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Canadian Law and the Control of Exposure to Hazards

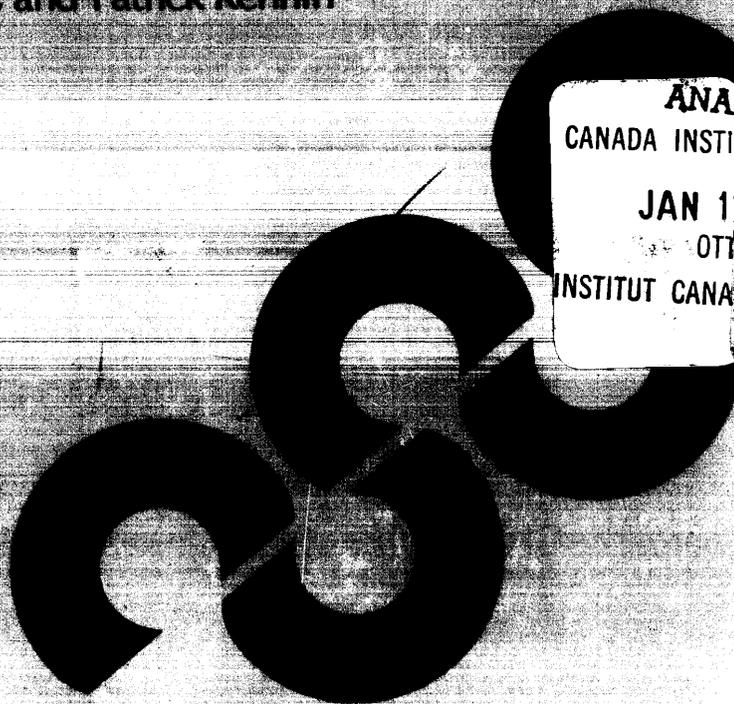
By Robert T. Franson, Alastair R. Lucas,
Lorne Giroux, and Patrick Kenniff

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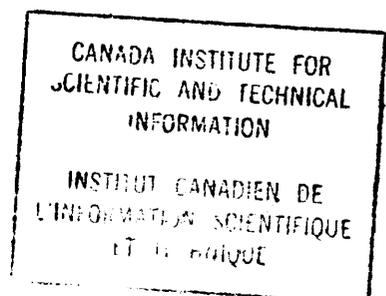
OTTAWA

INSTITUT CANADIEN DE L'I.S.T.



CANADIAN LAW
AND THE
CONTROL OF EXPOSURE TO HAZARDS

ANALYZED



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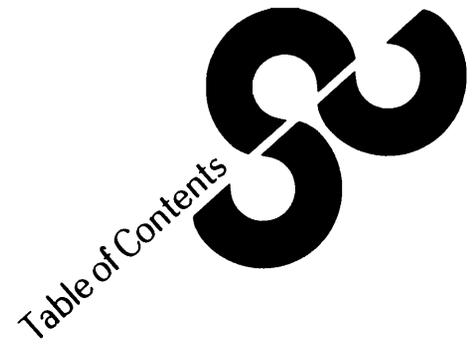
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FOREWORD

The two articles that comprise this background study deal with legal aspects and issues relevant to the control and regulation of hazards in Canada - particularly those of a long-term, low level nature. They are part of the background material that was accumulated during the course of the Science Council study dealing with this problem. They were commissioned to provide the Council with a clear picture of the legal framework within which Canadian regulatory agencies and the courts operate to control hazards and compensate those affected by them. A clear understanding of our legal and judicial system, that is, of the opportunities it affords and the constraints it imposes, is essential if policy recommendations are to be realistic and credible.

In particular, six hazards were selected for investigation, asbestos, lead, mercury, oxides of nitrogen, radiation and vinyl chloride monomer. They were selected because they are broadly representative of hazards pertinent to the Canadian scene, from which lesson applicable to other hazards can be learned. Asbestos was chosen primarily because of Canada's position as a major producer, because of the synergistic effects of fibre inhalation and cigarette smoking, and because asbestos actually has a relatively long history of being scientifically suspect. Lead was chosen because there is real concern about occupational and public exposure to it; because there is no expert Canadian source of information to which the public has access; because, while a legal framework for protection has been set up, it does not appear to be operational, and because the effects of low doses of lead over the long term and the more immediate effect of low doses on children is unknown. Mercury was chosen because human exposure to its most toxic form is primarily through the food chain; because there is an increasing amount of evidence that many of Canada's lakes and rivers are excessively contaminated with mercury; and because those who have been most exposed are an easy identifiable minority - the native people. Oxides of nitrogen were selected because, in Canada, there appears to be little concern about either the many sources that emit NO_x or about the potential consequences to affected occupational groups and the general public. Radiation was selected mainly because its regulation is a federal responsibility, while the standards in force are of international origin; because the nature of the radiation hazard is unique; and because its potential as a hazard may be enormous. Finally, vinyl chloride monomer was selected because it is a good example of one of several hundred new synthetic organic chemicals introduced each year that later turn out to have marked carcinogenic, mutagenic, teratogenic or general sematic effects; and because of its economic importance.

The two articles are complementary. The first, by Franson and Lucas, deal holistically with the Canadian legal system and touches upon such things as constitutional jurisdiction over hazardous substances, the legislative framework and some special legal problems. The second, by Giroux and Kenniff, examines, in some detail, one of Canada's jurisdictions, namely Quebec. Quebec was chosen because its legal system differs somewhat from all the other provinces, therefore offering a unique opportunity to make useful comparisons.

The articles are concerned with existing law in the light of the statutes and regulations applicable to the six substances studied. The framework and the scope of the authors' studies, as well as the means available for carrying them out, were not such as to enable the authors to verify empirically the application and enforcement of the statutes and regulations analyzed herein. A study of that scope would require the use of survey and analysis techniques which were simply not available. For this reason, criticism of the existing system will be limited to those problems which relate specifically either to the content of the statutes and regulations or to the administrative structure set up to administer them.

This Background Study is being published to provide members of the interested public and students of environmental law with a reference. Such a reference dealing with the Canadian situation is not otherwise available, to the best of our knowledge. This background study is one of a series that, we hope, will illuminate the problems associated with control of exposure to long-term hazards. As with all background studies, the analysis and conclusions are those of the authors and do not necessarily reflect the views of the Science Council.

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PART I
THE LEGAL CONTROL
OF HAZARDOUS PRODUCTS
IN CANADA
by
Robert T. Franson
and
Alastair R. Lucas

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Robert Franson was born in Brooklyn, New York in 1932. He received a Bachelor of Engineering Physics from Cornell University in 1962. He received a Juris Doctorate from the University of California, Los Angeles in 1967 and was a Legislative Research Fellow at the University of Michigan Law School from 1967 to 1969. In 1968, he was admitted to the Michigan Bar.

Dr. Franson became an Assistant Professor at the University of British Columbia in 1969. During 1972, he was a consultant and member of the Computer Committee of the Law Reform Commission of British Columbia. He has also been a member and consultant of the B.C. Ecology Reserve Advisory Committee and a member of the B.C. Task Force on Public Participation, Man and Resources Programme. During 1976-1977 he was working at the Law Reform Commission in Ottawa. He is currently an Associate Professor in the Faculty of Law, University of British Columbia.

Robert Franson has published numerous articles in legal and environmental journals. His special interests are in environmental and resource law, administrative and constitutional law.

ALASTAIR R. LUCAS

Alastair Lucas was born in Prince Albert, Saskatchewan in 1944. He received a BA in 1965 and a LL.B. in 1966 from the University of Alberta. In 1967 he received a LL.M. from the University of British Columbia. During his academic career he received the Horace Harvey Gold Medal in Law and was editor of the Alberta Law Review. In 1968, he became a member of the Alberta Bar and the Law Society of Alberta. In 1975 he became a member of the Bar of the Northwest Territories.

Alastair Lucas began teaching in 1968 at the University of British Columbia and since 1976 has been an associate professor at the Faculty of Law, University of Calgary. During 1971-72, he was on leave to act as Policy Advisor for Environment Canada.

Alastair Lucas is a member of several legal and environmental societies. He has written several books and articles. He is interested in administrative and environmental law, particularly in the areas of pollution control administration, decision making, land use control, and environmental impact assessment.

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CHAPTER I

INTRODUCTION

The Canadian legal system poses few absolute constraints on government actions to control and regulate hazardous substances. If government is committed to strict regulation or prescription of such substances, an appropriate legal technique can nearly always be found for implementing the policy. As shown in Chapter II of this study even the constitutional division of powers will rarely present serious restrictions. Certain types of regulation may be unavailable to one level of government in some circumstances. However, co-operative federal-provincial regulation will obviate problems of this type. The key question is whether the governments will adopt an appropriate regulatory policy. Once a policy is agreed on, an effective legal regime can always be devised.

This is not to say that lawyers have no role in developing effective policies. On certain policy issues, such as appropriate enforcement techniques and design of regulatory procedures, lawyers' training and experience does give them expert qualifications.

For the policy developed to regulate each particular hazard, there will be a preferred legal strategy among the alternatives available. In a sense this question too is a policy question. However, to answer it well, certain information will be necessary. The constitutional framework must be known. Existing law and legislation relevant to the hazard must be identified and their operation understood. Operation of the legislation must be largely determined by empirical observation. In addition, a number of special problems must be considered, including such things as whether the common law provides any relevant rights and remedies, and to what extent decisions related to the particular hazard are subject to judicial review in the courts. Judicial review questions include the right of members of the public to receive information from regulatory agencies, and the degree to which the public is entitled to participate in regulatory proceedings. These subjects are discussed in the study that follows.

Chapter II outlines constitutional considerations. Chapter III reviews federal and provincial legislation relevant to regulation of

the six hazardous substances that are the subjects of case studies in the larger Science Council Study.* The legislation is categorized, and comments on general legislative approaches are included.

Special legal problems, including private law actions, judicial review, access to information, enforcement, and public participation, are reviewed in Chapter IV. Particular attention is given to problems of proof, such as the concept of burden of proof, and legal and scientific proof under conditions of uncertainty.

*The substances are asbestos, lead, mercury, oxides of nitrogen, radiation, and vinyl chloride.

CHAPTER II

CONSTITUTIONAL JURISDICTION OVER HAZARDOUS SUBSTANCES

Constitutional limitations are often mentioned as a reason why governments are not able to combat environmental problems as effectively as they might wish. To what degree is this true? Our conclusion is that there are very few real legal limitations on the powers of government to deal effectively with environmental hazards. In the first place, the techniques by which the provinces and the federal government may co-operate are well known and overcome any constitutional limitations from which either level of government might suffer. Even if one level of government were forced to "go it alone" it would probably find that it has ample constitutional power at its disposal to accomplish its objectives.

Legislative jurisdiction in Canada is divided between the Dominion Parliament and the Provinces by the British North America Act. Most of the federal powers are assigned by s. 91 of the Act, and most of the provincial powers by s. 92. Municipal government is the responsibility of the provinces, and municipalities take their powers as delegates of the provincial legislatures.

The Act does not deal specifically with any of the hazards under consideration here. Consequently it is necessary to review constitutional jurisdiction in more general terms to determine what functions in the manufacturing, processing, and distribution of hazardous substances fall within the jurisdiction of the respective senior levels of government.

A. Federal Jurisdiction

Section 91 of the B.N.A. Act, which defines federal jurisdiction, begins by giving Parliament the general power to "make Laws for the Peace, Order and good Government of Canada." It goes on to enumerate certain specific classes of subjects that are declared to be within the exclusive jurisdiction of Parliament. Many of these so-called enumerated powers cover fairly specialized activities like fisheries, shipping, navigation, banking, and so on. Clearly, any environmental hazards created by these activities could be dealt with by Parliament. For example, pollution-causing activities of the shipping industry are regulated under the Canada Shipping Act and compensation is provided for those harmed by such pollution.(1)

Among the six hazards covered by this study only lead and lead compounds are covered explicitly by these regulations.

1. The Criminal Law Power

The enumerated powers of Section 91 also include some very general powers. The two most likely to be of use in dealing with hazardous substances are the criminal law power and the trade and commerce power. There appear to be very few limitations on what the Parliament of Canada can do under the criminal law power. It certainly includes the power to prohibit conduct that had not been regarded as criminal in the past,(2) that is, to make new crimes, and to enact legislation for the prevention of crimes.(3) In fact, it has been said that any time Parliament prohibits certain conduct and attaches penal consequences for engaging in it, that legislation may be sustained under the criminal law power.(4)

There are two limitations that should be noted. First, the courts have not allowed Parliament to encroach on areas that are traditionally within the provinces' jurisdiction by resorting to the criminal law. The leading cases involved federal attempts to gain regulatory control over the insurance industry,(5) over the pricing of essential commodities,(6) and over the production of butter substitutes like margarine.(7) It seems unlikely that they would be applied to legitimate federal attempts to control the manufacture and distribution of hazardous substances for two reasons. First, the courts were probably motivated chiefly in those cases by a desire to preserve an area of exclusive provincial jurisdiction over the regulation of local trade. That jurisdiction would not be threatened by regulations that focus on hazardous substances. Second, the traditional role of the criminal law is to prevent people from engaging in conduct that might be harmful to others, and regulation of the production and distribution of hazardous substances seems to fall fairly within the role.*

One case is of particular interest. In Standard Sausage Co. v. Lee the British Columbia Court of Appeal upheld federal legislation that prohibited the use of sulphur dioxide in meat products despite the fact that the evidence showed that it was not harmful to health.(8) The Court reasoned that adulteration of food

*In fact, the Manitoba Court of Appeal has so held in a decision reported since this paper was written; R. v. Cosman's Furniture (1972) Ltd. et. al., (1977) 1. W.W.R. 81 (leave to appeal denied, 20 December 1976)

had historically been dealt with by the criminal law. That being so, Parliament had jurisdiction, and it was up to Parliament alone to determine how best to deal with the problem and which adulterants could be tolerated. The same approach was taken in a more recent case dealing with federal regulations limiting the use of cyclamates in foods.(9)

A second limitation on the criminal law power concerns the kinds of remedies or sanctions that may be available. Traditionally, criminal legislation calls for the trial of the accused before the ordinary courts and imposition of a fine or imprisonment on anyone found guilty of contravening the legislation. In fact, these features have often been relied upon by courts for the purpose of deciding whether legislation could be sustained constitutionally as valid applications of the federal criminal law power. It has therefore been suggested that only these remedies would be available under the criminal law power.(10) If that were so, certain desirable regulatory remedies such as stop orders and advance rulings would probably be ruled out.

Some flexibility has been allowed. In one case, legislation was sustained that gave the sentencing court the power to issue injunctions prohibiting conduct that might have lead to future violations.(11) Mr. Justice Locke observed that the power of Parliament is not restricted to defining offences and providing penalties. It also extends to legislation designed for the prevention of crimes.(12)

However, it is not clear how far the courts are willing to go in allowing flexibility. In a very recent case Chief Justice Laskin had occasion to question the degree to which a civil remedy would be provided for the victim of a criminal act. He had this to say:(13)

"The attempt to mount the civil remedy ... on the back of the Criminal Code proves too much ... The principle which would arise from such a result would provide an easy passage to valid federal legislation to provide and govern civil relief in respect of numerous sections of the Criminal Code and would, in the light of the wide scope of the federal criminal law power, debilitate provincial legislative authority and the jurisdiction of provincial Courts so as to transform our constitutional arrangements on legislative power beyond recognition."

Clearly, the remedies that may be provided under the criminal law are limited in some respect, and it may not be amiss to suggest that any remedies must be related either to penalizing the criminal or to preventing future criminal activities.

2. The Trade and Commerce Power

The trade and commerce power is of interest in this study because so many potentially hazardous substances are in the flow of commerce. It is attractive to think that one centralized regulatory scheme could be established by the federal government under the trade and commerce power dealing with trading of such substances.

The courts have had numerous occasions to consider the scope of the trade and commerce power, and although it was restrictively interpreted in earlier years, it has recently been interpreted more broadly to allow effective federal regulation of interprovincial trade. Once goods enter the current of interprovincial trade they are subject to federal regulation. While purely intraprovincial transactions may not be regulated per se, federal legislation is not invalid simply because it has some incidental impact on such transactions.

But does the power include the power to make regulations designed to protect consumers or the environment generally from harmful substances? We raise the question because it is usually assumed that the purpose of the trade and commerce power is to allow Parliament to regulate the economic affairs of the nation. That is, the focus of the power is economic in nature. May Parliament pass legislation under this power that is not economically motivated, legislation that is motivated by health and safety considerations? The courts do not appear to have decided the point. In one recent case before the Federal Court Mr. Justice Heald expressed the view that regulations limiting the use of cyclamates in food could be regarded as commodity standards and that they might be authorized by the trade and commerce power.(14) However, he declined to decide the point because he felt that the regulations were clearly valid under the criminal law power.

