
Slow Death

Work — the silent killer

By Jack Basuk

Introduction

The essays in this book are aimed mostly at those for whom occupational health is of greatest importance — working people. They attempt to explain in non-technical language the most relevant aspects of the problems associated with occupational health.

After scanning the literature, of which there is a great deal, I asked myself: is there anything new I can add? What new insights can I bring? I am not a physician, nor a health specialist of any sort. For the last 15 years my professional endeavors have had to do with government science policy, and for the last eight, with regulatory policies designed to protect human health from occupational and environmental hazards. I therefore decided to tackle the essays from the perspective I know best and also from the perspective I believe is most important.

Occupational health issues are principally political in nature. Keeping that in mind, the essays examine the history of occupational health problems and how the pertinent sciences, technologies and laws have been affected (and frequently distorted) by socio-political-economic values.

In turn, the essays attempt to deal with how these factors have ultimately responded to the

need to protect workers from the onslaught of agents and conditions that would rob them of their most precious possession — their health.

It is my hope that workers will come to more fully appreciate the political aspects of occupational health, and demand a more active role in the resolution of such political issues. Workers must insist on their right to take part in decisions affecting their health where that right is not recognized. They must never allow their work to prejudice their health, no matter how desperately they need employment. No job is worth one's health, and certainly not one's life.

I would like to thank those who gave me this labour of love, namely Colin Lambert and Ed Finn of CUPE. Special thanks to Jon Alexander from Carleton University who provided many ideas and assisted in the editing. Finally, extra special thanks to my wife Nikki for her forbearance, patience and her very helpful readings of the text.

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Workers' Health: The Problem

According to a recent poll commissioned by the Ontario Nurses' Association, a majority of people are concerned about occupational health and safety hazards, and feel that tougher regulations, inspections and penalties are needed to protect workers.

According to the Ontario Worker's Compensation Board, there were 365,124 work injuries in that province in 1984 — roughly one for every 11 people employed. Two hundred workers were killed; 172,002 suffered disabling injuries; and 192,919 suffered injuries requiring first aid or medical treatment.

These statistics do not describe the total problem. They often do not include injuries which are hidden and become a problem only after some time. These include diseases such as high blood pressure (which can lead to strokes), cancer, heart disease, muscular and skeletal deformities, skin diseases, hearing and visual loss, various lung diseases, miscarriages during pregnancy, and loss of fertility and virility. Moreover, the social, psychological and economic costs to injured workers and their families — the cost of shattered lives, uncertain futures and broken families — never appear in the official statistics.

Current legislation regarding workplace hazards and the enforcement of those laws are clearly inadequate. No preventable risk to workers' health can be justified, and no employers' actions that put workers' health in jeopardy can be tolerated.

Governments are urged to accept the promotion and maintenance of the highest degree of workers' physical, mental and social health, as a central consideration and primary objective of social and economic policy. The immediate development and implementation of strategies to reduce, if not eliminate, occupational hazards through the collective efforts of government, employers and workers should be undertaken.

These were some of the points made by the Ontario Nurses' Association in a full-page newspaper ad. The title of the ad, "Dying For A Living", is actually the title of a book in

which Lloyd Tataryn examined the plight of asbestos, gold and uranium miners. He is also the author of another book that partially deals with worker exposure to the chemical formaldehyde, titled, "Formaldehyde On Trial."

Other books that have been written on occupational health and associated issues include: "Crisis In The Workplace" by Ashford, "Assault On The Worker" by Reasons, Ross and Paterson, "Occupational Health & Safety Law" by Nash, "Reproductive Hazards at Work" by Chenier, "The Politics of Cancer" by Epstein, "The Expendable Americans" and "Outrageous Misconduct" by Brodeur, "Work Is Dangerous To Your Health" by Stellman and Daum, "Of Muscle And Blood" by Scott, and many others. In addition, countless proceedings of numerous conferences, workshops, symposia, etc. have been published.

No Shortage of Organizations

Further, a whole host of organizations, governmental and non-governmental, has been created or asked to deal with occupational health problems. At the international level, some examples are the International Labour Organization, the World Health Organization and the Organization for Economic Cooperation and Development.

In the United Kingdom, the Alkali Inspectorate has long been charged with dealing with working conditions. A Royal Commission on Environmental Pollution was created a number of years ago to evaluate, amongst other things, the effects on human health of a variety of perceived hazards, and the British Royal Society has published a number of monographs on risk.

In the United States, the National Academy of Science, The American Association for the Advancement of Science, The National Institute of Health, the Environmental Protection Agency, The National Institute of Occupational Safety and Health, and the Occupational Safety and Health Agency, are

all, in one way or another involved with occupational health problems.

In Canada, various provincial Departments of Labour, Workers' Compensation Boards, Health and Welfare Canada, Environment Canada, Agriculture Canada, Labour Canada, the Department of Energy, Mines and Resources, the Canadian Council of Resource and Environmental Ministers, the Department of Corporate and Consumer Affairs, the Canadian Council of Occupational Safety and Health, the Interdepartmental Committee on Toxic Chemicals, the National Research Council Associate Committees on Scientific Criteria for Environmental Quality and on Toxicology, Schools of Industrial Hygiene, and the Occupational Health Officers of various trade unions, are all responsible for a variety of aspects, often overlapping, of occupational health. Legislation, at both levels of government, has been put in place, ostensibly to protect Canadian workers.

Attitudes

In short, there have been growing concerns about occupational hazards in recent years. But how have those who are at greatest risk — i.e., workers — reacted? In "Workers At Risk: Voices from the Workplace," a report published in 1984, researchers Dorothy Nelkin and Michael Brown attempt to respond.

They start by citing a series of national "quality of worklife" surveys that the University of Michigan Institute for Social Research conducted in 1969, 1972, and 1977. These surveys suggested that production workers were becoming increasingly aware of the dangers and more concerned about their health. Between 1969 and 1977, the proportion of those who said they were exposed to one or more hazards on the job increased from 38% to 78%. In 1972, 72% of male production workers reported exposure to air pollution and fumes and 45% to dangerous chemicals.

The original research by Nelkin and Brown consisted of trying to understand how workers who handle chemicals in very different occupations and work environments perceive and cope with the risks they knowingly take. For example, how do railroad workers, chemical workers, nurses, fire fighters, pharmaceutical workers, laboratory technicians,

gardeners and artists deal with the conflict between the risks and benefits of their work that they all have in common?

The results were not uniform. For example, while there was widespread anxiety, many workers asserted that their work was "worth the risks." Some workers adapted to hazardous conditions by accepting the risks as part of the job and by accepting situations they recognized as grave by such rationalizations as, "Everyone is going to die sooner or later" or "If this doesn't get you, something else will."

Others sought ways and means to improve the conditions of their work by serving as health and safety representatives for their unions. Still others served informally as resources for co-workers concerned about particular health problems.

These activists were usually the ones who initiated grievance procedures, appealed to the Occupational Safety and Health Administration, confronted management directly, and tried to organize their co-workers to change hazardous conditions. Approaches to taking precautions also varied from downright rejection (usually because of the discomfort involved, the negative reaction of their supervisors or the teasing of their peers) to total acceptance.

In summary, Nelkin and Brown found that these differing perceptions of risk were, in large measure, due to different attitudes towards work and the value of labour. As would be expected, the contrast between professionals and unskilled production workers was sharp. The former generally felt that, "I love what I do, so I don't really feel that I'm taking any risks" or "It's worth the risk." But few blue collar workers expressed any such sense of job satisfaction. They usually said, "We have no choice."

Nelkin and Brown concluded that occupational health problems are becoming, increasingly, a political issue that has to do with fundamental questions of justice. There is an uneven distribution of risks, and it appears that those most at risk generally reap the fewest benefits, have the fewest choices and have developed a fear and resentment based on the perception that they are considered a marginal and expendable class of citizens.

The Key Question

In light of all the research that has and is being undertaken: all the concern voiced in the many books that have been published, papers written and conferences and meetings held; in light of all the legislation that has been passed and bodies created or mandated to deal with the problems of occupational health; in light of the increased awareness of workers that their labours often have been dangerous and in light of all the collective bargaining that has taken place around occupational health issues; why is it that serious occupational health problems still exist? In particular, why has exposure to toxic substances become a major problem at so many work sites, especially when we live in a modern, technologically advanced and information-conscious society?

The essays in this book do not deal with health problems due to workplace accidents, but rather with those that are the result of long-term, low level exposures to hazards of a chemical or physical nature. This is not because workplace injuries are unimportant. It is because public awareness of the magnitude and scope of health problems due to low level exposures is relatively recent, and because the frequent disputes about the effects of these exposures have often led to an inability by everyone concerned to do anything about them.

Exposure is Nothing New

Actually, exposure to chemical health risks in the working environment has long been with us, probably since prehistoric times. However, three very important factors should be kept in mind. First, the freedom to choose one's occupation and place of residence, for the most part, was restricted throughout human history. For some people this is still true.

Second, the freedom to select one's risks, or the freedom to reject risks imposed by others higher up in the social, economic and political hierarchy (in other words, by management), was equally nonexistent. Again, this is often still true.

Third, information about the effects of these exposures mostly did not exist. Even when such data was available, it was often repressed because those responsible did not

want to admit liability and did not want to bear the costs of compensation or clean up. (While this is not as prevalent today as in the past, it unfortunately is sometimes still true.)

In an article titled, "Chemical Health Hazards In Workplaces, Prehistory To The Present," published in *Science and Public Policy*, Volume 12, No. 1 (February 1985), Ulf Ulfvarson provides a broad overview of the history of chemical occupational dangers:

- Prehistoric persons were exposed to smoke, carbon monoxide and other degradation products due to the burning of organic substances such as fat, however not to a health threatening extent. Simply put, the harshness of their existence probably was much more important in determining their life expectancy.

- Primitive agriculture only slightly increased exposures to chemicals, but again this was not important in determining life expectancy. However, during this period, the use of metals became more extensive and exposure to them introduced new risks.

- During the period that was marked by the growth of towns and cities (urbanization), new materials were needed for various purposes, among them: building materials for houses and fortifications; metals for making weapons; writing materials for the bureaucracy; colours for textiles, leather and other objects; ceramics for a number of uses; textiles for clothes; and drugs or poisons for the preparation of pharmaceuticals.

(During these periods there was a dawning awareness of occupational disease. The effects on alchemists, miners, smelter workers, stone-cutters, potters and painters, as a result of exposures to lead, mercury, arsenic, sulphur dioxide, carbon monoxide and silica dust were noted. They were ignored because the political realities of the times dictated that there could be no negative suggestions about work, particularly since all wealth was produced by labour. To be fair, another reason they were ignored was that there was no understanding of the relationship between exposure and disease.)

- The period from the Middle Ages to the Industrial Revolution was marked by a relative explosion of new manufactured materials that contributed to a concentration

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NO. OF WORK INJURIES IN CANADA PER HUNDRED WORKERS Includes Occupational Illnesses					
Province	1972	1977	1980	1981	% Difference 1972-1981
Nfld.	10.96	9.97	8.88	9.67	-11.8
P.E.I.	11.11	10.36	10.64	10.12	-8.9
N.S.	13.29	11.96	12.59	12.70	-4.4
N.B.	14.01	12.23	13.08	12.62	-9.9
Quebec	11.06	12.99	15.45	15.37	39.0
Ontario	13.28	11.82	11.61	10.54	-20.6
Manitoba	9.71	9.67	10.71	10.31	6.2
Sask.	12.34	13.35	13.19	13.35	8.2
Alberta	1.12	14.26	15.88	15.27	25.1
B.C.	13.16	13.67	15.69	15.31	16.4
Yukon	N/A	N/A	N/A	N/A	—
N.W.T.	N/A	N/A	N/A	N/A	—
Canada	12.39	12.46	13.46	12.93	4.4

Source: Labour Canada

and intensification of exposures to perilous substances at work. While they are too numerous to list, some were: new alloys, glass works, glazes, chemicals such as sulphuric acid, nitric acid, hydrochloric acid, acetic acid, acetone, acrolein, benzene, phenol, etc., gunpowder, wood alcohol, burning lime and potash.

