii that although studies in the USA, Canada, Sweden and Finland failed to find any clear link between computer use and adverse pregnancy outcomes, the matter has not been concluded.

[119] Mogensen *supra* footnote 3 states at 10: "More research is needed to clarify the extent to which extremely low frequency EMFs present a public health problem."

[120] Joan Stigliani, The Computer User's Survival Guide (Sebastopol, CA: O'Reilly & Associates, 1995) at 220.

[121] Peters argues that policies that allow for the removal of women from certain jobs for reasons of fetal protection are discriminatory. Exclusion from work on video display terminals to reduce

Other computer related harms are similarly debated. During the 1970's and early 1980's, when emissions from computers were higher, researchers identified a link between cataracts and computer use.[123] Recent studies do not reveal higher rates of cataracts or other serious eye problems among computer users.[124] There is evidence, however, that continued focus on a computer screen causes visual problems and eye strain.[125] Approximately seventy-five per cent of computer users experience eyestrain due to detailed, close point work on a monitor.[126] Improper lighting, screen glare and rapid pacing contribute to the visual strain that is common among computer users.[127]

(a) Predominant Health Issues

The implications of computer use on the musculoskeletal system and the prevalence of "techno-stress" have taken center stage in the occupational health and safety debates.[128] Bawa makes forceful statements against the effects of computers on human beings. People, she claims, are "paying the costs" for the technology.[129]

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reproductive damage would have seriously curtailed women's employment opportunities given their high participation rates in white-collar office work. See Catherine Peters, "Excluding Women from the Toxic Workplace: Genuine Fetal Protection or Impermissable Discrimination", (1991) 49: 2 *Toronto, Faculty of Law Review* 68.

[122] Another topic that is not addressed is the health hazards that result from the use of toxic chemicals in the manufacture of semiconductor chips and electronic components. For a discussion see: Kenneth Geiser, "Health Hazards in the Microelectronics Industry", (1986) 16: 1 *International Journal of Health Services* 105.

[123] Imrhan *supra* footnote 118 at viii.

[124] Stigliani *supra* footnote 120 at 222.

[125] Lawrence Rose "Workplace Video Display Terminals and Visual Fatigue", (April 1987) 29:4 *Journal of Occupational Medicine* 67 at 68.

[126] Stigliani *supra* footnote 120 at 130.

[127] *Ibid.*

[128] Bengt B. Arnetz, "Technological Stress: Psychophysiological Aspects of Working With Modern Information Technology", (1997) 23:3 *Scan J Work Environ Health* at 97; the term "techno-stress" was coined by Brod in 1988 in his book Techno-Stress: The Human Cost of the Computer Revolution.

[129] Joanna Bawa, Computers and Your Health: The Essential Manual for Every Computer User (Berkeley, California: Celestial Arts, 1996) at *ix - x*.

Bawa states:

> From simple, measurable complaints like headaches and stiff necks, to more serious medical disorders such as eyestrain and repetitive strain injury, to complex social problems like stress, unemployment and work alienation, people are paying the price of rapid computerization at home and at work.[130]

Work design and job structure cause health problems for employees, despite earlier claims that technological innovation would enhance workers' comfort and control.[131]

(ii) Overview of Repetitive Strain Injuries

Repetitive strain injuries are a prominent concern in the literature on workplace health.[132] These conditions are common among frequent computer users due to the compressed range of physical motion associated with work tasks.[133] According to a researcher at the National Institute of Occupational Safety and Health, based in the United States, increased automation has shifted the focal point of work from "the trunk to the to the upper extremities [arms]."[134] Physically reduced workloads accompany an accelerated work pace. Imrhan explains that keyboard data entry requires the fingers to work like the pistons of a racing car to enter vast quantities of information into the computer.[135] The fingers are often striking as many as 17,000 keystrokes per hour. Even jobs that do not require repetitive motions at these extremes are physically challenging. This is because "the associated work forces are concentrated on smaller

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[130] *Ibid.*
[131] Robert Karasek and Töres Theorell, Healthy Work: Stress, Productivity, and the Reconstruction of Working Life (Harper Collins, 1990) at 251-252.
[132] See for example: Emil Pascarelli and Deborah Quilter, Repetitive Strain Injury: A Computer User's Guide (New York: John Wiley & Sons, Inc., 1994)
[133] R. Dennis Hayes, "Digital Palsy: RSI and Restructuring Capital" in James Brook and Iain A. Boal Resisting the Virtual Life: The Culture and Politics of Information (San Francisco: City Lights Books, 1995) at 178.
[134] Vern Putz-Anderson (cited in Pinsky) in Hayes *ibid* at 178.
[135] Imrhan *supra* footnote 118 at 15.

parts of the anatomy, i.e., the ligaments, tendons, muscles, and nerves that control the hands, wrists and arms of the worker."[136] Computers prohibit the range of body motion needed to maintain good health. Users hold the upper body still while muscles and tendons in the hands and forearms work at a constant pace.[137]

(iii) Clarification of Terms

Researchers use a range of terms to label the conditions under discussion in this thesis. Musculoskeletal injuries and cumulative trauma disorders are umbrella terms used to describe a vast array of impairments.[138] The often-confusing terminology is attributable to the difficulties that the scientific and medical professions face in distinguishing the symptoms or in ascertaining the origins of computer-related injuries.[139]

In Canada, the label "repetitive strain injuries," coined in the 1980's, is used widely in the press and other popular literature.[140] Given the acceptance it has received in public discourse, repetitive strain injury is the term most commonly used in this thesis.[141] Scientists object to the term because it incorrectly infers that the injury is traceable to a

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[136] Ibid.
[137] Pascarelli and Quilter *supra* footnote 132 at 4; The authors state that at 5 that the computer "virtually encases people in a virtual straitjacket."
[138] Imrhan *supra* footnote 118 at 7-8.
[139] *Ibid.*
[140] "RSI Watch: Nine Key Recommendations released from RSI Watch", *Starbeat*, March 1998, at 10.
[141] The Institute adopts this approach for Work and Health see "Institute Pursues Multiprong Approach to WMSDs/RSI Research," (fall 1996) 4 At Work: The Newsletter of the Institute for Work & Health at 7.

single source.[142] Research into this condition regularly reveals numerous factors -- from the physical features of the workstation, and the degree of social support at the workplace, to the time spent at the keyboard and the worker's gender -- that contribute to its' development.[143] Not surprisingly, professionals recommend an array of treatments: the purchase of ergonomic equipment, physiotherapy, massage and relaxation therapy; or taking frequent breaks, getting additional rest and altering work tasks.[144]

While the public uses the term "repetitive strain injury," the term "work-related musculoskeletal disorders of the upper extremity" is used by researchers at the Toronto based Institute of Work and Health.[145] This label is preferred because it refers to the workplace and because it, correctly, does not implicate a "specific cause or pathology."[146] Attributing cause is complicated. Ong states: "reported symptoms of VDT operators usually revolve not around discrete clinical entities like tenosynovitis and carpel tunnel syndrome, but around a class of chronic conditions, often involving pain at multiple sites without any sufficiently clear clinical or pathological sign."[147]

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[142] Imrhan *supra* footnote 118 at 4 objects to this term for differing reasons. He concludes that these conditions are illnesses rather than injuries because they develop over extended periods. In contrast, Injuries occur due to the sudden application of force.
[143] Wansbrough, *supra* footnote 30 at 2.
[144] Pascarelli and Quilter *supra* footnote 132. Sufferers in the Reid et.al. study *supra* footnote 115 (At 606) were encouraged to try "a bewildering array of treatments, none of which were permanently effective, a very few of which provided temporary relief and most of which either exacerbated the problem or had no effect."
[145] At Work, The Newsletter of the Institute for Work & Health, *supra* footnote 141.
[146] *Ibid* at 7.
[147] Choom-Nam Ong, Sin-Eng Chia, Jerry Jeyaratnam, and Kay-Chuan Tan, "Musculoskeletal Disorder Among Operators of Visual Display Terminals", (1995) 21:1 *Scand J. Work Environ Health* 60 at 60.

(iv) Common Forms of Repetitive Strain Injuries

Often abbreviated RSI, the term "repetitive strain injury" refers to a wide range of ailments that involve the nerves, tendons, muscles, soft tissues and the blood system. It can affect the neck, shoulder, arm and hand.[148] Carpal tunnel syndrome is the most widely known workplace related muscular injury. It results when "the median nerve of the wrist is compressed."[149] Appendix I reproduces a chart outlining types of RSI. Repetitive and intense hand movements that damage muscles and bones in the upper extremities cause or intensify these impairments.[150]

Improvements to equipment design and to the user's physical demeanor (posture, chair height), ease yet do not expel musculoskeletal concerns.[151] Because physical interventions fail to eliminate musculoskeletal disorders, it is likely that they are not "solely related to the physical characteristics of the display terminals or the layout of the workplace, but rather to the overall nature of the work of keyboard operators."[152] Staff in a two-year study of repetitive strain injuries at the Toronto *Star* linked ten factors to their injuries. These were: jobs with repetitive tasks, poorly designed workstations, poor posture, too much computer keyboard use, working without breaks, stress, lack of training, lack of exercise, poorly designed tools and excessive

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[148] Stigliani *supra* footnote 120 at 72.
[149] Nicole Baer, "Repetitive Strain Injury Complaints Becoming Common in the Workplace", The [Regina] Leader Post (Saturday July 3, 1993) at D3.
[150] Horst H. Mueller, "Highly Vulnerable: Computer Users and RSI", *Worksite News*, Oct/Nov 1996 at 12.
[151] Ong *supra* footnote 147 et. al. state at 61: "Several recent investigations have shown that ergonomic intervention could help minimize the musculoskeletal problem. However, even if the environment and the workstations are optimal, VDT operators still have musculoskeletal complaints".
[152] *Ibid.*

workload.[153] In fact, one researcher argues that eyestrain and headaches are the only harms directly attributable to computer use. He concurs with a World Health Organization finding that 'psychosocial factors are at least as important as the physical ergonomics of work stations and the working environment.'[154]

(v) Incidence of Repetitive Strain Injury

Statistics documenting the increasing incidence of repetitive strain injuries confirm that it deserves the attention it receives in the thesis. The 1998 World Health Organization World Health Report identifies "musculoskeletal disorders" among the top ten occupational health problems in the world.[155] The World Health Organization states that occupational health and safety concerns will become an even greater problem without the adoption of preventive measures. [156]

Canadian researchers express similar concerns. The increased number of people performing computer keyboarding has led to an increase in soft-tissue injuries.[157] In a study conducted for the Toronto *Star*, the Toronto based Institute for Work and Health discovered that "work-related musculoskeletal disorders" or repetitive strain injuries, "comprise the single largest category of lost-time injuries in Canada."[158]

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[153] *Starbeat, supra* footnote 140.
[154] Arnetz *supra* footnote 128 at 98 citing "Work with Visual Display Terminal: Psychosocial Aspects and Health: Report on a World Health Organization Meeting", (1989) *31 J. Occup. Med.* 31 957 at 957.
[155] *Ibid* at 95.
[156] *Ibid.*
[157] Horst H. Mueller, Repetitive Strain Injuries on the Rise for Computer Users, *FEEL GOOD,* June/July 1998 at 7.
[158] Wansbrough, *supra* footnote 30 at 2. The article notes that work-related musculoskeletal disorders include "shoulder pain, tendonitis, bursitis, tennis elbow, forearm pain/discomfort and carpel tunnel syndrome."

Repetitive strain injuries account for forty per cent (40%) of work-related injuries.[159] They cost the Canadian economy almost $800 million annually.[160] Kome states that "[musculoskeletal injuries] are the number one cause of lost-time claims for Workers' Compensation."[161]

The statistics cited cause researchers to conclude that repetitive strain injuries constitute a "workplace epidemic."[162] Carpal tunnel syndrome, as it is frequently called in the United States, has been labeled "the 'in' injury" and the "malady of the information age" by the popular press due to the attention it receives.[163] Repetitive strain injury or carpel tunnel syndrome fascinates audiences because it challenges the commonly held notion that computer work is safer than other forms of work.[164] Dembe refutes this claim stating: "Carpel tunnel syndrome has now become one of the most frequently diagnosed CTD's, and one of the most serious and disabling."[165] Numerous activity restrictions result from repetitive strain injuries:

> Many people with RSI complain about having difficulties opening doors, which requires twisting, pushing, or pulling arm movements. They find themselves losing their grip on the newspaper or telephone; doing the dishes is too painful for them; and they cannot even grasp a hairbrush, much less hold their hands to the keyboard. Social situations can present problems, too. Some people are reluctant to shake hands during an introduction for fear of triggering an episode of pain. [166]

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[159] *Ibid*, insert "Program may cut RSI rates up to 80%".
[160] *Ibid.*
[161] Kome *supra* footnote 92 at 7.
[162] Imrhan, *supra* footnote 118 at x; see also Allard E. Dembe "The History of Carpel Tunnel Syndrome", *New Solutions*, Spring 1997 at 15. Dembe notes that Dr. John Millar, former head of the U.S. National Institute for Occupational Health and Safety, describes carpel tunnel syndrome as a 'mega-epidemic'.
[163] Dembe *ibid* at 15.
[164] Kome *supra* footnote 92 states at *xiv*: "Perhaps the notion that innocuous-seeming keyboards and mouses can actually hurt people seems so bizarre that it has captured the public imagination."
[165] Dembe *supra* footnote 162 at 15.
[166] Pascarelli and Quilter, *supra* footnote 132 at 2.

Workers with repetitive strain injuries become easily fatigued, experience pain and discomfort, and may have difficulty performing to the level of their ability. Individuals incur significant expense from the injuries. The costs also extend to the workplace through workers' compensation costs and through human deficits caused when skilled people are unable to perform to their maximum level. [167]

(vi) The Controversy Surrounding Repetitive Strain Injury

Controversy surrounding the existence of repetitive strain injury is ongoing. Surgeons declare that the conditions are "over-diagnosed and over-treated," claiming that the motivations for patients are financial.[168] Dr. Richard Eaton highlights the monetary rewards that flow from workplace injuries through worker's compensation claims, stating: 'You get out of work and you get paid for it.'[169] The fragmented development of RSI is a factor prompting the backlash against it. [170] The disorders may take weeks or years to manifest fully.[171] A variety of factors influence their occurrence, notably the severity of the strain, the amount and distribution of rest times during working hours, and the worker's health and fitness levels.[172] Inadequate sleep intensifies the degree and longevity of cumulative trauma disorders.[173] Furthermore, the sources of the conditions are difficult to isolate and its' history and development

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[167] Stobbe *supra* footnote 34 at 531.
[168] Baer *supra* footnote 149 at D3
[169] *Ibid* quoting Dr. Richard Eaton, director of the Hand Surgery Centre at St. Luke's Hospital in New York City. Dr. James Murray of Sunnybrook Health Science Centre in Toronto agrees that patients may be overtreated. He puts this down to a copycat syndrome where workers present for surgery following a diagnosis in a co-worker and due to the complexity of recognizing true repetitive strain injuries.
[170] Mueller *supra* footnote 157 at 7.
[171] Imrhan *supra* footnote 118 at 8.
[172] *Ibid.*
[173] *Ibid.*

are highly dependent on individual factors. Treatment outcomes are unpredictable and rarely subject to meticulous assessment.[174]

Reactions against repetitive strain injuries were at a high point when Australia experienced "an epidemic" between the years of 1983-1987.[175] Skeptics argued that repetitive strain injuries were "not organic in origin, or not work-related or both."[176] Critics claimed that the injuries were the consequence of an ordinary workday, the product of malingering, or flights of fancy from unstable victims.[177] Pro-labour activists pointed to the analytical weaknesses in the arguments presented against repetitive strain injury. They noted that viewpoints antagonistic to RSI promoted insurers' and compensation agencies' interests, and demonstrated a bias against women by discounting an injury common among females.[178] Notably, the studies opposing RSI failed to acknowledge the socio-political environment that provoked the rising rates of injuries.[179] To obtain a complete picture, Reid, Ewan and Lowy interviewed 52 women who experienced repetitive strain injuries. The research team charted the course of the illness and documented the women's encounters with an often-indifferent medical profession.[180] The women experienced a vicious cycle of referrals to insensitive doctors (and occasionally psychiatrists). They reluctantly presented their

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[174] Instititute for Work and Health, At Work *supra* footnote 141 at 1.
[175] See for example, Wayne Hall and Louise Morrow, 'Repetitive Strain Injury': An Australian Epidemic of Upper Limb Pain" in (1988) 27:6 *Soc.Sci.Med.* at 645-649.
[176] Reid, Ewan and Lowy, *supra* footnote 115 at 601.
[177] *Ibid* at 601-602.
[178] *Ibid* at 602.
[179] *Ibid.*
[180] Reid, Ewan and Lowry, *supra* footnote 115.

symptoms in ways that did not jeopardize workers' compensation claims.[181] The reactions the women experienced from disbelieving practitioners resulted from a combination of sex role stereotyping, class bias and unfamiliarity with an occupational illness that varied from the traditional pattern.[182] The victims of RSI traveled a "pilgrimage of pain" -- a journey of suffering -- where they met skeptical and inept health professionals.

Arguably, an element of the doubt surrounding RSI is abating due to the weight of scientific evidence documenting its occurrence. Many issues, however, remain outstanding, including the exact cause of RSI, the best methods for treating it and preventing it and the role of the various players -- individuals, employers, governments -- in developing solutions that promote workplace health.[183] The enactment of ergonomic standards in various jurisdictions throughout the world suggests that skepticism towards these conditions is dissipating, without entirely disappearing.

D. Conclusions

This chapter outlined the significant changes in the nature of work and in the profile of occupational illness and injury. The text noted that the alterations are dramatic and subject to a range of reactions. In 1989, the International Labour Organization (ILO) commented on the absence of legislation aimed at the promotion of healthy practices relating to computer use. It stated:

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[181] *Ibid.*
[182] *Ibid.*
[183] Stigliani *supra* footnote 120 at *xii* , she states: " For computer-related health problems, everyone is responsible to some degree - individuals, employers, equipment providers and the government."

> Legislative and other official activities have been comparatively limited, given the massive and growing number of [visual display units] VDUs in use in commerce. Such limited official activity may be explained partly by the very rapid growth of VDU use and by the relative dearth of definitive information on positive and negative aspects of their use, and partly by the fact that the "effects" of VDU work are less easily observed than the effects of work with highly toxic substances, are not associated with a particular easily defined set of symptoms or syndromes, and do not appear to be life-threatening.[184]

Over the years, governments have altered the situation identified by the ILO by introducing computer related health and safety legislation. European countries have been particularly active in the development of regulations on computer use. In Canada, formal legislative initiatives are limited to the Provinces of Saskatchewan and British Columbia. These provinces introduced regulations in recent years under the authority of health and safety statutes. In other provinces, workers are protected by a "general duty" to maintain healthy and safe workplaces that occupational health and safety acts impose on employers.

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[184] International Labour Office, Working with Visual Display Units, Occupational Safety and Health Series (International Labour Office: Geneva, 1989) at 11.