In a sense, Mr. Justice Heald's position is revealing. Many of the constitutional uncertainties that might be pointed out are unlikely to seriously limit Parliament's powers because other heads of power can be relied on to support Parliament's actions. It may be uncertain whether the trade and commerce power can be relied on to support legislation dealing with hazardous substances, but the criminal law power and the general power appear adequate to allow Parliament to take effective action. The trade and commerce power adds another justification that might be offered. Certainly some commodity standards are motivated by economic considerations and would be beyond question.(15) With respect to more doubtful cases it

must be borne in mind that the person challenging any legislation has the burden of showing that it is unconstitutional. It would be hard to mount such a challenge because of the difficulty of determining the real aim or objective of the legislation, and because Parliamentary debates, speeches, and other extrinsic aids probably could not be resorted to before the courts.

3. The General Power

The general power to pass legislation for the peace, order and good government of Canada includes three theoretical bases for federal jurisdiction -- a residual power, an emergency power, and a power to deal with questions of national dimensions or of national interest.(16) Of these, the last probably offers the most important basis of federal jurisdiction over hazardous substances, but it is not yet clear how broad this basis is. It has been the subject of controversy, and was restrictively interpreted at first but has been relied on more frequently in recent years. Courts have held that the federal power to legislate with respect to matters of national concern extends to the establishment of the national capital area,(17) and the regulation of aeronautics,(18) telecommunications,(19) and atomic energy.(20) The holding that control of atomic energy falls within the general power makes that hazard unique among those being studied because it may therefore be regulated completely by the federal government.

One recent case does shed some light on the degree to which the general power may assist the federal government in dealing with the problems posed by the interprovincial movement of hazardous substances. Interprovincial Co-operatives v. The Queen in Right of Manitoba involved mercury pollution in Manitoba that was allegedly caused by activities in Ontario and Saskatchewan.(21) Mr. Justice Pigeon, whose judgment was concurred in by two others, expressed the opinion (in dicta) that the federal Parliament has jurisdiction under the general power over interprovincial pollution similar to that it possesses over interprovincial trade.(22) The other four justices also stated that the federal Parliament has legislative jurisdiction over interprovincial water pollution, although for different reasons. It is tempting to conclude therefore that the Court will uphold federal jurisdiction over the interprovincial movement of all environmental contaminants in the future.

4. Other Powers

In addition to the powers discussed above it should be noted that a number of other federal powers may be helpful in controlling

hazardous substances. For example, the taxation or spending powers could be used to create financial incentives that might be as effective as direct regulation. Federal jurisdiction over the census and statistics allows the federal government to collect information it needs concerning the distribution and production of such substances. Finally, its acknowledged power over imports under the trade and commerce power may give the federal government substantial control over hazardous substances because so many of them are produced outside Canada.

B. Provincial Jurisdiction

Provincial jurisdiction is even broader. The grants of power over property and civil rights and over local matters contained in s. 92 of the B.N.A. Act give the provinces jurisdiction over most matters of concern. They may legislate with respect to manufacturing within the province, with respect to labour relations and the working environment, and with respect to waste disposal. Most of the hazards under study could be effectively controlled by such legislation.

However, there are some limitations. First, the provinces may not legislate with respect to matters beyond their boundaries. Second, they may not legislate at all with respect to federal Crown property or other classes of subjects that are within exclusive federal jurisdiction. Finally, provincial legislation becomes inoperative whenever it conflicts with valid federal legislation.

The first of these limitations is relatively straightforward and has important ramifications in the environmental field. These can best be illustrated by referring again to the recent Supreme Court judgment in Interprovincial Co-operatives v. The Queen in Right of Manitoba.⁽²³⁾ Plants in Saskatchewan and Ontario had caused mercury pollution in water flowing into Manitoba. As a result losses were experienced by Manitoba fishermen, who were prevented by federal regulations from marketing fish affected by the pollution. In response, the Manitoba legislature passed legislation allowing the government to pay compensation to the affected fishermen, to take an assignment of their claims, and to sue any people responsible for the pollution for the compensation paid to fishermen and for other damages. The courts were authorized to issue an injunction against the polluters in such a case, and the legislation expressly provided that authorization by another jurisdiction would not constitute a defence to the action. These two provisions persuaded three justices of the Court that Manitoba was attempting to legislate with respect to civil rights outside of the province and they therefore held the legislation unconstitutional. A fourth Justice ruled that legislation could not constitutionally have an extraterritorial

effect, and therefore held it inapplicable. It was noted that the federal Parliament had legislative jurisdiction to deal with such problems.

The second limitation mentioned above is also very important. Clearly the provinces may not legislate with respect to matters that are within the exclusive jurisdiction of Parliament, for example interprovincial trade and commerce or the criminal law. For this reason, determination of provincial jurisdiction often becomes more an exercise in determining the true limits of federal jurisdiction than anything else.

There is also some uncertainty concerning the scope of this limitation. Although it is clear that the province may not legislate with respect to federal Crown property, or with respect to enterprises that are subject to exclusive federal jurisdiction, it appears that valid provincial legislation of general application may apply to these classes of subjects in certain circumstances. For example, lessees of federal Crown property are subject to general provincial legislation as long as the Crown's rights or title are not impaired.(24) It has also been held that provincial legislation may be applied to enterprises within the exclusive jurisdiction of Parliament, like the communications, transport, or shipping industry, as long as the legislation does not relate to some essential or integral part of the enterprise.(25) Under this rule labour relations of such enterprises have been held to be beyond provincial jurisdiction(26), but workmen's compensation has been held to be within provincial jurisdiction.(27)

Another controversy exists concerning the scope of this limitation. It is clear that the provinces may not legislate with respect to interprovincial trade and commerce, but what constitutes interprovincial trade? As we pointed out above, the scope of this federal power is not clear. The controversy is particularly important when considering the regulation of hazardous substances, most of which are produced and distributed by large national or international corporations.

May the provinces seal their borders to products they regard as harmful? It is not easy to answer the question. Several of the recent trade and commerce cases illustrate the problem. In the Manitoba Egg case it was held that the Province could not subject eggs from other provinces to a provincial regulatory scheme that required the province of origin to be identified.(28) In another case it was held that the Province could not subject incoming hogs to a regulatory scheme that would have established quotas, despite the fact that the "foreign" producers would not be discriminated against.(29) The key in both cases was the fact that produce could not freely enter the Province.

Provincial legislation prohibiting or controlling the entry of harmful substances could be characterized as health legislation falling within provincial jurisdiction over property and civil rights or local matters, rather than as legislation with respect to trade and commerce.(30) It appears that this possibility was recognized by Chief Justice Laskin in the Manitoba Egg case:

"Conversely, the general limitation upon provincial authority to exercise its powers within or in the Province precludes it from intercepting either goods moving into the Province or goods moving out, subject to possible exceptions, as in the case of danger to life or health"

However, it is hard to be certain that courts would adopt this approach, especially since there is a split of authority on the point.(31)

Finally, under the doctrine of paramountcy provincial legislation becomes inoperative when it is in conflict with valid federal legislation. This limitation on provincial jurisdiction is particularly important with respect to matters that are regulated under the criminal law, because Parliament's jurisdiction under this power is so broad.

Unfortunately, the courts have not been very clear about when the doctrine of paramountcy applies.(32) Some have argued that it applies whenever Parliament has entered the field and enacted legislation dealing with the subject under consideration. Others have suggested that it only applies when there is a direct conflict between the federal and provincial legislation in the sense that both can not be obeyed at once. It appears that in recent years the courts have inclined toward the latter view and have allowed both provincial and federal legislation to operate whenever possible.(34) For example, in the Interprovincial Co-operatives case, discussed above, three of the Justices expressed the view that the provinces could validly pass water quality regulations more stringent than those contained in the federal fisheries regulations if they wished.(35)

C. Special Jurisdictional Problems

1. Collecting Information

The most obvious power relating to acquisition of information is the power given Parliament over the census and statistics.(36) Certainly this power would be adequate to enable the federal government to

collect any information it felt it needed. In addition, the acquisition of information is largely accomplished by financing research and surveys of one kind or another. Both levels of government probably spend their monies as they see fit, without reference to any limitations on legislative jurisdiction. It therefore follows that both levels of government have very broad powers to collect information.

Power to compel the release of information is another matter. The federal government has a very broad power to compel the release of information, in its power over statistics and census. In addition it can rely on the criminal law power to require the production of any information that may relate to offences under the criminal law. Provincial jurisdiction would have to be based on other matters within the control of the province. For example, the release of information concerning the financial control of company, its proposed practices with respect to its enterprise, and so on, could be required as a condition precedent to granting a mineral lease or even a pollution control permit. However, in such circumstances the province could probably only compel the release of information that related somehow to the particular lease or permit that was being requested.

Once the government has obtained information about an individual there are no constitutional constraints concerning what it does with that information. There is no constitutional right to privacy in Canada. However, it should be recognized that there are strong policy reasons for assuring that an individual's privacy is respected, and governments generally treat information obtained from either individuals or corporations as confidential. It should also be noted that although both levels of government undoubtedly have broad constitutional powers to collect information about their citizens there appear to be strong political limits on their ability or desire to do so.

2. Compensation for Injuries

Jurisdiction to provide compensation for injuries caused by hazardous substances depends to some extent on the kind of compensation scheme being established and on who causes the damage. Three general kinds of scheme may be identified: (1) compensation funds established from general revenue; (2) special compensation funds maintained by compulsory contributions levied against the industries likely to cause injury; and (3) private rights of action given to any injured person to proceed directly against those causing the injury.

In general, there appear to be no reasons why either level of government could not use its own spending power to compensate anyone who is injured. It also seems clear that the provinces could establish special contributory funds requiring contributions from industries within their boundaries, as they have done in the case of workmen's compensation. The federal power appears to be more limited. It should be able to establish such funds with respect to any industry that is subject to its exclusive jurisdiction, for example, shipping, transportation, and atomic energy, since this would be reasonably ancillary or incidental to its powers over these industries. It should also be able to limit the liability of these enterprises if it so wishes.(37) However, it seems unlikely that Parliament could establish such a fund covering all industries engaged in interprovincial trade and commerce.(38)

Similar observations might be made concerning private rights of action. Generally, this is regarded as a matter falling within provincial jurisdiction over property and civil rights within the province. Just as Parliament could establish special funds relating to industries subject to its exclusive jurisdiction, so too it should be able to change the rules relating to the liability such industries face. However, it is more difficult to predict whether Parliament could act more generally and require persons who have violated any federal statute to pay compensation for injuries resulting from their violations. In one case a court refused to construe the Combines Investigation Act as giving rise to a civil cause of action because the court believed that this would be beyond Parliament's jurisdiction.(39) However, in a subsequent case the Supreme Court, speaking through Mr. Justice Judson, questioned that reasoning.(40) The courts have upheld various sections of the Criminal Code allowing the judge in a criminal proceeding to order the accused to restore the victim's property or pay compensation.(41) In addition, it has been held that Parliament may provide civil liability for penalties as a means of enforcing its legislation.(42)

The most recent pronouncement of the Supreme Court on the subject is contained in MacDonald, Railquip Enterprises v. Vapor Canada Ltd.(43) The validity of three sections of the Trade Marks Act was in question. These sections would have had the effect of allowing someone injured by unfair competition to sue for damages. It was argued that the conduct could be prohibited by Parliament's jurisdiction to provide for a civil remedy for damages. Chief Justice Laskin rejected this argument and added that the existing cases did not "give any encouragement to federal legislation which, in a situation unrelated to any criminal proceedings, would authorize independent civil proceedings for damages and an injunction."(44) Presumably if the civil remedies did relate to the criminal proceedings his reaction would be different.

In conclusion, it appears that the cases do support federal jurisdiction where the civil right of action is of a penal nature, or where it is closely connected with the sentencing process. Civil remedies could also be provided against enterprises that are within exclusive federal jurisdiction. Beyond this, however, it is unclear whether federal attempts to provide civil remedies would be upheld. Where they have an obvious relationship to some federal interest they will be easier to sustain but, from the approach taken in the Vapor Canada case, it seems unlikely that the courts will be very sympathetic to federal attempts to provide civil remedies for violation of federal statutes.* However, Federal criminal offences can be relied on by the courts to establish standards of care for conventional negligence actions.(45)

D. Conclusions

From the foregoing it is clear that both senior levels of government face some constitutional limitations in dealing with hazardous substances. There are also areas of uncertainty in constitutional law that may sometimes cause doubt concerning the permissibility of certain approaches. Nonetheless, it seems unlikely that constitutional limitations or uncertainties could seriously hamper the efforts of either level of government to regulate hazardous substances.

In the first place, federal and provincial governments may co-operate to provide a complete regulatory scheme. The legislative techniques involved have been proven constitutionally valid and effective in a variety of different fields, most notably in natural products marketing.(46) Put simply, all that is required is that both levels of government enact dovetailing legislation that delegates administrative and enforcement responsibilities and powers to an appropriate agency.

Even if the federal and the provincial governments find that they cannot co-operate, it is still possible for either to act effectively alone. It is true that some options are limited in such

*Further doubt on the federal power to provide civil remedies was cast by a decision of the Manitoba Court of Appeals, reported since this paper was written. In R. v. Zelensky, (1977) 1 W.W.R. 155, section 653(1) of the Criminal Code allowing a judge to order someone convicted of a crime to compensate the victim, was held unconstitutional. Leave was granted to appeal to the Supreme Court of Canada on 25 January 1977.

a case, and that the approach taken to a problem may have to be carefully tailored to fit the legislative authority of the level of government that is taking action. For example, the federal Parliament may not be able to provide civil remedies against certain kinds of damage, but if conduct is harmful it could make a criminal offence and prescribe steep fines. With the money collected, Parliament could compensate the victims. Our point is that both levels of government have enough power to take effective action.

As has been indicated, the provinces have very broad powers. The chief difficulties they face involve federal activities: enterprises like railroads that are subject to exclusive federal jurisdiction, and pollution-causing activities outside their boundaries. There is not much they can do about these deficiencies except negotiate and hope that they can persuade federal authorities or other responsible provincial authorities to act. We do not have any data concerning the size and scope of these activities, or of the environmental problems they create, but it is difficult to believe that they are so extensive as to seriously impair the quality of any province's environment or that such a province would be unable to obtain the co-operation of neighbouring provinces and the federal government.

Federal jurisdiction is more limited in some ways, but Parliament does have the power to control the hazards produced by any of the activities or enterprises that are subject to Parliament's exclusive jurisdiction, for example shipping, aeronautics, communications, navigation, fishing, and the production and use of atomic power.

In addition, Parliament may regulate any activity under the criminal law, simply by prohibiting that activity and providing penalties. While this power may not be used to encroach on provincial jurisdiction, it is clear that the power is very broad and could be used to control the production, use, and distribution of hazardous substances. The remedies that could be provided under this power might not be as flexible as one would want, and the courts might have to be relied on for enforcement. This would mean that problems of proof would arise, but some of these problems can be ameliorated by deeming a substance to be harmful in the legislation, or by doing away with mens rea (criminal intent) requirements, as has been done in a number of statutes. Parliament may also rely on the trade and commerce power to regulate products in interprovincial trade, although the extent of this power is not entirely clear. The general power to make laws for the peace, order and good government of Canada may also be relied on to support any legislation remedying some national emergency, or dealing with a subject that has not been assigned to either Parliament or the provincial legislatures

directly, or that has become a matter of national concern. It seems clear that, taken together, these powers authorize Parliament to control the interprovincial movements of hazardous substances. Other federal powers can also be relied on.

Consider, for example, asbestos. Parliament does not have jurisdiction over the extraction, local use, or generally over the work place. However, it does have jurisdiction over any products that are in interprovincial trade and by means of its policy can achieve considerable leverage with respect to those products that are not in interprovincial trade. For example, many areas have been persuaded to adopt a model building code that has been drafted with the support of federal agencies. In addition, the federal government may use its spending power to encourage the building industry, other industries, and even provincial governments to adopt measures it believes are required. There may also be practices which are suitable for control by the criminal law power. Thus, although Parliament acting alone cannot institute a complete regulatory scheme dealing with asbestos it can certainly have a very substantial impact on the practices regarding that substance.

It is certainly true that government officials are often very sensitive to their constitutional limitations and to the sensitivity of their colleagues in other jurisdictions. They can also be highly protective of their own area of jurisdiction. No doubt these tendencies serve to interfere with co-operation from time to time. It is our observation that government officials often seem overly cautious with respect to their jurisdiction and believe that it is smaller than it really is. To this extent limitations described above may have a deleterious impact on our collective ability to control hazardous products. But it need not be so. More often than not the excuse of constitutional difficulties is used as a smoke-screen to hide a basic unwillingness on the part of those involved to take the actions that are necessary.

CHAPTER III

THE LEGISLATIVE FRAMEWORK

A. Classes of Legislation

Man-made hazards are subject to a wide variety of legislative controls at the federal and provincial level. In this section the general types of legislative controls that exist for all six of the specific hazards will be reviewed. The emphasis here will be on the range of federal and provincial legislation that is relevant and on highlighting the various legislative techniques that have been used. Specific legislative controls, particularly detailed standards, that are relevant for each contaminant will be reviewed on a contaminant by contaminant basis in the next section.