Again the effects of exposures were noted, and again very little was done despite much better information. It was during this period that Bernando Ramazzini, who has been referred to as "the father of occupational medicine," exposed the significance of the working environment for certain sicknesses. He also gave an account of preventive measures to be taken against different occupational risks.

- The Industrial Revolution gave rise to "worker specialists" and a far more extensive division of labour. The obvious negative consequence (besides less stimulating tasks, more restriction and discipline) was more specialized exposure to physical and chemical risk factors. Dangerous exposures became concentrated to a higher degree than ever before to fewer persons. The assembly line made dependence on the machine total. All had to work in a predetermined manner. The scope for individual control of one's work was minimized, and this adversely affected the

workers' chances of protecting themselves from various risks. Protective measures had to be organized centrally, in the same way as the rest of the manufacturing operation.

A Chemical Soup

Occupational diseases now became fully visible. Stone dust lung disease among miners and grinders; lead poisoning among painters and potters; cancer among chimney sweepers, cotton workers, miners again and those tending coal fires in steel mills; dental necrosis (a disease that destroys the jaw bone) among workers manufacturing phosphorus matches — these were just a few of the hazards that workers faced.

- In the hundred years from 1860, world industrial output increased by a factor of 30, the production of energy by about the same amount and steel production by several hundred times. To the earlier known occupational diseases, new ones were added. They include asbestosis, kidney trouble from cadmium, different effects on the respiratory passages from various types of dust, leukemia and injury to blood-forming organs from exposure to benzene, liver damage from exposure to carbon tetrachloride, methyl mercury poisoning, cancer of the liver due to exposure to vinyl chloride, a whole host of cancers due to exposure to newly discovered carcinogens, irreversible

**TOTAL COMPENSATION PAID
BY ALL JURISDICTIONS IN CANADA
IN CURRENT DOLLARS – 1960 TO 1984**

Jurisdiction	Total Payments	No. of Payments	Avg. Payment Per Claim
Canada	\$17,833,700,000	21,932,900	\$813
Nfld.	\$216,400,000	300,300	\$721
P.E.I.	\$31,800,000	65,000	\$489
Nova Scotia	\$466,900,000	672,500	\$694
N.B.	\$330,400,000	584,300	\$565
Quebec	\$4,892,900,000	5,657,300	\$865
Ontario	\$7,096,500,000	8,646,600	\$821
Manitoba	\$431,000,000	794,500	\$542
Sask.	\$545,200,000	730,700	\$746
Alberta	\$1,433,900,000	1,896,900	\$756
B.C.	\$2,354,700,000	2,553,200	\$922

Source: Workers' Compensation Boards

neurological damage leading to psychological changes due to exposure to a variety of organic solvents, allergic responses due to effects on the immunological system, and so on and so on.

Truly we live and work in an environment that can be characterized as a *chemical soup*. As can be ascertained from the above historical outline, we always did, except that the number of chemicals that have been introduced into the environment, marketplace and workplace since World War II is many times greater than all the chemicals previously introduced in human history.

It appears we are committed to chemical technologies. We have certainly benefited from them, but at what price? We really do not know. Every technological development that has ever been introduced has had adverse effects, many of them hidden. The need to know what they are and may become has never been more pressing than now. However, this need to know must never be used as an excuse for doing nothing. Exposures to chemicals, dust and elevated amounts of energy forms such as noise, should be reduced or eliminated.

It is workers who are normally the first to be exposed, usually to the greatest degree, and the first to suffer the consequences.

Human beings are not guinea pigs.

CHAPTER 2

Workers' Health: Science

To best portray science's role in occupational matters it is necessary to discuss, albeit briefly, what is meant by "science." It appears to mean many things to different people and is often used in a variety of ways that are frequently confusing.

Science is supposed to be a "value free search for truth." It is obvious that "truth," whatever it is, has value. It is equally evident that searchers for truth, whoever they are, have biases, prejudices, opinions and points of view which are an expression of personal values or vested interests. It is the *scientific* search that is supposed to be value-free or closest to that state.

The results of the search (research) should be completely independent — or as independent as possible — from the values or views that are held by the searcher-scientist or from the economic, social and political advantage that may result from the use of the results of the search.

It has been argued that complete objectivity is impossible. There may be more than a grain of truth to this assertion. It is of particular importance in the area of occupational health. The scientist working for a large corporation, for example, will more than likely place a different interpretation on scientific findings than one hired by a trade union, who may in turn differ with a government scientist in a regulatory agency or an academic scientist in a university.

Further, the claim that science is a "value free search for truth" is itself somewhat contentious. A scientific search is nothing more than an attempt to answer a question using a particular method called scientific. Insofar as the search is based on a question to which an answer is being sought, and since that question is only one of many that need answering, *the choice of the question is itself* value laden and probably affects the way the search will be approached and the results arrived at.

Need For Workers' Input

This is an important point to keep in mind when considering occupational health issues. Clearly the choice of questions will eventually have a strong bearing on the occupational health decisions affecting workers' lives. These choices are made by the institutions, organizations, agencies, corporations and individuals paying for the research. The choices will reflect *their* interests and values.

Historically, workers have had very little say in the process of selecting research topics pertaining to occupational health issues. Further, the results of the research undertaken were seldom made available to workers in a language they could understand. Also, workers were hardly ever made aware of them or their importance, especially when the risks and the economic stakes were great.

It is high time for a change. Workers must have a say in selecting occupational health research projects or, at the very least, in the setting of research priorities. They also *must* be made aware of the results of these efforts.

One final and important thought about "science." In its quest for truth, "science" nearly always *measures* something or other. These measurements have a built-in amount of uncertainty. This uncertainty, in some instances, is so small that for most purposes it can be discounted. In other cases, however, this is not so.

Unfortunately, the sciences associated with measuring environmental and occupational risk often have a significant degree of uncertainty. When assessing the results of risk measurements, this must be clearly understood. New methods that will reduce uncertainty may eventually be developed. In the interim, only the collection and analysis of more data can achieve such a reduction of uncertainty.

What role should science play in the arena of occupational health? How important is that role? The answer to the latter question is easy. *Science's role is paramount in resolving occupational health issues.* Any decision

supposedly taken to assist workers who face workplace hazards should be based on as complete and factual information as possible, and on interpretations that rely on careful analyses and not on biased opinions. Otherwise, the harm that workers may have to endure could be catastrophic.

Identifying Risks

The answer to the first of the above two questions is somewhat longer. The tasks that science should perform fall into three broad categories: (1) identification and quantification of risks, (2) prevention, and (3) cure.

This chapter deals mostly with the first of these categories. The next chapter will examine the preventive and curative phases of occupational health — in other words, the medical aspects of the problem.

Nicholas Ashford, in his book, *Crisis In The Workplace*, cites two American studies that have contributed to identifying research needs on potentially harmful materials. They are, *Chemicals And Health* (1973) and *Man's Health And The Environment — Some Research Needs* (1970). (The following comments on these two reports have been extracted from pages 102 and 103 of Ashford's book.)

The committee that prepared the *Chemicals And Health* report had concluded that the exposure of workers on their jobs is of much less significance than general environmental exposure. Ashford did not agree with this conclusion. He states, "If cancer is, in fact, contributing significantly to the deaths of workers, and if one counts cancer in the figures for occupational exposure as well as respiratory disease, the job-related causes of death may be much more significant than the general environmental causes.

"Placing cancer with the causes in the workplace environment may be more justified, especially when one realizes that the standards for workplace exposure are one to two orders of magnitude less stringent than those for the general environment — if they are enforced at all."

The report, titled *Man's Health And The Environment — Some Research Needs*, contains an extensive discussion of the research needs regarding industrial exposures. Among the findings of the report were the following:

- Advances in technology are rapidly changing the industrial environment and often are responsible for new health problems.

DEATHS IN CANADIAN INDUSTRY BY TYPE 1971-1981

(† Data Not Available for Quebec)

Type of Work Fatality	1975	1976	1977	1978†	1979†	1980†	1981†
Transport	265	275	280	228	220	254	243
Struck By or Against	230	161	153	114	131	124	119
Caught In, On or Between	81	81	57	51	90	94	59
Fall and Slip	102	113	81	63	80	74	69
Drowning and Asphyxiation	61	53	36	46	34	31	35
Cardiovascular Strain	70	44	51	62	39	67	59
Overexertion	11	17	8	0	0	1	4
Systemic Poisoning	23	7	14	7	13	5	5
Occupational Illnesses	155	132	105	95	106	115	105
Fire, Explosion & Temp. Extremes	45	45	32	14	39	20	19
Contact With Electricity	56	39	55	23	28	21	30
After or Later Effects	45	65	37	64	65	63	57
Miscellaneous	28	26	34	25	27	41	26
Total	1172	1058	943	792	872	910	830

Source: Labour Canada

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• The biochemical, pharmacological and immunological mechanisms that lead to lung damage by environmental agents are insufficiently known. These gaps in our knowledge are to a large extent the consequence of the lack of an effective, systematic, coordinated and basic-science-oriented national program on causation, prevention, and treatment of lung disease; and the nonexistence of an effective, systematic, coordinated and basic-science-oriented national program in occupational health.

Environmental Factors

• There is abundant evidence that the great majority of cancers — probably over 90% of the total — are caused, maintained or promoted by specific environmental factors. Many of these cancers are physical and chemical agents that directly concern the environmental and occupational health professions. Cancer must therefore be regarded as one of the most significant potential consequences of exposure to contaminants.

• Rather than depending on hope, luck and hindsight (as has often been the case up to now), more careful surveillance of the population's health and more systematized testing for the safety of individual chemicals now in use, or proposed for future use, must now be employed.

• Among the potential effects from exposure to chemicals, three are of particular concern. These are (1) cancer (carcinogenicity), (2) diseases caused by genetic changes (mutagenicity), and (3) direct damage to the fetus (teratogenicity).

They share the following features: their insidious nature — that is, it is possible to be afflicted with one of these diseases for a long spell without being aware of it; the relatively long time lag between exposure and overt effect; the irreversible nature of the resulting disease; the great susceptibility of tissue from very young persons; the possibility of other causes producing the same diseases; and the aggravation of these effects by the interactions of a number of chemicals (synergism).

As a result, it is difficult to develop simple and reliable tests for evaluation of the

products of new technologies and, in fact, new products are being introduced into our society faster than their safety can be ascertained.

• In spite of the large investment of time and effort in research in toxicology, there are several areas that remain relatively unstudied. These include: the problems of extrapolating results from animal studies to man; the detection of early and low levels of injury; and approaches to the study of interactions of toxic agents to produce synergism or antagonism.

• There is a growing recognition that psychological and social factors play a role in the creation of hazards and that this role requires study and understanding. This represents a new challenge for the social and human sciences.

In summary, the preceding partial list indicates areas where scientific research is of critical importance in identifying the nature and magnitude of risks that workers face. It is obvious that this knowledge is essential if measures to prevent and/or treat occupational disease are to be effective. One has to know what one is confronting if one is to deal with it successfully. (The measures just referred to will be part of a future chapter.)

Hazards and Risks

The terms "hazard" and "risk" have particular significance for scientists specializing in environmental and occupational risk analysis. They are often used as if they mean the same thing. While they are related, they do not have an identical meaning and therefore should not be interchanged.

"Hazard" refers to the nature and sometimes to the size of the peril. For example, the hazards associated with a severe earthquake are the extensive destruction of property, as well as the loss of many lives, and the infliction of much injury to humans. The major fatal hazard associated with cigarette smoking is lung cancer, while with exposure to asbestos fibers it is mesothelioma, a relatively rare pulmonary cancer.

"Risk," on the other hand, refers to one's chances of suffering the hazardous consequences of a particular activity. In other

words, the term "risk" is statistical in nature.

The use of some extreme illustrations will best explain. Let us assume that if a plane crashes into a building, everyone in it will perish. That is the nature of the hazard. But what is the *risk* of getting killed in one's home by a plane crashing into it if only one plane a day flies over it at a time when one is away at work? The answer appears to be zero but it is not. As long as one airplane, capable of flying, exists anywhere in the world, there is a chance, albeit extremely small, that it will fly over one's home when one is in, crash into it and kill everyone in it. It therefore appears that, for the most part, *there is no such thing as zero risk*.