Chapter III: Occupational Health and Safety Legislation as the Framework for Ergonomic Regulations

A. Introduction

In Cyberlaw: What You Need to Know About Doing Business Online, Johnston, Handa and Morgan observe that society is experiencing a dramatic economic, social and cultural shift as we enter the third millennium.[185] Two four-letter words prompt the changes. The first is "code"-- a reference to the advanced knowledge of DNA making the human genome project possible.[186] The second word is "chip," a reference to the central component of "computer and communication technologies."[187] The "chip" is the driving force behind the information revolution sweeping the globe. Its' development led to the global and local networks that form the information highway.[188]

The power of the chip is awe-inspiring and grand. Vehicles like the Internet allow transcendence of time and space.[189] The collapse of these dimensions corresponds with the disintegration of societal institutions. The erosion of geographical and political barriers due to the new technologies creates demands for society to redefine itself. "Technology," Franklin observes, "has muddled or even destroyed the traditional

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[185] David Johnston, Sunny Handa and Charles Morgan *supra* footnote 15 at *ix*.
[186] *Ibid*
[187] *Ibid.*
[188] Menzies (1996) supra footnote 16 at 21.
[189] Johnston *supra* footnote 15 at 6. Ursula Franklin, The Real World of Technology (Toronto: CBC Enterprises, 1990) explains at 47 : "The technological possibilities of information gathering, storage, and evaluation, interwoven with a tight net of administrative infrastructures, have made it possible to treat certain parts of the future as parts of the present

social compass."[190] In the face of massive change, the legal system's ability to promote health in the modern workplace is under review. One way that that law has responded to the changing labour force is through the enactment of ergonomic guidelines matching the workstation to the worker.[191] In Saskatchewan and British Columbia, governments enacted ergonomic regulations as a component of industrial health and safety laws. For this reason and because the laws provide general protection where no specific standards exist, statutory principles are outlined in this chapter using the Saskatchewan Occupational Health and Safety Act, 1993 as the model.[192]

B. Occupational Health and Safety Law in Canada

Before the 1970's, occupational health and safety laws covered specific industries like mining and construction rather than all workplaces.[193] In 1972, Saskatchewan introduced the first omnibus legislation in Canada.[194] Currently, almost every Canadian province including Alberta, Manitoba, Ontario, New Brunswick, Newfoundland, Nova Scotia, Prince Edward Island, Quebec and the Yukon, has adopted omnibus legislation to promote occupational health.[195] The sole exception, the Province of British Columbia, addresses workplace safety in the Workers'

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[190] Franklin *ibid* at 14.
[191] See DeMatteo, B., Terminal Shock, (Toronto: NC Press, 1985), Chapter 13 - Legislative and Other Initiatives at 160.
[192] For a comparison of occupational health and safety laws in Canada see: George K. Bryce and George R. Heinmiller, A Comparison of Fundamental Rights and Duties In Canadian Occupational Health and Safety Statutes, Submitted to the Royal Commission on Worker's Compensation in British Columbia, Issues Paper #6, September 3, 1997, http://www.gp.gov.ca/rcwc/research/Issues6Rights.pdf.
[193] Canadian Employment Safety and Health Guide, *supra* footnote 33 at 957.
[194] Section 42, Occupational Health and Safety Regulations, 90/88.
[195] Canadian Employment Safety and Health Guide, *supra* footnote 33 at 957.

Compensation Act.[196] In the Northwest Territories, the Safety Act includes standards and guidelines governing occupational health.[197] The Canada Labour Code outlines guidelines and standards for federal employees.[198]

(i) Background and Overview

The original safety laws in Canada were the Factory Acts enacted in the 1880's.[199] They required employers to take protective measures including providing fencing around machines, ventilation, eating places and bathrooms.[200] The miserable conditions in factories at the turn of the century prompted demands for legislation.[201] Modern day occupational health and safety legislation differs from early factory legislation by including an external and internal focus. External regulations establish detailed safety standards for industries to follow.[202] The statutes also impose an "internal responsibility" system that requires labour and management to collaborate on safety initiatives within their workplace.[203] Every Canadian jurisdiction outlines three basic rights granted to workers: the right to know, the right to refuse, and the right to

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[196] Workers' Compensation Act, R.S.B.C. 1996, C. 492, in force April 21, 1997, as amended by 1997, c.52, 1998,c.50. In spring 1998, the government enacted a revised occupational health and safety regulation, partly outlined in the next chapter.
[197] Canadian Employment Safety and Health Guide, *supra* footnote 33 at 958,
[198] Canada Labour Code, R.S.C. 1985 c. L-2.
[199] Harvey J. Krahn and Graham S. Lowe, Work, Industry and Canadian Society: Second Edition (Scarborough, Ontario: Nelson Canada, 1993) at 280. Jane Ursel's research documents the origins of state intervention in the labour process. She states "the state has a long history of mediation in the labour process that significantly predates industrialization or the Factories Act." Before the introduction of the Factory Acts, workers obtained minimal protection through master and servant laws. See Jane Ursel, Private Lives, Public Policy: 100 Years of State Intervention in the Family (Toronto: Women's Press, 1992) at 85 quoting H. Clare Pentland.
[200] Ursel, *Ibid.*
[201] According to Ursel, *ibid* at 86 the Factory Acts were a more sincere attempt to "regulate conditions of work and employment" than had been evidenced in the past when the state acted as the "employers henchman" by repressing and policing labour activity.
[202] Christie, England and Cotter *supra* footnote 25 at 327.
[203] *Ibid* at 339.

participate. Granting workers the "formal legal right" to partake in discussions on working conditions had the effect of "broadening traditional occupational health and safety concerns."[204]

Tucker argues that the laws create a "system of self-regulation" where workers are the subordinate partners, rather than a meaningful partnership.[205] Given this finding, it is not surprising that critics pinpoint numerous weaknesses in occupational health and safety legislation. The thoughtfulness and complexity of the critiques is beyond the scope of this paper. A wide range of weaknesses are identified, from the law's inability to promote health and safety in small workplaces,[206] and the predilection to safety rather health concerns[207] to the law's tendency to reinforce management's power over the conduct of work.[208] Walters and Haines found that workers were uninformed of their rights under the legislation.[209] This alarming finding suggests that many workers are unaware of a main policy instrument outlining their entitlements in the workplace. Other conceptual criticisms highlight the tendency to ignore competing class

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[204] Sass (1989) *supra* footnote 24 at 157. Sass states: "In practical terms, this means improving employee access to the information impacting on them; providing greater control to workers on health and safety committees; expanding enforcement procedures available to inspectors and to workers, particularly the right to refuse dangerous work; updating guidelines outlining exposure to environmental hazards and expanding occupational health and safety laws to include issues that were formerly beyond their authority."

[205] Tucker *supra* footnote 105 at 216.

[206] Joan M. Eakin, "Leaving It Up to the Workers: Sociological Perspective on the Management of Health and Safety in Small Workplaces", (1992) 22:4 *International Journal of Health Services* 689-704.

[207] Katherine Swinton, "Enforcement of Occupational Health and Safety Legislation: The Role of the Internal Responsibility System", in K. Swan and K. Swinton, Studies in Labour Law (Toronto: Butterworth, 1982) at 159.

[208] Sass *supra* footnote 20 at 167.

[209] See: Vivienne Walters and Ted Haines, "Workers' Perceptions, Knowledge and Responses Regarding Occupational Health and Safety: A Report on a Canadian Study", (1988) 27:11 *Soc. Sci. Med.* See 1189-1196 for a detailed discussion.

interests,[210] to focus on individual rather than collective rights,[211] and the failure to infuse socialist oriented solutions into the law. [212] Sass attributes Canada's failure to achieve injury and harm free workplaces to serious weaknesses in the "major public policy instruments designed to prevent industrial injury and disease."[213] His observation underscores the need to revitalize the law to address the industrial re-organization of the last decades.

(ii) Objectives of Occupational Health and Safety Legislation

The definition of "occupational health and safety" in Clause 2(1)(p) of the Saskatchewan legislation reflects the commitment to worker health that forms the cornerstone of the law. It defines this term as:

> (i) the promotion and maintenance of the highest degree of physical, mental and social well-being of workers;
> (ii) the prevention among workers of ill health caused by their working conditions;
> (iii) the protection of workers in their employment from factors adverse to their health;
> (iv) the placing and maintenance of workers in working environments that are adapted to their individual physiological and psychological conditions; and
> (v) the promotion and maintenance of a working environment that is free of harassment.[214]

Clause (i) defines health in sweeping terms, reflecting contemporary thinking that health is more than the absence of disease.[215] The Act establishes an expansive

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[210] According to Tucker *supra* footnote 105 at 216: "In the past as well as the present, "the common interest of labour and capital is constructed on an implicit agreement that 'practical solutions to hazardous conditions must not jeopardize competitiveness and jobs.'

[211] Sass (1989) *supra* footnote 24 at 168.

[212] H. J. Glasbeek, "Agenda for Canadian Labour Law Reform: A Little Liberal Law, Much More Democratic Socialist Politics" (1993) 31:2 *Osgoode Hall Law Journal* 233.

[213] Sass (1989) *supra* footnote 24 at 161.

threshold, seeking to guarantee the "highest degree" of workplace health attainable. Clauses (ii) and (iii) correlate poor health with an inadequate working environment. The fourth clause, (iv), obliges the workplace to adapt to the "physiological and psychological" requirements of individual workers rather than demanding that workers conform to the needs of the workplace. Occupational health and safety objectives are sufficiently broad to incorporate the injuries found in the contemporary workplace. Achieving occupational well being would see the elimination of all forms of harm.

Imrhan, however, contends that the afflictions that result from computer use are predominantly "occupational illnesses, not injuries."[216] This distinction is important for a predominant focus of occupational health and safety legislation is the prevention of immediate harm rather than the reduction of illness.[217] According to Swinton, the occupational health and safety committees mandated under the legislation deal more effectively with safety rather than health issues due to the complexity of workplace illness and disease.[218] Her finding has application to the contemporary workplace where health issues predominate.[219] Unlike industrial accidents or other workplace traumas that occur immediately, computer related work injuries often occur slowly,

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[214] The Occupational Health and Safety Act, S.S. 1993, c. 0-1.1

[215] See for example, Saskatchewan Health, A Saskatchewan Vision for Health: A Framework for Change, August, 1992, citing the World Health Organization definition: "Health is a state of complete physical, mental and social well-being and not merely the absence of disease."

[216] Imhran, *supra* footnote 118 at 4.

[217] *Ibid* at 13. Daykin comments that in the U.K. an area of concern " . . . is the priority given to acute occupational illness, and in particular, industrial accidents, over other patterns of ill health. The inadequacy of the existing arrangements in relation to the prevention and reporting of chronic disease has been widely noted." Daykin *supra* footnote 29 at 155.

[218] Swinton, *supra* footnote 207 at 159.

[219] See Imhran *supra* footnote 118.

making it difficult to ascertain the cause and time of onset.[220] Professionals may doubt that these aches and pains result from overexertion from computer work because they could not pinpoint a specific time that injury occurred.[221] Management and other administrators often think in terms of injuries caused by a solitary episode like a crushed finger, a broken arm or a chemical burn.[222] That cumulative trauma disorders were not traceable to a single incident adds to the skepticism. Consequently, professionals often discount and dismiss repetitive strain injuries.[223] While this inclination is diminishing, a significant amount of confusion and distrust lingers, underscoring the desirability of standards that formally recognize these injuries.

(iii) Administration of the Legislation

While the workplace has changed considerably over the past two decades, the existing policies reflect principles adopted in the early 1970's and 1980's.[224] Section 68 (1) of the Occupational Health and Safety Act, 1993 establishes the Occupational Health and Safety Division of Saskatchewan Labour as the body responsible for the administration of the Act. In accordance with section 69(a), the Division oversees occupational health and safety matters and "the maintenance of reasonable standards for the protection of the health and safety of workers and self-employed persons in Saskatchewan." Its' powers include conducting research and educational programs and

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[220] Repetitive strain injuries are said to develop in three stages. First, the worker experiences pain during working hours yet recovers overnight. Second, the pain becomes more intense and persistent. Third, the pain is constant and is accompanied by decreased strength and continual pain. Horst H. Mueller, FEEL GOOD, June/July 1998 *supra* footnote 157 at 7.
[221] Imhran *supra* footnote 118 at 12.
[222] *Ibid* at 12
[223] *Ibid* at 13.

working in co-operation with the joint occupational health and safety committees (or equivalent) mandated under the legislation. Section 71(1) of the Act provides for the appointment of occupational health officers whose primary duties are performing inspections in workplaces to insure compliance with the Act and intervening in refusals to perform unsafe work where required. Section 30(1) authorizes the occupational health officer to serve a notice of contravention when violations occur. The Director has the power to review decisions of occupational health officers (section 49(1) and adjudicators have the power to review the Director's decisions (section 50 (1). Persons who offend legislative provisions are subject to a penalty under section 58 (1). In most circumstances, a fine constitutes the penalty.

(iv) Enforcement of Occupational Health and Safety

Commentators argue that the enforcement of occupational health and safety laws is seriously lacking.[225] It is noted that state officials tend to resolve disputes through mediation, a strategy that avoids punishment and overlooks questionable behavior.[226] When penalties result, they are often minor fines that are ineffective in inducing compliance with the law.[227] Prosecutions are rare and generally fail to serve a "prevention function." [228] At best, they deter future violations.

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[224] The implementation of the Workplace Hazardous Materials Information System in 1987 is an exception. This program is discussed in more detail in Chapter V.

[225] Christie, England and Cotter *supra* footnote 25 at 335. They state: "Probably no aspect of Canadian health and safety legislation has received more criticism that it's insipid enforcement machinery."

[226] *Ibid* at 336. According to Christie, the efforts to effect self-government through mediation may be true when the law is broken unwittingly. It is, however, an ineffective means of penalizing "renegade employers" who decide that breaking the law "is more profitable than honouring it."

[227] *Ibid.*

[228] Cathy Walker, Director - CAW Health and Safety Department, "Why We Need Ergonomics Regulations", Presentation to Human Factors Association of Canada, Mississauga, Ontario, October

Enforcement measures are also weak due to the low levels of inspection that result from understaffing and infrequency of stop work orders.[229] Declining state commitment to social welfare initiatives suggests that increased enforcement measures are unlikely. Without personnel to monitor, manage and act as a resource for workplaces, there is diminished likelihood that corporations will follow the letter of the occupational health and safety laws. Prosecutions are particularly difficult on ergonomic regulations, because "injuries develop over time and are often invisible."[230] Furthermore, legal sanctions are unlikely when employers fail to comply with ergonomic regulations due to the tendency to discount the seriousness of the injuries.[231]

(v) Duties and Responsibilities

To achieve the goal of workplace health, statutes in most jurisdictions outline the duties of employers, employees and others.[232] In Saskatchewan, the employer and the employee are obliged to comply with the Act and to cooperate with staff performing official duties. Section 3(a) obligates employers to "ensure, insofar as is reasonably practicable, the health, safety and welfare at work of all of the employer's workers." The primary duty on workers (section 4(a) is to: "take reasonable care to protect his or

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22, 1998, http//www.ca/communications/speeches/ergonomics.html Cathy Walker, "Why We Need Ergonomics Regulations", Presentation to Human Factors Association of Canada, Mississauga, Ontario, October 22, 1998, http.//www.caw.ca/communications/speeches/ergonomics.html at 13.

[229] Christie England and Cotter *supra* footnote 25 at 337-338. In Saskatchewan for example, approximately twenty officers serve approximately 30,000 workplaces.

[230] *Ibid* at 14.

[231] *Ibid.*

her health and safety and the health and safety of other workers who may be affected by his or her acts or omissions." The general duty clauses oblige employers and employees to maintain workplaces that are free from all harms, including computer related work injuries.[233] The sections impose broad and sweeping rights and responsibilities. If upheld to the fullest letter, the clauses have tremendous potential to eliminate harm.

A barrier to the achievement of harm free workplaces is the fact that the legislation assumes that workers and employers exercise equivalent control over the workplace. In fact, the power of management exceeds that of workers.[234] Walker states:

> Many governments in Canada claim that they, their agencies and employers and employees all have a common goal: to create the safest workplaces in the world. We know that it is not true. If employers truly shared this goal we would not need unions, we would not need government regulations, and we would not need health and safety committees. We could simply rely on the employer to make our workplaces safe. But the goal of employers is profit. If safety coincides with the goal of profit, then workplaces will be safe. If it does not, workplaces will not be safe. Unfortunately, in most cases it is the latter that is the case.[235]

In creating nearly equivalent responsibilities, the legislation overlooks that employees are subordinate to managers and lack the capacity to implement decisions.[236] The

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[232] The Saskatchewan act outlines the duties for employers, workers, self-employed persons and contractors, owners and suppliers. For the reasons of brevity and clarity, only employers and employees are discussed.

[233] The next chapter demonstrates the barriers that present themselves in this regard.

[234] *Ibid.*

[235] Walker *supra* footnote 228 at 3.

[236] According to John Sheilds and Harley D. Dickinson, "Health for Sale: The Political Economy of Occupational Health and Safety" in B. Singh Bolaria and Harley D. Dickinson, Health, Illness and Health Care in Canada (Toronto: Harcourt, Brace & Company, Canada, 1995) at 681:

> Only when the workplace becomes democratized, that is, when workers gain real control over decision-making powers with regard to investments, job design, new technology, etc., will they be able to effectively participate in decisions that tackle the underlying problems of job

assertion that all parties -- employers, employees and the government -- have an equal share in resolving and identifying health and safety issues has been a feature of occupational health and safety law since the enactment of the Factory Acts.[237]

The division of responsibilities and duties outlined in the legislation would have greater meaning in workplaces if employees were valued participants in the achievement of workplace goals.[238] The 'command and control' style of management often found in the workplace undermines collaborative efforts on health and safety issues.[239] Businesses who implement workplace health promotion programs may do so from a "quality of work" perspective where worker health is promoted to insure productivity and profit making. Firms who adopt this perspective are often motivated by a belief that healthy employees are able to contribute their maximum to the corporation.[240] While laudable, these programs vary from the "quality of life" standpoint that occupational health and safety laws encouraged. The latter view flowed from the belief that activities in the workplace should not curtail the enjoyment of life outside of working hours.

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hazards. This will also necessitate workers increasing their influence over the health and safety bureaucracy of the state. Only under these conditions will workers be able to begin to realize the slogan 'our health is not for sale.'

[237] Tucker *supra* footnote 105 at 216.

[238] According to Sass, effective health and safety initiatives articulating a "more democratic form and organizational structure" are dependent upon the penetration of "existing management prerogatives, and of their traditional right of control over the labor process, and the planning of work." Sass (1989) *supra* footnote 24 at 171.

[239] Jarboe and Joel Yudken *supra* footnote 102 at 6.

[240] The Institute for Work and Health argues for the adoption of a "health improvement culture" where all levels of the organization are committed to the achievement of workplace health. The Institute maintains that "a real accountability for health by top management" is essential. (Institute for Work and Health, "How the Workplace Can Influence Employee Illness and Injury" Occasional Paper #8 by Lynda S. Robson, Michael F. Polanyi, Michael S. Kerr and Harry S. Shannon (Toronto: April 1998) at 10.

Legislation helps to ensure that workplaces value the bodily integrity of workers over productivity and profits. Vogel describes the drawbacks that often accompany private control of occupational health and safety. He states:

> . . . anything which tends to reduce occupational health management to the framing of a coherent set of measures which give effect to objectives set by company management, risks giving rise to prevention activities whose main aim is to avoid direct costs to the firm (accidents, prescribed diseases, absenteeism) rather than problems whose costs are socialized and hence concealed.[241]

Arguably, a better view sees workplace health as a human right rather than as an efficiency measure.

(vi) The Trilogy of Rights

The achievement of modern occupational health and safety legislation most commonly cited is the imposition of three rights - the right to know, to participate and to refuse.

(a) The Right to Participate

The primary vehicle for participation of workers is the joint occupational health and safety committee mandated in almost every jurisdiction.[242] The Saskatchewan statute specifies that committees must consist of a minimum of two and a maximum of twelve members, at least half of which must be employees. While there are variations across the country, the basic thrust of sections mandating the establishment of health and safety committees is similar. In essence, the provisions enshrine the "right to participate." Involving workers makes sense from a moral perspective for they risk

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[241] Vogel *supra* footnote 39.
[242] See Bryce and Heinmiller, *supra* footnote 192 for variations.

their health and bodily integrity when conditions are hazardous. Therefore, workers require sufficient information to assess the risks, to question the existence of hazards, and to articulate opinions about the likelihood of harm.[243] This right also has a practical basis; the research proves that worker involvement reduces the rates of accidents and injuries.[244] Helping to identify trouble spots and to propose workable solutions are activities that rightly involve the employees who work directly with problematic equipment and hazardous substances.

Generally, a committee has the power to receive, consider and dispose of employee complaints relating to the health and safety of the workplace; to establish educational and other programs for the workers' protection; to participate in health and safety-related inquires and investigations; to access government and employer reports on the employees whom it represents; and to request from an employer whatever information it considers necessary to identify existing or potential health hazards at the workplace.[245] Critics stress that this body is an advisory one, without the power to demand exacting changes in the workforce.[246] A further concern is the fact that the committees are required only in larger workplaces.[247] Therefore, the law does not

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[243] Swinton *supra* footnote 207 at 147.
[244] *Ibid.*
[245] Randall Scott Echlin and Christie M. Thomlinson, For Better or For Worse: A Practical Guide to Canadian Employment Law (Aurora, Ont.: Aurora Professional Press, 1996) at 130.
[246] Tucker *supra* footnote 105 at 218.
[247] The Saskatchewan Occupational Health and Safety Act, 1993 for example, mandates the establishment of committees in workplaces with 10 or more employees. See Section 15(1).

provide workers in smaller firms with an important means of conveying their concerns to management.[248]

(b) The Right to Know

The right to participate corresponds with the right to know. The Saskatchewan Occupational Health and Safety Act, 1993 imposes an obligation to provide "all required information" to the occupational health committee, the occupational health and safety representative, and the workers without representation by these agents. Required information is defined as information that an "employer, contractor, owner or supplier" knows or suspects:

> (i) may affect the health and safety of any person who works at a place of employment; or
> (ii) is necessary to identify and control any existing or potential hazards with respect to any plant or any process, procedure, biological substance or chemical substance used at a place of employment.[249]

The right to know is the often heralded as one of the major victories of modern occupational health and safety law.[250] Information on workplace hazards is essential to the work of occupational health and safety committees and representatives, and forms

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[248] See Eakin *supra* footnote 206 for a detailed discussion of the health and safety challenges in smaller firms.