Relevant legislation has been classified into ten categories:

1. General pollution control statutes;
2. Industrial safety, workmens' compensation and occupational health legislation;
3. Special statutes dealing with particular contaminants;
4. Motor vehicles statutes;
5. Public Health statutes;
6. Food and Drug statutes;
7. General contaminants statutes;
8. Statutes regulating development and use of particular resources;
9. Statutes regulating specific industries;
10. Consumer safety statutes.

1. General Pollution Control Statutes

General pollution control statutes exist in all the provinces. These establish regulatory schemes based on permits or approvals to regulate the discharge of contaminants into air, water or land. "Contaminants" and "Pollution" are defined broadly enough to include all of the six case study hazards.

An example is the Ontario Environmental Protection Act(47), which deals mainly with contaminant discharges into air or land. "Contaminant" is defined in Section 1 (c) as "any solid, liquid, gas, odour, heat, sound, vibration, radiation, or combination of any of them resulting directly or indirectly from the activities of man..." The Act then provides (by s.14) that it is an offence to: "add, emit or discharge contaminants, or cause or permit the deposit, addition,

or cause or permit the deposit, addition, emission or discharge of a contaminant into the natural environment that, a) causes or is likely to cause impairment of the quality of the natural environment for any use that can be made of it; b) causes or is likely to cause injury or damage to property or to plant or animal life; c) causes or is likely to cause harm or material discomfort to any person; d) adversely affects or is likely to adversely affect the health of any person; e) impairs or is likely to impair the safety of any person; or f) renders or is likely to render any property or plant or animal life unfit for use by man." Violation of this provision is a criminal offence, punishable by fine on summary conviction.

The other main regulatory technique used in the Environmental Protection Act is to empower the Minister of the Environment to issue stop or control orders where he is of the opinion, following investigation, that contaminant release will impair the quality of the natural environment.

For contaminant discharges into air, approval terms and conditions are based on ambient air quality criteria established by regulation. These include criteria for lead, mercury, and nitrogen dioxide. The ambient criteria are not linked to offence or compliance order provisions. Consequently they are not legally enforceable as such, except to the extent that they are incorporated as terms or conditions in approvals issued by the Ministry of the Environment. Regulations under the Environmental Protection Act, however, establish point of impingement (stack) standards (as opposed to ambient criteria) which are enforceable through criminal prosecutions.

In the case of water pollution in Ontario, the regulatory scheme established under the Ontario Water Resources Act(48) is somewhat different from that under the Environmental Protection Act. There is simply a prohibition against the discharge of "any material of any kind into ... any water ... that may impair the quality of the water." Breach is punishable on summary conviction by fine or imprisonment. In addition, the Ministry of the Environment has power to order industries or municipalities to alleviate the effects of contaminant discharges into water by installation of control equipment or by other means. The Ministry is also empowered to review and approve the construction of municipal and industrial sewage works. Thus although certificates of approval are required for sewage works, for small but cumulatively significant discharge of contaminants into water the main regulatory quasi-criminal, rather than regulation through a general system of licensing. Criminal prosecutions are also used to enforce certificate terms and conditions imposed on operators of sewage works. The prohibition against discharges of material likely to impair the quality of water is wide enough to cover any of the case study contaminants.

Some provinces, such as Alberta and Saskatchewan, have separate air and water statutes. The remainder have pollution control statutes that include discharges into both air and water.

There are also federally enacted general pollution control statutes. The main ones are the Canada Water Act,(49) the Clean Air Act,(50) and the Fisheries Act.(51) The Fisheries Act is based on a specific federal power -- that in relation to sea coast and inland fisheries (52) -- but is cast in general terms with a prohibition on the discharge of any deleterious substance in waters frequented by fish. Any of the subject contaminants is likely to be interpreted a deleterious substance within the Fisheries Act. The Canada Water Act and the Clean Air Act are also cast in general terms. However, since the provisions have not been fully implemented in the case of the Canada Water Act by the establishment of Water Quality Management areas, and in the case of the Clean Air Act by the promulgation of specific emissions standards, they cannot in practice be regarded as general pollution control provisions. Non-enforceable ambient air quality objectives have been made under the Clean Air Act. Regulations establishing lead standards for gasoline have also been made under the Clean Air Act. However, these should be regarded as specific contaminant standards and will be discussed under the appropriate heading.

2. Industrial Safety, Workmen's Compensation and Occupational Health Statutes

All provinces have enacted industrial safety statutes. Some industrial safety statutes simply contain a general requirement that employers take all measures necessary to prevent inhalation, ingestion, or skin contact with toxic substances; or that dangerous substances be handled and used only in certain ways or by certain persons; or that ventilation equipment, special clothing or other protective equipment be used. Other statutes contain specific standards with respect to substances such as lead, vinyl chloride and asbestos.

Workmen's Compensation statutes contain provisions that conditions resulting from exposure to hazards such as lead and asbestos be considered compensatory industrial diseases. Some workmen's compensation statutes also contain environmental hazard provisions including, in some cases, specific substance standards that in other provinces would be found in industrial safety legislation. Examples include the accident prevention regulations, and the asbestosis regulation under the British Columbia Workers' Compensation Act.(53) Occupational health legislation such as the

Saskatchewan Occupational Health Act(54) also contains general powers permitting the Minister of Labour to remedy certain occupational hazards and in addition to define and prescribe hazardous substances by regulation. Certain public health acts such as those in Newfoundland(55) and Manitoba(56) contain similar provisions requiring employers to take steps to prevent harm to employees as a result of inhalation or ingestion of toxic substances. Some public health act provisions refer to particular hazards such as the Manitoba Lead and Benzol Regulations which are intended to protect persons engaged in industrial processes involving these substances.(57)

It should be emphasized that both the federal and provincial governments have enacted industrial health legislation. The federal standards contained in the Dangerous Substances Regulations made under the Canada Labour Code(58) apply, with certain exceptions, to works, undertakings, or businesses under the legislative jurisdiction of the Parliament of Canada.

3. Special Statutes Regulating Particular Contaminants

Apart from the general pollution control statutes there are a number of provincial and federal statutes regulating the use and disposal of particular contaminant substances. The radiation standards under the federal Atomic Energy Control Act Regulations(59) are in this category, as are provincial radiation standards either under special acts (such as Alberta's Radiation Protection Act)(60) or under provisions contained in public health acts.(61) Federal and provincial pesticides control legislation is another example. It should be noted that some statutes purport to regulate a particular contaminant as such whereas others of this class are designed to regulate substances that contain quantities of particular contaminants. Examples of the latter type of regulations include the leaded gasoline and regulations and controls on agricultural fertilizers. It should also be noted that some of these special contaminant provisions are actually regulations under general pollution control statutes. The Gasoline Regulations(62) under the Federal Clean Air Act are an example. Another example are the Chlor-Alkali Mercury Regulations(63) under the federal Fisheries Act.

4. Vehicle Standards

Both federal and provincial statutes regulate contaminant emissions into the atmosphere from motor vehicle exhaust. Specific standards have been set by regulations under the federal Motor Vehicle Safety Act,(64) as well as by some of the provincial statutes for evaporative and exhaust emissions, including oxides of nitrogen. The federal and provincial controls interlock. Federal regulations

require that new vehicles be equipped with emission control devices that permit the federal contaminant standards to be met. Most provincial statutes require that vehicles sold in the province be so equipped, and also that emission control devices be maintained in proper working order.

5. Public Health Acts

As already mentioned, certain provincial public health acts contain occupational health requirements including requirements for particular contaminants. Health acts also include pollution provisions of a general nature, such as provisions relating to the abatement of nuisances, and the discharge of contaminants into air or water causing a danger to public health. Many public health acts also contain food safety provisions including food preparation standards(65) that are supplementary to the standards established by the Federal Food and Drugs Act.(66) As already indicated, provisions for regulation of radiation sources are included in many public health acts. It should be noted that there is no federal legislation that parallels exactly the provincial public health statutes. Federal health legislation tends to deal directly with particular hazards such as food safety and hazardous consumer products. However, public health legislation that is generally similar to provincial legislation is included in the ordinances of the Yukon Territory and the Northwest Territories.

6. Food and Drug Acts

The basic regulations for contaminants in food and drug products are found in regulations under the Federal Food and Drugs Act. The regulations prescribe detailed standards for the quality and quantity of food and drug component substances. Use of certain substances as additives or in packaging is absolutely prohibited. For example, subject to certain exceptions no food may be sold in a package manufactured from a polyvinyl chloride formulation containing an octyltin chemical. Maximum quantity standards are prescribed for numerous toxic substances including heavy metals such as lead. Maximum quantities of lead are prescribed for some 24 foods.

Another Federal statute relevant to food and drug regulation is the Consumer Packaging and Labelling Act.

It has already been noted that supplementary provincial food standard provisions such as regulations for food preparation conditions are included in a number of the provincial public health acts.

7. General Contaminants Control Statutes

The only legislation of a general enough character to be included in this category is the federal Environmental Contaminants Act.(67) It should be noted however that a somewhat narrower range of contaminant substances is controlled as to distribution, sale, and use under pharmacy acts in the various provinces.

The Environmental Contaminants Act establishes a regulatory system whereby substances may be investigated, and if the Ministers of the Environment and National Health and Welfare have reason to believe that a substance constitutes a "significant danger to health in the environment" they may require detailed information and substance testing. If, following such testing, the Ministers are satisfied that the substance does constitute a significant danger they may, by following the prescribed procedures set out in the Act, add the substance to the Schedule of the Act containing prescribed substances. The intent of the Act appears to be to establish a pre-marketing screening requirement for new chemical substances. Whether or not this will happen in practice is not clear since by the terms of the statute the only warning of release of new chemicals is the requirement that first time manufacture or importation of more than 500 kg of a substance be reported to the Minister.(68) The mechanisms of the Act must be put into operation by the Department, and this can be done only where there is sufficient evidence to suggest a potential problem. The operation and effectiveness of the Environmental Contaminants Act is discussed in greater detail below.

8. Particular Resource Statutes

Legislation that establishes detailed management schemes for resources such as water and minerals usually contains pollution control provisions that include the discharge of the six case study hazards. In some cases, the provisions are quite specific. For example, the Saskatchewan Pollution Prevention Regulations for the Mineral Industry(69) establish allowable concentrations of radioactive elements in water receiving discharges of mine or mill waste.

In fact, legislation governing mining operations can for many purposes be treated as a separate class. Typically, complete and detailed working and safety codes including ventilation standards, underground diesel engine operating standards, and safety equipment provisions have been enacted.(70) The mining statutes are provincial statutes with the exception of the mining ordinances of the Yukon Territory and Northwest Territories.

9. Special Industry Regulation Statutes

At the provincial level, statutes regulating contaminants produced either in-plant or discharged into the ambient air by industrial processes tend to be general, rather than confined to specific industries. Perhaps the most obvious exception is the legislation relating to mine safety. Other examples include provincial legislation ating pesticide use and application,(71) and legislation that sets out specific standards dealing with such operations as asphalt paving plants.(72)

There are several groups of federal statutes that establish contaminant standards for particular industries. Perhaps the most obvious are the regulations under the Atomic Energy Control Act which set radiation standards. Another example is the Pollution Prevention Regulations under the Canada Shipping Act.(73) These regulations deal with discharge of contaminants by ships and are detailed enough to include, for example, a standard for lead discharge into coastal waters. Regulations under the Fisheries Act have established standards for chlor-alkali mercury plants, pulp and paper mills,(74) and petroleum refineries.(75)

10. Consumer Safety Statutes

The federal Food and Drug Regulations and the provincial public health food preparation standards might be included in this category. The federal and provincial pesticides acts, and particularly the provincial pharmacy acts might also be regarded as consumer safety oriented. Apart from food and drug safety and poison control legislation, the most important consumer safety statute containing important consumer safety statute containing contaminant standards is the federal Hazardous Products Act.(76) The schedule to this Act includes specific standards for maximum release of lead by glazed ceramic products,(77) electric kettles,(78) pencils and artists' brushes,(79) and children's furniture and toys.(80) Standards have also been set under the Act for asbestos fibres in toys(81) and clothing.(82)

B. Specific Contaminant Standards

The statutes discussed above give the agencies of government broad regulatory authority over the contaminants being considered here. Typically, regulations may be passed under each statute providing for its enforcement. In addition, officials are given the power to issue

or refuse licences, to inspect establishments, and to order operators to remedy unsafe conditions.

One technique that can be used by regulators to implement environmental control is the establishment of specific standards respecting allowable concentrations of contaminants, either in the ambient environment or in any waste discharges. The approach has been used in some but by no means all cases. Below we indicate what formal standards or guidelines have been established respecting each of the contaminants under study.

At this point, it may be helpful to explain the difference between guidelines and regulations. A regulation may be defined as a rule made by competent authority relating to actions of those under its control.(83) Regulations are specifically authorised by statute, are legally enforceable in the ordinary courts, must usually be passed by Order in Council, and must be published in the official gazette of the jurisdiction. A guideline is an informal statement issued by a regulatory agency setting forth the standards of conduct that it expects those under its control to exercise. It is not enforceable in the ordinary courts.

Because regulations must be published in the official gazettes it is possible to find them in any well equipped law library (although it can sometimes be very difficult because most indexes are inadequate). Guidelines are extremely difficult to find because they are usually not published in the regular way. The only reliable way of discovering their existence is to call the departments that may have issued them. In some cases departments have taken the position that guidelines are internal documents and may not be disclosed.

The guidelines and regulations which were found that establish specific standards for the contaminants under study are discussed below. It should be emphasised that the mere fact that specific standards have not been established with respect to a particular contaminant or activity does not mean that the contaminant or activity is not regulated. Elaborate conditions may be contained in licences issued by regulatory authorities and inspectors may deal vigorously with any conditions they consider hazardous even though there are no specific standards. It should also be noted that we have not discussed all the regulations found because there were too many, and they differed from each other in many unimportant respects. Those mentioned seemed to be fairly representative. We have also mentioned those guidelines we became aware of, but we believe that there are probably many more that we could not discover because they were not published. The regulations and guidelines issued by Quebec are not discussed because separate studies have been undertaken concerning that Province.

1. Asbestos

Federal

An occupational standard for asbestos exposure of 2 fibres/cm³ greater than 5 µm determined as a time-weighted average for an 8-hour workday was recommended by a federal-provincial working group in a report issued under the authority of the Department of National Health and Welfare on 22 May 1976.(84)

Section 10 of the Canada Dangerous Substances Regulations made under Part IV of the Canada Labour Code incorporates the maximum level of asbestos fibres specified by the American Conference of Government Industrial Hygienists (ACGIH).(85) Until recently this Threshold Limit Value (TLV) was the 1975 ACGIH standard of 5 fibres/cm³. However, federal labour safety officials have recently been instructed to use a 2 fibre/cm³ standard for surveillance. This standard applies to workers in industries that are subject to the legislative jurisdiction of the Parliament of Canada and is based on general protective authority found in the Canada Dangerous Substances Regulations. The 2 fibre/cm³ guidelines is also applied to workers in the federal public service under an internal government directive.

Under the Hazardous Products Act, advertising, selling, or importing toys or clothing products containing asbestos is prohibited unless the product is designed as protection from fire or heat, or is constructed so that with reasonably foreseeable use asbestos fibres will not become separated from the product.(86) Also prohibited are products that are composed of or contain any type of asbestos and that are for use in modelling or sculpture, or are for use by children and made in such a way that asbestos may become separated from the products.(87)

Provincial

Alberta has adopted a standard for all forms of asbestos dust or fibre of not more than 2 fibres/cm³ greater than 5 µm in length in air, measured as a time-weighted average. Maximum airborne concentration of asbestos dust is not to exceed 10 fibres/cm³. These are guidelines made under authority vested in the Provincial Board of Health by regulations under the Public Health Act, to establish occupational health standards.(88) The regulations also provide that where no standard is defined, the acceptable limits established by ACGIH constitute the standard. Following proclamation

of the Occupational Health and Safety Act(89) on 2 December 1976, these regulations are administered by the Occupational Health and Safety Division of the Department of Labour under the aegis of the new Act, pending development of Occupational Health and Safety Act Regulations.

The British Columbia standard under the Accident Prevention Regulations is 5 million particles/cu ft (Impinger).(90) Working conditions are regulated through requirements for ventilation and respiration equipment. The Asbestosis Regulations require annual medical examinations for mine workers.(91) Draft Industrial Health and Safety Regulations include a TLV of 2 fibres/cm³ greater than 5 µm for chrysotile and 0.2 fibres/cm³ for crocidolite along with a 15-minute maximum exposure of 5 fibres/cm³.(92) The new regulations have not yet been promulgated.