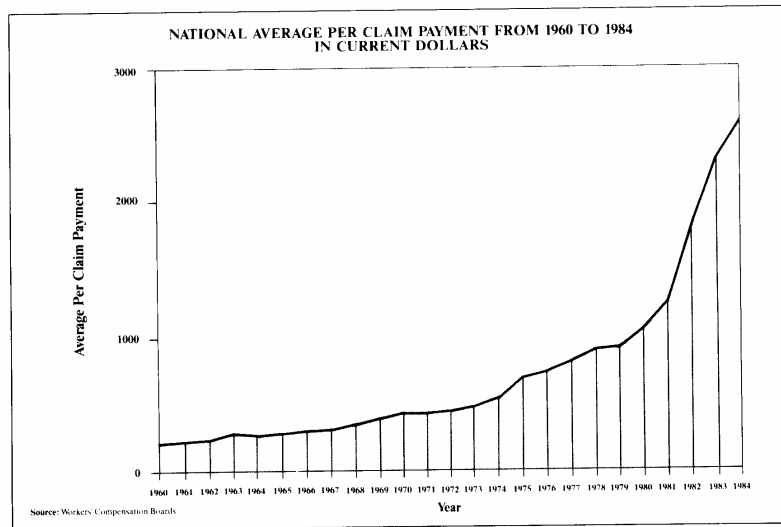
What happens to the risk if, on a regular basis, the plane flies over when one is home? The answer is now obvious. The risk, while very small and probably still impossible to measure, is certainly quite real. What happens to the risk when 50 planes fly over each hour of the day? The risk, while still very small, has grown much larger.

What happens to the risk if these 50 planes flying over each hour are piloted by suicidal

fanatics intent on crashing their planes into all the buildings in this region? The answer now depends to a large degree, on the number of buildings in the vicinity, the ability of the pilots to succeed in their endeavors, visibility, the terrain, etc. In any case, it is evident, that the risk has now become very large, indeed unacceptably so.

Upon close scrutiny of the above example the scientific use of the term "risk" becomes clearer. The chances of being killed by a plane crashing into one's home depends on a number of factors. First, the person in question has to be at home during the time the plane or planes were flying over. Second, a plane has to crash into the person's home. This depends on the chances of planes crashing anywhere in the vicinity. These chances dramatically grow as the number of planes flying over increase and the intent of the pilots becomes murderous.

Summarily, measuring risk combines the possible consequences of a specific occurrence with the frequency of that occurrence. (Occurrence means exposure to the hazard. After all, when there is no exposure there is



no risk.) The accuracy of the risk measurement therefore depends on validity of the information about the nature of the hazard and the frequency of its occurrence.

The Health "Lottery"

This approach as applied to occupational risks appears similar to playing dice with two die. One's chances of coming down with a specific occupational disease can vary all over the place in a manner analogous to one's chances of rolling a two with the die (one in thirty-six), rolling a seven (six in thirty-six) and rolling a twelve (again one in thirty-six).

It is disturbing to note that workers' health often appears to be the result of a lottery. When large numbers of workers are exposed to a particular chemical, only a certain percentage will become ill. It is impossible for contemporary science to predict with any accuracy who these individuals will be. Thus, who becomes sick seems to be the result of random selection. *This is unacceptable.* Even if predictions become possible — which they might — it would still be unacceptable because it would still be a lottery, only of a different order. The predictions would be based on a person's genetic makeup, which itself is largely a matter of chance. It appears that we are nearly always at risk. There are three types: (1) those we knowingly take; (2) those imposed by industry, government, neighbours, etc. that we are aware of and have either accepted or are fighting; and (3) those imposed that we are not aware of. It is the latter situation that is intolerable in a democratic society. *As much as possible, risks must be measured and the results of these measurements conveyed to those at risk so that they will be in a position to either accept or reject such risks.*

Disagreements about risk measurements, especially occupational and environmental risks, often occur. The science of measuring risk is relatively new, so that there is still a great deal of uncertainty associated with it. It is this uncertainty that has fed the fuel of various controversies over occupational health. Some argue that the onus of proof is on those who claim that certain risks are unacceptably high. Others assert that those who would expose workers and the general public to chemicals and energy forms must first

demonstrate that they are safe.

While removing or lessening scientific uncertainty will not necessarily resolve this dispute, at least the chances of reaching some agreements about the risks would be enhanced. What is needed is *more* scientific research, not less, as our current government in Canada appears to believe.

Some of the scientific disciplines involved in measuring risk are physics, analytical chemistry, medicine, statistics, field biology, microbiology, toxicology and epidemiology. With respect to the risks associated with long-term low-level exposures to chemicals, the latter two — toxicology and epidemiology — are of particular importance.

Problems with Toxicology and Epidemiology

Toxicology is the science of measuring how dangerous to humans is exposure or intake of drugs and chemicals. In other words, a toxicologist is someone who attempts to discover the effects of such exposures or intakes. This is usually done by the use of animals whose systems resemble those of humans. In other instances bacteria, human cells and tissue cultures are employed. In some rare instances humans are used, usually with their informed consent and when it is strongly believed that the adverse effects will disappear once the exposure ceases.

Each of these approaches has problems. The first is both costly and very time consuming. It has also generated a great deal of controversy about the validity of extrapolating the results of animal experiments to humans and about the ethics of using animals for such purposes.

The second, while cheaper and faster, can only provide, at this time, very cursory evidence as to the hazardous nature of various chemicals. Its main use could be for quick screening to assist in establishing an order of priorities when selecting chemicals for further testing.

The third has obvious limitations.

Epidemiology is the science that searches for the sources or causes of diseases in given populations. The populations can be defined in a variety of ways. Some examples are: people living in a particular region, munici-

pality or in some particular location in a city; workers labouring under similar conditions and being exposed to the same contaminants; people who consume particular products; people who fall into particular age groups; persons who are members of particular races or national origins; persons of the same sex; or persons of the same lifestyle.

The methods used by epidemiologists vary, but are all statistical in nature. The most accurate method uses a large sample size. It is thus quite costly and time consuming.

Epidemiology represents the best measurement of risk available. The major problem with it is that it is *after the fact*. It looks backward and as such is not preventive except for future disasters that may resemble past ones. It counts bodies. In a sense, human beings become guinea pigs.

Despite these reservations, epidemiology is extremely important. It is the only way we can ascertain whether regulatory policies designed to protect us are effective.

In conclusion, despite difficulties and uncertainties with the science of risk measurement, it is the only way of finding out about risks, in and outside the workplace. Truly, it is the only game in town. A better appreciation of it is needed, mostly by our politicians.

It is becoming more apparent that many, if not the majority, of diseases prevalent in our society are due to hidden risks. What we have already learned may be nothing more than the tip of the iceberg. We have to find out what more is out there, what these things are, and what they mean. *We need more, not less, of the sciences involved.*

CHAPTER 3

Workers' Health: Technology

Technology... the knack of so arranging the world that we don't have to experience it — Max Frisch, 1957

Automating an industry makes it more efficient; automating a human life primitivizes it — Erich Fromm, paraphrased.

The word "technology" has become a very common term in today's world. It conjures up a variety of feelings. For some, it is an object of fear; for others, a matter of indifference; for others still, an opportunity for economic gain; and finally, for a few, a panacea for all that ails the world. If we all had a common understanding of what is currently meant by this term, there would result a levelling-out of our respective biases and feelings about it.

Perhaps we could agree on the following very broad usage of the term: Technology includes all material things, (the hardware, i.e., raw material, tools, machines, devices, factories, etc.), all people and other living things, and the way these groups are organized and used (software) to produce goods and services that we need or desire. More simply still, technology is nothing more than what is used, and how, to produce marketable products, desirable personal services, and things such as home-cooked food, music, home entertainment, etc.

Humanity and technology are inseparable. Man is its creator and its creature. This has been so throughout human history. Nearly all activity, including human labour and particularly the workplace, are manifestations of technology. It will become obvious that technology is at the heart of occupational health issues. After all, the tools that workers use, where they are used, how they are used, the way the work is organized, the type of materials involved, and the general working conditions all have a strong bearing on workers' health. These are all technologically determined.

Long ago, we boarded a technological

treadmill. *Who or what is in control and for whose benefit?* These are the ultimate bottom-line questions. Of more immediate and equal importance, however, is this question: *If technology is so closely bound to humanity, why is it at the core of so many of our problems, especially those related to workers' health?*

The answer is to be found by examining the nature of technology.

The relationship (and distinction) between science and technology has changed dramatically over time. Unlike science, which strives towards value-free examinations of natural and social phenomena to obtain "truth," technology, by its very nature, is value-laden. Technology has always been with us, whereas science as we know it today is only about 400 years old. Originally the links between the two were rather weak. Today, science and technology appear to have grown inseparable.

Our forebears used fire, the wheel, water and wind power, simple tools, dyes, folk remedies, various chemicals, metals, etc., without any understanding of how they worked. This empirical approach to technology was somewhat limiting. With the advent of science and the subsequent growth in knowledge and understanding, technology took off. One has only to compare how people live and work in technologically advanced countries today with the predominant conditions 150 years ago. The wildest imaginations of that time could not conceive of so much that we take for granted today.

As we contemplate how far we have come in the last 40 years the future becomes awesome. Where are science and technology taking us? What problems will they solve? At what price? What new and unforeseen problems will they create? How should we approach these powerful new technologies which will irrevocably alter human society and more particularly the workplace? These are not easy questions to answer. No one group or individual should unilaterally make the momentous decisions that will be required.

Everyone with a vested interest (and especially workers) must become knowledgeable enough to make meaningful contributions to the discussions, debates, and ultimately to the decisions.

It is equally important to retain our sense of adventure and to proceed into the future with confidence and excitement about the fantastic developments that await us. As citizens and workers with a strong vested interest, we must have a say in these critical matters. We must not passively allow major technological decisions to be imposed on us.

A Voice for Labour:

Technology is value-laden. A technology is selected or sought because someone perceives that there is value in its use. Dr. Omond Solandt, the founding Chairman of the Science Council of Canada, often remarked that every industrial or technological development has both positive and negative potential, and with human nature being what it is, one could be sure that both would probably be realized at some unforeseen cost, to the environment, to society or to human health. His point was that those who are in a position to select major technologies and to impose their choices on society, for whatever reasons, have power — immense power — be it economic and/or political. This has never been more true than in this most technological of times.

It does not matter whether the technology selected is of general importance, such as energy sources; more restrictive such as work technologies; more restrictive still, such as military technologies; pervasive, such as communications technologies; useful, such as materials and chemicals technologies; or essential, such as transportation or medical technologies. Every one of these technologies has particular values. A specific technology's chances of being selected are high if its perceived values correspond with the criteria used for selection. This has important ramifications for the workplace.

In our political economic/system, it is management's prerogative to decide what to produce and how. Thus, it is management, to a large degree, that decides on the design of the workplace. Not only are workers usually not consulted, but they often have been (and

still are) considered as just another cog in the technological machinery.

Management's prime imperative when making technological decisions is the reduction of costs. Very little attention has been paid to *human* costs except when workers, through collective action and continued vigilance, have compelled management to reduce or eliminate health risks, or when government has set and enforced obligatory safety standards.

The modern managerial style was pioneered by an engineer named Frederick W. Taylor (1856-1915), often called "the father of scientific management." His basic assumption was that workers would be motivated to make their work more efficient and therefore to produce more to earn more money. A second assumption was that the worker's world was focused on himself. Thus his relationship to his fellow workers, to his boss, to the total organization and to his immediate environment could be ignored and he could therefore be considered nothing more than an extension of the machine. Thus the notion of a "standard" worker, with standardized motions, hours, wages and work routines came into vogue. Unfortunately this dehumanized concept still prevails in many workplaces, even though its underlying assumptions were soon shown to be false.

The collective actions of workers and the corresponding growth of the trade union movement clearly indicated that workers wished to protect themselves from the arbitrary and capricious actions of management, that there was a need for expression as members of social groups, and that workers are not always motivated toward the maximization of work, efficiency and greater monetary reward.