[249] Section 9(1).

[250] Richard M. Brown, "Canadian Occupational Health and Safety Legislation", (1982) 20:1 *Osgoode Hall Law Journal* 90 at 90-91. Brown sees the fulfillment of this right as essential to the integrity of the system.

He states:

> An employee's right to know the hazards of work rests upon a basic human entitlement to information that bears directly upon bodily integrity. Information is also a central part of an effective campaign against injury and disease because all strategies designed to promote health and safety depend upon a knowledgeable workforce.

the basis for decisions made on refusals of unsafe work. Without the facts, there is no basis to enforce the standards.[251]

However, the power relationships that exist within the workplace weaken the right to know. The right to know assumes that the granting of information identifying a problem is the sole prerequisite to the implementation of corrective measures. As stated earlier in this text, relations of subjugation and subordination limit the ability of workers to effect meaningful change in the workplace.[252] Another problematic aspect of the right to know is that it envisions a one-way flow of information. It establishes employers and managers as the experts who have an obligation to inform employees of risks. Employees under this system are passive recipients of information, rather than agents empowered to act for themselves. Cassou and Pisarro argue for a different system. They state:

> Sharing knowledge . . . cannot just mean transmission of expert knowledge, but implies that the knowledge of those who experience working conditions, the 'nonexperts,' be recognized and taken into account. This is essential for problems related to the perception of health or working conditions, which have only recently been emphasized. [253]

Notwithstanding the limitations that commentators identify, the right to know may be among the most effective in contemporary settings. Numerous theorists allege that

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[251] *Ibid* at 91.

[252] Sass comments: "The most damaging injury we observed in Saskatchewan was not from the noise, dust and toxic chemicals in the work environment, but from the subordination and structure of command in industry, and its effect upon the character development of the worker, produced by fear of punishment and dismissal." Robert Sass, "Alternative Policies in the Administration of Occupational Health and Safety Programs," (College of Commerce, University of Saskatchewan, Saskatoon, Canada, Reprint Number 87-03) at 251.

[253] Bernard Cassou and Bernard Pissarro "Workers' Participation and Occupational Health: The French Experience," (1988) 18:1 *International Journal of Health Services* 139 at 149 quoting Dejours, C., *Travail: usure mentale*, Le Centurion Paris 1980.

computer related health problems are avoidable if stringent ergonomic programs are implemented.[254] If properly informed, workers could mount powerful arguments in favor of ergonomic initiatives.

Outlining a detailed list of the information that managers must share with workers would strengthen Canadian ergonomic regulations. The San Francisco Ordinance, discussed in the next chapter, outlined detailed requirements for information sharing.[255] It called upon employers to provide computer users with education and training on a variety of health risks.[256] These protective measures included ergonomic principles, the necessity of taking regular breaks, and the need for regular eye exams, among others. The Ordinance required the provision to workers with up to date research on the health effects of VDT use and of the contents of the Ordinance.[257] According to the Saskatchewan regulation on musculoskeletal injuries, outlined in the next chapter, employees have a right to information on the workplace risks that cause or provoke the injuries.[258] Employers must also show workers the safest ways to perform their tasks and responsibilities.[259] The British Columbia regulation imposes similar responsibilities.

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[254] Mogensen *supra* footnote 3 at 143.
[255] San Francisco Health Code, Video Display Terminal Worker Safety, HL-201, 3-91.
[256] Section 1307. These included "known and suspected" VDT related health concerns documented by scientific research "including musculosketal strain, cumulative trauma disorders such as carpal tunnel syndrome, vision effects, possible reproductive effects and psychological stress" and "VDT-related health effects including poorly designed work stations, long periods of physical immobility, poorly adjusted furniture, ackward postures, poor visual correction, inappropriate levels of lighting, excessive glare, and excessive or continuous keyboard activity."
[257] *Ibid.*
[258] See Section (3)(a) of the Occupational Health and Safety Regulations, 1996.
[259] *Ibid*, Section 4.

(b-i) Education as a Component of the Right to Know

Another option that would strengthen the right of workers "to know" about hazards in the work environment is enhanced educational opportunities. The Communications, Energy and Paperworkers Union of Canada developed a prototypical course on ergonomics. It addresses a range of topics -- from workplace factors, to worker empowerment, to implementing change in the workplace.[260] The course fosters understanding of ergonomic regulations. Trainees are required to review the content of the standards to pinpoint their application and uses in the workplace. Injecting "consideration for the worker, using ergonomic principles, into the decision making process at the design and redesign stages" is the principal course objective.[261] Union initiatives supplement legal ones by building public support and policy momentum for the creation of ergonomic standards. The CEP course model is worthy of promotion by provincial governments concerned with "the right to know."

(c) The Right to Refuse Unsafe Work

Analysts call the right to refuse unsafe work the strongest among the rights available to workers.[262] If a task jeopardizes health and safety, the legislation authorizes the worker to exercise the right to refuse unsafe work. The wording of the Saskatchewan regulation is illustrative of a typical provision. Section 23 states:

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[260] Communications, Energy and Paperworkers Union of Canada, Ergonomics, Participant Version by Brian Kohler, National Representative, - Health, Safety and Environment (Health, Safety and Industrial Relations Training Fund, April 1998). The course objectives are fostering understanding of the relationship between occupational injuries and accidents and workplace design, presenting a definition of "ergonomics", applying fundamental ergonomic principles to resolve workplace and job design issues, identifying approaches to engender workplace change, outline ergonomic standards recently enacted in Canada and the United States.

[261] *Ibid* at 5.

> A worker may refuse to perform any particular act or series of acts at a place or employment where the worker has reasonable grounds to believe that the act or series of acts is unusually dangerous to the worker's health or safety or the health or safety of any other person at the place of employment until:
>
> > (a) sufficient steps have been taken to satisfy the worker otherwise; or
> > (b) the occupational health committee has investigated the matter and advised the worker otherwise.

While the law protects the worker from penalty for declining to perform the duty, the right is subject to review by an appropriate authority. Expecting employees to justify their decision diminishes the potency of this right. Shields and Dickinson state:

> Dangers have tended to be interpreted narrowly by both management and government, thereby greatly limiting the potential power of this provision. Consequently, few employees are willing or able to exercise their rights due to fear of management retaliation.[263]

Workers are likely to have trouble exercising the right to refuse in the modern workplace. Contract, part-time, non-permanent, "flexible" workers may refrain from using the right due to their fears of jeopardizing tenuous employment relationships. The aches and pains of computer work, while debilitating, are also unlikely to constitute the kind of danger required to trigger "the right to refuse."

C. The Advantages of the Existing Legislation

As stated in the introduction, ergonomic standards within Canada are a component of the occupational health and safety laws outlined in the preceding paragraphs. Farraday highlights the possibilities that the health and safety model holds for the resolution of

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[262] Tucker *supra* footnote 105 at 219.
[263] Sheilds and Dickinson *supra* footnote 236 at 680.

contemporary occupational health problems.[264] While Farraday's focuses on the merits of occupational health and safety laws regarding workplace sexual harassment, her logic has application to the law's usefulness in relation to other workplace injuries such as RSI. She reasons that occupational health and safety legislation, along with tort law and mediation, are useful approaches for the resolution of sexual harassment claims because "they remain clearly focused on the injury that a woman has suffered."[265] In her view, an awkward, overly administrative system encumbers human rights laws. Tort law is similarly restrained.

Consequently, the joint occupational health and safety committee "gives women the strongest protection of their rights."[266] Additionally, occupational health and safety committees have the authority to address the health concerns of workers immediately and through innovative strategies. Because the committees include worker and management representatives, they can tailor the remedy to a particular workplace. Committee members can apply their knowledge of the parties involved to determine the solutions likely to foster behavioral changes. Occupational health and safety committees have the authority to act proactively, meaning that they do not have to wait for individual complaints to come forward to correct workplace safety issues. Thus they can use their initiative to pinpoint and act on problems. When individuals bring complaints, the health and safety committees serve as an intermediary between

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[264] Fay Farraday, "Dealing with Sexual Harassment in the Workplace: The Promise and Limitations of Human Rights Discourse", (1994) 32:1 *Osgoode Hall Law Journal* 33 at 36.
[265] *Ibid* at 62.

workers and employers or workers and harassers, providing the worker with support and protection in bringing an issue forward. While her comments address sexual harassment in the workplace, they highlight the potential that occupational health and safety law holds for addressing workplace injuries related to the use of computers. The law empowers women to refuse to work in situations where workplace sexual harassment impairs their health. Similarly, it is a means for refusing unsafe computer related work. Furthermore, the general duty placed on employers to maintain healthy workplaces reinforces that problems "belong" to the workplace rather than to the individual.

The Communications, Energy and Paperworkers Union of Canada agrees that the joint occupational health and safety committee is an effective mechanism for addressing ergonomic issues.[267] The committees have a broad mandate to promote health in the workplace. The workers on the committee face health issues that parallel those of their co-workers. Therefore, this body is favorably positioned to identify and address workplace concerns -- from sexual harassment to repetitive strain injury.

D. The Limitations of the Health and Safety Model

In contrast, other analysts assert that the restructuring of the last decade significantly hampers the law's ability to promote health in the contemporary workplace. In his article "Labour Law Without the State," Arthurs questions labour law's relevance to

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[266] *Ibid* at 62. In making these arguments, Farraday appears to ignore critiques that outline the limitations of joint occupational health and safety committees. A similar concern can be raised in relation to her discussion on the merits of "right to refuse" provisions.

the modern workplace. He notes that while labour law has always been subject to a divergent set of assumptions, all are questionable due to "the rapid and ramifying social, economic, political, and technological developments sometimes collectively referred to as 'the new economy.' [268] Arthurs' asserts that these changes are altering governments and the nature of employment, introducing corresponding changes to labour law.[269] He comments:

> In short, the Canadian version of the economy is characterized by fissiparous tendencies in politics and social life. These have created an environment hostile to the survival of the postwar labour law system and make its reform or renovation very difficult. Indeed, the fault lines in that system run right to its core: the nature and organization of paid work which labour law is meant to regulate.[270]

Arthurs argues that labour market reorganization compromises the state's ability to govern workplace relations. About occupational health and safety, Vogel's perceptions are similar. He states:

> . . . the legal concepts used are not really relevant to large-scale casualisation and job insecurity. The increase in "atypical" employment relationships, refocusing on core business lines, the rise in outsourcing (especially multi-tier subcontracting) and other factors all combine to undermine rules designed to apply to secure jobs in large or medium-sized firms. [271]

The labour law paradigm developed in the post war years assumes a classic working arrangement where a typical worker with lengthy job occupancy performs routine tasks in a hierarchical structure within a flourishing economy based on large-scale

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[267] Communications, Energy and Paperworkers Union of Canada, Ergonomics, Participant Version, *supra* footnote 260. The manual refers to the joint committee throughout.
[268] H.W. Arthurs, "Labour Law without the State?" (1996) 46 *University of Toronto Law Journal* 1 at 4.
[269] *Ibid.*
[270] *Ibid* at 11.
[271] Vogel *supra* footnote 39.

production.[272] While departures from this form always existed, deviations threaten to become standard in the Post Industrial Age characterized by the erosion of full-time permanent work. It is doubtful whether current labour law applies to an employment structure unfettered by definite work categories. Arthurs comments:

> The relatively clear line between workers and entrepreneurs blurs in the case of 'experts', 'consultants,' or 'specialists' who survive from contract to contract, in effect practicing serial monogamy in their working lives; their entitlement to bargain collectively or to be insured against unemployment or work-related injuries blurs likewise.[273]

Worker organizations raise similar questions regarding teleworkers who perform their duties from decentralized locations, like the home.[274] One study observes:

> While the employer refuses to pay for ergonomic furniture, teleworkers put laptops on kitchen tables and risk eyestrain, back problems, and repetitive strain injury. The federal government's telework policy tells those working at home that health and safety is their responsibility, thus attempting to erode hard-won worker rights under the Canada Labour Code.[275]

Furthermore, occupational health and safety law delegates the task of determining the occupational health and safety plan to an internal committee. This model, mandated only in large workplaces, achieves greater success when workers approach management for agreement on health and safety measures with accurate information and the support of strong unions.[276]

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[272] Arthurs *supra* footnote 268 at 11-12.
[273] *Ibid* at 18.
[274] Jan Borowy and Theresa Johnson, "Unions Confront Work Reorganization and the Rise of Precarious Employment: Home-based Work in the Garment Industry and the Federal Public Service", Re-shaping Work: Union Response to Technological Change (Don Mills, Ontario: Ontario Federation of Labour, 1995) at 41.
[275] *Ibid.*
[276] Vivienne Walters and Margaret Denton, "Workers' Knowledge of their Legal Rights and Resistance to Hazardous Work", (1990) 45:3 *Relations Industrielles* 531 at 543.

Modern workers often have limited attachments to one workplace due to increased part-time and contract work. They conduct rigidly defined tasks and endure practices, like monitoring, that undermine their authority and decision making capacity. These factors curtail the likelihood that they will pressure management for health and safety policies. In the contemporary workplace unfettered by strong allegiances, workers may fear jeopardizing their positions by raising concerns relating to health and safety. The scarcity of secure employment means that workers are likely to strive for harmony within the workplace by foregoing equipment and procedures that would minimize harm. Quinlan summarizes the obstacles that the law faces, stating:

> . . labour market changes are undermining the effectiveness of OHS laws by reducing the coverage and effectiveness of participatory mechanisms, making the implementation of internal control systems more difficult, creating more work-settings where the enforcement of even basic OHS standards is problematic, and increasing demands on already stretched inspectorates. OHS agencies also need to re-orientate their compliance activities to recognize the problems associated with outsourcing etc.[277]

(i) Labour Law in the Post-Industrial Age

Many analysts agree that massive industrial restructuring, like that evidenced in the current age, diminishes the effectiveness of labour standards law. Sengenberger concedes this point yet he maintains that the appropriate state response is "modernization, not deregulation or degradation."[278] His approach is advisable in relation to occupational health and safety law where revitalization is also required. [279]

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[277] Quinlan *supra* footnote 4 at 14.
[278] Werner Sengenberger, "Labour Standards: An Institutional Framework for Restructuring and Development" in Werner Sengenberger and Duncan Campbell, Eds. Creating Economic Opportunities: The Role of Labour Standards in Industrial Restructuring (Geneva: International Institute for Labour Studies, 1995) at 4.
[279] *Ibid* at 9.

The enactment of ergonomic standards is a means of achieving this objective. Ergonomic standards have the benefit of asserting collective responses to contemporary workplace issues. In isolation, however, they are not sufficient to address the limitations of current occupational health and safety programs.[280] Expanding the scope of occupational health and safety laws to modern working arrangements and workers requires further effort. Vogel advocates for two improvements: "the development of a new bargaining power to reaffirm that people's health comes before business competitiveness" and the creation of "new ways of covering all work situations in a context of globalization and job insecurity."[281]

(ii) The Changing Social Policy Climate

It is doubtful whether the required changes will be forthcoming without significant pressure on policy makers. Elling cites several reasons for the enactment of occupational health and safety legislation in six industrialized countries -- Sweden, Finland, the former German Democratic Republic (G.D.R.), the former Federal Republic of Germany (F.R.G.), the United Kingdom and the United States of America -- in the late 1960's and early 1970's.[282] Influential factors included a strong world economy and high employment rates, which positioned labor to demand better working

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[280] Quinlan and Walters present thorough reviews of labour market changes that threaten the achievement of occupational health and safety goals. Michael Quinlan supra footnote 4 and David Walters and Philip James, Robens Revisited - the case for a review of occupational health and safety regulation (London: Institute of Employment Rights, June 1998)

[281] Vogel *supra* footnote 39.

[282] Ray H. Elling, The Struggle for Workers' Health: A Study of Six Industrialized Countries (Farmingdale, New York: Baywood Publishing Company, Inc., 1986) at 26 While they are beyond the scope of his study, Elling states that other Western European countries and Eastern European countries were affected by this trend.

conditions.[283] Furthermore, civil rights movements in the United States and the anti-Vietnam sentiment influenced workers. [284] Other factors the six study countries shared were wealth, high industrialization and urbanization, comparable health indicators (infant mortality and life expectancy), and advanced capitalist economies, with the exception of the former G.D.R.[285] A vibrant workers' movement was also a determinant of a superior occupational health and safety system.[286]

Canadian governments enacted occupational health and safety laws during a period characterized by progressive policy reform.[287] By the 1970's, an extensive array of social programs existed directed toward health, welfare and income security as well as initiatives in the area of housing, employment training and funding for educational supports.[288] The spiraling cost of the programs and a growing individualistic sentiment is undermining public support for the post-war safety net. Yalnizyan describes the changes stating:

> The rights of citizenship have shifted from entitlements to the responsibilities of individuals and more limited 'mutual' obligations between the state and individual. The message of the rugged individual is pervasive, with the poor being told they are responsible for themselves and the rich being assured they are responsible for no one *but* themselves.[289]

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[283] *Ibid.*

[284] *Ibid* at 63. Elling reasons that the rational for this activity "must be understood within the dynamics of each country's political economy." While there were common features, variations were apparent in each country Elling studied. Sweden, for example, experienced increased labour militancy during this period that partially culminated in gains in the area of occupational health and safety.

[285] *Ibid* at 71-73.

[286] *Ibid* at 29.

[287] Peter S. Li, The Making of Post-War Canada (New York, Oxford University Press, 1996) at 85.

[288] *Ibid.* The most important of these programs was the publicly funded health system that arose in the post-war years. One study states that health care is one of the "rare few cherished equally in all regions of the country." Canadian Bar Association, Task Force Report on Health Care, What's Law Got to Do With It? Health Reform in Canada (Ottawa: Canadian Bar Association, August 1994) at 19.

[289] Armine Yalnizyan, "Securing Society: Creating Canadian Social Policy" *supra* footnote 68 at 54.

The increasing stratification of society prompted Secretary of Labor Robert Reich to ask: "What do we owe one another as members of the same society who no longer inhabit the same economy?"[290] Reich's comment hints that the public concern for workers that prompted the health and safety revival in the 1970's may be giving way to a less egalitarian framework. The social climate undermines the commitment to the welfare of workers that provided the basis for occupational health and safety laws. The social contract that promoted prosperity and community participation among societal members is threatening to disappear.[291]

(iii) The Anti-Ergonomic Regulation Business Lobby in the United States

In the United States, the development of ergonomic regulations has been particularly controversial due to the powerful business lobby mounted in opposition to the laws.[292] Business leaders argue against ergonomic standards stating that they impose excessive monetary and practical burdens. They require that all employers become knowledgeable in ergonomics, "a field for which there is little if any credible evidence."[293] Detractors often minimize the implications of the injuries or maintain that they are correctable through private initiatives. The deference that the U.S. government has shown to business demands is further evidence of the collapse of the post-war social framework.

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[290] Rifkin *supra* footnote 51 at 180 quoting Robert Reich, The Work of Nations: Preparing Ourselves for 21st Century Capitalism (New York: Random House, 1992) at 303.

[291] The iron curtain, Menzies argues, has disappeared in favor of a silicon one- "an invisible digital divide between the rich and poor, the technologically enfranchised and the technologically disenfranchised." Menzies supra footnote 16 at 10.

[292] "Ergonomics: Business Groups Oppose First Proposed Standards", [Regina]Leader Post (February 20th, 1999) at C3.