The Nova Scotia maximum level guideline is 5 fibres/cm³. However, new facilities must meet a 2 fibre/cm³ maximum level.(93)

The Ontario Ministry of Health Occupational Health Branch Data Sheet establishes a 2 fibre/cm³ time-weighted average maximum level. (94) The TLV for crocidolite is 0.2 fibres/cm³. The maximum level for a 15-minute exposure is 10 fibres/cm³. The Data Sheet is based on regulations made under the Industrial Safety Act, 1971,(95) which provide that an industrial establishment must be adequately ventilated to ensure the safety of all persons, and that air contaminants must, "so far as practicable", be removed at or near the source of contamination.(96) The Data Sheet maximum levels are guidelines for implementation of the policy embodied in the Act and regulations. While failure to comply with the published TLV may be considered failure to take all practicable measures, and therefore an offence under the regulations, the vagueness of the criteria in the regulations makes a successful prosecution a very remote possibility. The Data Sheet maximum levels are therefore essentially guidelines unenforceable in law.

The Ontario Ministry of the Environment has published tentative guidelines for emissions of asbestos into the ambient air apart from workplaces.(97) The ambient air quality criterion proposed is 0.04 fibres/cm³, 24-hour average for fibres greater than 5 µm in length.

Saskatchewan has Asbestos Regulations made under the Occupational Health Act in 1975.(98) The Regulations themselves do not lay down any threshold limit values for asbestos. Exhaust ventilation is required in work places to prevent dispersal of asbestos dust into the air. There is an absolute prohibition against

bringing crocidolite into any work place. Exhaust and respiratory equipment must be tested regularly. Respiratory equipment and protective clothing must be provided and used, and persons regularly engaged in an asbestos process are required to undergo a regular medical examination.

In order to implement and enforce these general requirements the Saskatchewan Occupational Health and Safety Division has established a guideline TLV of 2 fibres/cm³. This limit is not specifically enforceable.

2. Lead

Federal

The federal government has undertaken a number of measures that are aimed at controlling lead pollution. The lead content of both leaded and unleaded gasoline has been specified by regulations.(99) In addition, specifications have been issued for gasoline purchased by the government.

National emission standards for secondary lead smelters have been issued under the Clear Air Act. These call for limiting particulate emissions to 0.046 g/m³ from blast furnaces and 0.023 g/m³ from holding furnaces. Lead concentration in the particulate must not exceed 63% by weight.(100)

Canadian Drinking Water Standards and Objectives, dated 1968, establish a maximum permissible lead concentration of 0.05 mg/L.(101) Lead is also listed as an adulterant under the Food and Drug Regulations and maximum tolerable limits are specified. Different amounts are specified for a number of different foods; the highest concentrations are allowed in cream tartar (20 ppm), sodium nitrite (20 ppm) and gelling agents except gelatin (20 ppm).(102)

A number of regulations have been issued under the Hazardous Products Act that are intended to control lead pollution. These prohibit the advertising, sale, or importation of kettles that release in excess of 0.05 ppm of lead, glazed ceramic products that release in excess of 7 ppm of lead; and toys that allow toxic substances to be ingested, inhaled or absorbed through the skin.(103)

Provincial

No specific regulations were found dealing with lead in Alberta, Manitoba, New Brunswick, Nova Scotia, Prince Edward Island or the Territories. However, it should be noted that the Saskatchewan water

quality criteria, which do refer to lead, were apparently prepared in co-operation with both Alberta and Manitoba; presumably both of these Provinces have similar criteria although we could not find them in published sources.

Manitoba has passed regulations dealing with the handling of lead in industrial and manufacturing processes,(104) but no specific standards appear to have been established.

In British Columbia, standards have been established for lead in the working environment.(105) It is the responsibility of the employer to reduce the level of lead contamination to below 0.2 mg/m³ of air. The maximum limit of lead that may be absorbed in the human body is 0.08 mg/100g of whole blood and 200 ug/l of urine.

Guidelines are also established for acceptable pollution caused by the mining, milling, food, agriculture, petro-chemical, and miscellaneous industries. It is British Columbia's practice to establish three levels of objectives: Level A, Level B, and Level C. The explanation in the report dealing with the mining industry is typical:

"It is recommended that generally all new or proposed discharges meet Level A objectives. It is expected that nearly all existing waste discharges are meeting, or soon will be meeting, Level C, and it is recommended that the discharges be upgraded to interim Level B."(106)

The Level A objectives for ambient air quality pertaining to the mining and smelting industry are 2 µg/m³ of air (annual geometric mean) and 4 µg/m³ of air as a maximum in 24 hours. Level B objectives are identical and Level C objectives are 3 µg/m³ (annual geometric mean) and 6 µg/m³ (max. 24h)(107) The objectives established for particular emissions vary depending on the kind of industry and whether the plant is an existing plant, a new plant, or a plant that has been added to or improved. The objectives for the mining and smelting industry are: Level A, 7 mg/m³; Level B, 11 mg/m³; and Level C, 23 mg/m³.(108) Special objectives are established for lead smelting plants, expressed in terms of pounds of lead per ton of lead produced: Level A, 0.9 lb/ton; Level B, 1.5 lb/ton; and Level C, 2.0 lb/ton.(109)

Objectives are also established for liquid effluent discharges. For the mining and associated industries the objectives for lead are: Level A, 0.5 mg/L; Level B, 0.1 mg/L; and Level C, 0.5 mg/L.(110) The objective for metal finishing plants and similar

industries is somewhat higher: Level A, 0.2 mg/L; and Level C, 0.5 mg/L .(111)

Objectives have been established for other industries, but the foregoing is representative of what exists. It should be remembered that the objectives are not enforceable per se; they obtain their effect because the officials of the pollution control branch normally refer to them when deciding whether or not to issue a pollution control permit.

Newfoundland has passed regulations prohibiting anyone from discharging effluent that contains an excess of 0.1 ppm lead into public sewers or any body of water.(112) Proposed air pollution control regulations will establish criteria for acceptable air quality and the standards for emitted contaminants. Air quality is acceptable if it contains less lead than $15 \mu\text{g}/\text{m}^3$ averaged over 24 hours and less than $10 \mu\text{g}/\text{m}^3$ averaged over 30 days. The limit on the emissions is $20 \mu\text{g}/\text{m}^3$ averaged over 30 minutes.(113)

Ontario has established both ambient air quality criteria and emission standards relating to lead. Air quality is acceptable if it contains no more than $5 \mu\text{g}/\text{m}^3$ over 24 hours and a geometric mean of $2 \mu\text{g}/\text{m}^3$ over 30 days.(114) The maximum concentration of lead allowed in emissions in both free and combined form is $10 \mu\text{g}/\text{m}^3$ at the point of impingement averaged over one half hour.(115)

Criteria are also established with respect to water quality.(116) These criteria are to be used in establishing standards for water basin management and for effluent. For livestock, 0.05 mg/L is considered desirable.(117) For irrigation; 20 mg/L is permissible.(118) For public service water supplies, 0.05 mg/L is permissible.(119) Effluent guidelines and receiving water quality objectives have also been established for the mining industry. Liquid effluents should not contain a concentration of heavy metals in excess of 1 mg/L. The receiving water objective for lead is 0.1 mg/L in hard water and 0.05 mg/L in soft water.(120)

The Quebec Water Board has issued directives to operators of mines in Quebec stating that the concentration of dissolved metals in the effluent of tailing ponds shall be kept at a level that will not affect the aquatic life of the receiving stream.(121)

Saskatchewan has established water quality criteria whose effect is described in the document:

"The Commission has not felt it desirable to set up rigid effluent or receiving water standards, but has chosen instead

to examine each case of waste disposal and water pollution on its own merits, considering each case from the broader water quality management point of view. Guidelines or criteria are, of course, necessary to assist in the evaluation of each case and these are contained in the following comments and tables."

For surface water the maximum concentration of lead suggested is 0.05 mg/L. For municipal drinking water the maximum concentration suggested is 0.05 mg/L.(122)

3. Mercury

Federal

Regulations have been passed under the Fisheries Act limiting the amount of mercury that may be discharged by a chlor-alkali mercury plant.(123) Under these regulations the amount of mercury contained in the liquid effluent from such a plant is limited to 0.005 lb per ton of mercury produced by that plant during the day. Regulations have also been proposed under the Clean Air Act stipulating the amount of mercury that may be emitted to the ambient air by such a plant.(124) These standards are expressed in terms of daily emission in grams per thousand kilograms of daily designed capacity, as follows: in ventilation gases from the cell room, 5 g; in the hydrogen gas streams originating from the denuders, 0.1 g; in the ventilation gases exhausted from the end boxes, 0.1 g; and in the gases exhausted from tanks and retorts, 0.1 g.

Chlor-alkali mercury plants report to the Department of the Environment on their total mercury purchase and use and their total mercury inventory, as well as mercury discharged in air emissions and effluents. It is interesting to note that Environment Canada has taken the position that this monitoring data cannot be released to citizen organizations because it would be unlawful to do so.(125) They state that the data can only be used by the Department for the purpose for which it was provided, namely, to inform the Minister. It is reported that the data may not even be used for prosecutions under the Act.

Regulations have not been issued under the Food and Drugs Act specifying the amount of mercury permissible in food; however it is understood that the Foods Directorate issued a guideline in 1971 forbidding the distribution, sale or consumption of fish containing more than 0.5 ppm of mercury. It should be noted that the Department of the Environment has the authority to close fisheries when safe

levels are exceeded, and relied on this authority when mercury pollution arose in Manitoba as a consequence of commercial activities in Saskatchewan and Ontario.(126)

No regulations dealing with mercury have been issued under the Pest Control Products Act; however, a memorandum distributed in December 1970 announced that the production of mercurial-seed dressing products should be terminated.

The discharge of mercury in the ocean is limited by regulations issued under the Ocean Dumping Control Act.(127) Under permit, a carrier can dump substances containing not more than 0.75 mg of mercury and mercury compounds per kilogram of solid waste, and 1.5 mg/kg in liquid waste. Mercury is also named as a pollutant substance under the Pollutant Substance Regulations issued under the Canada Shipping Act.(128) Under these Regulations vessels are forbidden to discharge mercury in Canadian waters.

Provincial

No specific standards for mercury were found in Alberta, Manitoba, New Brunswick, Nova Scotia, and Prince Edward Island.

British Columbia has published guidelines for the release of mercury to air and water under the Pollution Control Act. For the mining and smelting industry the objectives for airborne emissions are as follows: Level A, 0.003 g/cu ft; Level B, 0.005 g/cu ft; Level C, 0.010 g/cu ft.(129) For liquid effluents the objectives are: for Level A, 0.001 mg/L; Level B, 0.003 mg/L; Level C, 0.01 mg/L.(130)

For chlor-alkali mercury plants guidelines have been established in terms of pounds of mercury per ton of chlorine produced.(131) For air emissions the Level B and C objectives are 0.026 lb/ton. The Level A objectives are 0.02 lb/ton. For effluent discharges, the Level C objectives are 0.005 lb/ton, the Level B objectives are 0.001 lb/ton, and the Level A objectives are 0.0006 lb/ton. For solid wastes, the objectives are 0.002 lb/ton. The total allowable monthly balance on mercury purchased, inventory, and mercury added to the system are: Level C, 0.034 lb/ton; Level B, 0.0301 lb/ton; Level A, 0.0237 lb/ton.

For chemical industries other than petroleum refineries, the Level B and C objectives for effluent discharge are 0.05 mg/L, and the Level A objectives are 0.002 mg/L.(132)

Ambient air quality objectives have also been established for

the mining and associated industries equal to a maximum level of $1.0 \mu\text{g}/\text{m}^3$ (monthly average).(133)

In Newfoundland regulations have been passed prohibiting the discharge of mercury in excess of 0.5 ppm to sewers and 0.005 ppm to any body of water.(134)

Ontario's air quality regulations establish permissible emissions standards for alkyl mercury ($1.5 \mu\text{g}/\text{m}^3$) and for free and combined mercury ($5.0 \mu\text{g}/\text{m}^3$).(135) This is measured at the point of impingement. The ambient air quality criteria call for an average (24 h) concentration of $2.0 \mu\text{g}/\text{m}^3$ (136) If these limits are exceeded the director has the power to order industries to close down their operations.

Effluent guidelines have also been published for the mining industry and prohibit the discharge of mercury in excess of the existing background concentrations.(137)

Saskatchewan has issued water quality criteria (guidelines) that establish a maximum permissible concentration of mercury of 0.001 mg/L.(138)

4. Oxides of Nitrogen

Federal

Under the Clean Air Act national air quality objectives have been established for nitrogen dioxide as follows:

1. Maximum desirable level (139) $60 \mu\text{g}/\text{m}^3$ (0.03 ppm)
2. Maximum acceptable level (140)
 - One hour average $400 \mu\text{g}/\text{m}^3$ (0.21 ppm)
 - 24 hour average $200 \mu\text{g}/\text{m}^3$ (0.10 ppm)
 - 1 year average $100 \mu\text{g}/\text{m}^3$ (0.05 ppm)
3. Maximum tolerable level (proposed)(139)
 - $300 \mu\text{g}/\text{m}^3$ (24 h avg.)
 - $1000 \mu\text{g}/\text{m}^3$ (1 h avg.)

The maximum tolerable levels were published for comment to be submitted by 15 October 1976. After that date they will be put in final form for promulgation as ambient air quality objectives.

The levels are not standards and are therefore not legally

binding. However, they are intended to provide a framework for regulation. Provinces are encouraged to adopt them as standards.

Provincial

In Alberta, the federal ambient air quality levels for NO₂ are duplicated in a provincial regulation.(142)

British Columbia has standards applicable to various types of operations. In underground mines where diesel engines are used ventilation must achieve a maximum of 5 ppm NO₂.(143) The mining and milling effluent guidelines established under the Pollution Control Act set an NO_x level at 5 lb/ton of nitric acid produced (Level A); 20 lb/ton (Level B) and 60 lb/ton (Level C).(144) The chemical and petroleum industry guidelines set Level C from nitric acid plants at 60 lb/ton of 100% acid produced.(145) The food processing industries guidelines establish Level A at 600 ppm (NO₂) or 1.146 µg/m³ for food production operations.(146) Levels are established for gaseous and particulate emissions by other industries per ton of fuel burned. For example, Level C for coal burned in stationary industrial sources is 54 lb/ton.(147) None of these guidelines or objectives is directly enforceable except to the extent that it is incorporated into pollution control permits as terms and conditions.

New Brunswick's Mines and Quarries Regulations set the maximum level for NO₂ in mines at 10 ppm.(148)

Newfoundland has circulated draft regulations which establish the maximum NO₂ concentration at 410 µg/m² (1 h) and 205 µg/m³ (24 h). (149)

In Ontario, Ambient Air Quality Criteria under the Environmental Protection Act set maximum NO₂ levels at 0.20 ppm (1 h) and 0.10 ppm (24 h).(150) Under general regulations pursuant to the Industrial Safety Act, an Occupational Health Protection Branch Data Sheet specifies a time weighted average of 5 ppm NO₂ for workplaces. (151) The General Regulations under the Environmental Protection Act contain a limit for maximum concentration at point of impingement (1/2 h avg.) of 500 µg/m.²(152)

Saskatchewan's Ambient Air Quality Standard for NO₂ is 400 µg/m² (1 hr); 200 µg/m² (24 h) and 100 µg/m² yr).(153) Regulations under the Mines Regulation Act fix the maximum concentration of NO₂ in mines where diesel engines are operated at 5 ppm.(154)

5. Radiation

Federal

Radiation is unique among the hazards studied because it is regulated principally by one centralized agency established specifically for the purpose. The framework is provided by the Atomic Energy Control Act(155) which established the Atomic Energy Control Board. Under the Act, the Board is given extensive regulatory powers over all aspects of atomic energy. It may, with Cabinet approval, make regulations for developing, controlling, supervising and licensing the production, application and use of atomic energy and regulating the production, import, export, transportation, refining possession, ownership and use or sale of prescribed radioactive substances. Violation of the Act or Regulations is an offence punishable, on summary conviction, by a fine of up to \$5000 or imprisonment for up to two years, or both.

The Act itself merely provides the framework for regulation. The real controls are spelled out in the regulations promulgated under the Act.(156) These require anyone who uses specified radioactive substances or operates a nuclear facility to obtain a licence from the Board.(157) The Board is empowered to include conditions in these licences respecting the health and safety of workers, the measures that will be taken to protect workers, the method of operation, the ways wastes will be handled and the maximum amount of material that may be allowed to escape. It is specifically provided in the regulations that every licensee must maintain records concerning its method of operation, particularly the dose of ionizing radiation received by any person as a result of the use of prescribed radioactive substances or the operation of a nuclear facility.(158) A duty is imposed on the licensee to ensure that the dose received by any individual does not exceed the limits prescribed in the regulations.(159) Workers who have received more than the permissible dose are prohibited from engaging in further work that is likely to result in further exposure, and the Board may prescribe a lower permissible dose for individual workers in some circumstances. Schedules I and II of the regulations list the prescribed radioactive substances and specify the permissible dose rates.