Several years ago, in New Zealand, a team of efficiency experts hired by an American subsidiary suggested that the workers be paid their basic weekly salary for a normal week's work but paid a generous extra amount for anything above their normal quota. The workers quickly discovered that what was once a week's work could be done in three days and that three days' work was preferable to five and that four days of leisure were better than two. So much for Mr. Taylor!

The Workplace "Battlefield"

While not all technology is synonymous with work, all human labour is a manifestation of technology. In other words, a specific workplace, including all those who toil in it, is synonymous with a specific technology. When one talks about a workplace and conditions of work, one is really referring to a specific set of technological conditions. The reason this point is being made is to dispel any notions that technology is always benign.

The history of the workplace and therefore of its attendant technology is shocking, as the following quotes illustrate. They are taken from the introduction to a report titled, *Work Is Dangerous To Your Health*, by Jeanne M. Stellman and Susan M. Daum.

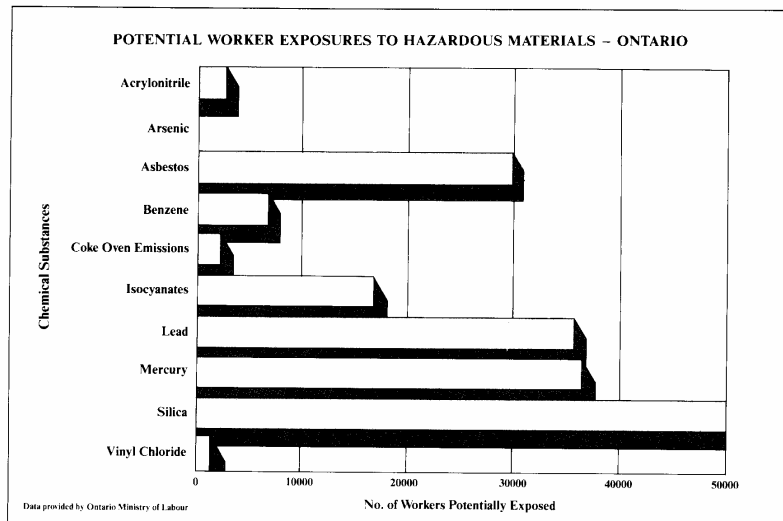
"Each day millions of workers enter a battlefield, but they fight no foreign enemy and conquer no lands. No borders are in dispute. The war they are fighting is against the poisonous chemicals they work with and the working conditions that place serious

mental and physical stress upon them. The battlefield is the workplace."

"The hundreds of thousands of cases that are counted are only those which are 'recognized', those which result from such extremely dangerous or unhealthy conditions that the development of disease is obvious and provable. Uncounted in these already shocking statistics are the millions of workers who die prematurely of some common illnesses, such as heart or lung disease or cancer or a multitude of other illnesses that are also caused or aggravated by exposure to the environmental insults of the workplace."

"If present trends continue, it is almost certain that such conditions will get worse rather than better. The introduction of new chemicals is not accompanied by health and safety programs that ensure their safe use."

"The primary concern of businessmen and engineers with workers lies in increasing their productivity. It means that maintenance crews are cut down to the minimum number and machinery is not kept in good working order. It means there are fewer shutdowns for



preventive maintenance. Increasing productivity means that the speed of production lines is kept at a maximum, which physically drains and injures workers and produces shoddier merchandise for the consumer. Greater productivity often means less investment in proper ventilation, air pollution control and other devices that make the work environment safer. In essence, greater productivity may demand that workers sacrifice their lives and well-being for more production and profit."

A Strong Indictment

The preceding quotations are a strong indictment of traditional workplace technologies, particularly in the resource and manufacturing sectors of industry. Working conditions in the service sector are probably not much better. The temperature extremes and automobile exhaust that postmen, street cleaners and garbage collectors face; the fumes that fire fighters inhale; the eye stress incurred by office workers seated in front of video display terminals, coupled with the stale and contaminated air they breathe when working in enclosed buildings; the various hazards faced by longshoremen and teamsters — these are but a few of the service technologies that pose unacceptable risks for workers.

The list of hazards workers face from a wide variety of work situations (technologies) is very lengthy. Most workers have now become painfully aware of the risks they are taking while earning a living. Large volumes detailing industrial hazards have been published, (e.g., *Dangerous Properties Of Industrial Materials*, by N. Irving Sax — Van Nostrand Reinhold Company and *Work Is Dangerous To Your Health, A Handbook of Health Hazards In The Workplace and What You Can Do About Them*, by Jeanne M. Stellman and Susan M. Daum — Vintage Books).

While the number of work related risks is too numerous to list here, they can be placed into a relatively small number of categories, such as: effects of noise and vibration; effects of heat and cold, effects of radiation such as light, ultraviolet, micro-wave, ionizing radiation, infra red; effects of exposure to a wide variety of chemicals, including various forms and kinds of dust; and last but far from least, exposure to stress.

Stress warrants special mention because it is only recently that its importance as a major cause of disease has been realized. A great deal remains to be learned; however, much is already known and much more suspected. *It may very well be that stress is the leading cause of nearly all diseases.* There are many possible sources of stress, but it is doubtful if any are more responsible for it than the workplace.

According to Drs. Stellman and Daum, when the body is subjected to stress, biological changes occur, leading in some cases to symptoms such as reduced appetite, loss of weight, inability to make decisions, irregular bowel movements, headaches, skin rashes, insomnia, backache, nervousness, tremors, poor memory, and irritability. In other instances, these symptoms may not appear but chronic stress can lead directly to actual diseases, such as ulcers, migraine, asthma, ulcerative colitis, high blood pressure and most deadly of all, coronary heart disease.

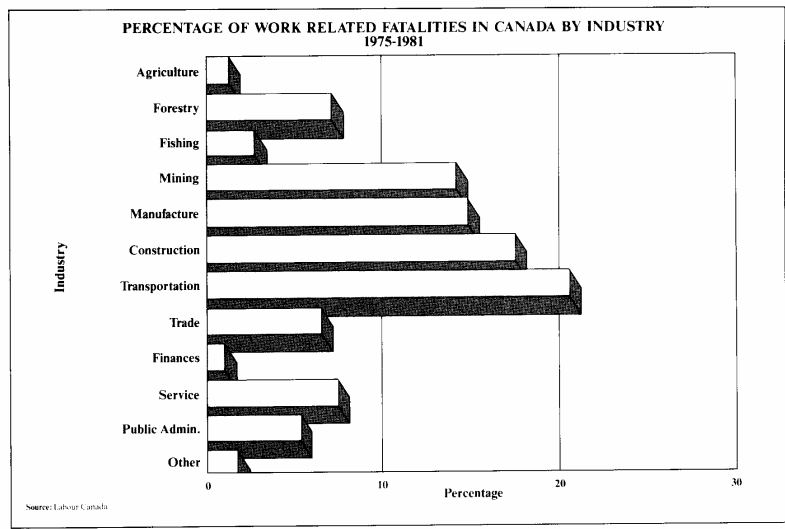
The Many Roots of Stress

The source of stress varies. Working in a noisy, dirty, dimly lit, isolated, rigidly supervised environment is certainly stressful. The rate of work may cause stressful reactions. If it is too fast it may cause strain, feelings of fear, anxiety, depression, etc. If it is rather slow it may be boring, leading to an unwillingness to work and to the commission of mistakes that can be harmful. Emotional and psychological pressures due to fear of injury, to job and financial insecurity, and to constant pressure to succeed contribute greatly to stress reactions.

Fatigue is closely related to stress and the various feelings associated with fatigue, such as boredom, weariness, depression, anger, exhaustion, etc., can cause diminished skill in performing tasks and changes in the heart rate and brain waves. Causes of fatigue include: monotony, unpleasant surroundings, intensity and length of manual and mental work, and mental and emotional causes such as conflicts, responsibilities, fear and worry.

One very unfortunate side-effect that often occurs as a result of stressful situations is the use of alcohol and drugs to escape. While alcohol in moderate amounts may even prove beneficial, it can cause serious liver damage if

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the worker in question is also exposed to chlorinated hydrocarbon solvents such as carbon tetrachloride and tetrachloroethane. Chronic use of excessive quantities of alcohol leads to addiction. The same is true for hard drugs. In both cases the results are usually disastrous. The use of alcohol or drugs is obviously not the proper way to relieve job stress.

What does the future hold in store for workplace conditions? They certainly have changed drastically in the last hundred years. If the trend continues, as seems likely, labour technology will be totally altered. Indeed, the workplace, as we know it, may completely disappear. The goal is to make sure that, however work is carried out, working conditions will dramatically improve. Advances in electronics, computers, artificial intelligence, robotics, biotechnology and new materials such as ceramics, new alloys and plastics promise much with respect to improving work conditions and reducing occupational risks.

The other side of the coin is that the potential for invading workers' privacy will

probably be heightened — that arbitrary testing of job applicants for psychological and genetic characteristics may become common; that the industrial use of genetically engineered micro-organisms may pose new and unforeseen occupational risks; that the tremendous increase in efficiency of electronic information processing devices will produce greater work-loads which in turn will cause more stress; and that the potential for deskilling may become greater. In light of all this, it is evident that workers should strive to keep abreast of changing conditions to ensure that their interests are protected.

Can technology assist in resolving occupational health problems? The answer is most certainly "yes." For example, the practice of medicine must take into greater account the occupational sources of disease. For good historical and compassionate reasons the practice of medicine has been treatment-oriented. However, most experts now agree that the general improvement in the health of citizens in the developed world has been due to improved sanitation, more leisure time, better nutrition, more effective personal

hygiene, more exercise, improved personal habits such as quitting cigarette smoking, drinking in moderation and finally, better working conditions.

Emphasis on Prevention

It is obvious that prevention is more desirable than treatment. Doctors who treat patients successfully and then return them to the conditions that created their diseases in the first place are only doing half their job. Usually this occurs because of the doctors' ignorance and corresponding lack of interest. In other instances, it has occurred because of the physician's vested interest.

Very few medical practitioners have been trained in schools of industrial or occupational medicine, or, for that matter, in any aspect of preventive medicine. Yet physicians and scientists often feel that only they can understand the problem, take samples of air or measurements of noise, and administer medical tests. They hide behind a screen of jargon which only they can understand, to promote themselves as infallible experts.

Fortunately, times are changing. Prevention is becoming more than just a catchword. To a greater degree, the experts are talking *to*, instead of *down at* those of us who have a real interest. A new breed of doctor is emerging, the occupational health specialist, who combines his or her expertise in medicine with a knowledge of working conditions to promote the efficiency and well-being of the worker.

Provincially-sponsored community health clinics offer these specialists a viable locale to treat and especially to prevent occupational disease. While medical treatment for a specific disease is the same no matter what the cause happens to be, these clinics usually are more accessible, more flexible in their approaches to patients, and more ready to communicate than are the standard medical institutions, something workers can really appreciate.

A new discipline, called ergonomics, has emerged. Its basic philosophy is that, if the traditional work ethic is truly valuable, *the workplace ought to promote health and not to lessen it.*

Finally, fear has often been expressed about

job losses occurring if money is spent to improve working conditions and on pollution abatement. While the fear of unemployment is understandable, it would appear that the fear of disease and death should be greater. Moreover, workers' health and lives should never knowingly be sacrificed to produce any product. We need look no further than Bhopal and Chernobyl.

However, improvements need not lead to a loss of jobs. Many of the plants that require improvement are marginal (unproductive) because of their age. They have to be shut down and replaced, or drastically altered. Modernizing workplaces can lead to greater efficiency. American polyvinyl chloride plastic companies howled when they were forced to meet new occupational exposure standards. One year later they easily met these standards while the price of polyvinyl chloride actually decreased. There was no loss of jobs or profits. Furthermore, new jobs are being created as exposure control companies are springing up. There could easily be a net increase in employment.

Finally, the lesson from all this is clear. *Technology takes on the values of those who control it.* One-sided corporate control of workplace technologies or related ones such as medicine is not in the best interest of working people. Their jobs, their future and their health are on the line.