E. Policy Alternatives in the Prevailing Climate

In the reformulation of the policy framework, varieties of alternatives present themselves. One is to allow corporations to develop solutions at the firm level without regulations and without adequate attention to risk assessment.[294] The second option is to engage social members in a discussion outlining the parameters of work, working hours, and "what kind of living standard the industrialized world can afford to provide for productive adults." [295] The Canadian Auto Workers Union argues that ergonomic regulations provide a vehicle for promoting fair and equitable social policies:

> Business tries to claim that detailed safety regulations make companies less competitive. We disagree. Detailed safety regulations level the playing field so that companies who employ sound safety practices will not be competitively disadvantaged by those who don't. Some companies claim that safety regulations pose a hindrance to their ability in enhancing technological change. Once again, we disagree. Sound regulation forces technological change, especially in the area of ergonomics design, that meets the needs of society as a whole.[296]

F. Conclusions

This chapter outlined principles in occupational health and safety laws in Canada, using the Saskatchewan Act as the reference point. These laws provide the framework for ergonomic regulations. They also protect workers in the provinces where standards are absent. The text noted that while certain provisions have enormous potential to protect workers, the realities of the workplace impede the achievement of health and safety goals. In addition, the changes wrought by the Post-Industrial Age challenge

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[293] Ibid, citing U.S. Chamber of Commerce President Peter Eide.
[294] Kome *supra* footnote 92 at xv.
[295] *Ibid.*
[296] Walker *supra* footnote 228 at 8-9.

these laws. A prominent method for revitalizing workplace health and safety statutes is the enactment of ergonomic standards, addressed in the next chapter.

Chapter IV: Ergonomic Reform Initiatives

A. Introduction

The last chapter argued that modern working arrangements undermine the relevance of labour statutes, including occupational health and safety laws. A popular response to the calls for change is the enactment of guidelines for the safe use of computers. This chapter discusses Canadian ergonomic regulations in Saskatchewan and British Columbia. The regulations seek to eliminate or reduce a range of injuries, including those caused by the repetitive motions and awkward postures that often accompany computer use. The chapter also outlines programs of the Institute for Work and Health in Ontario. The text outlines certain global developments, without providing a comprehensive survey, for comparative purposes.

(i) Background Information on Ergonomic Standards

The enactment of ergonomic regulations gained momentum in the 1980s and 1990s. Sweden was the first to implement legislation outlining guidelines for computer use in 1985.[297] In his study of legislative initiatives conducted in 1985, DeMatteo noted that "a worldwide response to the growing public concern and reaction to the potential health hazards of VDTs" was evident in the 1980s.[298] He discovered that national governments, quasi-governmental agencies and international bodies had responded to

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[297] Mogensen *supra* footnote 3 at 35.
[298] DeMatteo, *supra* footnote 191, see Chapter 13, "Legislative and Other Initiatives" at 160.

computer use through a range of legal and policy initiatives.[299] The inclination that DeMatteo outlined in the 1980's continued in the 1990's.

(ii) The Global Context of Reform

Guidelines to reduce computer related work injuries are prevalent in numerous jurisdictions throughout the world, with the exception of parts of Asia and Africa.[300] Australia, for example, enacted a National Code of Practice to prevent 'occupational overuse syndrome.'[301] Norway's Working Environment Act incorporates exemplary guidelines on computer use.[302] Amendments in 1995 required the provision of detachable keyboards and adjustable terminals.[303] Importantly, the opinions of workers are required during the implementation stages of technological innovation and during ergonomics training. Unions successfully negotiated "maximum two-hour shifts and half-day limits on VDT use" to reduce stress, vision problems and RSI's.[304]

In general, reform is occurring at a variety of levels of government - including municipal, national and regional - and with the support of unions and worker organizations. The next sections highlight essential initiatives to illustrate the range and scope of reform efforts.

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[299] *Ibid.*
[300] Interview with B. Saravanabawan, Worker's Compensation Board of British Columbia, August 3,1999.
[301] *Ibid* at 174.
[302] Mogenson *supra* footnote 4 at 37 citing National Labour Inspection of Norway, Regulations for Working with Display Screen Equipment, 1995.
[303] *Ibid.*
[304] *Ibid.*

B. International Developments and Innovation

i) Sweden

Sweden is a recognized leader in occupational health and safety policy, particularly noted for the Work Environment Act, which promoted an expansive view of worker well-being that included both physical and psychological concerns.[305] Importantly, the law emphasizes the role of workers in creating a healthy work environment.[306] In the area of ergonomics, Sweden remains at the forefront. In 1998, Sweden enacted regulations directed at the prevention of musculoskeletal injuries. The twelve sections of the Provisions of the Swedish National Board of Occupational Health and Safety on Ergonomics for the Prevention of Musculoskeletal Disorders cover "ergonomic conditions concerning musculoskeletal disorders at work."[307] The regulations were enacted to ensure that "workstations, jobs and work environment conditions" are "designed and arranged" to avoid ill health and fatigue.[308] Section 2 states the primary responsibility imposed upon employers:

> The employer shall as far as is practically possible design and arrange work and workstations in such a way that the employees can use work postures and working movements which are favourable to the body.

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[305] For a discussion of the development of Swedish policy see: Eric Tucker, "Worker Participation in Health and Safety Regulation: Lessons from Sweden", (Spring 1992) 37 *Studies in Political Economy*, 95 at 98-113.

[306] *Ibid*; Tucker concludes that the strength of these reforms is diminishing.

[307] Provisions of the Swedish National Board of Occupational Safety and Health on Ergonomics or the Prevention of Musculoskeletal Injuries, issued by the National Board of Occupational Safety and Health pursuant to Section 18 of the Work Environment Ordinance (SFS9977: 1166); http://www.arbskey.se/afseng/AFS9801.pdf. The Swedish Occupational Safety and Health Administration has identified "musculoskeletal disorders" as a prioritized supervision area due to the fact that these injuries account for a "total of 40 per cent of reported occupational injuries". An objective of the agency is to decrease the number of employees engage in monotonous, repetitive work. See: The Swedish Occupational Safety and Health Administration, Plan of Activities 1997-1999, http://www.arbsky.se/vplan/vplaneng.htm#musculoskeletal.

[308] *Ibid*, Section 1.

The section requires the avoidance of prolonged or frequent work where the trunk of the body is "bent or twisted" or where the worker positions his or her hands above the shoulders or below the knee. In addition, the section stipulates the provision of any "special visual aids" by the employer.

Section 4 imposes an obligation on the employer to ensure that "physically monotonous, repetitive, closely controlled or restricted work" is infrequent.[309] If routine, repetitious work is unavoidable, the law requires that the employer minimize harmful health effects through "job rotation, job diversification, breaks" or other measures that foster variety. Section 5 demands that employer's grant to an employee "opportunities of influencing the arrangement and performance of his work that sufficient variation of movement and recuperation can be achieved." Section 6 obliges the employer to establish that employees have appropriate training and information. It states:

> The employer shall ensure that the employee has sufficient knowledge concerning
>
> - suitable work postures and working movements,
> - the proper use of technical equipment and aids,
> - the risks entailed by suitable work postures, working movements and unsuitable manual handling, and
> - early indications of the overloading of joints and muscles.[310]

Employees are required in Section 7 to devote adequate attention to the instructions received on the most appropriate means of performing a task. Sections 8 and 9 place

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[309] *Ibid.*

obligations on manufacturers, importers, suppliers and providers as well as persons involved in the construction of buildings to abide by health and safety laws.

(a) TCO Certification Program

The Swedish Confederation of Professional Employees (TCO) developed a certification program for computer displays, keyboards and system units.[311] TCO has a membership of 1.3 million professionals in a variety of occupations -- from teachers, to nurses, to secretaries -- in the public and private sectors.[312] TCO decided to use its' members' expertise to encourage product development that was "user friendly" and without "risks to health."[313] Therefore, TCO sought to influence manufacturing and buying patterns through the development of stringent criteria that evaluate computers on environmental and ergonomic factors. On application, TCO certifies models that meet the safety criteria developed.[314] TCO'99, the third in a series of specifications, articulates the most demanding requirements.[315] It focuses on ecological specifications relating to manufacturing and recycling, ergonomic and functional conditions, and covers specifications for alternative keyboard designs and portable computers.[316] Because legislation was ineffective on product development, particularly with

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[310] *Ibid.*
[311] See for example: TCO'95 Certification: Requirements for Environmental Labelling of Personal Computers (Report No. 1. Third Edition) (TCO, The Swedish Confederation of Professional Employees, in co-operation with The Swedish Society for Nature Conservation, NUTEK, The National Board for Industrial and Technical Development in Sweden and SEMKO AB). (Stockholm, 5 March 1996) at one.
[312] *Ibid.*
[313] *Ibid.*
[314] "Two Powerful Reasons for Choosing TCO-labelled computer equipment - quality and the environment", TCO Brochure.
[315] The others were TCO'92 and TCO'95.
[316] TCO Brochure, *supra* footnote 28.

"multinational IT-companies," TCO established its system to influence the market.[317] In TCO's view the program is a success: "Today, says Per Erik Boivie, Development Manager, "about 100 million employees around the world are working in front of TCO certified monitors." [318] In creating a registry of the most healthful products, TCO's approach is novel for many ergonomic programs address problems after computers are installed and in use. TCO's certification program emphasizes the importance of proactive measures that reduce the possibility of harm at the outset.

ii) Council of Europe

In Europe, standard setting is common due to the enactment of a European Union Directive in 1989 committing member states to standardized policies and procedures on the health and safety of workers.[319] It establishes a general framework for the "introduction of measures to encourage improvements in the safety and health of workers at work."[320] It imposes a general obligation on employers to insure the well being of workers, in both public and private sectors.[321] The Directive endorses the involvement of workers and their representatives in decisions relating to health and

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[317] Email correspondence from Per Erik Boivie, TCO Development Manager, to the author dated February 25, 1999.
[318] *Ibid.*
[319] Council Directive 89/391/EEC of 12 June 1989 on the introduction of measures to encourage improvements in the safety and health of workers at work, Official Journal L183, 29/06/1989 p.0001-0008; http://europa.eu.int/eur-lex/en/lif/dat/1989/en_389L0391.html.
[320] Council Directive 89/391/EEC of 12 June 1989 on the introduction of measures to encourage improvements in the health and safety of workers at work, Official Journal L 183, 29/06/1989 p.0001-0008 http://europa.eu.int/eur-lex/en/lif/dat/1989/en_389L0391.html
[321] *Ibid.* Article 5, General Provision 1: "The employer shall have a duty to ensure the safety and health of workers in every aspect related to the work."

safety.[322] One important achievement of the Directive was its endorsement of harmonized standards among member states.[323]

The European Framework Directive provides for the implementation of "daughter" directives on specific measures. In 1990, the European Union issued a subsidiary directive on the health requirements for work with display screen equipment. In particular, the Visual Display Unit Directive requires information for and consultation with workers on all aspects of safety, together with training in the use of the workstation. The Directive requires the governments of member states to introduce legislation by December 31, 1992.[324] Its provisions were immediately applicable to equipment bought following the enactment of the directive. The Directive mandates the upgrading of all equipment purchased before 1992 within four years.[325] The Work with Display Screen Equipment Directive is praiseworthy for its efforts to promote safe computer use practices. Vogel is critical of it, however, because it does not incorporate the fundamental principles found in the Framework Directive of employer responsibility, assessment and avoidance of risk, adapting the workplace to the individual and involving workers in decision making.[326] In his view, it is "more

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[322] Article 11, Ibid.

[323] The preamble to the Framework states: "Whereas Member States' legislative systems covering health and safety at the work place differ widely and need to be improved; whereas national provisions on the subject, which often include technical specifications and/or self-regulatory standards, may result in different levels of health and safety protection and allow competition at the expense of health and safety." The Framework Directive's emphasis on harmonized standards has not been completely successful - Vogel notes identifies important disparities in the legislation enacted by Member States due to regional and cultural adaptations. The challenge faced is to "attain the substantive minimum objectives . . . while preserving the best of each national system . . . ". Laurent Vogel, supra.

[324] Richard Kidner "The VDU Directive", *New Law Journal*, December 12, 1990 at 1796.

[325] *Ibid.*

[326] Council Directive on Health and Safety, *supra* footnote 300.

concerned with preventing eyestrain than with workstation design ergonomics, job content or software design."[327]

iii) San Francisco Video Display Terminal Worker Safety Ordinance

The Video Display Terminal Worker Safety Ordinance enacted by the City of San Francisco in 1990 is demonstrative of a community initiative that promoted healthy practices on VDT use.[328] The Ordinance emphasized the City of San Francisco's responsibility to provide video display terminal operators with "a safe and healthy work environment."[329] It noted that a number of health problems arose from computer use including headaches, eyestrain and "general malaise."[330] The Ordinance stated that employers could promote workplace health by providing adjustable workstations, information on workstation design and work routines and by providing education on the roots of and treatment for health concerns that flow from VDT use.[331]

(a) Provisions of the Ordinance

The Ordinance established a Video Display Terminal Advisory Committee. It consisted of seven members with representatives from business and labor, nominated by the San Francisco Labour Council. The Ordinance required the appointment of three members with backgrounds in scientific research related to the use of VDTs.[332] Additionally, it established standards relating to workstations. Subjects addressed

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[327] Vogel *supra* footnote 39.
[328] San Francisco Health Code, Video Display Terminal Worker Safety, HL-201, 3-91.
[329] Section 1301(a), Findings.
[330] *Ibid.*
[331] *Ibid.*

included seating, seat pans, back rests, the use of swivel chairs, protection against glare and printer noise, and detachable keyboards. Employers were to provide arm rests, foot rests and wrist rests on request.[333] The Ordinance granted workers who performed repetitive keyboard motions with a 15-minute "alternative work break" distinguishable from regular coffee and lunch breaks. The Ordinance encouraged employers to transfer pregnant VDT operators to other types of work, on request.[334]

(b) The Life Span of the Ordinance

The Ordinance was short-lived; in 1992, the California Superior Court declared that the San Francisco VDT Ordinance violated the California Occupational Health and Safety Act, 1973 by legislating in an area of state rather than municipal jurisdiction.[335] The decision was a success for the businesses that lobbied against computer use regulations.[336] IBM and other computer manufacturers paid the legal fees of the firms that challenged the law.[337] Though short-lived the Ordinance is praiseworthy for its efforts to publicize and to address computer related work injuries. The San Francisco model generated national attention and was under consideration by other urban centres

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[332] Section 1303. The functions of the Committee were to make policy recommendations to the Health Commission in relation to the implementation of the Ordinance, to recommend amendments to the Ordinance and to keep the Board apprised of VDT laws and regulations enacted within California.
[333] Section 1304.
[334] Section 1306, 3(b).
[335] C&T Management Services, Inc. v. The City and County of San Francisco (1992) WL 49929 (Cal. Superior), not officially published. The Court ordered that the Ordinance was "invalid, void and unenforceable as it applies to private places of business."
[336] Mogensen *supra* footnote 3 at 140
[337] *Ibid.*

when rendered void by the court.[338] Its' popularity may have been a factor in the State of California's decision to enact ergonomic regulations in 1997.[339]

C. Canadian Developments

The plethora of international initiatives contrasts with the North American situation where a "legislative vacuum" exists in relation to ergonomic standards.[340] Fortunately for workers, two Canadian provinces, -- Saskatchewan and British Columbia, -- have introduced regulations on the elimination of musculoskeletal injuries.

i) Ergonomic Initiatives in the Province of Saskatchewan

In 1981, the Province of Saskatchewan became the first Canadian jurisdiction to establish regulations on ergonomic requirements within the workplace.[341] In 1996, the government enacted a second regulation following the introduction of the Saskatchewan Occupational Health and Safety Act in 1993.[342]

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[338] *Ibid* at 140-141

[339] California Occupational Health and Safety Standards Board, Ergonomic Standard and Related Litigation Status, California Code of Regulations, Title 8-Section 5110, Repetitive Motion Injuries; website: http://www.dir.ca.gov/OSHAB/ergo_stand_status.html.

[340] Kome *supra* footnote 92 at 175.

[341] Section 42, Reg. 90/88. The section contained four clauses. Clause (1) required employers to provide workers with "appropriate seating" where the adoption of a sitting pose would not interfere with work responsibilities. Clause (2) outlined further specifics on the seat and the footrest. Clause (3) mandated the employer to "provide effective protection for any worker" whom risked injury by performing work that limited "motion or action", was repetitive in nature, required continuous mental exertion, or demanded "excessive or awkward physical effort." According to Section (4), appropriate remedial actions were the provision of equipment and tools and the adoption of operating procedures designed to remedy "the harmful effects of work". Section (c) identified the adoption of "work schedules with rest and recovery periods, changes in workloads", alternative arrangements or other measures directed towards the promotion of health in the workplace.

[342] S.S., 1993, c. O.1-1.

(a) Overview of Regulation 81

Regulation 81 of the 1996 Saskatchewan Occupational Health and Safety Regulations mandates the adoption of practices and equipment that optimize the fit between workers and machinery. Specifically, the regulation seeks to reduce workplace related "musculoskeletal injury."[343] Section 1 defines musculoskeletal injuries "as an injury or disorder of the muscles, tendons, ligaments, nerves, joints, bones or supporting vasculature." Clause (a) through (g) list the factors that cause or aggravate this type of injury including "repetitive motions, forceful exertions, vibrations, mechanical compression, sustained or awkward postures, limitations on motion or action" and "other ergonomic stressors."[344] The references to repetitive motions and ergonomic factors mean that the regulations apply to computer-related injuries, and others.

Section (2) imposes a duty on the employer or contractor, "in consultation with the committee," to regularly review workplace responsibilities that "may cause or aggravate musculoskeletal injuries." Upon the identification of a risk, the regulation requires action to prevent injuries and to ensure that employees who are demonstrating signs of distress seek medical attention. Section (3)(a) states that the employer or contractor has a duty to provide information to workers about "[the] risk and of the signs and common symptoms of any musculoskeletal injury associated with that worker's work."

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[343] The Occupational Health and Safety Regulations, 1996, Chapter 0-1.1 Reg. 1.
[344] *Ibid.*

(b) Protection for Workers Who Are at Risk

Clause 3(b) further obliges employers and contractors to "provide effective protection for each worker who may be at risk." The regulations specify that this may include the following actions:

> (i) providing equipment that is designed, constructed, positioned and maintained to reduce the harmful effects of an activity;
>
> (ii) implementing appropriate work practices and procedures to reduce the harmful effects of an activity;
>
> (iii) implementing work schedules that incorporate rest and recovery periods, changes in workload or other arrangements for alternating work to reduce the harmful effects of an activity.

Section (4) requires that employers or contractors educate "at-risk" workers on procedures and practices, "including the use of appropriate work practices and procedures, equipment and personal protective equipment," that will diminish workplace injury.

The final section of the regulation imposes duties upon the employer or contractor where a worker is demonstrating signs of a musculoskeletal injury. Where evidence of injury is present, section (5) requires employers or contractors to:

> (a) advise the worker to consult a physician or a health care professional who is registered or licensed pursuant to an Act to practice any of the healing arts; and

> (b) promptly review the activities of that worker and of any other workers doing similar tasks to identify any cause of the symptoms and to take corrective measures to avoid further injuries.

Regulation 81 works in tandem with other regulations that address ergonomic factors: in relation to lifting and handling of loads (Section 78), jobs performed while sitting or standing (Sections 79 and 80), shift work and constant exertion (Section 82) and visually demanding tasks (Section 83).

(c) Code of Practice for Work Involving the Use of Visual Display Units

A Code of Practice for Work Involving the Use of Visual Display Units, attached as Appendix III also provides "practical guidance" on the best practices to adopt when working with computers.[345] The Code of Practice applies to workers who use visual display terminals for more than 10 hours per week or 4 hours per day.[346] In contrast to Regulation 81, the code is six pages in length and covers a variety of topics, including glare reduction, ergonomics, work breaks and others. Section 9 requires that each visual display unit operator be fully informed of the provisions of the Code of Practice, the conditions that contribute to muscular, skeletal or visual problems, and of appropriate work station operation.[347] While the Code of Practice lacks the force of law, it is a supplement to the regulations and provides detailed guidance on the best practices to adopt when using a computer for extended periods. The Code of Practice is helpful in illuminating the workplace features that require consideration on

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[345] Saskatchewan Labour, Occupational Health and Safety, Code of Practice for Visual Display Units, Section 1. The Code of Practice is under revision to bring it in line with the provisions of the Act.
[346] *Ibid* Section 2.
[347] *Ibid.*

the implementation of an ergonomic program. British Columbia lacks a similar document meaning that important information is not available in that format.

Evaluation of the Provisions

While groundbreaking and laudable in its intent, Regulation 81 contains certain deficiencies, outlined in the discussion that follows.