The federal Parliament has also passed legislation covering radiation emitting devices.(160) Regulations have also been passed specifying construction standards for various kinds of equipment, including photofluorographic X-ray equipment, baggage inspection devices, laser scanners, dental X-ray equipment, television sets, and microwave ovens.(161) Some of these include a specification of allowable leakage. For example, the exposure rate allowed due to leakage from television receivers must not be more than 0.5

milliroentgen/h measured over a 10 cm square at 5 cm from any external surface.(162) Voluntary safety codes have also been prepared by the Department of National Health and Welfare covering the operation of medical and dental X-ray equipment and certain other devices.

Provincial

The provinces have also enacted some measures designed to protect people from radiation. For example, Alberta has issued regulations under its Radiation Protection Act controlling the installation and use of medical and paramedical X-ray equipment.(163) The regulations specify the operating procedures that should be used and design standards that the equipment must meet. Licensing of radiological technicians is covered by another Act, the Radiological Technicians Act.(164) Other provinces have similar power either under special acts or under legislation such as the public health acts.(165)

6. Vinyl Chloride

Federal

Following a recent amendment, the federal Food and Drug Regulations prohibit the sale of food in a package whose contents may yield any amount of vinyl chloride.(166)

Under Part I of the Schedule to the Hazardous Products Act, sale or importation of disposable metal containers containing pressurizing fluid composed in whole or in part of vinyl chloride is prohibited.(167)

Provincial

The VCM worker exposure limits in Alberta, British Columbia, Ontario and Quebec are as follows:(168)

	8-h time-weighted avg. (ppm)	15-min. max. (ppm)
Alberta	5	10
British Columbia	1	5
Ontario	10	25
Quebec(169) 1 (500)	1 (500)	5

To underline a point made earlier, we wish to draw attention to the fact that none of the standards is included in a regulation and therefore directly enforceable. British Columbia's standard will be included in regulations if draft industrial safety regulations now under consideration are adopted.(170) Similarly, the Quebec standard,

although formally published, is also merely a draft or "proposed" regulation.(171) The Ontario standard is a threshold limit value included in a Ministry of Health Occupational Health Protection Branch Data Sheet.(172) This TLV is based on regulations made under the Industrial Safety Act which generally require that work places be adequately ventilated "so far as is practicable". However, because the TLV is not written into the regulations, failure to comply with it is not necessarily a legally enforceable breach of the regulations. The Alberta standard is similar; it is based on general authority to establish occupational health standards found in Regulations under the Public Health Act.(173)

C. Commentary

Standards for work place environment are established almost exclusively under one category of legislation - the industrial safety, workmens' compensation and industrial health statutes, although relevant provisions are also contained in some public health acts and certain of the special statutes regulating particular contaminants.(174) Most of the remaining statute categories are concerned with ambient conditions and waste disposal. The majority of these are concerned with a wide range of contaminants, only a small number of which - notably radiation hazards - have been addressed directly by special statutes.

There remains a class of statutes directed toward protection of human health from hazards presented by consumer products. The Hazardous Products Act and the food and drug statutes are in this category. It is interesting that by far the most important legislation in this category is federal rather than provincial. There is little doubt that provinces have constitutional authority to establish hazard standards for consumer products, including food and drugs, but they appear to have chosen not to do so. The reason could be that the regulatory machinery of the federal food and drug administration is well established and contains substantial expertise that would be difficult and costly to duplicate.

In the ten statute categories discussed above two main legislative control techniques are apparent. One is the regulatory technique characterized by the licensing or approval systems administered by administrative agencies, government departments or government officials. The second technique is outright prescription backed by a quasi-criminal penalty or series of penalty provisions. There is no particular pattern apparent in the use of the two techniques either among the six subject hazards or in federal and provincial legislation. In fact, many individual statutes incorporate both techniques. Some statutes appear to be essentially prescriptive, but in fact regulatory features are incorporated in

the day-to-day administrative and enforcement practices of the responsible agency. The federal Food and Drugs Act is a good example. The regulations contain specific numerical standards for particular contaminants backed by quasi-criminal sanctions including confiscation provisions. However, in practice, product tests and information on products are submitted for food and drug agency review that normally leads to "approval" for marketing of the product. The Health Protection Branch also uses warning letters, seizures, and negotiations for voluntary withdrawals of products. There is a relatively formal regulation making procedure that includes prior information circulars and submission of industry comments.(175)

Regulatory performance should be examined to determine which of these two control techniques works better, and under what circumstances.

In general, the coverage of these statutes seems adequate. Some type of regulatory authority exists with powers that are generally adequate to deal with each of the contaminants studied and with any activities that might create risk. The workplace is covered by legislation at the federal level and in all provinces. General environmental, pollution control, and public health legislation cover the outside environment. Manufacture and import of contaminants can be controlled under the federal Environmental Contaminants Act, and food purity can be protected under the federal Food and Drugs Act.

That is not to say, however, that the statutes themselves are adequate. There are structural deficiencies that can be noted. For example, few of the statutes provide adequately for either public participation in decision-making or public disclosure of information. These deficiencies are discussed in Chapter IV. In addition, the adequacy of a statutory scheme does not determine the adequacy of enforcement or implementation. These are determined by the collective will of all involved and can only be evaluated after a careful study of the actual practices of the agencies charged with enforcement. All we mean to say here is that there do not appear to be any areas of activity that are beyond the reach of existing statutes.

There appears to be a good deal of overlap among statutes that deal with contaminants in one form or another. For example, the mercury content of a particular plant's effluent could be regulated under the pollution control legislation of a province, under the federal Fisheries Act, or in appropriate circumstances, under the Canada Water Act. The same problem might be dealt with by controlling manufacturing processes under the Environmental Contaminants Act.

It should not be assumed that overlapping jurisdiction of this kind is necessarily bad. On the contrary, it may be one way of assuring that all interests are consulted before action is taken. In addition, it would be very difficult to draft statutes dealing with different subjects that neither overlap nor leave important areas out altogether. If one must choose between gaps in jurisdiction and overlapping jurisdiction, perhaps the latter is preferable.

It is easy to understand the need for supplementary legislation, that is, legislation that overlaps other existing legislation in order to assure that there are no gaps, but it is not so easy to understand why the legislature does not indicate which legislation is to play the primary role, and which the supplementary role. Environment Canada officials maintain that the Environmental Contaminants Act is designed for a supplementary role. It is intended to cover problems that cannot be dealt with effectively under other environmental legislation. Nowhere does the statute itself reveal this intention. It might be better if it did; at least members of the public would not be as easily frustrated by apparent inaction under such legislation if they understood its purpose fully.

Another feature of the legislative framework described concerns the standards that have been established specifying the amounts of contaminants that will be tolerated. Although standards exist that cover a number of contaminants and a number of areas of activities, it is quite clear that there are significant gaps. Does this indicate a lack of effective regulations? The answer is simply not clear. It is certainly possible for authorities to regulate the use and dispersion of contaminants quite vigorously without promulgating any definite standards. For example, stringent conditions could be included in pollution control licences. Safety inspectors could quickly discover hazardous conditions and order them to be remedied. Only studies of actual regulatory behaviour can provide definite answers. However, we are inclined to suspect that a lack of standards often indicates that regulators do not have clear policies.

In addition, the data show that regulators seem to have a clear preference for issuing guidelines rather than regulations. Why? What effects does this practice have? We have already noted that guidelines are not enforceable and that they are very much more difficult for researchers and other members of the public to find. No doubt they can be changed more quickly than regulations, but perhaps the loss in enforcement and publicity are too high a price to pay for greater flexibility.

If standards enshrined in regulations are indeed more effective, several problems are apparent.(176). First, empowering

statutes and regulations do not require regulatory authorities to establish standards for any particular contaminant. The power to establish standards is nearly always given in discretionary terms, and for reasons discussed in Part IV it is unlikely that courts will order reluctant regulators to promulgate standards.

A second problem is the fact that even if an agency does establish contaminant standards, it is rarely under an enforceable duty to review and revise existing standards in the light of new knowledge. Some agencies, such as the British Columbia Pollution Control Branch, have adopted a policy of periodic review of standards. The Branch holds full public inquiries at five year intervals to assess the adequacy of particular standards established under the Pollution Control Act. However, periodic review of this type - especially review involving public consultation - appears to be the exception rather than the rule.

A final distinguishing feature of the legislation is that most of it is drawn from the point of view of the receiving environment, whether it is the working environment or the natural environment, and covers many different kinds of contaminants. Only a few of the statutes were directed at particular contaminants, notably those dealing with radiation. Is one approach better than the other? Again, regulatory performance would have to be examined to answer the question. One cannot help observing, however, that the current approach does not encourage any one agency to develop an overview of all the problems created by a contaminant. Perhaps the problem is unavoidable. If the regulatory system were organized along contaminant lines there would have to be a great many agencies and no one would be able to develop an overview of the receiving environment. But if we must organize our regulatory activities according to the receiving environment, is there not some way to compensate for the deficiency in this form of organization by encouraging some agency to develop the necessary overview concerning each contaminant?

CHAPTER IV

SPECIAL LEGAL PROBLEMS

A. Problems of Proof

Scientists concerned with public health and environment protection are becoming increasingly interested in the legal concept of burden of proof. The idea of placing the burden of justification on proponents of activities likely to result in introduction of any of the six subject hazards into the environment is seen as a means of requiring regulatory decision-makers to give greater weight to evidence of potential health or environmental damage.(177)

1. The Burden of Proof and Environment Protection

It has been shown by a number of legal writers that in legal proceedings to protect health and environmental values the environmental interest is likely to be the initiator (the plaintiff), and that in law the burden of proof is on the plaintiff for practically all purposes. The problem has been eloquently stated by Professor James Krier in a pioneering article on the subject:(178)

"Burden of proof rules at present have an inevitable bias against protection of the environment and preservation of natural resources. This is the case for the following reasons. Essentially two classes of demands can be made on such resources as air, land, water, wildlife and so on: (1) demands which consume or deteriorate those resources (water pollution, the slaughter of wildlife, the harvesting of forests); (2) demands which do not consume or deteriorate them (swimming, bird-watching, hiking and camping). In a world without laws, those who wish to use resources for consumptive or deteriorating ends will always prevail over those who wish to use them for non-consumptive or non-deteriorating ends. This is simply because consuming users, by exercising their demands, can foreclose non-consuming users from exercising theirs, while the contrary cannot hold true. In short, the polluter's use can stop the swimmer from using and enjoying a lake, but the swimmer's use cannot stop the polluter from polluting the lake.

Of course, we live in a system with laws, but it is a loaded system. And it is loaded precisely because of the point I have just made. For even in a world with rules against resource consumption (against, for example, pollution), the leverage inherent in resource consumers means that they can continue their conduct until sued. In short, they will almost

inevitably be defendants, and those whose uses preserve rather than deteriorate will ineluctably be plaintiffs. And it is one of the simple facts of our present system that (for a host of reasons) plaintiffs most generally carry the major burden of proving most of the basic issues in a lawsuit. The result is striking: Even with a system of substantive rules against resource consumption, our present rules ensure that in cases of doubt about any facet of those rules, resource consumption will prevail."(179)

(a) Burden of Proof in Law

Several observations must be made on Professor Krier's statement. First, he does not refer to a burden of proof; rather, he refers to "burden of proof rules". The significance is that in the judicial process there are a number of different burden of proof rules designed to fit different situations and types of legal issues. However, courts and legal scholars have classified two basic types of burdens.(180)

These are: (1) the burden of adducing evidence (evidentiary burden); and (2) the ultimate burden of persuasion (burden of proof). The evidentiary burden is one of initially producing sufficient evidence to justify the judge allowing the hearing to continue. Once this has been done by the initiating party there is a sense in which the evidentiary burden is said to shift to the other party. The latter runs a risk of losing if he presents no evidence, but he will not inevitably lose. It depends on whether the tribunal regards the first party's evidence as sufficiently cogent to discharge the burden of proof. Thus the burden of proof is borne by the party who will lose if, in light of all the evidence, the decision-maker entertains the appropriate degree of doubt.

It is apparent that the incidence of both the evidentiary burden and the burden of proof is an important factor in a lawsuit. The burden of proof for all issues is normally on the initiating party (the plaintiff in a civil suit and the prosecutor in criminal proceedings) throughout. As a general rule, the party bearing the burden of proof also bears the evidentiary burden. All of this of course is subject to statutory modification.

The burden of proof rules must be distinguished from the concept of standard of proof. It has been stated that the party bearing the burden of proof will lose if on all the evidence the judge entertains the appropriate degree of doubt. It is this appropriate degree of doubt that is characterized as the standard of proof.

In a civil case the usual standard is proof on a "balance of probabilities". The criminal standard requires that the tribunal be satisfied "beyond reasonable doubt". These standards can be viewed in terms of the degree of conviction or subjective certainty that the tribunal entertains as to the reliability of the evidence.

It can be seen that the burden of proof may be the determining factor when the tribunal is in doubt on any issue. But it will be a much more important factor where the higher "beyond reasonable doubt" standard of proof is required. In civil cases, with the balance of probabilities standard, the court simply weighs all of the evidence before it in reaching its decision. In the end, it may entertain doubts, but still find that on balance the plaintiff's allegations of damage are more probable than not, and therefore that the burden of proof has been discharged.

(b) Industry Orientation

The second observation is that although Professor Krier's point concerns burden of proof, it is apparent that the problem underlying his statement is the "industry orientation" of resource management law and legislation. A number of writers have asserted that this situation exists in Canada, as well as in the United States.(181)

With reference to the classes of legislation developed in Part III, this criticism may be applied directly to statutes regulating development and use of particular resources (Class 8), and statutes regulating particular industries (Class 9). It may also be applied to general pollution control statutes (Class 1), on the ground that acquisition of resource rights and approvals under other legislation creates a presumption in practice that the proponent will be given pollution control approval, i.e., there is a presumption of entitlement to pollution control approval. The Pollution Control administrators may set treatment and monitoring requirements as terms of approval, but they cannot deny approval; and in practice they cannot even set unduly restrictive terms unless it is clearly shown by some other party or by the agency itself that a severe risk exists.(182) The proponent does not bear the burden of proof. There is some evidence that this problem is exacerbated by the training and industry experience of many pollution control administrators.(183)

The same is true of public health statutes (Class 5), special statutes dealing with particular contaminants (Class 3), and possibly industrial health and safety and workmen's compensation statutes (Class 2). The reasons are found in the effects of industry pressure and agency personnel attitudes on enforcement policy,(184) and also

in the fact that ultimately quasi-criminal prosecutions must be relied upon for enforcement. In the case of prosecutions not only is the burden of proof on the prosecutor, but the beyond reasonable doubt standard of proof may prove to be impossibly high. This has been the experience in many federal Fisheries Act prosecutions where it is necessary to prove beyond reasonable doubt that a substance is "deleterious to fish". If sub-lethal effects of a substance on fish are suggested but unconfirmed, expert witnesses are likely to be unwilling to say that the substance is "deleterious".(185) Many prosecutions are not taken as a result. Similar problems have occurred in prosecutions under the federal Food and Drugs Act.(186)

A related problem is the fact that agencies have often been unwilling to resort to prosecution except as a last resort. Informal bargaining with contaminant dischargers is preferred.(187)

In the case of workmen's compensation act standards, several provincial statutes permit penalty assessments where in the opinion of the board, working conditions are unduly hazardous.(188) It appears that in some penalty assessment cases the burden of proof has been effectively placed on the company.(189)

The Food and Drugs Act merely contains prohibitions against, for example, selling "an article of food that has in or upon it any poisonous or harmful substance."(190) In addition, sale of certain specified foods and drugs is prohibited. Breach may be the subject of a quasi-criminal prosecution. Forfeiture may be ordered upon conviction. The burden of proof regarding health risk appears to be very much on the Health Protection Branch of the Department of National Health and Welfare which administers the Act. However, in practice the burden may be on producers of new products. The data for proposed new substances are submitted to the Branch for review. Sale of the substance commences only following Branch approval.(191)

Similarly, the motor vehicle exhaust emission standards in federal and provincial motor vehicle acts simply set maximum contaminant limits backed by quasi-criminal penalties. Under the federal Motor Vehicle Safety Regulations,(192) at the beginning of each model year representative samples of all makes and models of vehicles imported into or made in Canada are tested by the Ministry of Transport. The Ministry must show that standards are not met.

However, the B.C.(193) and Ontario(194) statutes place the testing requirement on the manufacturer. Detailed procedures for testing various types of vehicles are set out. Tests must prove satisfactory before sales can commence. Thus, the burden of proof appears to be different under federal and provincial statutes that,

in outline, are otherwise very similar. Specific contaminant standards under the motor vehicle statutes do differ however.