CHAPTER 4

Workers' Health: The Law

There are two principal ways in which societies try to deal with occupational health problems — the formal structures and tools, and the more informal methods. Although this chapter necessarily concentrates on the formal or legal aspects, the informal means should not be discounted. They may, in fact, be far more effective, at least from the individual worker's point of view.

Occupational health clinics, education, voluntary compliance with nonlegal standards of sanitation and pollution control, individual and collective crusades, voluntary joint health and safety committees, as well as social, psychological and personal support from family, friends and neighbours probably have far more significance for workers' health than all the fancy sounding laws that governments pass to make themselves look good.

Yet, when all else fails, what remains are those formal approaches, i.e., the "law." The law becomes a court of last resort. Law has been called "Dead Politics," since laws are mostly shaped by political forces. The underlying and critical role of politics should always be kept in mind when considering laws that deal with occupational health issues.

The common cliché, "Ignorance of the law is no excuse," is often used when finding someone guilty of a misdemeanor or a felony. A victim's ignorance of one's rights under the law of ten allows the victimizers to continue to victimize their victims. This has been especially true in the area of occupational health.

The law has long had its detractors and defenders. Probably from the very first moment a law was put forward it was attacked, ignored or ridiculed. It is such an easy thing to do. Yet, how often has one heard the refrain, "There ought to be a law!" Shakespeare criticized it by referring to the law's delay. He went much further in his play *Henry VI* where he suggested, "The first thing we do, let's kill all the lawyers."

Long before Shakespeare, St. Augustine commented that "Necessity has no law," by which, it is assumed he meant that the need

for food, justice, reasonable equity, freedom, health, etc., prevails over laws that prevent their acquisition. Oliver Goldsmith, in his work, *The Traveller*, noted that "Laws grind the poor, and rich men rule the law." Charles Dickens was no kinder when, in *Oliver Twist*, he suggested that "the law is a ass, a idiot."

A Nation of Laws

Perhaps the most cutting criticism of the law comes from Anatole France, the great French writer, when he said, "The law, in its majestic equality, forbids the rich as well as the poor, to sleep under bridges, to beg in the streets, and to steal bread."

While the "law" has had many detractors, many have defended it. No one has been able to come up with anything better. Oliver Wendell Holmes said it best when he wrote, "The law, wherein as in a magic mirror, we see reflected not only our own lives, but the lives of all men that have been! When I think on this majestic theme, my eyes dazzle."

Those of us who live in societies where the law truly prevails have a lot to be thankful for. A nation of laws provides its citizens with much protection against those who would harm them, no matter how powerful they may be. It also provides its citizens with the means to defend themselves. Most important of all, the law in our society provides us with the means for changing it. It is up to us to learn what these laws are and how to use them.

What is the law? Is there any ultimate bottom line, purpose or goal for the law, and if there is, what is it? On the surface these questions appear rather philosophical and somewhat irrelevant to occupational health issues. They are not. Those who shape our laws are strongly influenced by the views they hold with respect to these questions, no matter whether they are held consciously or subconsciously. It is their state of mind, which is largely influenced by their values, that shape the laws they create.

There are those who believe that the law is the word of God. Others hold that the law is

synonymous with so called natural law. Many believe that laws function to protect society and others that it is the best way of resolving a wide variety of disputes. Some believe strongly in the punitive and penal aspects of law, while others hold that law, by its coercive power, prevents undesirable behaviour.

With the possible exception of the first of the above mentioned beliefs (belief in law as the word of God precludes the other possibilities, a situation which is unacceptable), there is some validity to all the other points of view, in that, collectively, they serve to keep society running on a more or less even keel and in a somewhat harmonious fashion. It does this by providing society with a code of behaviour which is coercively enforced and consists mostly of a list of "do not's".

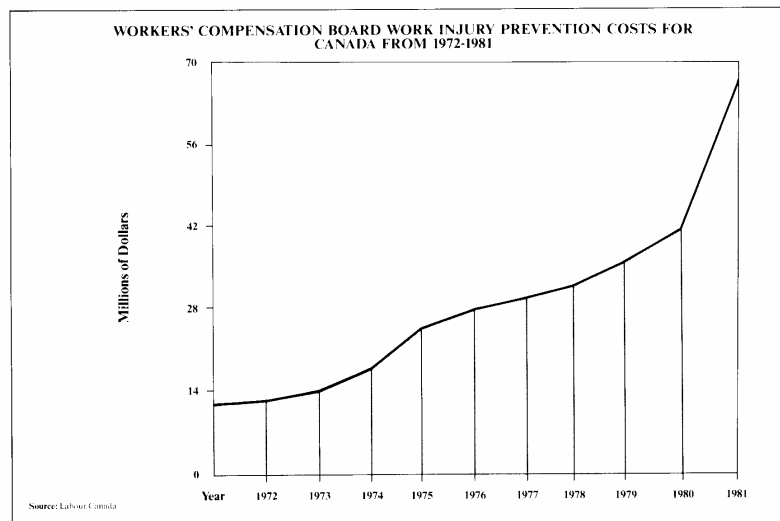
The Law isn't Sacred

Our laws have a long history and tradition. To a very large extent they have worked and worked well. There can be no doubt that the law merits respect, consideration and observance. However, the law is not sacred, holy, saintly and absolute. It is not etched in stone

nor is it a reflection of "natural law." If the latter were true, there would be good reason to believe that we would have all perished by now. Nature is neither benevolent nor compassionate. It is unyielding and unforgiving, and its laws are not concerned with human welfare.

While the laws of nature may be a manifestation of God's word, the law is man's creation. It was created by man to serve man. As such, it suffers from all the deficiencies of humanity. It is value laden so that those who frame, interpret and enforce it have enormous power, because it is usually their values and interests or those belonging to the rich and powerful, as opposed to the poor and disenfranchised, that get translated into laws that benefit the former and do disservice to the latter. Yet, despite these deficiencies, and perhaps with science, the arts and philosophy, it has become one of the great edifices of human thought and more importantly, of human practice.

The realization that law is essentially artificial is important because it allows for changes. Changing conditions bring on the need for changes, not only in the written laws



but in the bodies that frame, interpret and enforce them. This is especially true today.

The Science Council of Canada's report titled *Regulating the Regulators — Science, Values and Decisions*, refers to two leading American thinkers who have highlighted such current needs. Judge David Bazelon of the United States Court of Appeal has written: "The astounding explosion of scientific knowledge and the increasing sophistication of the public have radically transformed our attitude toward risk regulations. As governmental health and safety regulations become pervasive, there is a pressing need to redefine the relation between science and law. This is one of the greatest challenges now facing government and indeed society as a whole."

Dorothy Nelkin, Professor of Political Science at Cornell University, adds: "Until recently, the risks of technology have mainly been perceived as a technical problem, not a political issue; a problem to be relegated to expertise, not to public debate. But controversies have politicized the issue of risk, called attention to the interests and the question of power that are involved. Several features of the disputes over risk have contributed to this politicization and to the difficulties of conflict resolution."

Need for Changes

Most people would agree that there is need for changes in the law. Nowhere is the need greater than in the arena of occupational health. How can or does the law protect workers and how should it be changed to fulfill that function better?

First, let us examine what the law is supposed to do. It is supposed to protect workers' health by regulating the workplace. This is presumably accomplished by setting standards that prohibit the excessive exposure of workers to unsanitary conditions, to certain toxic chemicals, and to various energy forms such as noise and radiation. Further, in certain jurisdictions, worker-management health and safety committees have been created to monitor workplaces and to set exposure standards. In these instances, workers have been given the right to refuse work they deem unsafe.

Next, and about as important as regulation,

is compensation. The establishment of provincial Workers Compensation Boards to provide economic relief for insured and diseased workers, as opposed to using the courts as a means of acquiring such assistance, is a major advance. It is much faster than the courts and certainly does not cost the worker needing help one red cent.

What is wrong, then, with the above scenarios? On the surface they appear reasonable. First let us deal with regulation. Certainly, the recent introduction of health and safety committees, along with the right to refuse work deemed unsafe by workers, are very positive steps. The problem is that the number of provinces where that is the law are few, and that the total number of workers who have these rights represent a very small proportion of the Canadian labour force. More importantly, when it comes to regulating the workplace, the law is deficient in a number of ways.

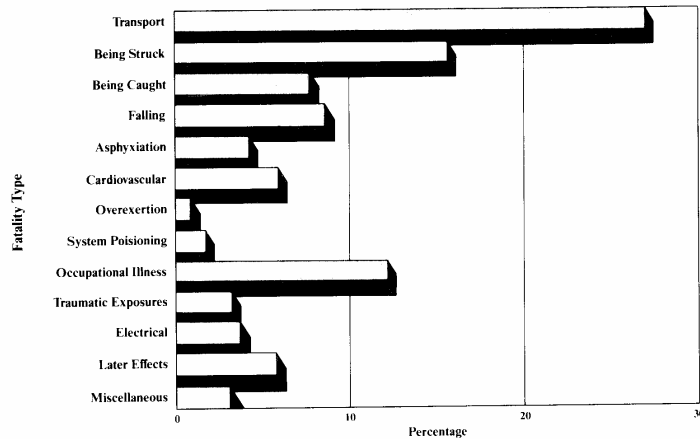
While for the most part it prohibits dangerous behaviour on the part of management, it does not promote healthy work conditions. Further, any behaviour that is not explicitly prohibited is permitted. This is similar to a practice based on the "residual rights theory" which at one time was in vogue and may still be. That practice consisted of the notion that anything that was not covered by a collective agreement between management and labour belonged to management. This gave employers a free hand when they decided to introduce new technologies, no matter what the effect was on workers.

Class Action Suits

It is true that workers, individually, have the right to lay criminal charges and sue for damages. However, the costs are prohibitive and the rules of evidence make it nearly impossible for a worker to win his/her case against the high-powered battery of expert lawyers usually used by management.

Three changes may improve this situation. First, workers and others should be able to engage in class action suits. This would result in making the costs for each individual involved reasonable. It would also allow for the easier introduction of wide ranging

PERCENTAGE OF WORK RELATED FATALITIES IN CANADIAN INDUSTRY BY TYPE
1975-1981



Source: Labour Canada

evidence from a greater number of sources, namely the plaintiffs.

Second, the rules of evidence in these cases have to be reconsidered. English laws have always been based on the tenet of innocence until guilt is proven. This principle has served the ends of justice well but it has limitations. How can exposure to a certain chemical be shown to have caused a disease beyond a reasonable doubt, when it often takes years for that malady to develop? Further, for example, it is currently impossible to state categorically that a particular lung cancer was caused by cigarette smoking even if the victim was a four pack a day smoker. In other words, the causes of many, if not most, occupational diseases, are impossible to pinpoint to a court's satisfaction. Prudence appears to dictate that a new chemical should be considered *guilty* of being dangerous until proven safe.

Third, it is suggested that "equality before the law," one of the most basic principles of law in the western world, also needs some reconsideration. No one would dare recommend abandoning it and yet does anybody

really believe that this most democratic of legal ideas is truly followed? Are the rich and poor really equal before the law? Is the ordinary individual given the same deference by the legal process as our political and corporate leaders, their families and their acolytes? However, despite these transgressions, it is essential that this principle be retained and more honoured in practice.

One step towards that goal would be for the law to start differentiating sharply between the rights of corporate entities and those of individual citizens. This should ensure that the rights of the latter take precedence over those of the former, so that citizens and workers have some protection against those large, faceless, often nameless, impersonal, very powerful industrial organizations that seem to operate according to their own laws and solely in their own interest. To treat corporate entities and individual citizens (especially workers) equally is to treat them *unequally*. All the advantages accrue to the corporations. This results in a travesty of the principle of "equal rights before the law."

Administrative Law

These three recommendations deal with some general aspects of the law. Actually most regulatory law, including those parts of it that are supposed to protect workers' health, fall under a larger category called "administrative law." An illustration will best explain how this works. Years ago, Parliament passed a law called the Food and Drug Act. It gave the Department of Health and Welfare a mandate to ensure that articles of food and drugs that Canadian citizens consume do not pose a hazard to their health, and that claims about them are not fraudulent. To accomplish this, Parliament gave Health and Welfare the power to write regulations and to enforce them.