(a) Use of Technical Language

The use of the term "musculoskeletal injuries" may hamper Regulation 81's effectiveness. The drawback of this term is that it is highly technical in nature. While this term more accurately describes soft tissue injures and members of the scientific community prefer it, the public does not use it. Consequently, only the best-informed workers will recognize that the regulation applies to the injuries that popular literature labels "repetitive strain injury" or "carpel tunnel syndrome." Workers looking for guidance may not recognize that the legislation addresses their aches and pains. The use of a technically accurate term rather than one in public use infers that ergonomics is the domain of scientists and other specialists rather than workers. Because the regulations do not use the language of ordinary citizens, they appear to discourage review by employees and to preclude the "common sense" solutions they often voice.[348]

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[348] According to Sass, "liberal work environment policy" privileges the voices of experts - physicians, industrial engineers, toxicologists, epidemiologists over the observations of workers. Robert Sass, "A Conversation About the Work Environment", (1995) 25:1 *International Journal of Health Services* 117 at 120.

(b) The Location of the Standards within the Regulations

Locating the provision in the regulation section may limit the numbers of persons who know of its' existence. Governments enact regulations without the fanfare that accompanies legislation, a factor that limits public awareness. In her research, Walters found that workers were often unaware of occupational health and safety laws.[349] Her findings indicate informing employees of their rights under the law requires direct action.[350] Burying these clauses within the regulations lessens the likelihood that employees will know of them and will use them to push for enhanced health and safety initiatives.[351] This finding creates a role for governments and organized labour to promote awareness. Inclusion within the main body of the legislation under the responsibilities of the joint occupational health and safety committee or establishing a separate RSI subcommittee could also encourage familiarity and constructive action.

(c) Inclusion within an Established System

On a positive note, the regulation may have greater impact owing to its' inclusion within an established statutory system. Because the legislation has been in existence for almost twenty years, employers and activists are familiar with the focus and scope of the legislation. Pressure from the occupational health and safety committee enhances

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[349] Vivienne Walters and Margaret Denton, "Workers' Knowledge of their Legal Rights and Resistance to Hazardous Work", (1990) 45:3 *Relations Industrielles* 531 at 533. The authors found that forty four per cent of survey respondents "knew nothing about the [occupational health and safety legislation]."

[350] *Ibid* at 544. Walters and Denton state: "The policy-related implications of these data are that if we are to devote more attention to improving workers' knowledge of their rights, particular emphasis needs to be placed on women, non-unionized workers, and those with lower levels of education . . ."

[351] For a discussion of this issue see: George R. Heinmiller and George K. Bryce, "Occupational Health and Safety Provisions in Statute or Regulation?" Issues Paper #7, Royal Commission on Workers Compensation in British Columbia, September 1, 1997.

the likelihood of remedial measures. Because this framework has shaped workplace health and safety debates for over two decades, it provides a familiar platform to launch initiatives aimed at workplace health. In addition, Canadian unions are supportive of ergonomic standards. Their endorsement suggests that ergonomic regulations dovetail union efforts to achieve workplaces that are more humane. [352]

(d) Response to the Regulations

One of the most important achievements of the Saskatchewan ergonomic regulation is the emphasis placed on preventive measures. According to Pascarelli and Quilter, efforts directed towards the prevention of injury make the most sense. They state:

> Once people have damaged their soft tissues, they are always at greater risk for re-injury or chronic bouts of RSI. RSI can be prevented through education, ergonomics, and enlightened job design. RSI is far easier to prevent than cure, and if people don't heed this warning, all of society will eventually pay because its tax dollars will have to support permanently disabled people who otherwise would have led productive and self-sufficient lives.[353]

There is evidence to confirm that employers have been responsive to the health promotion message contained in the provisions. Prior to the enactment of Regulation 81, the Saskatchewan Department of Labour ensured that its policies complied with the Visual Display Terminal Code of Practice.[354] Staff underwent training on the

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[352] At a CUPE conference, Jacquie Griffiths, a National Health and Safety Committee member from Saskatchewan, stated: "Through our struggles we now have - for the first time in the history of Saskatchewan - legislation that covers public sector employees and that deals with violence, musculo-skeletal injuries, lifting and exposures to infectious materials and organisms". Canadian Union of Public Employees, Http://www.cupe.ca/topics/health-19971101-3p3.html.
Walker comments that CAW supported the development of the Saskatchewan and British Columbia regulation see Walker *supra* footnote 228 at 1.

[353] Pascarelli and Quilter *supra* footnote 132 at 12.

[354] Memo from Janis Rathwell, Assistant Deputy Minister, Saskatchewan Labour to Dave Ogram, Health and Safety Branch, October 26, 1994, outlining the Department's plan to ensure that "all staff are aware of the possible implications of VDT use and to ensure that all workstations comply with the VDT Code of Practice."

appropriate best methods for computer use. Departmental staff audited each workstation and purchased equipment purchases, where necessary. External efforts to comply with the Code of Practice and Regulation 81 occurred on a department by department basis meaning that there was no government wide strategy in response to the law.

(e) Staffing Issues in the Occupational Health and Safety Division

Notwithstanding the concern for ergonomics evidenced within Saskatchewan Labour, the Occupational Health and Safety Division staff lacks adequate time to devote to ergonomic concerns. The occupational hygienist that handles calls from employers inquiring about ergonomics reports that they average approximately one call per week.[355] Due to staffing constraints and time restrictions, health and safety officers handle questions about ergonomic considerations over the telephone. They are often unavailable to visit work sites to view and comment on the working arrangements. Inquirers receive a package of information in the mail that includes a standard letter, the regulations and Code of Practice, and supporting documentation on the incidence and treatment of repetitive strain injuries.[356] According to the standard letter, all employees who operate a visual display terminal in excess of 4 hours a day or 10 hours a week must be given a copy of the two page publication "Requirements for Visual Display Terminals and Visual Display Terminal (VDT) Operators," attached to the letter. The package contains detailed and valuable information. It is, however, complex and difficult to interpret. The absence of hands-on assistance forces

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[355] Interview with David Ogram, Occupational Hygienist, Saskatchewan Labour, July 15, 1999.

employers and workers to manage the delicate science of matching the human body to a machine. For some, discouragement or failure will result.

In its training course for union members, the Communications, Energy and Paperworkers Union of Canada stresses the importance of using qualified specialists when performing consultations.[357] The development of an effective plan is often beyond the skill level of ordinary staff. For example, a leading text on repetitive strain injury written by Pascarelli and Quilter, recommended to employers by Saskatchewan Labour, is two hundred pages and would require considerable time to read and synthesize before determining the appropriate action.[358] Given the challenges in treating these injuries, the availability of trained personnel to assist with the development of ergonomic programs would facilitate the implementation of successful programs. The Ford Motor Company of Canada agreed to hire a full time National Ergonomic Coordinator in 1996 during contract negotiations.[359] The CAW National President appointed the Coordinator to oversee ergonomic initiatives and to mediate concerns.[360] Appendix III reproduces the job description. This thesis recommends that Labour departments across Canada develop similar positions to assist workplaces with ergonomic problems.

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[356] Provided to the author by David Ogram.
[357] Communications, Energy and Paperworkers Union of Canada, Ergonomics, Participant Version, supra footnote 260 at 5.
[358] Emil Pascarelli and Deborah Quilter, Repetitive Strain Injury: A Computer User's Guide (New York: John Wiley & Sons, Inc., 1994).
[359] Contract Language Provided by Karen Clark, National Ergonomic Coordinator, CAW/ TCA.
[360] *Ibid.*

(f) Saskatchewan Telecommunications Corporation

In 1997, Saskatchewan Telecommunications (SaskTel) established four "state of the art" Customer Care Centres.[361] SaskTel referred to Regulation 81 and internal occupational health and safety guidelines. According to Tom Laird, General Manager, Customer Care, productivity "jumped enormously" upon the installation of ergonomically correct equipment.[362] The development of specialized workstations engendered commitment and professionalism because it sent the message that employees were valued. [363]

SaskTel established workstations with reference to ergonomic considerations and with input from staff. Ultimately, the company chose adjustable, electronically controlled desks that allow workers to occupy a standing, sitting or crouching position. Chairs, footrest, and electronic pads which allow the keyboards to be raised or lowered separately from the desks, wrist rests, comfortable head sets and other special equipment were purchased to maximize employee productivity and ease. Centre staff handle incoming calls from customers and promote SaskTel services on outgoing calls. Annually, the centres handle approximately twenty million calls per year.

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[361] Interview with Tom Laird, SaskTel General Manager, Customer Care, July 30, 1999.
[362] An additional benefit is the attention from other employers that the centre attracts. Over 778 persons representing local, national and international businesses visited the call centre in 1998 to examine the lay out and to explore ergonomic principles in the working space.
[363] Adjustable equipment also enables the hiring of disabled persons who can adust the workstation to accommodate wheelchairs, prosthesis' or multiple sclerosis outcomes. SaskTel is the largest "equity" employer among the Saskatchewan government Crown Corporations.

(g) Computer Monitoring at the Call Centres

Importantly, the Call Centres have not escaped the realities of the technological age as the Regina Call Centre monitors the activities of all personnel. It documents and routes incoming calls, noting the time a worker spends in response. The monitoring centre is a reminder that ergonomic efforts often exist in tandem with economic concerns. Measuring productivity through monitoring is common in modern corporations striving to succeed in competitive environments. By inference, companies sometimes enhance employee comfort to facilitate higher profits. Ergonomic principles make jobs in the contemporary workforce bearable yet more is required to ensure that the work is enjoyable and meaningful.

(h) The Need for Greater Clarity

Clearly, there have been positive consequences from the implementation of ergonomic regulations. For Saskatchewan Telecommunications, the guidelines served as a basis for health and safety achievements. While the SaskTel example demonstrates the regulation's positive influence, the fact that the corporation strengthened the legal requirements by enacting its' own policies points to limitations in the law. The brevity and absence of specifics in the regulation may leave employers and employees without clear direction. Arguably, the difficulties in assessing a bewildering array of products and recommended practices will deter even favorably disposed persons from implementing programs. Details on the components of a program could alleviate some of the confusion managers might feel in making decisions about the most effective practices. Owing to this, the Canadian AutoWorkers' prefers clear, prescriptive laws

that are easy to follow instead of vague, performance-based regulations.[364] In their view, obscure laws are subject to divergent interpretations, making it difficult to determine the level of activity needed for compliance.[365] The imprecise wording in the regulation leaves to employers the important task of determining the level of effort required by the legislation.

The succinctness of the provisions enacted in Saskatchewan may be beneficial given the difficulties in determining a formulaic response to repetitive strain injuries.[366] Because opinions vary on the most effective preventive efforts and treatments for these injuries, there are advantages to allowing firms to discovering the most effective approaches on their own.[367] However, flexible plans require review and evaluation by ergonomics consultants to achieve success.

(i) Saskatchewan Workers Compensation Board

Statistics from the Saskatchewan Workers Compensation Board reveal a growing reluctance to compensate workers with repetitive strain injury. This finding is unfortunate for claims for carpal tunnel syndrome increased between the years of 1987 and 1997.[368] In 1987, claimants completed 96 claims, with 77 or 80% allowed. In 1997, claimants prepared 254 claims with 76 or 30% allowed.[369] The growth in claims

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[364] Walker *supra* footnote 228 at 9.
[365] *Ibid.* They state: "Flexibility may mean that the employer will have the flexibility to comply (or not) with sound safe work procedures."
[366] According to Imrhan, no definitive policies have emerged. Imhran *supra* footnote 118 at 89.
[367] See the discussion in the Chapter V on the absence of a single solution to ergonomic issues.
[368] Saskatchewan Workers' Compensation Board, Carpel Tunnel Syndrome Statistics for Period, 1987 - 1996, Summary and Carpel Tunnel Syndrome Claims by Gender, 1990 - 1997.
[369] *Ibid.*

may result from increased reporting flowing from increased public awareness regarding repetitive strain injury.[370] The declining success rate in awards lends credence to the assertion that Workers' Compensation Boards are increasingly reluctant to recognize repetitive strain injuries.[371] The Workers Compensation Board granted over fifty per cent of claims before 1996. In that year (1996), the number allowed dropped to 31% per cent declining to thirty per cent 30% in 1997.[372] The figures are particularly disconcerting in relation to gender. On average, the Board denied female claimant's compensation twice as often as it did male claimants.[373] In 1997, for example, eighteen per cent of the claims made by women were successful compared to forty-three per cent of the claims made by men.[374] This finding suggests that a bias against women is operative in the development of policies and in the resolution of claims. Clearly, women urgently need research and policy initiatives on their occupational health and safety concerns.[375]

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[370] Repetitive strain injuries are often claimed to suffer from a domino effect where a diagnosis in a few workers leads to an "epidemic". Pascarelli and Quilter *supra* footnote 132 argue in contrast that reporting practices are rational. Workers see that their colleagues are injured and seek treatment for their discomfort. At 11

[371] Kome *supra* footnote 92; see Chapter 5 "Compensation? But You Don't Look Disabled", at 71-99. Communications, Energy and Paperworkers Union of Canada, Ergonomics, Participant Version supra footnote 260 at 5; George Rosenau, Manager, Saskatchewan Workers' Advocate indicates that he has attended conference and working sessions where this problem is identified and discussed.

[372] Saskatchewan Workers' Compensation Board, Carpel Tunnel Syndrome Statistics for Period, 1987 - 1996, Summary and Carpel Tunnel Syndrome Claims by Gender, 1990 - 1997.

[373] *Ibid.*

[374] *Ibid.*

[375] See for example Karen Messing, Barbara Neis and Lucie Dumais, Invisible: Issues in Women's Occupational Health (Charlottetown, P.E.I.: gynergy books, 1995).

Official documents distributed by the Board reveal antipathy toward the injuries.[376] One publication quotes Dr. Hadler, of University of North Carolina, a leading opponent of repetitive strain injuries.[377] He expresses strong doubts that workplace activities result in repetitive strain injuries, and questions the reason for seeking remedy under Worker's Compensation. He chastises surgeons for treating "these fearful, anxious, 'injured' workers," and claims that physicians use greater discretion with other injuries. The inclusion of disparaging remarks within official documents produced by the Workers' Compensation Board is suggestive of the attitudes that worker's face in submitting a claim. A significant portion of the Office of the Workers' Advocate's[378] caseload is devoted to appealing decisions that deny the claims of persons with repetitive strain injuries.[379] The Board frequently argues that the conditions result from activities performed outside of working hours.[380] That Board decisions are confidential and of no value as precedents makes it difficult to track its' reasoning.[381]

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[376] Repetitive Strain Injuries (Also Known as Cumulative Trauma Disorders, Overuse Injuries/ Syndrome and Carpel Tunnel Syndrome), Document Prepared by the Saskatchewan Worker's Compensation Board, provided to the author by the Saskatchewan Worker's Advocate.
[377] *Ibid.*
[378] The Worker's Advocate is a branch of Saskatchewan Labour that provides guidance and assistance to complainants who wish to strengthen or appeal claims before the Saskatchewan Worker's Compensation Board.
[379] Personal interview with George Rosenau, Manager, Worker's Advocate, Saskatchewan Labour, July 15, 1999.
[380] *Ibid.*
[381] George Rosenau reports that his office has been unsuccessful in obtaining internal policies on the handling of repetitive strain injuries, despite his repeated attempts to obtain the documents.

(j) The Promotion of Surgery by the Workers' Compensation Board

One reported case suggests that the Board is forcing complainants to undergo surgery as a remedy for carpal tunnel syndrome.[382] According to the case report, The Workers' Compensation Board suspended Crystal Sjodin's claim when pregnancy prevented her from undergoing the surgery that the Board deemed necessary to her recovery.[383] The case suggests when claims related to repetitive strain injuries are accepted, the Workers Compensation Board promotes surgery as a treatment option.[384] Surgery is a common and controversial treatment.[385] Pascarelli and Quilter are doubtful about the effectiveness of surgical interventions. They believe that tissue healing can only occur with time, rest and physical therapy.[386] The desire to have employee's return to work rather than concern for workers may prompt the Board to advocate surgery. The Saskatchewan Worker's Compensation Board's questionable response to repetitive strain injury underscores the importance of measures that seek to prevent and promote the most appropriate uses of computers.

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[382] "Plenty at Stake in WCB Case", [Regina] Leader Post (Saturday May 9, 1998) at A4.

[383] *The Workers' Compensation Board* v. *Alma Wiebe (Board of Inquiry) and the Saskatchewan Human Rights Commission*, (July 2, 1998), SK. No. 616 (Q.B.)[unreported]. The Saskatchewan Worker's Compensation Board presented to the Saskatchewan Court of Queen's Bench, arguing that the Saskatchewan Human Rights Commission did not have the authority to hear a discrimination case levied against it.

[384] The organization, Voice of the Blue Rose Advocacy, Inc. which describes itself as "A United Force Striving for Equal Rights and Justice for Injured and Disabled Persons", states that due to Workers Compensation Board policies: "Injured Workers are forced to submit to medical treatment under the threat of termination of benefits." Pamphlet, Regina Chapter.

[385] Pascarelli and Quilter supra footnote 132 at 77. The authors refer to the findings of Dr. Robert Markison, a hand surgeon and associate clinical professor of surgery at the University of California, San Francisco who advises caution, noting that surgeons are sometimes too ready to operate, even though non-surgical interventions are equally effective.

(ii) Ergonomic Regulations in British Columbia

British Columbia is the second province to address ergonomic issues in occupational health and safety law.[387] The Government of British Columbia enacted regulations in the "General Conditions" section of the Workers Compensation Regulations in the spring of 1998. The process in British Columbia was more involved and more controversial than in Saskatchewan. An advisory committee, established in 1992, spearheaded the consultation process. After extensive deliberations and comprehensive public meetings, the Province of British Columbia introduced draft regulations in 1994 aimed at reducing or eliminating the "human suffering and financial costs associated with ergonomic hazards on the job."[388]

(a) Impetus for Ergonomic Guidelines

The impetus for ergonomic guidelines resulted from the discovery that musculoskeletal injuries accounted for almost one third of the Workers Compensation Board claims in British Columbia.[389] The recognition of the high costs of ergonomic related injuries and diseases led to the preparation of draft regulations "to address the substantial and increasing incidence of adverse health effects to workers and resulting claims."[390] Official numbers identified back strains and repetitive strain injuries as particular

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[386] *Ibid.*
[387] B.C. Occupational Health and Safety Regulation, B.C, Reg. 296/97. The government provided a one-year "grace" period before enforcing the regulation.
[388] "BC draft ergonomics regs aim to minimize injuries", (July 18, 1994) 17:28 Canadian Occupational Health and Safety at 1.
[389] Workers' Compensation Board of B.C., The Secretariat for Regulation Review, Board of Governors, Draft Ergonomic Regulations, May 1994 at 1.
[390] Canadian Occupational Health and Safety *supra* footnote 338 at 1.

problems.[391] The objective of the draft regulations was eliminating or reducing "the risk of adverse health effects to workers through the application of ergonomic principles and methods in the workplace."[392]

(b) Evaluation of Risk Factors

Sections 2 and 3 of the draft regulations demanded that employers ascertain and assess conditions in the work environment that created deleterious health effects. Section 2 obliged the employer to (a) identify potentially harmful job characteristics, provide education on likely health effects and training on "procedures for reporting symptoms and injuries." Finally, section (c) of the draft regulation required employers to conduct a risk identification:

> . . . whenever a change in the work environment is planned or occurs, or newly available information indicates that workers may be at risk of adverse health effects from exposure to ergonomic factors.

Section 4 of the draft regulations listed the ergonomic factors that employers must consider when identifying and assessing risks: the physical demands of work; the layout and condition of the workplace or workstation; the characteristics of objects handled; the environmental conditions; the features of work clothing and personal protective equipment; and characteristics of the organization of work, identified as work schedules, work-rest cycles, job rotation and enlargement and work rate.

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[391] *Ibid.*
[392] *Ibid.*

(c) Additional Provisions

The original British Columbia plan directed employers in Section 4.51(1) to educate workers on the detrimental health consequences of failing to comply with ergonomic principles. Additionally, the draft Section 7 required employers to prepare a written plan outlining proposed actions to control risks related to ergonomic factors in the workplace. The stipulations in the draft regulations that follow up action occur was commendable because it reinforced the regulation's importance and underscored the need for concrete steps directed towards the elimination of injuries.

(d) The Consultation Process

The Ergonomics Subcommittee held extensive consultations on the draft regulations throughout British Columbia. Over 600 persons made representations during the review process with over half coming from employer representatives.[393] While most presenters acknowledged the importance of preventing musculoskeletal injuries in the workplace, there was resistance to the draft ergonomic provisions.[394] A typical opposing comment noted:

> We accept that there will be ergonomic regulations. However, we submit that the regulations as proposed are unworkable and impractical for the vast majority of businesses operating within the province. Business is looking for a reasonable and workable approach. [395]

One commentator expressed general agreement yet noted that his organization was

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[393] Workers' Compensation Board of British Columbia, Summary of Public Hearings on Draft Ergonomic Regulations and Associated Documents, February 1995, at 1.
[394] *Ibid.*
[395] *Ibid* at 2.