Generally speaking the burden of proof under the federal Environmental Contaminants Act is on Environment Canada. The authorities under the Act must "be satisfied" that a substance "is) ... or will constitute a significant danger in Canada ... to human health or the environment ...,"(195) before it can be added to the Schedule of prescribed substances. Danger to human health or the environment must be "suspected" by the authorities before they can begin to investigate and collect data on a substance. They must "have reason to believe" that a substance will constitute a significant danger to human health or the environment before the manufacturer can be compelled to disclose information on the substance.(196)

But there is a mandatory reporting requirement for anyone who imports or manufactures more than 500 kg of a chemical compound for the first time. Any available information respecting danger to human health or the environment must be disclosed.(197) The Minister may also issue notices to require importers, manufacturers and processors of particular substances to provide specified information regarding quantities of substances.(198) Thus it is possible that in practice the mandatory reporting requirement could be used to shift the burden of proof, or at least a significant evidentiary burden, to manufacturers and importers of potentially hazardous substances.

Four principal points can be taken from this discussion:

1. The burden of proof is more likely to be on the regulatory agency (or on third party environment or health protection interests) than on the producer of hazardous substances.
2. Incidence of burden of proof relative to hazardous substances varies across the different categories of statutes. Even statutes of the same class and type can differ in the allocation of burden of proof e.g. Motor Vehicle Act.
3. In discussing burdens of proof it is necessary to specify the nature of the burden, and also to specify what it is that the party bearing the burden must prove. Statutes are often not clear as to nature and allocation of burden of proof.
4. As a result of (3), nature and allocation of burden of proof is often determined by informal agency policies and practices.

2. Standard of Proof and Uncertainty

Hazardous substance issues can often be characterized as situations in which there is some evidence of a risk of damage, but

the likelihood of the risk culminating in damage cannot be demonstrated with objective certainty.(199) It is largely or entirely speculative.

In many types of legal action, such as actions for injunctions to enjoin activities likely to cause environmental damage, courts require that a likelihood of imminent irreparable damage be shown.(200) The court must be satisfied on a balance of probabilities standard of proof (as opposed to burden of proof) that the test has been met. But where scientific evidence shows only that the action in question creates an unquantifiable, i.e. unknown, risk, a court is not likely to find that the balance of probabilities standard of proof has been met. The real difficulty is not burden of proof but standard of proof. In fact it has been suggested that the burden of proof concepts are irrelevant to the problem of uncertainty. Gelpe and Tarlock (201) put the argument as follows:

"The modern function of the burden of persuasion (i.e. the burden of proof) is to make it possible for the trier of fact to decide issues that could not otherwise be decided. When the issue is treated as whether an activity will cause injury to human health or to man's ability to use a resource and there is no evidence of a risk of future injury, it is likely that the activity will be allowed regardless of where the burden of going forward (i.e. the evidentiary burden) lies, so shifting that burden does not solve the problem. On the other hand, if the burden of persuasion were shifted and those undertaking an activity had to establish as part of the prima facie case that there will be no injury; i.e., that there is no risk, the result would be an irrational curtailment of resource use."(202)

Recent U.S. statutes and court decisions have alleviated the uncertainty problem somewhat by following a "risk-benefit" approach that permits courts to use a flexible standard of proof, with the degree of certainty required varying with the gravity of the alleged harm and the benefits of the defendant's activity. Courts are thus able to enjoin risk to health in situations of uncertainty where the demonstrated benefits of the activity are found to be outweighed by the risks. The standard is flexible in the sense that a "lower" standard of proof will suffice where (1) the magnitude of the damage, should it occur, would be large; (2) the probability of occurrence is significant; and (3) feasible alternatives exist. Canadian courts do essentially the same thing in determining whether preliminary injunctions should be granted under the test of "balance of convenience."(203)

In Canada, apart from preliminary injunctions, serious problems of proof in situations of uncertainty continue to exist in

civil legal actions and judicial review proceedings. A good example is the recent Ontario case of Re Canada Metal Co. Ltd. and MacFarlane.(204) The Director of the Air Management Branch of the Ministry of the Environment issued stop orders which had the effect of shutting down the Toronto lead reclamation facilities of Canada Metal Company and Roto-Cast Ltd. The Director acted under provisions of the Environmental Protection Act which empowers him to make stop orders when he is of the opinion "upon reasonable and probable grounds ... that a source of contaminant is ... discharging into the natural environment any contaminant that constitutes ... an immediate danger to human life, the health of any persons, or to property ..." The action was taken after data showing high lead blood levels in some persons residing near the plants were received by the Air Management Branch.

The stop orders were quashed by the Ontario Supreme Court on the application of the Companies. The Director had acted on a staff report which indicated that "soil, vegetation and ambient air quality surveys in the vicinity of the Canada Metal Plant...showed...levels of lead considerably in excess of those found in a normal urban environment". There was also information from the Ministry of Health that 725 blood samples had been taken from nearby residents, and three samples showed "unsafe levels".

The court concluded that the Director had acted without proper evidence. He had exercised his power "arbitrarily and not judicially." Mr. Justice Keith stated:

"What possible evidentiary value is there in the words 'considerably in excess of those found in the normal urban environment'? There was no evidence as to what the lead levels were in a normal environment, let alone what...the Director...in his own mind regarded as a normal urban environment. To say that lead levels in the soil, vegetation and ambient air in the vicinity of the Canada Metal Plant were in excess ... of those found in a normal urban environment, whatever that means, was absolutely worthless."(205)

As to the blood tests he found that:

"725 persons were tested and 722 were in effect found not to have unsafe blood lead levels. In other words, on the basis of this affidavit, 99.6% of those tested living in "the vicinity of the plant" showed no unsafe blood lead levels. During the course of the argument, it was conceded by counsel for the respondent that the individual with the highest reading worked with lead in a battery plant and that his condition could in no way be attributed to Canada Metal. Further, the person with the 93 µg reading turned out to be a

20-month-old infant who suffered from the characteristic of eating dirt - a characteristic that in itself presented a serious hazard to life and health, regardless of what was in the dirt. There was no information whatever of any value as to the person with the 76 μg reading.

The affidavit is silent as to how long these or any of the other persons tested had, in fact, resided "in the vicinity" of the Canada Metal plant, or what their ages were, or what their other exposures had been, if any. In other words, it appeared when even the most elementary checks were made, that only one person at most had a high blood lead level out of 725 persons tested, that at that time could not reasonably be accounted for other than the presence of the Canada Metal plant."(206)

No express reference was made to the evidence of the lead expert called by Canada Metal. However, Mr. Justice Keith noted that her evidence "pointed up the greater danger of jumping to a conclusion without proper study."(207)

Undoubtedly, more comprehensive data could have been produced on behalf of the Director. However it must not be forgotten that the Branch was attempting to act quickly in order to remove what appeared on the available evidence to be a serious health risk. The Director considered (subjectively) that a risk existed. The Court, on the basis of the objective evidence presented to it, disagreed (subjectively). The Director and the Court may have applied different standards of proof; or they may simply have disagreed as to the significance (weight) to be attached to the available evidence. It should also be noted that the Court had information before it that was not available to the Director when he made his order.

There is also an indication that the Court applied a different substantive standard or test. Mr. Justice Keith took pains to point out that it was reasonable to expect the Director to apply the same "balance of convenience" test that courts use in applications for interim injunctions. This is an open question.

Even more serious problems exist in prosecutions where the "reasonable doubt" standard of proof applies. The experience of the federal authorities in prosecutions under section 4 of the Food and Drugs Act is a good illustration. "Harmful substances" prosecutions have been unsuccessful because expert witnesses have been unable to state with certainty, i.e. to satisfy the court beyond reasonable doubt, that a substance "causes" cancer.(208)

3. Standard of Proof and Substantive Standards

To this point the discussion of standards of proof has related to courts. What of regulatory agencies? What standards of proof must they meet? For example, what standard of proof is relevant under the Environmental Contaminants Act in the Minister's decision that a substance constitutes a significant danger to human health or the environment and therefore should be proscribed? The Act does not say explicitly. Nor do any of the contaminants statutes reviewed clearly state what degree of subjective confidence decision makers must entertain in the evidence before them.

To continue the example, the Environmental Contaminants Act does contain a substantive standard or "test" that must be met by the Minister. He must be "satisfied" that the substance "constitutes a significant danger to human health or the environment." The problem is that this test is extremely imprecise. It does not indicate what factors the Minister is to consider, nor how he is to weight the various factors. It is not clear what method of testing should be used to determine "danger to human health or the environment." Should humans be tested? Should various components of the physical or biological environment be monitored? How should testing be carried out? What levels of particular contaminant substances should be regarded as significant?

Considerable latitude is left for exercise of discretion by the Minister on the advice of the administering agency. Within the general terms of the statutory standard or test, regulation and enforcement may range from vigorous to feeble and accommodating. It all depends on internally generated policies.

Two points emerge: (1) regardless of burden of proof, the substantive standard or test required for any particular hazard is critical; and (2) typically, statutes confer decision powers on agencies in wide discretionary terms, so that in practice the standard or test to be applied is a matter of agency policy.

4. The Burden of Cost

Some writers, while arguing that shifting the burden of proof is not relevant to the uncertainty problem, have suggested that there is another more important burden - that of cost.(209) They distinguish the issue of who must prove what, from the issue of allocation of costs of producing and presenting environmental impact and health risk information. Their point is that regardless of who has the ultimate burden of proof, it may be rational to require parties with greater resources or special expertise to bring forward

evidence on particular impacts or risks. Placing this cost burden of data gathering and of preparing an assessment statement on the proponent party is consistent with the normal incidence of the burden of proof - on the initiator of the proceedings.

The manufacturer-testing requirements in the British Columbia and Ontario vehicles acts and the reporting and testing requirements in the Environmental Contaminants Act are consistent with this view. All the general pollution control statutes contain powers to require detailed information from permit applicants. These provisions allow the cost burden to be shifted in practice. The practice of the Health Protection Branch under the Food and Drugs Act also has the effect of shifting much of the cost burden to the manufacturer.

It should be noted, however, that the majority of these provisions do not explicitly place the cost of research and testing on applicants. Rather they merely give the administering agency a discretion to order that particular tests be carried out and data filed. This comment applies to the Environmental Contaminants Act, the Food and Drugs Act, industrial safety statutes, and most general pollution control statutes.

B. Private Law Remedies

Private civil actions can play a limited role in the control of man made hazards.(210) Actions based on a number of heads of tort and property liability can be brought by affected persons to obtain compensation. Where the courts determine that the damage is more than trivial and not capable of monetary compensation, an injunction may be awarded that may have the effect of shutting down the contaminant producing activity. Occasionally the courts have also granted limited injunctions to restrict the duration of the offending activity or require reduction in the quality or quantity of the contaminant substances being discharged. In this way it is possible for a court, in effect, to establish judicial standards for a particular plant in relation to a particular person or class of persons. Generally, however, these attempts at judicial standard-setting have been relatively unsophisticated.

Normally it is necessary for the plaintiff to establish actual injury to health or damage to property or to the use and enjoyment of property as a result of discharge of the contaminant substance. The consequence is that actions of this type are usually after-the-fact control initiatives. In the case of sub-lethal effects on humans or animals as a result of inhalation or ingestion of particular toxic substances, it may be extremely difficult to prove on a balance of

probabilities that particular health conditions were caused by the toxic substance or substances released by the defendant.(211)

Actions to remedy damage caused by sub-lethal or cumulative effects of toxic substances may also run afoul of statutory limitation periods. Limitations statutes provide that actions must be brought within a specified period (usually 6 years) after occurrence of the harm.(212) The effect may be to prevent actions in relation to health damage, such as asbestosis, which develops over long periods of time following initial exposure to substances.

In private nuisance actions where no actual damage can be shown and the allegation is merely interference with the use and enjoyment of land (for example by fumes or odours) the court considers the nature and condition of the neighbourhood and attempts to balance the respective duties and obligations of the parties to determine whether the defendant's activity is "unreasonable". In other words, certain social and economic factors are taken into consideration in determining liability. It is possible to obtain interlocutory injunctions to restrain contaminant emission before damage takes place. However, to obtain such an injunction it is necessary to establish that if the activity should go ahead, damage is imminent and irreparable, and that no great hardship would be caused to the defendant by granting the injunction. The plaintiff must bear the onus of proof in this so-called "balance of convenience" test. It is also likely that the plaintiff will be required to give an undertaking that he will pay any damages the defendant suffers as a result of the interim injunction if the defendant is successful in the trial of the action.

In the case of actions to enjoin discharge of hazardous substances, the balance of convenience test will be difficult to meet. The recent case of Stein v. The City of Winnipeg(213) is a good example. Stein brought an action to restrain the city from proceeding with a program of spraying trees and shrubs on city property with the insecticide methoxychlor. The Chambers Judge denied the plaintiff's application for an interim injunction, even though it was clear that the city had failed to comply with section 653 (1) of the City of Winnipeg Act. This section requires the executive policy committee of the council to conduct an environmental impact review of "every proposal for the undertaking by the City of a public work which may significantly affect the quality of the human environment."

On appeal the interim injunction was denied. The plaintiff was unable to establish the existence of alternatives to methoxychlor that could deal effectively with the cankerworm infestation. Nor was the plaintiff able to show that she would suffer irreparable injury

if the spraying were to proceed. The following statement on the issue of irreparable injury by Mr. Justice Matas indicates the factors regarded as significant and the weighing process carried out by the court:

"I have considered the following to be relevant:

- 1) Only continued exposure to pesticide sprays would endanger plaintiff's health. It is a reasonable inference from the evidence that similar conditions would apply to unknown individuals with the same susceptibility.
- 2) Although the full programme will extend for several weeks, it will be a one-time spray application at any given location.
- 3) The spraying will not be city-wide but will be restricted to designated areas.
- 4) The programme may not be carried out in plaintiff's area; if it is, there will not be any spraying in the immediate vicinity of her residence.
- 5) Individuals may conduct spraying operations on their own property using compounds containing methoxychlor. The property may adjoin that of a person who is susceptible to the chemical.

"All these factors tend to minimize the aspect of irreparable injury alleged by plaintiff.

"On the other hand, the city has shown that cancellation of the programme will cause great inconvenience to it, i.e., to its residents. For example, Dr. Ellis said in para. 7 of this affidavit:

"That areas which are infested by forest tent caterpillars and cankerworm, if left unchecked, will result in the defoliation of trees leading to the weakening of the tree due to the lack of nourishment and the eventual reduction of the tree's resistance to subsequent attack by other tree pests and diseases.

"Of concern to the residents of the city would be the question of protection of its trees and the concomitant problem of what might be the impact on the environment of the city if there were an absence of trees in certain areas. The aesthetic and general environmental effect of loss of trees is an important factor to be considered.

"We have thus a conflict between two adverse environmental effects - a comparison of the adverse effects on Stein and perhaps others if there is a spraying, as against the effect on the aesthetic and general environment if there were no

spraying and a consequent loss of trees. This is not a case of a clearcut comparison of a hazard to health of humans as opposed to a hazard to inanimate objects. Absence of trees would have an effect on the human as well as on the physical environment.

"I have concluded that plaintiff has not discharged the onus of proof under the test of balance of convenience. In any view, the greater inconvenience would be with the city if an interlocutory injunction were granted. I would dismiss the application with costs here and in the Court of Queen's Bench."(214)

1. Locus Standi

The Stein case underlines another important constraint on actions of this type. To initiate an action the plaintiff must establish that he has locus standi, that is, he must show that he has suffered injury peculiar to himself and not merely inconvenience or harm common to the general public. The Manitoba Court of Appeal held that Stein did have standing, notwithstanding that there was no evidence of "special and peculiar" damage. However, this decision is substantially based on the section of the City of Winnipeg Act that expressly requires an environmental impact assessment. The provision is unusual, in that it is patterned after section 102 (1) (c) of the U.S. National Environmental Policy Act, which owes its effectiveness largely to citizen enforcement through legal actions. Standing remains a serious constraint to private legal action. This is clearly shown by the Rosenberg case which is discussed in the next section.

2. Class Actions

The standing requirement cannot be circumvented by bringing a class action on behalf of all members of the public affected by a hazardous substance. It has been held in a number of Canadian cases that a group of individuals, none of whom can show the requisite special damage, are in no better position than one of their number.(215)

C. Judicial Review

In the United States, questions related to the appropriate standard for judicial review have been important in the regulation of chemical hazards.(216) The reason is that traditionally, U.S.

courts have played an important review and enforcement role in regulatory matters generally. It is anticipated that the principal enforcement technique will be through legal actions, and statutes are drafted on this assumption. The role of the courts in the U.S. is illustrated by the extensive litigation related to the environmental impact statement requirement under the National Environmental Policy Act.(217) A number of actions have also been based on the contaminant standards of the federal Clean Air Act.(218)

The situation in Canada is quite different.(219) There is practically no tradition of judicial enforcement of regulatory requirements. The role of the courts is limited essentially to procedural and jurisdictional issues. In the absence of specific statutory directions courts will not review the merits of decisions by administrative agencies. To do so would be to usurp the function of the agency. Courts are particularly reluctant to move into the merits of regulatory decisions where the statutory decision powers confer broad subjective discretions. It has already been noted that most statutes concerned with regulation of hazardous substances contain wide subjective discretions of this kind.