Similarly, the federal and some provincial legislatures have given their respective Departments of Labour the power to write and enforce regulations regarding occupational health. Usually they consist of standards of exposure to materials and energy forms deemed unsafe and to standards of industrial practice thought hazardous. These powers fall under the heading of administrative law.

The major virtue of administrative regulatory law is that it provides regulators with quick and effective means to carry out their mandates. They need not be impeded by the various legal obstacles that lawyers and courts can usually utilize. Regulatory standards of behaviour are either met or they are not. If not, they can be enforced by the application of judicial sanctions or penalties.

Well, then, what is wrong with administrative regulatory law? Unfortunately, the answer is: *plenty*. Before elaborating, it must be emphasized that those involved in regulation, both at the bureaucratic and at times political levels, are mostly excellent at what they do. They should not be faulted for what are, essentially, flaws in the system and the occasional lack of political will to tackle, head on, some serious health problems in and out of the workplace. Canadians do not have too much to complain about with respect to how their basic health is being protected by their governments. Compared to most other nations, we are relatively well off. This does not mean that the flaws just referred to should not be identified and rectified. The workplace certainly has been and to a large extent is still

a sore point.

The system provides the Ministers responsible for the various regulatory agencies and their senior bureaucrats with wide discretionary powers. There is hardly any way they can be challenged, and even when an Act provides for appeal procedures, the final word usually still rests with the Ministers. Too much power held by individual groups is not a good thing. At least Ministers can always be voted out.

Senior bureaucrats, on the other hand, are far better protected and, traditionally, have hardly ever been held accountable. They have shown a disinclination to admit publicly to errors on their part or, on occasion, to the existence of any problems. It is not in their best interest to do so. Everything under their mandate must be perceived to be okay, otherwise they could be viewed as not doing their job. The public already views the bureaucracy with a certain amount of distrust and disdain so that any further addition of fuel to that fire is to be avoided as much as possible. It is well known that the bureaucracy discourages whistle blowing. Assertions such as "It is safe" or "There is nothing wrong" are standard ways of protecting one's rear end. It is heartening to note that the bureaucracy is opening up and, because of the Freedom of Information Act, information about what is internally transpiring is being made more readily available.

Risk of Collusion

Many regulations have been written with the collaboration of those being regulated. There is an oft-quoted assertion that regulators and those they regulate resemble each other and have more in common than the regulators have with those they are supposed to protect. Whether this is true is beside the point.

The perception probably exists because the regulators often actually come from the very same private sector under regulation and frequently have the same professional, technical or managerial background as those with whom they have to deal. They usually speak the same language, understandable only to them. (Two terms, frequently used when setting exposure standards are "best available technology" and "best practicable technology". It is unclear of what use either is

in protecting workers' health.) The rationale used to justify this is: "Who is in a better position to regulate an industry than those who know it best?" While there is some validity to this position, the possibility for unhealthy collusion, even if inadvertent, is too great. Changes are needed.

The problem of regulation with respect to occupational risks is exacerbated by the fact that there is no governmental body in Canada whose sole or principal mandate is to protect workers' health. Indeed, neither the federal Department of Labour nor its provincial counterparts can be said to speak for labour or to any degree represent labour in Canada's various cabinets. The United States, on the other hand, has, as part of the U.S. Department of Labour, its Occupational Safety and Health Administration (OSHA). Its sole mandate is to regulate the workplace to protect workers' health. Needed occupational risk information is provided by the National Institute of Occupational Safety and Health (NIOSH), whose function is to carry out or to fund research into work-related risks and the measures needed to lessen or eliminate them.

To be fair, Canada does have an agency whose sole function lies in the area of occupational health and safety. The Canadian Centre for Occupational Safety & Health (CCOSH) was created in 1979 by the federal Department of Labour. It has representation on its Board of Governors from labour, industrial management, and the provincial and federal governments. It has done an excellent job of gathering, packaging and disseminating useful information about all aspects of occupational risks to anyone who requires it. However, that is all it appears to do. It does no research of its own nor does it fund any. More importantly, it has no regulatory authority whatsoever and plays no role in either setting or advising on exposure standards.

National Code Needed

There is no reason why this agency cannot create an informal national code of occupational health, (somewhat along the lines of the National Research Council's national building code, which has no legal basis but is accepted across Canada), which could, after a reasonable gestation period, become nationally

accepted. The code need not have a legal basis, but failure to comply could be publicized along with requests for the reasons for noncompliance. If this were done the Centre's credibility would be considerably enhanced. All that is required is the political will, a commodity often lacking when it comes to protecting workers as opposed to their employers.

The impression may have been given that there is a dearth of Canadian laws and institutions involved with the protection of workers' health. Actually there may be too many. According to a report published by CCOSH in 1983, there are 108 agencies and 241 laws in Canada that deal with occupational health and safety. The trouble is that there is no unifying body or corpus of regulatory occupational law. Further, many of the laws are not aimed uniquely at occupational problems. The occupational aspects are often nothing more than byproducts of more general laws. Nor are the agencies uniquely directed to protecting workers' health. The occupational aspects are often nothing but a small part of some of these agencies' responsibilities.

While it is important that laws exist, it is more important that the workplaces be monitored and existing laws enforced. This is becoming more difficult to do in these times of deregulation and cutbacks. There does not appear to be any point in having laws that either are not or cannot be enforced.

Many, if not most, exposure standards in Canada are simply taken from the American Conference of Governmental Industrial Hygienists (ACGIH). This may give the impression that the standard setting process is technical in nature, but in fact the process is essentially political. It is very naive to assume that meeting some standard that was decided behind closed doors by so-called bureaucratic experts assures protection. A standard is a political decision. It is based upon how much the decision-makers are willing to pay for safety and how much safety they deem desirable from the point of view of their public image. Their values and vested interests are therefore of paramount importance when reaching decisions about standards.

Standards of protection, in a democratic society, should reflect what those who are at risk consider acceptable. At the very least, the standard setting process should allow for their input and require that it receive serious

consideration. Such a process should also be accountable to those at risk.

Finally, mention should be made of obligatory legally-based compensation to workers who have suffered occupational injury or disease. Today, nearly all compensation for work-related injury and disease is provided by Worker Compensation Boards. As noted earlier, this is a big improvement over using the judicial system for such purposes. Burdens of proof are not as onerous on workers. Financial assistance is provided more readily and rapidly. Avoiding litigation also means avoiding the unaffordable costs often involved.

Blaming the Victim

Workers' compensation schemes came about because of the failure of the legal system to provide remedies for injured workers. This was because victims were usually blamed for what happened to them, a position often upheld by the courts. As British Columbia's Mr. Justice Sloan stated in 1942: "Under the common law only 20 to 30% of the workmen injured in industrial accidents could hope to recover damages from their employers and even then, in many instances, after protracted and expensive litigation."

He was referring to industrial *accidents*. One can only guess at how inadequate the courts would be if they had to deal with industrial *diseases*!

Workers' compensation is a legally based right that workers have won. It is not a privilege. It is not charity. It is not welfare. It is not based on a means or need test. It reimburses workers for lost income.

How well is it working? Complaints about it have been increasing. For example:

- "Permanent disability pensions are inadequate."
- "Those suffering from permanent back injuries get only a maximum of 60% of their previous salary."
- "The red tape is horrendous."
- "Many workers are asked to return to work even when they claim they have not fully recovered. Failure to return cuts off their benefits."
- "Pain, suffering and anguish are not

compensated, only lost income."

- "It gets business off the hook at a nominal cost to it."

- "It measures its success, not by the amount of assistance it provides but by how carefully it doles out money."

- According to Reasons/Ross/Paterson in *Assault On The Worker*: "The boards have neglected industrial disease" by:

- being injury and trauma-oriented;
- by placing procedural roadblocks in the way of industrial disease claims, e.g., time limits, conservative diagnostic criteria and assessment rules, and limited lists of recognized industrial diseases;
- by not looking for claims but only responding to claims made; workers and their families are often ignorant of possible work causations, are caught up emotionally in the death or disability and neglect claims;
- by overlooking the fact that many diseases take years to develop and work-causation is either forgotten or impossible to reconstruct, or the worker is now retired or otherwise disabled.

The list goes on and on.

One comment often voiced is that there is no appeal to the courts of a Workers Compensation Board decision. While this appears to be true, some recent excellent initiatives do provide for appeals. Ombudsmen-type offices have been created. Hopefully they will lessen this problem.

For the sake of fairness, it must be admitted that the workload faced by most WCBs is very large. Errors are bound to occur. Yet most claims seem to be handled reasonably well. This does not mean that the complaints listed above do not have validity. Trade unions should play an active role in fighting for needed changes.

CHAPTER 5

Workers' Health: Summing Up

The previous chapter touched on the subject of how workers are treated after suffering injury or disease because of their work. This issue merits further examination. Much of what follows is derived from *Assault On The Worker* by Reasons, Ross and Paterson. The following poem appears on page 178 of that book and comes from Mark Warrior's "Sion" in Tom Wayman (ed), *Beaton Abbot's Got the Contract*. (Edmonton: NeWest Press, n.d.)

*Sion is thirty-eight
used to work the steel gang, used to run
bent double under the rebar,
now he cannot overload his tray
and must be careful to get help when throwing
seventy-year-old drunks out of the bar.

he never figured in the statistics
of those disabled by industrial accidents
yet another ten years' degeneration of his spine
will see him on the welfare rolls,
one of those bums too lazy to get a job,
in twenty years, should he live that long,
i shall probably be asking for help
to throw an old workmate out of the bar.*

In an ideal world, workers would never have to be compensated for occupational injury or disease since neither would exist because of perfect preventive measures. Alas, we do not live in an ideal world. We live in one where the political rhetoric of the day vehemently proclaims the importance of prevention. Such rhetoric promises — with equal vigor — equality of all before the law and equality of health care for all. But the system fails to achieve any of these objectives.

Workers' compensation is extremely important because the number of workers who suffer occupational injury and disease is enormous. The numbers who die, leaving families behind to cope, and those who acquire permanent disability, rendering them incapable of continuing to work, are also shockingly high. What happens to these victims of on-the-job hazards (many of which they were not aware of) is a question of tremendous social importance. How well they are taken care of

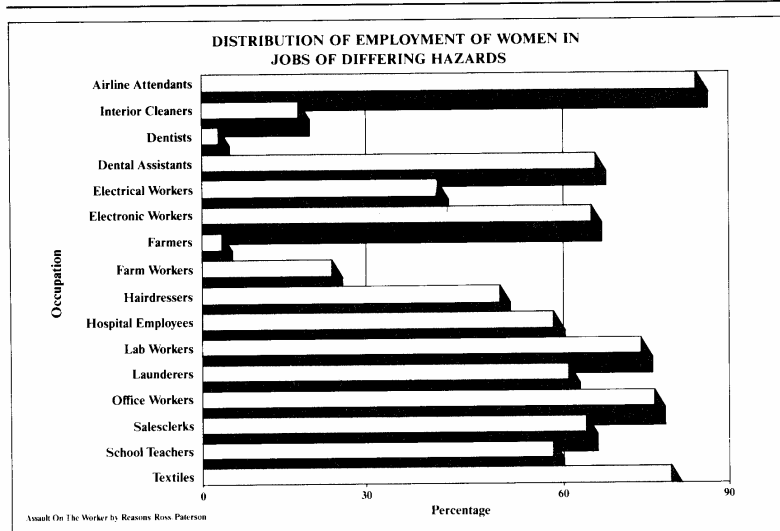
is a measure of how civilized and humane our society is.

Cheap Insurance for Employers

It is generally believed that the original and sole reason for the creation of Workers' Compensation Boards was to ensure that diseased or injured workers would get quick and fair relief because of lost wages without having to go to the courts and suffer the delays and costs of judicial litigation. It was perhaps the principal but not the sole reason. As it turns out, workers' compensation schemes are a form of very cheap "no fault" mutual insurance for employers. Such insurance keeps employers from being sued for large damages, enabling them to pay their insurance costs in an orderly fashion while maintaining their firms' financial structure.