"somewhat disappointed that employer concerns have not been reflected to the degree satisfying the ultimate test of economic reality and practicality."[396] Other commentators believed that personal characteristics of employees and individual habits -- "obesity, age, wrist-depth/width ratio, hand dominance and exercise level" -- caused the injuries rather than work activities.[397] In this vein, one presenter queried: "How will non-work-related ergonomic practices be taken into account, such as gardening and bowling?"[398]

(e) Response of Worker Representatives

Responses from worker representatives were generally favorable to the draft ergonomic standards.[399] During the public consultation process, they made over one third of the presentations. A typical positive comment asserted: "The regulations are long overdue, well thought-out and essential."[400] Another concluded: "The regulations will encourage companies to take a proactive approach to ergonomics and have a potential to create and solidify a cooperative working relationship between employers and workers."[401] The regulations may have appealed to workers and their organizations due to the provision mandating consultation with workers in the development of ergonomic plans. Regulation 11 required the employer to consult with the occupational health and safety committee or the worker health and safety representative on: risk identification, assessment and control, the content and provision

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[396] *Ibid.*
[397] *Ibid* at 11.
[398] *Ibid.*
[399] *Ibid* at 1.
[400] *Ibid.*
[401] *Ibid.*

of worker education and training and evaluation of measures taken to comply with the regulations. In the performance of a risk assessment, section 11 (2) required consultation with workers performing the tasks under review and "workers with signs or symptoms of adverse health effects resulting from exposure to ergonomic factors."[402]

The Draft Code of Practice also stressed the role of workers in determining appropriate steps. It stated:

> Because ergonomics is about fitting the job to the worker, it is important to include workers in the process of identifying, assessing and controlling risks. Workers often know best the activities and tools that contribute to their pain, and have practical suggestions about how to eliminate or minimize the risk of adverse health effects.[403]

Ultimately, the government abandoned the original provisions due to opposition from employers' groups who argued that the regulations were too demanding.[404] They stridently opposed to the Code of Practice that accompanied the regulations, stating that it was too onerous and complicated. While it lacked the force of law, the Code of Practice outlined detailed guidelines on ergonomic programs and procedures.[405] The Draft Code of Practice addressed considerations related to conditions of work in a chapter titled "Organization of Work." Topics discussed were lengthy working hours, rest cycles, job rotation and task variation and rates of work. The Code outlined

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[402] Draft Ergonomic Regulations, *supra* footnote 389, Sections 5 11.1 (1) and (2).
[403] Draft Ergonomics Regulations, at 1-6.
[404] Paul Jay, "British Columbia Introduces Ergonomic Standards", (July 1998) Canadian Lawyer 37 at 38.
[405] *Ibid.*

methods and initiatives that employers were required to adopt to detect, appraise, and control ergonomic factors in the workplace.

In 1998, the Government of British Columbia abandoned the draft regulations in favor of a shorter, less exacting set. The eight regulations that remain appear within the "General Conditions" section of the health and safety regulations. The sections enacted include some of the draft provisions, like the one mandating consultation with workers. Others were omitted, with the Code of Practice.

(f) Overview of the Regulations Enacted into Law

The regulations begin by defining musculoskeletal injuries or "msi" in Section 4.46.[406] Sections 4.47 and 4.48 of the "Ergonomics Requirements" require that the employer identify and assess workplace risks. Section 4.49 outlines the risk factors. Section 4.50 requires that employers "eliminate" where practical or minimize "the risk of MSI to workers." Section 4.51(1) requires the education of workers who may experience harm in "risk identification related to the work, including the recognition of early signs and symptoms of MSIs and their potential health effects." Section 4.52 stipulates assessment and follow-up. It states:

> The employer must monitor the effectiveness of the measures taken to comply with the Ergonomics (MSI) Requirements and ensure that they are reviewed at least annually.

The regulation mandates employers remedy shortcomings "without undue delay."[407] This wording underscores the importance of remedial measures for it stresses

immediate action.[408] The delegation of authority to employers is, however, problematic for they may choose to comply nominally or not at all, with limited fear of sanction. The failure to mandate that employer's report to labour officials on the implementation of ergonomic initiatives is of concern. It suggests that managers are accountable to themselves rather than to governments and workers.

(f-i) The Business Lobby Against Ergonomic Standards

The adoption of less extensive regulation in British Columbia due to employer opposition reveals the power of the employer lobby in determining occupational health and safety outcomes. The American based Occupational Safety and Health Administration (OSHA) has waged a protracted battle to enact ergonomic regulations. OSHA began working on the issue of ergonomics almost twenty years ago.[409] However, the agency has been unsuccessful in implementing ergonomic regulations. In 1995, Congress prohibited OSHA from using its funds to finalize the draft ergonomics standards the agency prepared.[410] In February 1999, OSHA published revised ergonomic proposals.[411] The U.S. Chamber of Commerce immediately opposed the ergonomics draft arguing that scientific evidence documenting the need for standards

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[406] The definition of MSI is "an injury or disorder of the muscles, tissues, tendons, ligaments, joints, nerves, blood vessels or related soft tissue including a sprain, strain and inflammation, that may be caused or aggravated by work."
[407] Section 4.50(3).
[408] The use of the word "undue", however, qualifies the immediacy.
[409] OSHA Ergonomics Chronology, http://www.osha-slc/SLTC/ergonomics/chronology.html
[410] *Ibid.*
[411] CNN-"OSHA announces draft for national ergonomics program," February 19, 1999; http://cnn.com/US/9902/19/workplace.injuries.02/index.html.

was non-existent. The Chamber of Commerce also cited the potential costs to business of the programs.[412]

The British Columbia government's decision to retract more detailed standards and U.S. government's stalling tactics suggest that corporate rather than worker interests dominate the development of industrial policy. In contrast to earlier decades when organized labour's view was influential, contemporary policy makers frequently seek to accommodate business demands at the expense of labour.[413] Labour's relatively weak lobbying position is a common feature in the contemporary age due to declining union membership and the promulgation of the belief that unions detract from economic competitiveness.[414]

(f-ii) The Business Influence in Europe

Europe's efforts to harmonize health and safety efforts are praiseworthy yet the attention given to business concerns is a limitation. Vogel states the European Community employment guidelines' emphasis on greater "flexibility" and on "more concessions to employers ("promoting private enterprise")" curtails the achievement of occupational health and safety goals.[415] The policies advocated are particularly deleterious to workers. While failing to reduce unemployment, they intensify

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[412] *Ibid.*
[413] Robert Sass, "A Strategic Response to the Occupational Health and Safety Establishment", (1996) 26:2 *International Journal of Health Services* 355 at 366. According to Sass, "the major Canadian political parties have declared unions and workers a "problem" and have excluded unions from political decision-making in the political and economic realm."
[414] For a thorough discussion of the challenges faced by unions, see Mantsios, ed., *supra* footnote 107.
[415] Vogel *supra* footnote 39.

employment insecurity and diminish working conditions, factors that diminish health and safety.[416]

(iii) Reform Efforts in Ontario

Initiatives in Ontario, while not regulatory in nature, provide examples of co-operative strategies that have attracted business commitment. The Institute for Work and Health funded by Workplace Safety and Insurance Board (formerly the Workers' Compensation Board) has worked cooperatively with governments and organizations to develop strategies to address repetitive strain injury. The Institute holds that ongoing business competitiveness depends on healthy work and healthy workplaces.[417] It facilitates corporate health initiatives by conducting studies, by hosting collaborative forums and by translating research findings into action plans. Repetitive strain injury is a major focus of the Institute because the injuries account for a significant portion of lost time injuries.

(a) RSI Watch

A collaborative project called "RSI Watch" initiated by the Toronto *Star*, in cooperation with the Southern Ontario Newspaper Guild and the Institute for Work and Health is an example of corporate action in relation to repetitive strain injuries.[418] Concerns about these injuries prompted the Toronto *Star* to embark on a two-and-a-half year research project outlining the incidence and possible causes of repetitive

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[416] *Ibid.*
[417] Institute for Work and Health, Annual Report, 1997, http://www.iwh.on.ca/AR/annual.htm.
[418] Institute for Work and Health, Key Research: RSI Watch (Study of Repetitive Strain Injury), http://www.iwh.on.ca/key1.htm.

strain injury among staff members.[419] During the initial phase of the project, the research team distributed a questionnaire to all staff. The survey results indicated that fifty-one per cent of the respondents experienced "work aggravation due to pain."[420] Sixty per cent of persons reported suffering neck or upper limb pain. Following the work setting evaluation, the researchers made nine recommendations. The recommendations addressed factors like equipment and workstations, the design of work, work volume and other characteristics of the work organization. Other topics included in the recommendations were reporting mechanisms and steps for eliminating repetitive strain injuries.[421] The articulation of the recommendations marked the achievement of the project's second phase. The final phase of the project will involve the creation of an ergonomic policy, workstation evaluations, treatment monitoring, and education and training. [422]

(b) Multi-Stakeholder Forums

Hosting stakeholder forums to identify common strategies on RSI is a component of the Institute for Work and Health's work plan. In May 1998, the Institute for Work and Health held a conference attended by employers, worker representatives and researchers to share experiences and to develop a plan to treat and prevent injuries. The Institute held a follow-up conference in 1999.[423] At the conference's end, participants identified steps for the prevention and management of repetitive strain

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[419] Wansborough *supra* footnote 30 at 2.
[420] *Ibid,* Insert "RSI Effects."
[421] *Starbeat, supra* footnote 140 at 11.
[422] Wansborough *supra* footnote 30 at 2.

injuries. Ultimately, participants formed twelve groups to research a variety of topics -- improving diagnosis of injury, identifying best practices, engaging injured workers in prevention activities, and documenting costs incurred by these injuries.[424] The conference fostered collaborative relationships between stakeholders. It expanded participant knowledge on repetitive strain injuries, clarified differing opinions and views, assisted with the creation of stakeholder networks on the issue of RSI, and outlined an integrated approach to RSI prevention and treatment.[425]

(c) Fostering Management Commitment

While voluntary, the initiatives developed by the Institute for Work and Health foster commitment to health and safety achievements at all organizational levels. According to Hopkins, this factor is the central determinant of successful programs.[426] He states that while "Governments and their OHS agencies have devoted a good deal of energy to reforming their systems of regulation," the most significant challenge that authorities' face is not in perfecting standards, it is in focusing management's attention on the well being of workers. [427] In conclusion, he argues "Unless this is done health and safety performance will not improve, no matter how good the regulations."[428]

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[423] Toronto Institute for Work and Health, RSI Planning Committee Group, "Building a Common Ground on RSI: A Report on a Multi-Stakeholder Project to Better Prevent and Treat Repetitive Strain Injuries in Ontario", (Toronto: Institute for Work and Health, May 12, 1999).
[424] *Ibid.*
[425] *Ibid.*
[426] Andrew Hopkins, Making Safety Work: Getting Management Commitment to Occupational Health and Safety (Australia: Allen and Unwin, 1995) at 15. He maintains that it is more effective to assign responsibility to management rather than to workers because "holding management responsible is more likely to achieve the desired outcome than is blaming the victim."
[427] *Ibid* at 184. Example of state action are "developing codes of practice which have the approval of all parties concerned" and "achieving uniformity of regulation across all Australian jurisdictions."
[428] *Ibid.*

The Institute for Work and Health dedicates its resources to building the common ground that Hopkins views as essential. The Institute invites personnel at all levels to participate in policy making. It encourages a team approach that complements laws and regulations by building commitment at every organizational level.[429] The achievement of this objective is, however, difficult. The Institute of Work and Health reports that few employers attended the multi-stakeholder conferences held to address repetitive strain injuries, despite efforts to encourage their attendance. [430]

(d) Model Clause for Collective Agreements

The Canadian Autoworkers Union and Communications, Energy and Paperworkers Union of Canada (CEP) believes that management commitment to ergonomic initiatives can be fostered through the collective bargaining process. Consequently, it developed a model clause for collective agreements.[431] According to Brian Kohler, CEP National Representative, Health, Safety and Environment, recommended provisions are: A commonly agreed upon definition of ergonomics, joint education on the specifics of ergonomics, allowing the Joint Health and Safety Committee to resolve ergonomic matters, and union veto on the selection of ergonomic consultants, where used. Others clauses include the review of occupations by members of the Joint Health and Safety Committee trained in ergonomics, the preparation of ergonomic checklists for specific occupations and ergonomic assessment by the Joint Health and Safety Committee prior to the implementation of new equipment and prior to the

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[429] In advocating for increased employer involvement, this thesis is guided by Hopkins who sees regulation as an important adjunct to rather than a substitute for business commitment.
[430] Institute for Work and Health, RSI Planning Committee Group, *supra* footnote 422 at 8.

establishment of new occupations. [432] CEP's efforts give credibility to the position that the collective bargaining process is a useful means of reinforcing workplace health plans.

D. Conclusions

This chapter outlined examples of ergonomic initiatives in various jurisdictions. It summarized Canadian regulations and strategies. These policies and programs, the thesis submits, play a crucial role in promoting the health of workers in contemporary work settings. The next chapter evaluates the Canadian developments discussed in this chapter and outlines areas where further action is advisable.

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[431] Penney Kome, "Repetitive Strain Injury", Insert: Some Handy Advice on RSI, Herizons, Spring 1999, 18 at 19.

[432] Email Correspondence from Brian Kohler to the author, August 3, 1999.

Chapter V: Evaluation and Visioning

A. Introduction

This thesis explored the connections between technological innovation and occupational health and safety. Chapter II outlined labour market restructuring and the health consequences that result from computer use. Chapter III described the challenges that restructuring and technological innovation pose for occupational health and safety statutes. Chapter IV outlined Canadian ergonomic standards and included references to American and European legal responses. This chapter begins by commenting on the effectiveness of ergonomic standards in advocating for the health and safety of workers.

B. Discussion of Ergonomic Standards

Ergonomic standards demonstrate the degree of concern that exists about the high incidence of work related musculoskeletal injuries. They also reveal the confidence that governments and policy makers hold in intervention strategies. It is widely accepted that computer related injuries like repetitive strain injuries can be eliminated or reduced by the application of ergonomic principles.[433] Canadian standards are an important component of the global ergonomic "network." Besides contributing to an international strategy, they reinforce the efforts of Canadian unions and organizations to ensure that policy makers give appropriate attention to ergonomic concerns in the modern workplace. In promulgating the idea that the machines used in the workplace

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[433] See, for example, Pascarelli and Quilter *supra* footnote 132.

should fit the physical requirements of the worker, ergonomic regulations help to create a climate where the worker's comfort and welfare is valued and promoted.

C. Positive Aspects of the Regulations

(i) The Symbolic Role of Law

In her discussions on the importance of legal recognition for sexual harassment, Farraday stresses the symbolic value that the law plays in highlighting an issue and in molding societal thinking about that problem.[434] She states:

> Law is an enormously powerful discourse, both ideologically and practically. It distributes social power and structures the ways in which we understand and value experiences by granting public legitimacy to particular ways of interacting. Legal rights are normative: they identify the boundaries of acceptable social interaction, shape an individual's sense of self, and impose a social responsibility to achieve in practice the ideals that are articulated in formal laws. Legal rights thus have intrinsic value because, once articulated as formal principles, they change the way society identifies injuries and recognize an entitlement to restitution.[435]

Following Farraday's reasoning, the inclusion of "musculoskeletal injuries" in the laws of Saskatchewan and British Columbia is an important symbolic achievement. Recognition in a well-established and powerful institution, like law, is an important tool in the hands of sufferers seeking recognition and treatment for their injuries. Chapter II discussed the problems individuals encounter in convincing health care professionals of the significance of their injuries. Sufferers traveled a "pilgrimage of pain" where their efforts to obtain treatment and understanding were often dismissed

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[434] Farraday, *supra* footnote 264 at 36.
[435] *Ibid.*

and disregarded.[436] The regulations may help to diffuse the skepticism that injured workers frequently encounter.

As Farraday comments, the law has tremendous authority as a public policy instrument. The acknowledgment of "musculoskeletal injuries" in occupational health and safety law shapes public attitudes and may generate positive responses to computer related workplace injuries. The enactment of standards is one step towards the elimination of computer related workforce injuries. The literature documents a tendency for sufferers to "work through the pain", often causing further harm.[437] According to Pascarelli and Quilter, repetitive strain injuries often take people by surprise because the majority of victims dismiss their symptoms until they are in significant pain or notably incapacitated.[438] By the time professional help is sought, serious damage has often occurred to the soft tissues.[439] Legitimizing these injuries in law may reduce the injuries through preventive efforts. Additionally, it may encourage individuals to identify and report their discomfort in the early stages reducing the likelihood of serious harm.

(ii) Practical Benefits of Ergonomic Regulations

The positive implications of ergonomic regulations are practical as well as symbolic. With the adoption of appropriate measures, repetitive strain injuries are preventable.[440] A successful program requires that workers and managers identify and correct

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[436] Reid, Ewan and Lowy, *supra* footnote 115 at 601.
[437] Stigliani *supra* footnote 120 at 63.
[438] Pascarelli and Quilter *supra* footnote 132 at 21.
[439] *Ibid.*

improper behaviors and deleterious factors in the work environment.[441] There is significant evidence that ergonomic approaches have positive implications for the health of workers. OSHA cites numerous examples of successful ergonomics programs.[442] The American Company 3M discovered that, for example, musculoskeletal injuries improved in ninety per cent of the cases reported when it introduced a company wide ergonomic program in 1991.[443] Five years after the installation of the program, recorded cases of injury decreased by 22 percent and lost-time cases decreased by 58 percent.[444] Similarly, Saskatchewan Telecommunications reported productivity gains and increased worker satisfaction after the installation of ergonomically correct equipment in its' Call Centres.

The regulations in Saskatchewan and the British Columbia impose a specific duty on employers to assess risks and to act to eliminate or reduce injuries. Additionally, training workers on safe practices is required. If employers follow the spirit of the legislation, it is likely that positive health and safety outcomes will result.

D. Limitations of Ergonomic Standards

While important, Canadian ergonomic regulations and others contain problematic features. First, the attention given to a particular type of workplace injury is disconcerting. Studies document the prevalence of other harmful conditions in the

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[440] Kome *supra* footnote 92 at 9.
[441] *Ibid.*
[442] Occupational Safety and Health Administration, U.S. Department of Labour, "Real Solutions", June 22, 1999; http://www.osha_slc.gov/SLTC/ergonomics/solutions.html.
[443] Occupational Safety and Health Administration, *Ibid*, (Technical Links);"3M Institutes Ergonomic Program, Reduces Injuries"; February 19,1999; http://www.osha-slc.gov/SLTC/ergonomics/3m.html.

modern workforce where "new technologies and possibly more insidious health concerns are arising."[445] In highlighting one condition, the law provides a particular type of workplace injury with a privileged position in the occupational health and safety debates. The legislation fails to specifically address an entire subset of important work related illnesses and injuries, including stress related conditions, chronic fatigue syndrome, sick building syndrome and others.

Measures that address the full scope of workplace harm require dramatic alterations to existing power structures and to the internal working environment.[446] The predominant solutions to repetitive strain injuries are purchasing appropriate equipment, implementing regular breaks and other approaches that focus on the physical aspects of work. While important, these measures treat occupational health and safety as a neutral science rather than a conflicting ground of class interests. Ergonomic standards downplay the socio-political context of worker health by defining occupational health and safety matters as technical issues that can be resolved through the application of detailed procedures.[447] Ergonomic regulations impose a template on workplace health issues that reinforces the view that occupational health is a science governed by rigorous methodolgy. This approach obscures the experiences of workers.

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[444] *Ibid.*

[445] Polanyi, Eakin, Frank, Shannon and Sullivan, *supra* footnote 31. At 8 it is stated: "These include "problems associated with the use of video display terminals, violence in the workplace and 'sick building syndrome'. Soft tissue injuries, many of which may be associated with computer keyboarding, now make up almost half of all workplace injuries in Canada. Finally, psychological and psychosocial problems are playing a larger role as demands for worker productivity increase."

[446] See the articles by Robert Sass, cited in this thesis.

[447] Harley D. Dickinson and Mark Stobbe, "Occupational Health and Safety in Canada", in B.Singh Bolaria and Harley D. Dickinson, Eds. Sociology of Health Care in Canada (Toronto: Harcourt Brace and Jovanich, 1987) at 435.