There are some exceptions to this judicial reluctance. A notable example is the Canada Metal case, discussed above.(220) However it is clear that grounds for judicial review of discretionary decisions of government agencies and officials remain narrow. This is particularly true where the agency or official has been careful to avoid written reasons for decision and disclosure of other relevant documents.

The result is that court intervention in enforcement or standard setting decisions of agencies concerned with hazardous substances is extremely limited. To set a decision aside it is necessary to establish that the agency acted completely without evidence on a material issue, or that it based its decision on irrelevant matters or failed to take relevant matters into consideration. It is virtually necessary to prove that the agency acted arbitrarily or capriciously.(221)

Provided that the decision process is characterized by the reviewing court as "quasi-judicial", decisions may be set aside on certain procedural grounds.(222) These include failure to provide interested persons with adequate notice, information, or opportunity to prepare and make representations.(223) The major difficulty with this type of review is that it will not directly affect the merits of a matter. If a decision is set aside on procedural grounds it is open to the agency to reconsider the matter using proper procedures and then make the same decision.

It is fair to add, however, that procedure and substance are often interrelated. Requirements for procedural "openness" are likely to have significant, though no easily measurable, effects on the substance of particular agency decisions.

There is also the problem of who is an interested person entitled to raise substantive and procedural issues in legal proceedings. This is the problem of locus standi that has already been illustrated by the Stein case.(224) Notwithstanding Stein, the class of persons entitled to bring action remains very narrow. It is still necessary to show a private economic interest in a decision. This is illustrated by the recent Ontario Court of Appeal decision in Rosenberg v. Grand River Conservation Authority.(225) It was held that two dissenting members of the Conservation Authority, which proposed to convey lands for highway purposes, had no standing to challenge the decision since their private rights were not affected.

Statutory limitation periods which prevent legal action after the lapse of specified time periods following events may also constrain judicial review. The cost of legal action - particularly the potential liability to pay the other party's costs if unsuccessful - is another significant constraint.

The foregoing discussion is not intended to suggest the desirability of extensive use of legal action as a review or enforcement technique. In fact, there is evidence that in the United States easy access to the courts has been a major source of regulatory delay, cost, and uncertainty.(226) It must also be remembered that judicial review cuts two ways. Actions may be brought by contaminant dischargers to set aside standards or to quash regulatory orders. The Canada Metal case is an example.

However, if judicial review and enforcement is largely unavailable, as it is in Canada, the question must be asked: how are the discretionary powers of hazardous substance agencies to be controlled? What if an agency fails to establish standards for hazardous substances, or establishes absurdly low standards, or declines to enforce standards? It is in these situations that public access to judicial review or other appropriate supervisory techniques may be extremely important. Alternative techniques for agency supervision include public access to agency information and public participation in agency decisions.

D. Public Participation

In a recent article one of the present authors concluded, following a selective review of Canadian federal and provincial environmental legislation and a full review of case law, that:

"Citizens rights to participate in decisions by resource and environmental management agencies are not extensive. There is also evidence that agencies with discretion to permit opportunities for public participation are generally either not doing so effectively or not doing so at all. In particular, participation has been extremely limited at the important issue formulation stage of agency decision processes. There are also few rights or opportunities to participate in implementation and enforcement of agency decisions."(227)

The review of hazardous substance regulation statutes in Chapter III suggests that the same conclusion holds here. Typically, statutes relevant to the six case study hazards contain no explicit public participation provisions - not even prior publication requirements for standard-setting regulations.(228) The Environmental Contaminants Act and the Food and Drugs Act contain no such provisions. Many of the provincial general pollution control statutes do contain public participation provisions relevant to particular applications and to general standard setting. However, with few exceptions these are within the discretion of the relevant agency. Notwithstanding that standard setting hearings have been held by agencies such as the B.C. Pollution Control Branch, the Alberta Environment Conservation Authority and the B.C. Workers' Compensation Board, public access is not guaranteed. The point here is that the statutes disclose either no authority or merely discretionary authority in agencies to involve the public. This raises the question of whether in practice agencies actually do exercise their discretion to hold hearings or otherwise provide opportunities for public participation. If empirical research suggests that in practice the public is effectively involved, the further question is whether it is desirable to write public participation guarantees into empowering statutes. If it is deemed desirable, what form should such guarantees take, having regard to the variety of public participation techniques available and the desirability of permitting each agency to choose techniques most appropriate to its duties and responsibilities?

There is also the problem of cost. Individuals and public interest groups have discovered that access to the hearing process of regulatory agencies may not be enough if effective intervention is inhibited by lack of resources. In proceedings such as contaminant standard setting, involving complex technical or scientific questions, public interest participants often require expert research assistance and expert witnesses in order to prepare and present submissions. Groups have applied to a number of regulatory bodies for financing. Most applications have been rejected, usually on the ground that the agency lacks legal authority to finance intervenors.(229).

Intervenors have been financed to participate in the proceedings of a number of ad hoc commissions of inquiry such as the Mackenzie Valley Pipeline Inquiry (Berger Commission), the Ontario Royal Commission on Electric Power Planning (Porter Commission), the federal Kitimat Oil Pipe Line Tanker and Marine Terminal Inquiry (Thompson Commission) and the Alaska Highway Pipeline Inquiry (Lysyk Commission). Several regulatory agencies including the Ontario Municipal Board and the Alberta Public Utilities Board have also financed public interest intervenors.

The major problem is that statutory provision for financing or awards of costs to public participants does not exist. Financing is therefore in the discretion of each particular inquiry or tribunal, assuming that the body's jurisdiction is wide enough to permit it. Sometimes even if jurisdiction to finance is doubtful, public groups can be accommodated through such devices as consulting contracts. But in any case, everything depends on the will of the particular agency. Thus, when the Alberta Public Utilities Board recently had doubts about financing public interest intervenors and refused reimbursement for certain costs incurred by intervenors based on "effectiveness" and "reasonably and necessarily incurred" criteria,(230) groups such as the Consumers Association of Canada were left with large bills for expenses following a major rate case.

No examples of statutory complaint procedures whereby enforcement or standard-setting activities can be initiated by citizens were found. Complaints will be received, but initiative is entirely within the discretion of agencies.

It is usually possible for individuals to commence private prosecutions without the assistance or consent of agencies.(231) However this may be difficult in practice because information necessary to determine whether offences are being committed may be within the exclusive control of the agency. For example, it may be impossible to tell whether a contaminant is being discharged in excess of statutory standards or permit conditions without access to monitoring data in the possession of the agency or the company in question.(232) If the agency fails to co-operate, judicial steps to compel disclosure of such information cannot be attempted until an action is commenced but it is unlikely that a prosecution can in fact be initiated without it.

E. Access to Information

Generally speaking there is no right to compel discovery or disclosure of information concerning hazardous substances that is in the possession or under the control of government agencies or departments.(233) In the 10 classes of statutes reviewed in Chapter III

the only explicit right to agency information found is that in the Saskatchewan Water Resources Management Act, 1972.(234)

There is no legislation designed to establish a presumption of disclosure subject to specified exceptions such as the U.S. Freedom of Information Act.(235) The Cabinet has published guidelines on the production of documents,(236) but these are for Parliamentary purposes only and could not be enforced by a citizen against government officials or departments. Moreover, they contain many very general exemptions. The combined effect of the federal Official Secrets Act and the Oaths of Office administered to both federal and provincial public servants is a practical presumption against disclosure.

A further constraint on production of government information is the doctrine of Crown privilege.(237) Where the doctrine is invoked by the filing of a Minister's certificate, the authorities suggest that a court may review the documents in question to determine whether the national security or the public interest would make disclosure inappropriate.(238) Although the court must determine this issue, substantial weight will be given to the Minister's affidavit. The check on extensive governmental use of Crown privilege is provided by the adverse publicity likely to result from any Crown privilege claim. Consequently, claims will be carefully considered by government officials, and in practice are likely to be limited to economic or national security considerations. However it is not inconceivable that privilege might be claimed on information relevant to radiation hazards such as material concerning the alleged Port Hope contamination.

A final restricting factor in disclosure of information is the law of defamation. Agencies have resisted disclosure of information showing possible offences on the ground that the information may be defamatory.(239) Even if such information is disclosed, its use by persons or groups or even by agencies themselves to generate publicity that may induce plants to reduce contaminant emissions may be restrained by interim injunctions in libel actions.(240) If such information is broadcast in defiance of an injunction, those responsible will be punished for contempt even if it is subsequently established that the statements in question were not defamatory.(241) Successful libel actions may also result in crippling damage awards.

For the past year, government secrecy has been under examination by a Parliamentary committee, the Standing Joint Committee on Regulations and Statutory Instruments. The enquiry began when the House of Commons referred to the Committee a private member's bill, Bill C-225, that would have guaranteed the private citizen access to government files. During its hearings the

Committee has heard evidence from numerous witnesses and has amassed an impressive amount of information concerning government secrecy.(242) One interesting item contained in its proceedings is a list of 33 statutes that contain secrecy provisions.(243) The list is far from comprehensive, but it does indicate the degree to which secrecy is favoured over disclosure in Canadian law. Since the Committee began its deliberations the Government has indicated, in the Speech from the Throne (October 1976), that it is also studying the possibility of introducing legislation.(244)

Three examples illustrate the seriousness of the limitations that are placed on disclosure. The first relates to the Department of the Environment. Under the federal Fisheries Act, the department is responsible for the regulations restricting mercury discharge by chlor-alkali mercury plants. A part of the enforcement involves the continuous monitoring of the mercury purchases, uses, and discharges by these plants. The information is essential to anyone who wishes to determine how well we are controlling mercury pollution. It has been released by the department in the past, but the department has since received advice from counsel that such data should not be released.(245)

A second example concerns the Northern Inland Waters Act. It is the practice under this Act to include conditions in each water licence relating to environmental control. It is clearly necessary to have access to these licences and conditions if one wishes to evaluate the adequacy of environmental controls or even to determine whether or not a particular plant is complying with the law; yet, a research associate of the authors was first denied access and then given limited access on the condition that he not disclose any of the information contained in the licences.

The third example concerns inspection reports, and is taken from the Proceedings of the Statutory Instruments Committee.(246) In 1975, a number of eating establishments in Whitehorse were inspected by health service officials. The service refused to release the results to the Consumers Association because "the release of such information would interfere with the working rapport which the health authorities were striving to improve in their relationships with proprietors of eating establishments". The Minister of National Health and Welfare explained more fully in a letter to the Statutory Instruments Committee:

"It should be noted that our Environmental Health Officers adopt an educational approach to the raising of standards of sanitation wherever this is possible. If the Environmental Health Officer were to allow laboratory results to be publicly announced when substandard conditions are first identified this would undermine the reputation of the operator

prior to his having been given an opportunity to remedy the situation. It would also surely damage the Environmental Health Officer's role as a helpful adviser and convert his position into that of a policeman."

The letter goes on to indicate that decisive action would be taken, including publicity, if there were "an imminent threat to the health of the public". But, of course, one incurs a greater risk of food poisoning when eating in establishments that are less sanitary than others. While the health service is giving the operators the opportunity of remedying the situation, without suffering any loss of business, it is denying the public the opportunity of selecting cleaner establishments to patronize, with less risk of food poisoning. They are also removing one of the most powerful incentives these establishments might have to improve their operation, namely loss of business.

There are valid reasons for non-disclosure of information. Our society values personal privacy very highly, and government collects a great deal of information about individuals. It is vigorously protected, and should remain so. Other information also needs to be protected, for example information relating to national security or international relations.

Trade secrets, another example of information that should be protected, are of direct interest in this study. The composition and method of manufacturing new chemical products are widely regarded as trade secrets. If they are disclosed, enterprises that develop new products may not be able to profit from their efforts. Unfortunately, this same information is required by anyone who wishes to assess the risks that new products create for public health and the environment. Obviously disputes will result, and it will be necessary to provide some forum for weighing the opposing interests in confidentiality and disclosure. As matters now stand the decisions are left to the departments holding the information and there are no mechanisms for review.

The examples discussed above, and the cases of secrecy documented by the Statutory Instruments Committee, demonstrate that far too much is kept secret. This undoubtedly has an impact on our collective ability to detect and react to risks created by new substances. We are not suggesting here that everything must be disclosed; that is obviously impossible for the reasons suggested above. Our criticisms are that there are no established mechanisms for requesting information; that there are no acceptable guidelines for determining when information should be released and when it should be withheld; and that there is no mechanism for reviewing decisions taken by individual public servants relating to questions of disclosure.

There are certain limited situations when people can obtain disclosure. For example, information can be compelled by subpoena in judicial proceedings. The problem here as suggested in the discussion of private prosecutions, is that the information may be needed at an earlier stage in order to determine whether or not legal proceedings should be initiated. Moreover, the doctrine of Crown privilege may prevent disclosure.

Parties to regulatory proceedings also sometimes have a right to information. Although the departments of government are free to withhold information whenever they please, regulatory tribunals are sometimes forced to disclose information. Procedural rules of fairness, sometimes called the rules of natural justice, require any tribunal holding a judicial-style hearing to disclose enough information to all participants to enable them to prepare and present their cases effectively.(247) Although these rules are very important, they suffer from a number of deficiencies. First, there are no recognized procedures for requesting information, and there are no guidelines concerning what should be disclosed. Second, the rules can only be invoked by a party to the hearing, so there is the initial question of who is a party, that is, who has standing to appear. Finally, the rules only apply when the tribunal is required to hold a judicial-style hearing. Unfortunately, it is not at all clear when judicial-style hearings are required. It is clear, however, that the requirement of procedural fairness does not usually apply in cases where the tribunal is making rules of general application. Thus, it would not apply when a tribunal is setting standards; yet this is one of the situations where disclosure is most important from the point of view of assessing risk and allowing for broad participation in the standard setting process.

Whatever its limitations, the procedural fairness requirement has forced regulatory tribunals to consider the question of disclosure on numerous occasions, and their struggles are instructive.(248) A review of the administrative decisions relating to disclosure convinces us that it is not possible to establish any reasonably drawn categories of information that would be completely exempt from disclosure. Any classification that affords protection to all the documents requiring it will also include many documents that could be released without creating any harm. The decision-maker will therefore have to consider the question in light of the particular circumstances of each case, weighing the harm that will be done by disclosure against the harm that will be done by non-disclosure.

Very often ways can be found of releasing the essential information without damaging other interests. For example, sometimes it would be possible to release study reports on the harm created by products without releasing the names of the companies involved. Another example was provided by the Department of the Environment. It receives quarterly reports from chemical companies concerning the volume of chemicals they produce or import. That material is very sensitive because competitors could use it to undercut one another's business. But once the data become stale--after the end of the year--they can be released safely. In other cases it would be possible to release averaged data. Thus questions of timing and identification are important. Release is also often possible if steps are taken to protect parties that would be harmed by release. For example, the information can be released subject to protective orders preventing the user from communicating it to people who might make unfair use of it.

The emphasis of Canadian law and administrative practice is on secrecy. There is no statute giving the citizen a right to information, and many statutes command that information be kept confidential. Agencies may have the discretion to release information in many cases, but natural conservatism, the training and traditions of the public service, and the desire to avoid embarrassment all militate against disclosure. This has a particularly unfortunate consequence for the control of hazardous substances. It keeps the private citizen uninformed concerning the level of contamination in his environment and thereby prevents him from making his wishes known to responsible officials. Those who produce contaminant substances are not disadvantaged by such a lack of information because the information is already within their control. The result is to bias the decision-making system in favour of contaminant production. The experience of regulatory tribunals suggests that the interests in disclosure and confidentiality can be balanced where a legal disclosure requirement exists. Legislation establishing a clear public right to information would therefore be one way of equalizing access to information and reversing the bias of our existing decision-making system.(249)

F. Compliance

1. Prosecution

Reference has been made to problems of proof in contaminant prosecutions. It should be noted that these are by no means insurmountable problems. First, as indicated in Chapter III, informal techniques such as warning letters and "voluntary compliance" have

been used effectively by agencies such as the federal Health Protection Branch.

It is also possible to facilitate prosecutions by statutory amendment. For example, if an offence that requires proof of "harm" or "damage to health" proves unmanageable in relation to particular substances, it is often possible simply to add the substances to statutory schedules of prescribed materials. This technique has been used by the Health Protection Branch under the Food and Drugs Act, and by the Environment Protection Service under the Fisheries Act. Removal of mens rea requirements (proof of intention) from offence provisions will also simplify prosecutions. This has been done successfully in the case of section 33 of the Fisheries Act.(250) Another method of simplifying proof ems in prosecutions is to include provisions making an analyst's certificate proof of the composition of waste discharges or the quality of the receiving environment, without the necessity of calling expert testimony. Both the Food and Drugs Act and the Fisheries Act contain sections of this type.