Now, since Workers' Compensation is a collective and in practice compulsory system, employers' premiums are kept as low as possible. They are supposed to correspond to how hazardous the employer's business happens to be as measured by medical aid, wage loss, pensions and fatal claims made by workers of that employer and in that industry. Here we come to the fundamental importance of workers' compensation when it comes to promoting safe and healthy workplaces: *Unless compensation assessment rates and penalty assessments accurately reflect the total costs of workplace ill-health, there will be no real economic incentive for employers to operate as safely as possible.* That is the theory of the system. Therefore, inadequate compensation — such as the massive historical failure to recognize and compensate for a variety of industrial diseases — actually contributes to negligence even as it works an economic injustice on the disabled workers.

That is the nub of the problem with current workers' compensation schemes. They are essentially insurance plans for employers. As such, they constitute a business and, as with all businesses the bottom line is to keep costs down and revenues high. In other words,



the WCB ethos is to make a "profit" or at least, avoid going into the red. The costs to be minimized are of course the compensation paid to disabled workers.

Revenues are generated from employers' contributions and, more importantly today, from investment of the "profits" of previous years. As of the end of 1977, all twelve Canadian WCBs together had approximately \$2.4 billion in investments, \$90.6 million in fixed assets, and \$382.8 million in cash. The type of securities that is purchased and the way these funds are administered both vary somewhat under the Workers' Compensation provisions of each province. They also vary with the financial administration and political policies of each provincial government.

No Worker Participation

What is clear is that business (especially the large resource and manufacturing industries dependent upon hydro, roads and railways) have been well served by the available WCB invested funds. In 1979 the Ontario WCB announced that its massive investment portfolio

was directed by executives from four multinational corporations. It is significant that the "business" affairs of a purportedly worker-oriented crown corporation had absolutely no worker participation. It is not surprising that very little research into ill-health prevention has been sponsored by WCBs, despite the huge funds at their disposal. These funds could also be used to pursue other health and safety related matters, such as favouring investment in businesses which themselves develop accident-prevention products and healthier technologies.

It is evident that Workers' Compensation Boards appear to be vested with a business orientation and therefore imbued with an accounting mentality. This mentality, in turn, is probably responsible for many of the complaints that workers voice about them. Across the country, WCB complaints are consistently among the leading categories of complaints received by provincial ombudsmen. They usually center about the following situations:

- wage-loss beyond two weeks;

- industrial disease and pension cases;
- the lack of comprehensive coverage;
- unfair compensation and compensation ceilings;
- waiting periods which unjustly fine the disabled worker and add to what he or she has already lost;
- unsatisfactory rehabilitation;
- the lack of job security and of new employment opportunities because of an injury-related inability to do one's former job;
- and, perhaps, most important, a lack of relief and compensation for things difficult to measure such as pain and suffering, family break-up, lower standard of living, loss of ability to conceive or bear children, etc.

Despite the aforementioned shortcomings, Workers' Compensation Boards are better than no boards at all. A recent survey of injured forestry workers in British Columbia indicated what they believe Compensation Boards should do. They recommended:

- more unannounced inspections, including inspecting small employers;
- talks and seminars by the WCBs for workers and the handicapped;
- enforcement of the safety rules and the provision of proper clothing and equipment by employers;
- elimination of the need for workers to lift overweight objects;
- the lessening of exposures to dust, chemicals and poor lighting; and
- hiring WCB staff from the ranks of workers.

It is up to all of us — workers, employers, politicians, bureaucrats, trade union leaders, doctors, etc. — to try to eliminate or lessen the deficiencies of Workers' Compensation Boards, and to ensure that they truly exist for the benefit of workers. It must be repeatedly emphasized that *compensation provided to workers suffering from occupational injury or disease is a right, not a privilege. It is not charity.*

Women at Risk

Very conspicuous by its absence in most of

the literature on occupational health is the mention of issues pertaining to the special risks women sometimes face in the workplace. These issues cannot be avoided since more than 40% of the work force now consists of women, and because their rate of participation is increasing much faster than that of men. According to an article in the *New York Review of Books*, (August 14, 1986), women have taken 80% of the new jobs created in the U.S. economy since 1980. Things are probably not much different in Canada.

Women comprise the majority of the work force in the fields of health and medicine, clerical work, teaching, and sales and services. They also constitute the majority of workers within certain manufacturing industries such as textiles, clothing and certain electronic devices such as silicon chips.

In *Assault On The Worker* Reasons, Ross and Paterson clearly show that women are exposed to as wide a variety and as dangerous as set of hazards as are men. They range in nature from:

- exposure to dangerous chemicals, bacteria, radiation, noise, extreme temperatures;
- poor quality ventilation;
- excessive muscular activity and at the other extreme, sedentary work; and
- stress due to low pay, lack of control, overwork, etc.

These conditions are not healthy for anyone who faces them. However, what may be unique for women is that their health may be affected more adversely or differently than is men's. For the most part we do not know the extent to which such differential impacts occur. There is, however, solid evidence that fetuses are very vulnerable and require much protection.

The scant interest in study and research about women's occupational health problems and risks has helped to perpetuate an inordinate amount of ignorance on this subject. This has occurred because, in the past, women usually were and, to a large but lesser extent, still are on the low rung of the occupational hierarchy; because many of their white collar occupations were thought to be "safe," and because fewer women than men belong to trade unions. Further, and for similar reasons, their health and safety

concerns are less likely to be addressed than are men's.

We do know, however, that women and their fetuses are naturally susceptible to certain hazards that men do not encounter. We also know that, despite the special nature of the work that the majority of women are obliged to do, women face hazards just as frequently as men.

What should be done about women's occupational health risks? The Canadian Advisory Council on the Status of Women issued a position paper on *Reproductive Hazards in the Workplace*. One of the fundamental principles it enunciated is:

"Any occupational hazard which may lead to disability, chronic illness or death of any worker or his or her potential offspring can and must be altered to provide maximum safety for the most susceptible worker in the labour force. The hazard, not the worker must be controlled and the workplace must be designed to provide protection for the most vulnerable worker. The term 'most susceptible worker' is defined as 'any worker, male or female, who is at risk from exposure to hazardous substances which may adversely affect their reproductive system and potentially, their ability to produce healthy offspring.'"

Furthermore, the position paper strongly recommended that the Canada Labour Code and the Canadian Human Rights Act be amended to prevent employment discrimination on the basis of reproductive capacity, pregnancy or childbirth. This is now required by our current Charter of Rights.

In summary, while it is true that women may be more vulnerable to certain occupational diseases and injuries, any employment policy that discriminates against them on these grounds is totally unacceptable. If a pregnant woman is being exposed to a hazard at work, and it is a hazard because of her pregnancy, the answer is not to remove the woman but to eliminate the hazard.

The Question of Costs

Another topic that requires attention in this final chapter is the question of costs. This question, which is at the core of most disputes surrounding occupational health, really boils

down to this: *Who should pay for all the measures needed to protect and compensate workers?*

To ask workers to cover the bulk of the costs is somewhat like asking the victim of a crime to pay the defence costs of the person charged with the crime. On the other hand, it is argued that if workers do not cover at least some of the costs, they are not entitled to provide any inputs into workplace decisions. This would mean no say on regulatory decisions that may affect their health and well being. (As the old saying goes: "He who pays the piper calls the tune.") It is further argued that if the onus for covering all the costs is placed at management's door, then industry will not be able to remain competitive and the end result will be the loss of jobs.

Well, then, how should the costs be distributed? It is evident that no one party should or can bear them all. Before attempting to answer this question, we should consider another important point.

Safety is a relative term. There may be more of it or less, and any amount of it has to be paid for. The cost of safety is related to how much of it is being sought. The relationship between the cost and the amount of safety is not linear. It is usually exponential. The following illustrates what is meant by this. If one can purchase 10 apples for \$1.00 and 20 apples for \$2.00, the price rise is considered linear. However, if one purchases a certain amount of safety for a certain price, doubling the amount of safety purchased will probably increase the cost (and therefore the price) tenfold, instead of doubling it as with the apples. This type of effect is usually the case with most technologies. A small increase in the performance and efficiency of a sophisticated technology, initially, usually costs a great deal.

In today's world improving the safety characteristics of a machine often entails costly technological and engineering activities. This is an important point. Let us assume, for example, that to make a certain industrial plant 90% safer costs \$1 million. To make it 99% safer may cost \$10 million. To make it 99.9% safer may increase the cost to \$100 million. The question then is: "How much should be spent?"

The answer should not only be based on the costs, but also on how much safety is

actually being purchased. In the example above, 90% improvement may be quite acceptable. In another situation a 99.9% increase in safety may still be unacceptably low. In the latter case it would appear that the plant in question should be closed down. In any case, the amount spent is obviously an item for negotiation, possibly between management, labour and government. It is evident that the amount of safety required is critical in determining the distribution of this type of cost.

Types of Costs

Before determining how costs should be distributed, let us list the types of costs involved. They are:

1. The costs of all research into occupational health problems.
2. The costs of measuring the risks of exposure.
3. The costs of cleaning up the work environment.
4. The costs of monitoring worker exposures.
5. The costs of lowering or eliminating exposure to hazardous materials and energy forms by introducing new or better technologies such as efficient ventilation systems, remote control devices, new protective devices, totally renovated and modernized plants.
6. The costs of medical treatment, rehabilitation and nursing care.
7. The costs of regulation and enforcement.
8. The costs of retraining when called for.
9. The costs associated with compensation.

The use of the notion of public and private goods is probably the best way of determining how the above costs should be distributed. Public goods are those made available by the state to all without immediate cost to any individual or group. The benefits are supposed to accrue to all. These goods include such things as universal medical coverage, hospitals, legal bodies such as the police and courts, our political institutions, airports, railway stations,

highways, public transportation systems, state owned radio and television broadcasting, the military, educational and research institutions, parks, public libraries, etc.

Private goods are those that are available to whoever can pay for them. The purchasers derive the major benefit from these goods. Most of what is called 'labour' falls into the category of private goods. Most of the benefits go to the employers of labour.

Labourers or workers usually take most of the health risks while receiving very few benefits in return.

Now, a piece of industrial machinery does work and is a private good, and no one thinks twice about who should bear the maintenance costs. It may seem clear that, on an analogous basis most of the costs involved in protecting workers' health should be borne by the employer. And yet a human worker is not a machine, and the protection of that person's health is not really similar to machine maintenance. It should not be solely motivated by economic reasons as it is with machine maintenance. Furthermore, while machines and their parts are easily replaced, it would be unconscionable if humans were still treated this way.

Let us now return to the various costs listed above. Risk analysis and occupational health research can be construed as partly private and partly public. Therefore the costs associated should be shared by government, industry and labour. The decisions as to what risks should be measured and what research should be undertaken should be the responsibility of a tripartite body, with labour having the major say. After all, it is labour that has the most at stake.

The medical, regulatory and retraining aspects fall into the category of public goods. As such their costs are borne by the taxpayer. What remains — i.e., prevention and compensation — should become the responsibility of management.

There is another type of shared cost that bears some mention. Labour has recently made some major salary concessions, allowing certain industries the opportunity to maintain their competitive positions. It is beyond the purpose of this book to argue whether this practice has been truly beneficial to labour or whether it has set an undesirable precedent. Recent events, however, have opened the door

for labour to share in covering occupational health costs normally borne only by industry. This has also raised the danger of using safety as a common negotiable item. Trade unions are becoming more vulnerable because of growing job losses. Under no circumstances should the workers' long-term interests in good health be traded off for short-term gains in terms of poorly paid employment.