Consequently, the model works to marginalize workers' concerns and to silence their opinions. Sass' criticizes the tendency in occupational health and safety law to direct the debates towards a narrow list of subjects. In this manner, the law reinforces particular solutions. Sass states:

> The law and regulations, by colonizing worker concerns, close down their conversation about the hazards and risks and their knowing and learning about their work environment. Further, they close down a potential communal act necessary to open up the condition for the possibility of meaningful participation in the correction of the concerns. Instead, the conversation shifts to the law and regulations as the 'authority' and way of knowing from the realm of experience.[448]

Sass' reasoning has application to ergonomic regulations. Ergonomic standards focus attention on certain types of injuries. Because the regulations frame problems narrowly, the solutions proposed to remedy harm exclude factors in the work environment. Thus, power relationships and working arrangements remain intact. Sass argues that effective solutions address work environment matters, like "how the work is organized, the design of the job, pace of work, monotony, scheduling, sexual harassment, job cycle and similar work environment matters of concern to workers."[449] Governments have not adopted Sass' recommendation on extending the law's scope. Ergonomic regulations, while groundbreaking in their efforts to fit machines to

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[448] Robert Sass, "A Conversation About the Work Environment", (1995) 25: 1, *International Journal of Health Services* 117 at 123.

[449] Robert Sass, "Workplace Health and Safety: Report from Canada" (1986) 16:4 *International Journal of Health Services* 565 at 571.

worker's needs and capacities, promulgate scientific rather than more worker oriented solutions.[450]

The prime limitation in the Canadian regulations is their failure to include workers as active agents in the identification of problems and in the development of remedies. The British Columbia law is the stronger of the two Canadian provisions because it obligates employers to consult with workers. Obtaining comments is desirable because workers are capable of developing detailed action plans based on their knowledge and experiences. Generally, programs that workers help to create meet with greater success than "official rules and regulations on hygiene and safety."[451] Workers frequently receive decisions made by managers with apathy and disinterest.[452] The implementation of effective occupational health and safety programs is dependent upon "both empirical knowledge and the common sense experience of workers."[453] Initiatives proffered by management eliminate the employee views that are essential to success. To remedy this, the educational materials of the Communications, Energy and Paperworkers Union of Canada advocate for worker participation in the development of ergonomic solutions.[454] The course manual urges participants to remember that

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[450] Factors like chair height, closing or opening blinds, terminal positions are among the few matters that workers control. The imposition of regulations in an authoritarian manner is likely to be resisted by workers. The author thanks Gary Brown, Saskatchewan Labour, for this insight.
[451] Cassou and Pissarro, *supra* footnote 253 at 149.
[452] *Ibid.*
[453] *Ibid.*
[454] Communications, Energy and Paperworkers Union of Canada, Ergonomics, Participant Version supra footnote 260 at 5.

"the true experts in any workplace, the people who know more about its problems than anyone, are those who work there."[455]

(i) Need for an Evaluation Mechanism

The absence of an evaluation mechanism to assess the Canadian regulation's effectiveness hampers its success. The British Columbia provision requires that certain activities occur as follow up to the implementation of the regulations yet there is no specific reference to an evaluation process. The RSI Watch committee that studied repetitive strain injuries at the Toronto Star proposes such a process. It recommend that the *Star*:

> Develop a systematic work assessment and workplace follow-up strategy to document successes and failures, possibly through the joint health and safety committees or RSI Watch Committee.[456]

The Canadian regulations, it is submitted, would be enhanced by the inclusion of similar provisions. In the absence of an evaluation process, it is difficult to determine the impact of the ergonomic initiatives on the workplace and to assess the merits of particular approaches.[457]

(ii) Canadian Regulations as a Component of Occupational Health and Safety Law

A further concern with the regulations is that they fail to address the concerns raised on occupational health and safety law. Because that discussion occurred in Chapter

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[455] *Ibid.*
[456] *Starbeat* at 40.
[457] According to Norman and Wells, there are few good studies evaluating ergonomic initiatives. Robert Norman and Richard Wells, "Ergonomic Interventions for Reducing Musculoskeletal Disorders: An Overview, Related Issues and Future Directions", Royal Commission on Workers'

III, this chapter does not repeat it. It is important to stress, however, that Canadian ergonomic regulations build on laws that incorporate practical and conceptual weaknesses. In addition to addressing these concerns, governments could strengthen ergonomics regulations by amending occupational health and safety laws to address the workers who labour outside of the scope of protective legislation.

E. Private versus Public Regulation

The preceding provisions discussed the strengths and limitations of ergonomic regulations. A debate that is pressing is whether private or public agencies are the most appropriate to govern occupational health and safety programs. While private corporations make an important contribution to workplace health promotion, this thesis argues that these programs are a complement to rather than a substitute for government regulation. According to Mogensen:

> . . . the privatization of occupational health and safety policy leaves workers with little protection against the vicissitudes of market conditions. Complaints that occupational safety and health protections are too expensive to justify their expense are, in effect, calls to transfer more of the costs of production to workers and society in the form of increased incidences of illness, injury and death.[458]

The existence of ergonomic regulations in Canada shows that governments are continuing in their role as protectors and promoters of workplace well-being. They are increasingly carrying out this function within a hostile climate. Hesitant compromises are often the result.

Compensation in British Columbia, May 1998, http://www/qp.gov.bc.ca/rcwc/research/norman-wells-intervention.

[458] Mogensen *supra* footnote 3 at 6.

(i) The Importance of Continued State Involvement in Occupational Health and Safety

Swinton argues that government involvement in occupational health and safety is necessary to its ongoing effectiveness.[459] She states that effective reforms require the support of government. In her view, the state plays an important role in setting and enforcing standards and in seeing that workers are properly educated on workplace issues related to their well being. She concludes her article with the statement that "the interaction of private and public ordering" is essential to the success of health and safety regulation.[460]

Polanyi, Eakin, Frank, Shannon and Sullivan argue in favor of strong governmental support for workplace health.[461] They assert that governments should play a leadership role in promoting workplace health regardless of the difficulties that the global economy poses to this objective. Governments create conditions that allow and encourage firms to make health enhancing organizational change (e.g. offering incentives for better workplace health) and enforce minimum standards of workplace health (psychosocial as well as physical). The authors conclude that:

> Governments should play a role of leadership rather than resorting to claims of powerlessness in [the] face of global economics and market forces, and find ways to ensure that workforce health is not compromised by concern for economic competitiveness.[462]

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[459] Swinton *supra* footnote 207 at 175.
[460] *Ibid.*
[461] Polanyi, Eakin, Frank, Shannon and Sullivan, *supra* footnote 31 at 31.
[462] *Ibid* at 35.

Occupational health and safety law is a particularly important vehicle for mediating the concerns of industry, government and workers. The existence of legislation works to ensure that profit making does not subsume concerns for the welfare of workers. State involvement promotes occupational health and safety with consideration for the quality of workers' life. It reinforces the fact that "occupational health is not a corporate objective as such."[463] Leaving the administration and governance of occupational health and safety to corporations could encourage them to advance the welfare of workers to achieve higher productivity and profits. Occupational illnesses and injuries reveal the "strains" that result from the contemporary structure of work. The ergonomic regulations discussed in this thesis are a means of revitalizing the commitment to the welfare of workers. In addition, strategies, like ergonomics standards, underscore the integrity and sanctity of workers' bodies.

F. The Need For A Broad Policy Response to Workplace Health and Safety

Government involvement in occupational health and safety allows for the development of a broad policy response to health related issues. Vogel states: "occupational health does not stop at the factory gate: combating gender inequalities, job insecurity and unemployment, setting public health objectives which address working conditions all necessarily transcend the workplace."[464] His comments highlight the importance of interdisciplinary collaboration on occupational health and safety. Health departments and policy makers are recognizing the importance of co-operative approaches to individual and societal well being. A Report by the Federal, Provincial and Territorial

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[463] Vogel *supra* footnote 39.

Advisory Committee on Population Health is one of a growing number of documents that emphasize work as an important determinant of health.[465] Studies of this type note that activities in the workplace have bearing on the individual's physical and mental capacity to enjoy life. The Report states: "Workplace injuries and occupational illnesses exact a large toll on the health of workers across Canada."[466] It notes that 423,000 workers received compensation for occupational injuries in 1993.[467] The extent of workplace claims led the authors to conclude that the protection of worker's health is an essential role for governments, policy makers and industry.[468] Studies of this type illustrate the growing awareness of the workplace as an important determinant of health. Because governments have a broad policy mandate, state involvement makes it possible to work across disciplines to develop comprehensive programs that seek to eliminate occupational harm.

(i) Public Health Responsibility for Workplace Health

Researchers are beginning to call for the expansion of the public health mandate to cover a broad spectrum of areas, including employment matters. Raphael, for example, notes that social inequality is the most pressing public health issue because it leads to social disintegration, individual malaise and increased mortality and morbidity.[469] Because he asserts that "economic inequality and its effects" are subjects within the

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[464] *Ibid.*
[465] Federal, Provincial and Territorial Advisory Committee on Population Health, Report on the Health of Canadians, (Toronto, Ontario, September 10-11, 1996) at 1.
[466] *Ibid* at 71
[467] *Ibid.*
[468] *Ibid*
[469] Dennis Raphael, "Public Health Responses to Health Inequalities", (November-December 1998) 89:6 Canadian Journal of Public Health 380 at 380.

mandate of public health, Raphael argues for the adoption of political strategies that address social issues as a component of public health.[470] In his view, public health should act as an ombudsman that investigates the implications of government health policy. Public health, says Raphael, should fulfill three functions: encouraging individual and community participation in health matters, advising on the development of healthy public policy and assessing the health consequences of government activity.[471] Raphael's findings suggest that significant overlap exist between the policy imperatives in occupational and public health. Both sectors are grappling with and attempting to implement policies that address the health implications of massive reorganization. To fulfill the political mandate envisioned by Raphael, governments could expand the role of public health inspectors to include shared responsibility for workplace safety and health through amendments to provincial public health acts. At present, the officers have a broad mandate to eliminate the spread of illness and disease in the community and to promote "public health." These officials could work cooperatively with labour departments to scrutinize workplaces, including the homes of teleworkers, to enforce ergonomic standards. The San Francisco Ordinance referred to in the last chapter granted the Director of the Department of Public Health of the City and County of San Francisco the power to:

> . . enter upon or into the premises of any employer . . . who employs one or more VDT operators to inspect said premises for compliance with this Article.[472]

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[470] *Ibid.*

[471] *Ibid* at 381.

[472] Section 1311, San Francisco Health Code, Video Display Terminal Worker Safety, HL-201, 3-91, (Added by Ord. 405-90, App. 12/27/90)

Because work is a leading determinant of health, policy makers should encourage collaboration between the various sectors to promote the well being of workers. The Government of Saskatchewan has taken steps in this direction for in the spring of 1999, it established an occupational health clinic in Saskatoon.[473] The Department of Labour and the University of Saskatchewan jointly fund the clinic. A Chief Occupational Medical Health Officer will lead research on the causes of occupational ill health and will assist with the development of regulations and guidelines aimed at prevention.[474] This cooperative effort demonstrates the collaboration between the health and labour sectors advocated in this thesis due to the possibility it presents for thoughtful and creative responses.

(ii) The Absence of a Single Solution to Ergonomic Issues

Assuming ongoing government regulation, the remaining dilemma is determining which of the myriad ergonomic approaches is the most effective and supportable. A range of players have developed ergonomic standards, from human factors organizations and occupational health professionals to trade unions, municipalities, national and international governments. The depth and scope of ergonomic guidelines makes it difficult to suggest one approach for all situations. Attempts to outline detailed blueprints in law met with derision in the United States and British Columbia. Furthermore, the international community has not reached agreement on the most effective approaches to computer use.[475] Imrhan cautions against the identification of

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[473] "New Occupational Clinic in Saskatchewan," 25 *Canadian Employment Safety and Health Guide*, June 1,1999 at 6.
[474] *Ibid.*
[475] Imrhan *supra* footnote 118 at 89.

detailed specifications on matters that are still under review.[476] Dr. Terry Sullivan, President of the Institute for Work and Health, advocates against the search for a "silver bullet" solution capable of resolving all health problems related to computers.[477]

Mogensen endorses the American based National Institute for Occupational Safety and Health (NIOSH) elements for safe computer use.[478] These are appropriate lighting (adjustable lighting is preferred) and the use of glare shields and backrest supports. Adjustable tables and chairs are essential along with detachable keyboards. In relation to the work structure, several provisions are key. Flexible scheduling is necessary - workers need mandatory breaks after two hours of work or one hour of intense work. Guidelines should require eye tests for workers when they commence employment involving extensive VDT use. Follow-up tests should occur periodically throughout the course of the users' career. The provisions should facilitate the transfer of workers experiencing health problems to other types of work. Monitoring should not be used to foster competition between workers.[479] In addition, Alcalay and Passick encourage employers to include workers in decision making on the selection of equipment.[480] This strategy helps workers to feel a sense of control thereby minimizing the likelihood

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[476] *Ibid.*

[477] Institute for Work and Health, "Understanding the Mystery of Multiple Causes of RSI Can Lead to Better Prevention and Cure", News Release, Toronto, Ontario, June 15, 1998. Sullivan states that because RSI is caused by multiple factors, 'no single chair, social support or incentive will cure the problem.' http://www.iwh.on.ca/rel_1.htm.

[478] Mogensen *supra* footnote 3 at 143-144 citing the NIOSH Recommendations contained in House Committee on Education and Labor, OSHA Oversight: Video Display Terminals in the Workplace: Hearings Before the Subcommittee on Health and Safety, 98th Cong., 2d sess., 1984, 16-19.

[479] *Ibid.*

[480] Rina Alcalay and R.J. Pasick, "Psychosocial Factors and the Technologies of Work", (1983) 17:16 *Soc. Sci. Med* 1075 at 1082.

of stress and stress related injuries.[481] While it is unlikely that Canadian governments will want to propose one approach, it is recommended that health and safety officers familiarize themselves with the NIOSH recommendations to encourage their use in appropriate situations. Studying the Swedish and Norwegian approaches could be helpful in promulgating examples of expansive programs. The involvement of workers in equipment purchases is another recommended option.

G. The Development of a National Initiative

The development of a national program that parallels the European model is worthy of consideration in Canada. A consistent regulatory approach would provide uniform protection to workers against computer related work injuries. The cooperation federal and provincial governments demonstrated in relation to the Workplace Hazardous Materials Information System (WHMIS) in 1987 set the precedent for a national program in relation to labour matters.[482] It required full disclosure on hazardous materials or products used in the workplace and mandated training for workers in handling dangerous materials or products.[483] Notably, provincial and territorial governments implemented separate legislation and regulations in relation to WHMIS. The WHMIS program shows that harmony is possible in the area of labour law.[484]

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[481] *Ibid.*
[482] See: Paul L.S. Simon, Hazardous Products: Canada's WHMIS Laws, 2nd Editon (Ottawa: CCH Ltd., 1989).
[483] *Ibid.* Recent British Columbia amendments, however, replaced the WHMIS Regulations, see Paul Jay *supra* footnote 404 at 37.
[484] Fudge *supra* footnote 52 at 11.

The implementation of universal ergonomic standards deserves equivalent national attention. The creation of comparable federal and provincial standards would underscore the importance of health and safety in Canada. Importantly, the development of a national vision that corresponds with the best international practices would underscore the need for consistent labour policy across the country. This development could lead to concordant policies between labour departments and Workers' Compensation Boards in relation to repetitive strain and other injuries.

H. Conclusions

The preceding paragraphs outlined initiatives directed towards computer related workplace illness in Canada and other jurisdictions. An achievement of the regulations in Saskatchewan and British Columbia is their contribution to a global movement that promotes the welfare of workers through ergonomic standards. In addition, they place importance on the recognition and prevention of computer related injuries, thereby ensuring that occupational health and safety concerns are not "lost" in the modern policy debates. Cathy Walker of the Canadian Auto Workers Union urges further governmental action, stating:

> . . . workers are at serious and increasing risk of musculoskeletal injuries. Employers must be compelled to use ergonomics to protect workers from these painful and disabling injuries. The time for detailed, prescriptive ergonomics regulations to be promulgated and stringently enforced in all Canadian jurisdictions is now.[485]

Following Walker, ergonomic regulations promote healthy practices in relation to computers and other technologies. They augment the general legal duty placed on

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[485] Walker *supra* footnote 228 at 15.

employers to maintain workplaces that are free from harm. Additionally, they help ensure the continued relevancy of occupational health and safety legislation within the changing world order. If enacted as a component of updated laws and with appropriate attention to psychosocial concerns, the regulations are a powerful tool for the achievement of workplace health and safety.

Chapter VI: Key Themes, Recommendations and Conclusions

A. Key Themes

A central theme of the thesis was the ongoing importance of policies that promote the welfare of workers. Workplace harm has not disappeared with the shift towards knowledge based work. Significant health problems are ongoing and tend to elude traditional occupational health and safety frameworks. A second important theme focused on ergonomic standards as the predominant legal response to modern occupational health and safety issues. At the micro-level, this strategy is likely to have a positive impact on the health and safety of workers if reinforced through thoughtful plans incorporating ergonomic fundamentals. At the macro-level, ergonomic regulations are not a complete answer to the varied health concerns that flow from the casualisation and reorganization of the labour force.

B. Recommendations

A number of recommendations proceed from the discussion contained in the previous pages of this thesis. Firstly, it is recommended that provincial, federal and territorial governments work jointly to develop a national ergonomics program. The harmonized regulations that result should be stringent enough to provide adequate protection without sacrificing the ability to meet the unique needs of particular workplaces. It is essential that regulations are enacted in keeping with the latest research findings and information. Additionally, the regulations brought into force by federal and provincial governments should: incorporate provisions that mandate the meaningful participation of workers; outline mechanisms for evaluation and assessment of the standards; and

should address workers, working situations and health issues currently outside of the scope of protective legislation. It is further recommended that provincial, federal and territorial governments work jointly to develop policies and practices that compliment and support ergonomics regulations. Strategies to consider are:

(i) The creation of ergonomics units in provincial labour departments; the units must have staff with specific knowledge of and responsibility for ergonomic issues; familiarity with NIOSH programs and with Swedish and Norwegian approaches is encouraged;

(ii) The development and implementation of educational programs for workers and managers;

(iii) The creation of cooperative working arrangements with a cross section of stakeholders to foster understanding and commitment to occupational health and safety issues in the workplace. While management support for programs is essential, policy makers should consider the concerns of employers and employees in the creation of workplace health and safety standards;

(iv) The expansion of the duties of public health officials to include workplace and home inspections to increase compliance with health and safety measures particularly ergonomic considerations;

(v) The establishment of collaborative projects that approach workplace wellbeing from an interdisciplinary approach, such as the occupational health clinic in Saskatchewan.

Finally, it is recommended that provincial, federal and territorial governments revitalize occupational health and safety laws to ensure their relevance in light of the dramatic changes that have occurred in the workplace. [486]

C. Conclusions

This thesis began with the assumption that the "gifts of the chip" are ambiguous. It discussed the impact of labour market reorganization on the structure of work and on the profile of workplace health and safety. That the changes wrought by automation undermine the occupational health and safety frameworks that emerged in the 1970's, emphasizing collective and co-managed responses to workplace issues, was a central argument. Modern illnesses, like repetitive strain injury, also challenge legal frameworks due to their fragmented development and the skepticism that health professionals demonstrate towards them. Innovative strategies have emerged in the face of these potential obstacles, including the enactment of ergonomic regulations. These measures are a crucial step towards the elimination of contemporary workforce injuries. They emphasize the state's continued commitment to health promotion in the

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[486] In reviewing and updating occupational health and safety law, governments should consider the ideas and recommendations in the report, Collective Reflection on the Changing Workplace. It made several recommendations about labour standards that have relevance to the occupational health and safety context. The Advisory Committee on the Changing Workforce who authored the report identified a number of legislative goals: The establishment of a base of legal rights adaptable to various sectors, the creation of training opportunities, the development of public policies on working hours, the promotion of various modes of worker representation in labour legislation, revised polices on social benefits that address access and portability and work skills development. Finally, the Committee recommended that governments "promote and facilitate the institution building for a wider continuing dialogue on issues related to the changing workplace.