Miscellaneous Issues

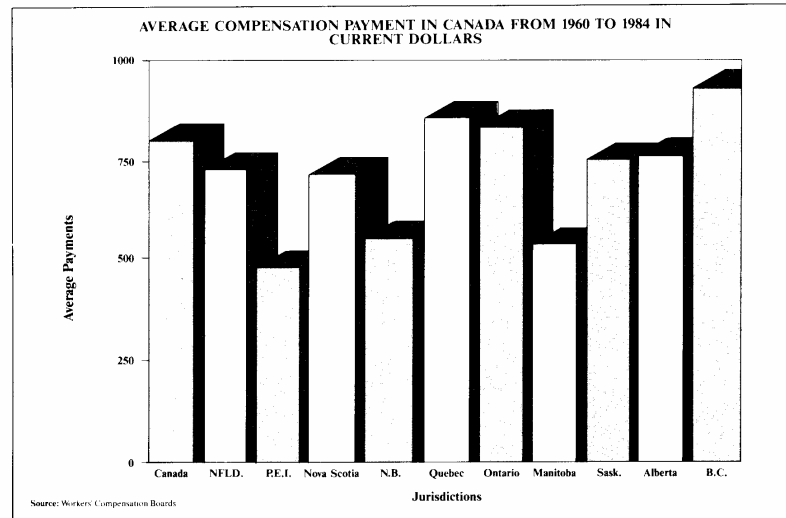
Let us turn to some additional matters that arise when occupational health issues are being debated.

The first is often called the "optimum argument." Its proponents argue that *too little* (or no) regulation of an industry where hazards are present will harm workers and others outside the plant. They may be harmed in sufficient numbers that the industry's economic viability will be irreversibly damaged due to the lack of trust that will arise and be expressed in the marketplace. Such arguments often go on to add that *too much* regulation

will cause the industry to lose its competitive edge.

Similarly maintaining that edge is said also to oblige industry to cut costs by laying off workers who very often may be its ultimate customers. From these perspectives, it would appear that the worker is in a no-win situation. The proponents' solution is that there is an *optimum amount* of regulation which on the one hand provides a reasonable amount of protection while on the other hand allowing industry to remain competitive.

The argument has seductive appeal because of its simplicity. However, the flaw in it is that once again workers' health or jobs will be sacrificed, since it will probably be the economic considerations that will carry the day. This "optimum regulation" idea should not be either blindly accepted or totally rejected. Like many seductive positions, there is some truth in it. Too much regulation could close down industries needlessly. It could actually do more harm than good to workers' health and, of equal importance, stifle industrial innovation that normally leads to



economic growth. What appears to be needed is balanced regulation that takes *all* factors into consideration, placing appropriate weight on each and arriving at measured and well considered regulatory decisions on a case by case basis. Those with a real interest in these decisions should be consulted.

The second issue is one that was dealt with in the chapter on law. It is being revisited here to allow a brief but important elaboration. It was suggested in that chapter that any new chemical should be considered guilty of being a hazard to human health until proven innocent of that charge. If the standard reverse position, which is normal to our laws, is taken, it would mean that people would have to get ill or die before remedial and punitive action would be taken. It is people who have or should have rights before the law. Technology is supposed to serve people, not be served by them. Technology, therefore should have no legal rights. It is expendable. People are not.

The third issue has to do with some terms that have just about become clichés. As with most trendy clichés they have little meaning and yet can cause misunderstanding and harm. The relevant terms here are risk and cost/benefit analyses. Actually, cost/benefit analysis makes some sense if it is not being applied in the occupational health arena. If a decision that entails a business expenditure has to be made, and when the costs and benefits can easily be measured in the same monetary units, there is no good reason why cost/benefit analysis should not be used in helping to make the decision. *However, when the costs involve human health and/or lives and there is no way the benefits can be measured the same way, it would be unforgivable to use cost or risk/benefit analysis in arriving at any decision.*

To use these tools would mean putting a dollar figure on human life, thus making human life expendable for a price. Any decision that may impose a health risk must be agreed to by those taking the risk — with full knowledge of the relevant facts. Health risks must never be imposed on anyone (but especially not on workers because it is they who are usually subjected to the greatest risks) without their knowledge and consent.

Finally, the question of testing workers for the presence of drugs in their urine and blood

bears some mention. This is an issue which at first glance seems to require the wisdom of Solomon to resolve. There is no doubt that such mandatory testing is an invasion of a worker's privacy and may contravene some of the provisions in our newly adopted charter of rights. On the other hand, does anyone want to fly in a commercial airplane without being sure that the pilot is not addicted to alcohol or drugs, or drive in a taxi, take a train, etc., without some reasonable assurance of safety? Does any miner, steelworker or construction worker wish to work beside someone who is on alcohol or drugs? Does any consumer wish to use a product that may be unsafe because of shoddy workmanship due to alcohol or drugs?

While it would appear that some degree of drug testing, on balance, is desirable, it must never be unilaterally imposed. It should become the responsibility of a tripartite body consisting of management, labour and government *only after it has been negotiated as part of a collective bargaining agreement between management and labour. Part of that agreement should also always include testing for toxic chemicals in workers' blood, urine, tissue, saliva, hair, etc. that may be present because of workplace exposures.*

Negotiated or mandatory drug testing should occur *only* when safety is clearly involved. Otherwise it should be voluntary. Whenever it is used, and no matter the circumstances, all the rights associated with due process, such as prior notification and confidentiality, should be guaranteed.

If a particular set of results is positive, no action should be taken until the possibility of false-positive results has been absolutely ruled out. The worker should be given every opportunity to defend himself/herself. If he/she is truly found to be on drugs, then he/she should also be offered every opportunity to detoxify and to permanently rehabilitate without prejudice. Only when this fails should punitive action be taken.

Lessons Learned

The following represents a brief resumé of the most important points made in this book:

Occupational health problems are as old as human history. What is new is the *awareness* of the problem. This has come about mostly

for two reasons. First, as workers have become better educated and more politically active, they have become far more sophisticated and more critical of all aspects of their working conditions. This became more apparent after the onset of the industrial revolution after working conditions had become so abysmal that workers came to realize that they were being treated in a manner that was totally unacceptable.

It is only in recent times that workers have become aware of the more subtle and long-term aspects of occupational injury and disease. This has come about principally because science and technology have provided new and very sensitive measures of the risks associated with exposures to small amounts of toxins, chemicals, materials or energy forms over the long term. There is still, however, a certain attitude prevalent among many young workers that needs to be overcome. It is the "macho" — it can't happen to me — approach to risks.

Risks fall into two categories, those that are easy to recognize because of their immediate and dramatic impact, such as traumatic injury or sudden death, and those that are invisible because they take place over time — in other words, a sort of *slow death*. The first type is relatively easy to measure. The second is incalculable without modern science and technology. There is no doubt that more resources should be devoted to making and improving measurements of the latter type of risk.

Despite the above exhortation, it must be remembered that science is not absolutely value-free and is often replete with uncertainty. Since science is not value free, scientists involved in risk analyses should declare their values and interests. They should get out of their ivory towers more frequently and choose projects that have more significance for workers. For example, the effect of workplace induced stress on workers' health is probably the most important area needing research today and yet very little is being done. Workers as well, through their unions, should get more involved in choosing research projects that will best serve to identify, measure and ameliorate workers' health problems.

Another particularly fruitful area for research and publicity would be the extent of

industry — and government — compliance with public laws and regulations, and the extent to which noncompliance is still being winked at.

Also, scientific uncertainty associated with any risk measurement should be clearly enunciated but should play only a minor role in making appropriate policy and regulatory decisions.

Finally, while the importance of statistics in regulatory science cannot be emphasized enough, they should be used rather judiciously when making and assessing regulations.

People are not numbers.

Political Power

At the heart of all occupational health issues is the exploitation of technology. On the one side of it is scientific research and development, innovation and marketing. On the other side is the measurement of its impacts and its regulation by the political, bureaucratic and judicial levels of government. Man uses technology, is used by it, especially in the workplace, and to a large extent is shaped by it. Whoever controls any or all of these aspects of technology has the power to make or break people, to affect their health, and in some instances to totally ruin society. Of course they also have the power to do just the opposite.

Thankfully, no one group or individual has such power. Our laws are supposed to prevent such a situation from arising. Yet it is obvious that workers have been treated for the most part as nothing more than gears in the machinery of technology. This has occurred because workers, until recently, have had no say in the design and operation of the workplace. *It is time for a change.*

As technology reflects the interests of those who control it, law reflects the interests of those who write, interpret and enforce it. Need more be said? Labour has had very little if any input in the formulation of laws and regulations that affect workers. Again, it is high time for a change. However, while labour should demand that it have a say in regulatory decisions, regulators should not be hampered in carrying out their regulatory responsibilities. Otherwise more harm than good would come out of opening up the regulatory process.

If one thought can be said to encompass all

the occupational health issues, it is that they are *political*. History has shown that all scientific, technological, health care delivery, legal, and regulatory decisions that are involved with occupational health issues and that involve the expenditure of money have been made by those with political and economic power — commodities that workers insufficiently possessed. It is clear that occupational health is another labour issue that is vulnerable to the political process. It is equally clear that workers must make occupational health a *political* issue and force politicians to respond to it. This cannot be done without the active involvement of workers in the political process. *Collectively, workers should support and vote for the political party that best represents their interests.*

We Do Have Choices

A final word about the responsibility any adult individual has when it comes to protecting his or her health. It is unfair to suggest that any time someone gets ill it is due to working conditions. To a certain extent we *do* have choices. We can choose to avoid smoking, excessive alcohol and drugs. We *can* eat a reasonably well-balanced diet and avoid junk, excessively sweet and high-fat foods. We *can* exercise in moderation and sleep normal hours. In other words, there is much we can do on our own to protect our health.

Since health is such a personal thing, workers cannot and should not rely too heavily on management, union officers, government or even the medical profession. Workers must have a right to expect that the means of protecting themselves and the needed information are available. They must also have a right not to have hazards and risks imposed on them without their informed consent. They must have the right to reject work they deem too dangerous. These rights have to be fought for by workers through their unions. Workers must insist that their unions obtain and retain these rights. In other words, workers must not only become politically active, but they must also play a larger role in the affairs of their unions. An 18th century French philosopher, Joseph de Maistre,

wrote: "Nations get the governments they deserve." It is equally true that "workers get the unions they deserve."

How can non-organized workers such as cleaners, migrant field workers, sweat shop workers, clerical workers, most service sector workers, and the growing numbers of non-unionized workers resulting from automation acquire and exercise these rights? Who speaks for them? Nobody! Who will speak for them? Nobody, unless they fight either to join or create a united front and become more politically active.

No matter how inadequate a union may be, *it is infinitely better for workers to belong to an organized collectivity than to try to fight their battles alone.*



**Jack Basuk
1987**

After 28 years of service, Jack Basuk left the Government of Canada's employ in Feb. 1986. He is currently self employed.

A native Montrealer, he graduated from McGill University in 1952. He also attended Sir George Williams University and did post-graduate work at the University of Montreal and Georgetown University, Washington D.C., in physical and analytical chemistry.

He taught various levels and courses of chemistry, in both English and French, at the Collège Militaire Royal and the Collège Rigaud de Vaudreuil.

He spent six years at Health and Welfare Canada's food and drug laboratories in Montreal, where he headed the vitamin and analytical instrumentation sections. When the Professional Institute of the Public Service obtained collective bargaining rights

for professionals in the Public Service, he represented the chemists from Montreal. It was during this period that he developed a strong interest in public health issues, more particularly from their regulatory aspects.

In 1971 he became Secretary of the Science Council of Canada and retained that position until 1977. He arranged the only meeting ever held between representatives from organized labour and the Science Council at a formal meeting of the Council. He wrote on the impacts of technology on labour. An article he authored on the potential effects of freons on ozone in the stratosphere was published by the Bulletin of the American Meteorological Society.

In 1977 he became a member of the professional staff of the Science Council. He remained in that capacity until his departure from the Council and government service in 1986.

During this time he created and ran two major Council studies, having to do with that part of the regulatory process that is supposed to protect the health of Canadian citizens.

The first culminated in a policy report to the federal government, titled, "Policies and Poisons." It examined how six chronic occupational and/or environmental hazards were being handled by Canada's legislative and bureaucratic authorities.

The second investigated the interface problems that exist between science and law, with particular emphasis on health regulation. This study resulted in a Science Council report called "Regulating the Regulators."

At the time of his departure from the Council, Mr. Basuk was engaged in studying the sciences used by the regulatory process to identify, quantify and reduce environmental and occupational health risks.

Jack Basuk

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