Collective Reflection, A Report by the Advisory Committee on the Changing Workforce, Final Report (Ottawa: Human Resources Development Canada, July 7, 1997) http://www.reflection.gc.ca/report_e.html see Chapter 9: "Conclusions and Recommendations," http://www.reflection.gc.ca/report/chap9_e.pdf.

workplace and reinforce the objectives of the occupational health and safety statutes. Therefore, strengthening ergonomic regulations in Saskatchewan and British Columbia and enacting similar provisions in other provinces was strongly encouraged. The thesis also recommended the review and revitalization of the health and safety laws to ensure their relevancy to an automated, global workforce.

Massive labour market restructuring and the altered profile of workplace health and safety have rendered the workplace absent of clear policy directives and legal norms. Consequently, modern workers are dealing with the ramifications of technological innovation in an uncertain climate that is suggestive of the transition from the Stone Age to the Bronze Age described in The Gift of Stones, cited in Chapter I. The workers in Crace's novel demonstrate the fortitude and resourcefulness that modern workers must cultivate to counter balance the detrimental effects of the Post-Industrial Age. At the novel's end, the handful of remaining villagers set out to find a new existence, with the village story- teller as their guide. Although the leader had journeyed only slightly beyond the village than most, he accepted the task of "inventing a future" for himself and the others.[487] The guide's vision of the future was ambiguous. In attempting to picture it, few images were clear:

> He closed his eyes and what he saw was the shingled margin of the sea with horses wild and riderless close by. He tried to place a sail upon the sea, but could not. He tried to fill the air with human sounds. But all he saw were horses in the wind, the tide in loops upon the beach, the spray-wet rocks and stones reflecting all the changes in the sky . . .[488]

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[487] Crace *supra* footote 6 at 169.
[488] *Ibid* at 169-170.

Similar uncertainty permeates the fate of modern workers. Given the rapidity of change, the development of definitive policies promoting workplace health is an elusive goal. The ergonomic standards outlined in this paper are guideposts in relation to occupational health and safety for employees in the uneven terrain of the Post-Industrial work world. By revising and strengthening occupational health and safety laws through ergonomic standards and through comprehensive amendments, rule makers can help to ensure that concern for the welfare of workers is an ongoing feature of social policy.

Appendix I: Types of Repetitive Stress Injuries

Illness	Other names	Primary Area Affected	Type	Symptoms
Bursitis		Shoulder, elbow	Connective tissue	Grinding sensation, pain or irritation, restricted motion
Carpel Tunnel Syndrome	CTS, writer's cramp, occupational neuritis, partial thenar atrophy, median neuritis	Wrist and hand	Nerve	Nerve tingling, pain or numbness in the area of the hand served by the median nerve - the thumb, the pointing finger, the middle finger and the half of the ring finger closest to the middle finger. Sensations also occur in the palm and back of the hand. In more advanced CTS, the pain can be excruciating. Symptoms are often severe during sleep. Loss of sensation, notably a feeling of clumsiness and loss of sensitivity to hot and cold.
Golfer's Elbow (Medial epicondylitis)	Tendinitis	Inside of the elbow	Connective tissue	Pain or irritation on the inside of the elbow, may radiate down the arm

Myositis	Muscle inflammation	Arm	Muscle	Aching, tiredness.
Raynaud's syndrome	Raynaud's Phenomenon,	Hands and fingers	Vascular	Sensitivity to cold Pale or white or blue hands, particularly following exposure to cold Occasional tingling or numbness, can lead to loss of sensation and control
Tenosynovitis	Tendosynovitis, tendovaginis, tenovaginitis, peritendinitis	Any tendon	Connective tissue	Pain or irritation, particularly while using the hand or arm. Swelling can occur.
De Quervain's Disease	De Quervain's syndrome, De Quervain's disorder	Side and base of thumb	Connective tissue	Aching in afflicted area. Weakness in thumb. Loss of muscle tone (muscle atrophy).
Trigger Finger	Stenosing tenosynovitis crepitans	Forearm	Connective tissue	Pain in the forearm or wrist. Snapping or jerking movement of one or more fingers. Rattling or crackling sound in hands or wrists.

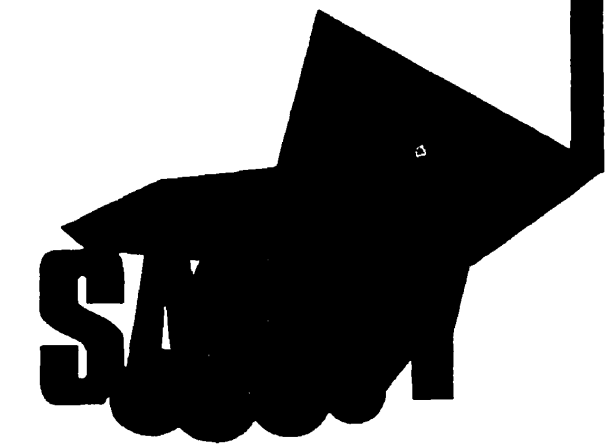
Tendinitis	Tendonitis	Forearm, elbow, shoulder	Connective tissue	Pain or irritation, particularly while using the hand or arm.
Thoracic Outlet Syndrome	Neurovascular compression syndrome, hyperabduction syndrome, cerviobrachial disorder, brachial plexus neuritis, costoclavivicular syndrome	Shoulder, arm, hand	Neurovascular	Tingling and/ or numbness in the fingers and hands. Weak hands. Atrophying muscles in the hand. Pale or bluish hands (as in Raynaud's syndrome). Arm pain. Chronic tired arms.
Ulnar Nerve compression at the elbow	Cubital tunnel syndrome, cubital outlet syndrome, cubital canal syndrome, beer drinker's arm, telephone operator's arm	Elbow, forearm, hands	Nerve	Tingling, pain or numbness in the area served by the ulnar nerve, particularly the little finger and the half of the ring finger closest to the little finger.
Ulnar Nerve entrapment at the wrist	Guyon's canal syndrome, Guyon's tunnel syndrome	Wrist and hand	Nerve	Decreased strength

Adapted from Chicago Legal Net.com (http://www.chicagolegalnet.com/rsi.htm)

Saskatchewan
Labour
Occupational Health
and Safety Branch

Appendix II: Saskatchewan Code of Practice

CODE OF PRACTICE FOR VISUAL DISPLAY UNITS



The *Code Of Practice For Work Involving The Use of Visual Display Units* was published in the Saskatchewan Gazette on March 7, 1989, in accordance with Section 45 of *The Occupational Health and Safety Act, 1993.*

CODE OF PRACTICE FOR WORK INVOLVING THE USE OF VISUAL DISPLAY UNITS

1. Public Notice

This code of practice is issued under Section 45 of The Occupational Health and Safety Act, 1993 by the director for the purpose of providing practical guidance with respect to the provisions of The Occupational Health and Safety Regulations. Work involving the use of visual display units is regulated in part by Sections 5, 8, 33, 34, 35.1, 42 and 80 of these regulations.

2. Application

This code of practice applies when an operator is required to use a visual display unit during the worker's normal duties, for more than 10 hours per week or 4 hours per day.

Adherence to the code of practice will ensure compliance with the appropriate regulations. The failure by any person to observe any provision of the code of practice is not in itself an offence under law provided other means are adopted to ensure the applicable regulations have been complied with. A code of practice is admissible as evidence in a prosecution for a violation of a provision of the regulation. This code of practice is intended to provide a minimum standard.

This code of practice is limited to provision of guidance with respect to the requirements of The Occupational Health and Safety Regulations. A visual display terminal must also comply with the requirements of The Radiation Health and Safety Act and regulations.

3. Interpretation

(a) "Visual Display Unit"

A visual display unit is, for the purpose of this code of practice, a screen which displays computer generated information that is utilized by an operator for the management or control of some systems of process. Visual display units include, but are not limited to, computer input terminals for work processing or data manipulation; display units associated with ultrasound imaging, digital radiography, nuclear magnetic resonance imaging systems, computer art, computer associated design, process control systems, simulators and radar displays.

(b) "Operator"

Operator in this code of practice means a worker who is required to use a visual display unit during the course of that worker's normal duties, for more than 10 hours per week or 4 hours per day.

4. Applicable sections of The Occupational Health and Safety Regulations

General duties

"5 Without limiting the generality of clause 3(a) of the Act, the duty of an employer under that clause includes:

(a) the provision and maintenance of a place of employment, plant, systems of work and working environment that are safe, without risk to health and adequate with regard to facilities for the welfare of his workers at work "

Orientation instruction to workers

"8.(1) Where a worker commences work at a place of employment, the employer shall provide him health and safety orientation instruction, upon the worker's starting work, during the time that he is at work and with no loss of pay.

(2) Health and safety orientation pursuant to Subsection (1) must include instruction on: (d) chemical and physical hazards; and (e) any other matters that are relevant to the health and safety of the worker while he is at work.

(3) Where a worker is transferred from one work process or area to another which differs substantially with respect to hazards, facilities or procedures, the employer shall ensure that the worker receives adequate health and safety orientation instruction with respect to the new work area."

Thermal environment

"33.(1) Every employer shall provide and maintain, in every indoor place of employment, thermal conditions including air temperature, radiant temperature, humidity and air movement which are reasonable and appropriate to the nature of the work performed.

(2) At every indoor place of employment where the thermal environment is likely to be of concern to the workers, the employer shall provide an appropriate and suitably located instrument for measuring the thermal conditions."

Illumination

"34.(1) Every employer shall provide, while workers are present, lighting sufficient and suitable for the work to be done in every part of a place of employment."

Glare

"35. Every employer shall ensure that:
(a) any artificial light source or reflective surface is positioned, screened or provided with a shade to prevent, so far as is practicable, glare or the formation of shadows that causes discomfort or a risk of accident to any workers."

Visual demands

"35.1 The employer shall identify those tasks that involve a potentially harmful visual demand on the worker, and shall:

(a) take all practicable steps to reduce the visual demand of the tasks;

(b) inform the worker of the risk of performing these tasks while the worker is suffering vision impairment or disability;

(c) inform the worker of the importance of consulting his physician if any vision impairment, disability or visual strain persists;

(d) where the cost of such consultation is not covered by the Saskatchewan Health Care Program, reim burse the worker for the reasonable cost of that consultation; and

(e) where it is not reasonably practicable for the worker to attend for such consultation except in working time, provide the worker with suitable time without loss of pay or other benefits to attend for the consultation."

"42.(1) Where workers have in the course of their work reasonable opportunities for sitting without detriment to their work, their employer shall provide and maintain for their use appropriate seating to enable them to sit.

(2) Where a substantial portion of any work can properly be done sitting, the employer shall provide and maintain:
(a) a seat suitably designed, constructed, dimensioned and supported for the worker to do the work; and
(b) where needed, a footrest which can readily and comfortably support the feet.

(3) The employer shall provide effective protection for any worker who may be at risk of injury from work that:
(a) takes place in a manner that imposes limitations on motion or action;
(b) is of a repetitive nature;
(c) requires constant and uninterrupted mental effort; or
(d) requires excessive or awkward physical effort.

(4) The protection mentioned in subsection (3) may include:
(a) the provision of equipment or tools designed, constructed, positioned and maintained to reduce the harmful effects of the work;
(b) appropriate operating procedures to reduce the harmful effects of the work;
(c) limited work schedules with rest and recovery periods, changes in workloads or other arrangements for alternating work to reduce the harmful effects of the work; and
(d) any other appropriate measures.

Noise reduction

"80 At every place of employment, the employer shall ensure that all reasonable practicable means are used to reduce noise levels in all areas where workers may be required to work."

5. Provisions of the code of practice

Relating to equipment

(1) The employer shall ensure so far as is reasonable practicable that the visual display unit is designed, constructed and maintained in a manner that minimizes physical and visual demands on the operator including the following:

(a) the quality of the screen must be adequate to ensure
(i) good legibility of the image;
(ii) uniformity of focus of the image;
(iii) uniformity of luminance of the screen;
(iv) adequacy of contrast between the characters and the background;
(v) lack of annoying flicker; and
(vi) lack of annoying jitter.

(b) where applicable, the screen and keyboard are designed, constructed and maintained in accordance with the characteristics included in the appendix.

Relating to the work station

(2)(a) The employer shall provide a seat which:
(i) permits the operator to maintain a comfortable resting position; and
(ii) where there is more than one operator, has the following characteristics:
(A) is easily adjustable for seat and back rest heights, and
(B) is provided with a back rest giving adequate lumbar support and which permits the operator to lean back to a comfortable resting position, and

(C) is rounded on the front, and
(D) is easily moved to permit the operator to place it in the optimum position for that operator.

(b)(i) The employer shall so far as is reasonably practicable provide a support for the visual display unit which permits the operator to operate the equipment with minimum physical demands and which has the following features:
(A) is adjustable by the operator, or provision is otherwise made to enable the screen and keyboard to be positioned at proper heights for that operator; and
(B) permits the operator, while sitting, to have adequate leg room.
(ii) For the purpose of this clause, the screen and keyboard positions shall be such as to permit:
(A) a screen viewing angle at the centre of the screen of from 10° to 30° below the horizontal plane at eye level, and
(B) a viewing distance which may be varied to suit the operator, within the range of 30 to at least 60 centimetres, and
(C) a keyboard placement that allows the operator's upper arm to hang vertically and the forearm/wrist to be parallel to the floor.
(iii) When it is not reasonable practicable to provide an adjustable table, the employer may provide pads of suitable heights to ensure that the screen and keyboard are positioned at proper heights.
(c) The employer shall provide, where needed, a foot rest which can readily and comfortably support the operator's feet, that is wide enough to allow shifting of the feet and that is of adequate height and angle to ensure that the operator's thighs are parallel to the floor.
(d) The employer shall provide, where a document holder is necessary, a suitably designed and dimensioned holder that permits the hard copy to be held at the same height as the screen and at the same distance from the eyes as the screen.

Relating to illumination

(3) The employer shall provide effective measures for reducing visual demands of the tasks which may include:
(a) the use of recessed, indirect or baffled lighting;
(b) use of dimmer controls for room or for work station lighting;
(c) the provision of a separate, shielded document lamp to illuminate reading documents when necessary;
(d) the provision of room lighting such that the value chosen shall reflect the need for the lower levels of illumination where the work is predominantly on visual display units and the higher where the work is mostly paper work.

Relating to glare reduction

(4) Every employer shall provide effective means for the control of glare or reflections that cause discomfort to the visual display unit operator which may include:
(a) the provision of curtains or blinds for windows or skylights adjacent to the work station;
(b) shielding luminaries and task lighting from adjacent desks;
(c) positioning the visual display unit and operator in relation to natural and artificial light sources;
(d) the provisions of screen hoods to block angular reflections and glare sources;
(e) using furnishings with a matte, non-reflective finish;
(f) painting walls in a matte, non-reflective coating.

Relating to thermal environment

(5) The employer shall maintain thermal conditions which are reasonable and appropriate to the nature of work with a visual display unit which may include
(a) positioning the operator at an appropriate distance from heating and cooling vents and ensuring that heating vents are ducted or shielded to prevent excessive airflow onto the operator;
(b) the use of humidifiers to maintain a minimum relative humidity as close to 30% as practical;
(c) steps to remove excessive heat generated by the visual display unit and associated equipment

Relating to noise

(6) the employer shall ensure that all reasonably practicable means are used to reduce excessive or annoying noise at a visual display unit work station which may include:
(a) the provision and installation of acoustic pads under keyboards and printers; and
(b) the provisions and installations of acoustic covers on impact printers to reduce the sound level from the printer to not more than to 65 dBA as measured at the work station.

Relating to eye examination

(7) Without prejudice to the generality of Section 35.1 of The Occupational Health arid Safety Regulations, the employer shall:
(a) encourage all persons who wear glasses to consult an optometrist, to verify whether their prescriptions are appropriate, before they commence work as operators;
(b) encourage each operator over 45 years in age to obtain professional ophthalmic advice on a biennial basis;
(c) where any operator experiences recurrent visual problems, encourage that operator to consult a physician.

Relating to pregnant operators

(8)(a) The employer shall establish a policy on pregnant women working on visual display units, in consultation with the occupational health committee, where such a committee is required.
(b) A pregnant operator who has a health concern may request the temporary re-assignment to alternate work which does not involve the use of visual display units.
(c) The employer shall allow a pregnant woman to change to other alternate work where this is available and possible.
(d) If alternate work is not available or possible, the employer shall grant the pregnant operator, who so desires, a definite leave of absence without pay and without loss of seniority for all or part of the remaining term of her pregnancy.

Relating to training

(9) Every operator must be fully informed as to the content of this code of practice, the factors which may lead to muscular, skeletal or visual distress and the correct method of use of the work station.

Relating to photosensitive epilepsy

(10) Where the employer is aware that an operator may be epileptic, the employer shall alert the operator to the possibility that exposure to visual display units may trigger an epileptic seizure and advise the operator to consult a physician.

Relating to work breaks

(11) Where the work demands constant and uninterrupted concentration on the screen by the operator, the employer shall allow the operator 5 minutes of non-visual display unit work after 1 hour of operation and 15 minutes of non-visual display unit work after every two hours of operation. The non-visual display unit work activity may coincide with regular rest breaks.

6. Effective date of approval

The effective date of approval of this code of practice is April 1, 1989.

APPENDIX

Desirable characteristics for a visual display unit*

Resolution:

Alpha-numeric characters that are used most of the time should have character height of about 2.6 mm at a viewing distance of 0.5 m or 3.6 mm at a viewing distance of 0.7 m.

The density of the dot matrix for the alpha-numeric characters should be not less than seven dot rows and nine dot columns. The distance between the lines should be such that letters from one line do not become mixed up with letters on the line below. The character design should enable ease of distinguishing between the similar alpha-numeric characters (e.g.. C & G. i Y 1, D & O). A screen size of at least 14" is desirable for intensive visual use.

Display stability:

Notwithstanding its interaction with other display parameters, refresh rate is an important determinant of flicker perception. A rate if 60 Hertz (cycles per second) is recommended for negative contrast displays (light characters in dark background) and a rate of 100 Hertz is recommended for positive contrast displays (dark characters against a light background).

Colour:

Colours for regular prolonged use units should not be at the blue or red ends of the spectrum since these make the image less distinct.

Luminance and contrast:

The display screen should be equipped with user controls for both image luminance (brightness) and contrast. The luminance of the characters or its background, whichever is brighter, should be at least between 35 and 45 candela per square metre. Under acceptable ambient conditions, the contrast ration between the characters and the background should be approximately 3.5:1.

The Keyboard:

A separate keyboard and an adjustable orientation of the screens are desirable. A keyboard profile as thin as possible with neutral coloured keys (e.g.. gray) and matte (non-reflective) finish is also preferred.

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* These are widely recommended parameters. International standardization of these and other parameters is currently under way (I.S.O. standards).

Appendix III-Job Description: National Ergonomics Coordinator, CAW/TCA

CAW/Chrysler National Ergonomic Coordinator

Chrysler Canada agrees to establish a CAW Ergonomic Coordinator, serving Windsor and Toronto area plants and offices. This is a full-time position assigned to the day shift.

The CAW Ergonomic Coordinator will be appointed by the CAW National President, who will advise the Company in writing of the name of the appointee.

The Ergonomic Coordinator's role will be to receive, analyze and assess Official Safety Complaint forms submitted by the CAW National Health and Safety Coordinator and the Chrysler Canada Manager - Occupational Health and Safety (i.e. the National Committee) that identify problems of an ergonomic nature. This analysis and assessment will assist the Union and the Company to determine the priority of each complaint, in order that Union and Company resources may be effectively applied and that problem resolution may be maximized. The Ergonomic Coordinator will assist in resolving disputes that may arise from time to tome, using generally recognized and established ergonomic standards.

The Union will promote an ergonomic process that uses advanced knowledge and skills in applied life sciences to recommend improvements to work stations, tools and work methods. It is understood that the implementation of recommendations can occur only after thorough discussion in a joint environment.

The CAW Ergonomic Coordinator will work on a pro-active basis to support joint CAW/Chrysler Canada Initiatives designed to reduce injuries and related Workers' Compensation costs.

The Ergonomic Coordinator will meet on a regular basis with the National Health and Safety Coordinator and the Chrysler Canada Manager Occupational Health and Safety to discuss issues and initiatives, as well as areas of concern which could be addressed by the National Joint Committee.

Following his/her appointment, meetings will take place to determine the courses required in order for the Ergonomic Coordinator to upgrade his or her skills in the field and to function effectively, at a cost not to exceed the normal employee entitlement under the Company's Tuition Refund Program taken in the aggregate over the life of the agreement. Tuition for said courses will be payable by Chrysler upon presentation of an invoice from the instructional institution.

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