2. Technology Forcing

Attention should be given to the auto exhaust emission standards that have recently been incorporated in the U.S. Federal Clean Air Act. Standards were not based on best available technology, as most Canadian standards seem to be. Rather, the standards were sufficiently high that, in order to meet them by the specified date, polluters were required not only to install needed abatement equipment but also, if necessary, to invent it. The history of the legislation is outlined in a recent monograph in the Environment Reporter.(251)

CHAPTER V

CONCLUSIONS

Our study of constitutional law convinces us that constitutional limitations should not seriously impair the ability of either of the senior levels of government to deal with environmental contaminants. Parliament and the provinces can co-operate by enacting complementary legislation. Moreover, both levels of government have ample powers to deal effectively with the subject without relying on others for assistance.

Legislation currently in force appears to cover all of the contaminants studied and all the activities that might cause contamination. Under this legislation, governmental agencies are given powers that appear generally adequate. This does not necessarily mean that Canada has dealt adequately with contaminants. Actual performance depends on much more than the adequacy of the legislation and can only be evaluated by studying regulatory behaviour.(252) Moreover, there are structural deficiencies in the legislation that will be discussed below.

Standards have been established for some, but not all of the contaminants studied. These standards may be based on best practicable technology, although often no criteria at all are apparent.(253) They are often established by guidelines that do not have the force of law and are not published. One result is that it is often quite difficult to determine what standards exist respecting a particular contaminant. The unenforceability of the guidelines may also impair regulatory performance, although this would have to be confirmed by empirical studies. The preference for standards based on best practicable technology also seems unwise. Such standards do not put any pressure on industry to develop better methods of control. In a sense, they are premised on the prediction that we can never do any better than we are today. It is a self-fulfilling prophecy.

Finally, the existing legal framework for regulation is seriously biased in favour of contaminant production. Our legal system emphasizes secrecy at the expense of disclosure. The Canadian citizen has no right of access to information in government files. Government agencies withhold studies that indicate the extent of contamination and the harms that result from it. They refuse to release information concerning potential violations of the law

because the information might be libellous(254) or might destroy the working rapport between the inspector and those under his authority.(255) Even regulatory standards are hard for the citizen to find because they are often issued informally, as guidelines. So the citizen can not inform himself adequately to participate in establishing standards or regulations, or to bring pressure to bear on elected representatives when the law is not being enforced properly.

Even if he could inform himself, the private citizen would find that he is not even entitled to participate in many important aspects of the regulatory process. For example, very few statutes require any form of public participation in the formulation of standards or regulations. And public interest groups are rarely consulted in practice, although industry usually is.

Producers of contaminant substances are not disadvantaged in these ways. They either possess all the information they need about the substances they produce and about governmental attitudes, or they have easy access to it. They are given access to the responsible governmental authorities on a regular basis, either directly by statute or as a matter of administrative practice.

The situation is exacerbated by burden of proof rules and by the nature of the risks that must be evaluated when one is dealing with contaminants. In our legal system, the burden is usually placed on the person who wishes to halt otherwise normal activities to prove they are harmful. Even government agencies usually face this burden. Unfortunately, the risks associated with the introduction of a new contaminant are rarely clear, and it is very difficult to prove that harm will result. Even new legislation like the Environmental Contaminants Act contains this bias. Under that Act danger to human health or the environment must be suspected by the authorities before they can begin to investigate and collect data on a substance, and they must "have reason to believe" that a substance will constitute a significant danger to human health or the environment before the manufacturer can be compelled to disclose information on the substance.

This lack of balance is clear, and it cannot fail to bias our system in favour of the introduction of inadequately tested contaminants into our environment. If we are serious in our desire to control hazardous substances we should enact legislation that will correct this imbalance by making the regulatory process more open and more accessible to the private citizen.

APPENDIX

BRITISH NORTH AMERICA ACT, 1867 (Selected Provisions)

VI. Distribution of Legislative Powers

Powers of the Parliament

91. It shall be lawful for the queen, by and with the Advice and Consent of the Senate and House of Commons, to make Laws for the Peace, Order, and good Government of Canada, in relation to all Matters not coming within the Classes of Subjects this Act assigned exclusively to the Legislatures of the Provinces; and for greater Certainty, but not so as to restrict the Generality of the foregoing Terms of this Section, it is hereby declared that (notwithstanding anything in this Act) the exclusive Legislative Authority of the Parliament of Canada extends to all Matters coming within the Classes of Subjects next herein-after enumerated; that is to say,-

1. The amendment from time to time of the Constitution of Canada, except as regards matters coming within the classes of subjects by this Act assigned exclusively to the Legislatures of the provinces, or as regards rights or privileges by this or any other Constitutional Act granted or secured to the Legislature of the Government of a province, or to any class of persons with respect to schools or as regards the use of the English or the French language or as regards the requirements that there shall be a session of the Parliament of Canada at least once each year, and that no House of Commons shall continue for more than five years from the day of the return of the Writs for choosing the House: provided, however, that a House of Commons may in time of real or apprehended war, invasion or insurrection be continued by the Parliament of Canada if such continuation is not opposed by the votes of more than one-third of the members of such House.

- 1A. The Public Debt and Property.
2. The Regulation of Trade and Commerce.
- 2A. Unemployment insurance.
3. The raising of Money by any Mode or System of Taxation.
4. The borrowing of Money on the Public Credit.
5. Postal Service.
6. The Census and Statistics
7. Militia, Military and Naval Service, and Defence.
8. The fixing of and providing for the Salaries and Allowances of Civil and other Officers of the Government of Canada.

9. Beacons, Buoys, Lighthouses, and Sable Island.
10. Navigation and Shipping.
11. Quarantine and the Establishment and Maintenance of Marine Hospitals.
12. Sea Coast and Inland Fisheries.
13. Ferries between a Province and any British or Foreign Country or between Two Provinces.
14. Currency and Coinage.
15. Banking, Incorporation of Banks, and the Issue of Paper Money.
16. Savings Banks.
17. Weights and Measures.
18. Bills of Exchange and Promissory Notes.
19. Interest.
20. Legal Tender.
21. Bankruptcy and Insolvency.
22. Patents of Invention and Discovery.
23. Copyrights.
24. Indians, and Lands reserved for the Indians.
25. Naturalization and Aliens.
26. Marriage and Divorce.
27. The Criminal Law, except the Constitution of Courts of Criminal Jurisdiction, but including the Procedure in Criminal Matters.
28. The Establishment, Maintenance, and Management of Penitentiaries.
29. Such Classes of Subjects as are expressly excepted in the Enumeration of the Classes of Subjects by this Act assigned exclusively to the Legislatures of the Provinces.

And any Matter coming within any of the Classes of Subjects enumerated in this Section shall not be deemed to come within the Class of Matters of a local or private Nature comprised in the Enumeration of the Classes of Subjects by this Act assigned exclusively to the Legislatures of the Provinces.

92. In each Province the Legislature may exclusively make Laws in relation to matters coming within the Classes of Subject next herein-after enumerated: that is to say,-

1. The Amendment from Time to Time, notwithstanding anything in this Act, of the Constitution of the Province, except as regards the Office of Lieutenant Governor.
2. Direct Taxation within the Provinces in order to the raising of a Revenue for Provincial Purposes.
3. The borrowing of Money on the sole Credit of the Province.
4. The Establishment and Tenure of Provincial Offices and the

- Appointment and Payment of Provincial Officers.
5. The Management and Sale of the Public Lands belonging to the Province and of the Timber and Wood thereon.
 6. The Establishment, Maintenance, and Management of Public and Reformatory Prisons in and for the Province.
 7. The Establishment, Maintenance, and Management of Hospitals, Asylums, Charities, and Eleemosynary Institutions in and for the Province, other than Marine Hospitals.
 8. Municipal Institutions in the Province.
 9. Shop, Saloon, Tavern, Auctioneer, and other Licences in order to the raising of a Revenue for Provincial, Local, or Municipal Purposes.
 10. Local Works and Undertakings other than such as are of the following Classes:-
 - (a) Lines of Steam or other Ships, Railways, Canals, Telegraphs, and other Works and Undertakings connecting the Province with any other or others of the Provinces, or extending beyond the Limits of the Province;
 - (b) Lines of Steam Ships between the Province and any British or Foreign Country;
 - (c) Such Works as, although wholly situate within the Province, are before or after their Execution declared by the Parliament of Canada to be for the general Advantage of Canada or for the Advantage of Two or More of the Provinces.
 11. The Incorporation of Companies with Provincial Objects.
 12. The Solemnization of Marriage in the Province.
 13. Property and Civil Rights in the Province.
 14. The Administration of Justice in the Province, including the Constitution, Maintenance, and Organization of Provincial Courts, both of Civil and of Criminal Jurisdiction, and including Procedure in Civil Matters in those Courts.
 15. The Imposition of Punishment by Fine, Penalty, or Imprisonment for enforcing any Law of the Province made in relation to any Matter coming within any of the Classes of Subjects enumerated in this Section.
 16. Generally all Matters of a merely local or private Nature in the Province.

95. In each Province the Legislature may make Laws in relation to Agriculture in the Province, and to Immigration into the Province; and it is hereby declared that the Parliament of Canada may from Time to Time make Laws in relation to Agriculture in all or any of the Provinces, and to Immigration into all or any of the

Provinces: and any Law of the Legislature of a Province relative to Agriculture or to Immigration shall have effect in and for the Province as long and as far only as it is not repugnant to any Act of the Parliament of Canada.

96. The Governor General shall appoint the Judges of the Superior, District, and County Courts in each Province, except those of the Courts of Probate in Nova Scotia and New Brunswick.

97. Until the laws relative to Property and Civil Rights in Ontario, Nova Scotia, and New Brunswick, and the Procedure of the Courts in those Provinces, are made uniform, the Judges of the Courts of those Provinces appointed by the Governor General shall be selected from the respective Bars of those Provinces.

98. The Judges of the Courts of Quebec shall be selected from the Bar of that Province.

99. (1) Subject to subsection two of this section, the Judges of the Superior Courts shall hold office during good behaviour, but shall be removable by the Governor General on Address of the Senate and House of Commons.

(2) A Judge of a Superior Court, whether appointed before or after the coming into force of this section, shall cease to hold office upon attaining the age of seventy-five years, or upon the coming into force of this section if at that time he has already attained that age.

100. The Salaries, Allowances, and Pensions of the Judges of the Superior, District, and County Courts (except the Courts of Probate in Nova Scotia and New Brunswick), and of the Admiralty Courts in Cases where the Judges thereof are for the Time being paid by Salary, shall be fixed and provided by the Parliament of Canada.

101. The Parliament of Canada may, notwithstanding anything in this Act, from Time to Time provide for the Constitution, Maintenance, and Organization of a General Court of Appeal for Canada, and for the Establishment of any additional Courts for the better Administration of the Laws of Canada.

109. All Lands, Mines, Minerals, and Royalties belonging to the several Provinces of Canada, Nova Scotia, and New Brunswick at the Union, and all Sums then due or payable for such Lands, Mines, Minerals, or Royalties, shall belong to the several Provinces of

Ontario, Quebec, Nova Scotia, and New Brunswick in which the same are situate or arise, subject to any Trusts existing in respect thereof, and to any Interest other than that of the Province in the same.*

117. The several Provinces shall retain all their respective Public Property not otherwise disposed of in this Act, subject to the Right of Canada to assume any Lands or Public Property required for Fortifications or for the Defence of the Country.

121. All Articles of the Growth, Produce, or Manufacture of any one of the Provinces shall, from and after the Union, be admitted free into each of the other Provinces.

132. The Parliament and Government of Canada shall have all Powers necessary or proper for performing the Obligations of Canada or of any Province thereof, as Part of the British Empire, towards Foreign Countries, arising under Treaties between the Empire and such Foreign Countries.

*The four western provinces were placed in the same position as the original provinces by the British North America Act, 1930, 21 Geo. V, c. 26 (U.K.).

NOTES

1. R.S.C. 1970, c. S-9, ss. 727-61, added by c. 27 (2d Supp), s. 3.
2. P.A.T.A. v. A.-G. Can., (1931) A.C. 310
3. Goodyear Tire and Rubber Co. of Canada v. The Queen, (1956) S.C.R. 303, 2 D.L.R. (2d) 11.
4. A.-G. B.C. v. A.-G. Can. (1937) A.C. 368, (1937) 1 D.L.R. 688.
5. A.-G. Ont. v. Reciprocal Insurers, (1924) A.C. 328, (1924) 1 D.L.R. 789.
6. In Re The Board of Commerce Act, (1922) 1 A.C. 191.
7. Ref. Re. The Validity of s. 5 (a) of the Dairy Industry Act (Margarine Case), (1951) A.C. 179, (1950) 4 D.L.R. 689.
8. (1933) 4 D.L.R. 501, (1934) 1 D.L.R. 706 (addendum). (B.C.C.A.).
9. Berryland Canning Co. v. The Queen, (1974) 44 D.L.R. (3d) 568 (F.C.T.D.).
10. D. Gibson, "Constitutional Jurisdiction over Environmental Management in Canada" (1973), 23 U. Tor. L.J. 54, 83; B. McDonald, "Constitutional Aspects of Canadian Anti-Combines Law Enforcement" (1969), 47 Can. Bar. Rev. 161.
11. Goodyear Tire & Rubber Co. of Canada v. The Queen, supra, note 3.
12. Ibid.
13. MacDonald, Railquip Enterprises v. Vapor Canada, (1976), 7 N.R.477; 66 D.L.R. (3d) 1.
14. Berryland Canning Co. v. The Queen, supra, note 9, at 575.
15. See The King v. Eastern Terminal Elevator Co., (1925) S.C.R. 434.
16. H. Marx, "The Energy Crisis and the Emergency Power in Canada" (1975), 2 Dalhousie L.J. 446.

17. Munroe v. Nat. Capital Comm'n, 1966 S.C.R. 663.
18. Johanneson v. West St. Paul, 1952 1 S.C.R. 292.
19. In Re Regulation and Control of Radio Communication, (1932) A.C. 304.
20. Pronto Uranium Mines Ltd. v. Ont. Labour Relations Bd., (1956) O.R. 862, 5 D.L.R. (2d) 342 (Ont. H. Ct.).
21. (1975) 5534 D.L.R. (3d) 321.
22. Ibid., at 357.
23. Supra, note 21.
24. Calgary and Edmonton Land Co. v. A.-G Alta., (1911) 45 S.C.R. 170; R. v. Karchaba, (1966) 52 D.L.R. (2d) 438 (B.C.C.A.).
25. C.P.R. v. Notre Dame de Bon Secours, (1899) A.C. 367; C.P.R. v. A.-G. B.C., (1950) A.C. 122.
26. Commission Du Salaire Minimum v. The Bell Telephone Co., (1966) S.C.R. 767.
27. Workmen's Compensation Bd. v. C.P.R., 1920 A.C. 184, 48 D.L.R. 218; Sincennes McNaughton Lines Ltd. v. Bruneau, (1924) S.C.R. 168, 1924 2 D.L.R. 7.
28. A.-G. Man. v. Man. Egg & Poultry Assoc., (1971) S.C.R. 689, 19 D.L.R. (3d) 169.
29. Burns Food Ltd. v. A.-G Man., (1974) 40 D.L.R. (3d) 731 (S.C.C.).
30. The provinces and the federal Parliament have concurrent jurisdiction over health: Parliament, by virtue of the criminal law power and the general power; and the provinces by virtue of their powers over local matters, property and civil rights. A helpful discussion is contained in McKall, "Constitutional Jurisdiction Over Public Health" (1975), 6 Man. L.J. 317.
31. Supra, note 28, at 717.

32. Compare R. v. Ferriers, (1910) 15 W.L.R. 331 (Sask. Dist. Ct.) with In Re Shelly, (1913) 4 W.W.R. 741 (Alta. S.C.). A useful discussion is contained in McKall, "Constitutional Jurisdiction over Public Health" (1975), 6 Man. L.J. 317.
33. See W.R. Lederman, "The Concurrent Operation of Federal and Provincial Laws in Canada" (1962-63), 9 McGill L.J. 185; B. Laskin, "Occupying the Field: Paramountcy in Penal Legislation" (1963), 41 Can. Bar. Rev. 234.
34. See, e.g., Ross v. Registrar of Motor Vehicles (1974), 42 D.L.R. (3d) 68 (S.C.C.).
35. Supra note 21, at 359 (per Pigeon, J), 335-36 (per Laskin, J).
36. B.N.A. Act, s. 91 (6).
37. Sincennes McNaughton Lines v. Bruneau, (1924) S.C.R. 168.
38. See Ref. re. Employment and Social Insurance Act, (1936) S.C.R. 427
39. Transport Oil Ltd. v. Imperial Oil Ltd., (1935) 2 D.L.R. 500 (Ont. C.A.).
40. Direct Lumber Co. v. Western Plywood Co., (1962) S.C.R. 646, 650.
41. Bennesiewicz v. Dionne, (1946) 1 D.L.R. 426 (Alta. Dist. Ct.). But see R. v. Zelensky, (1977) 1 W.W.R. 155.
42. Doyle v. Bell, (1884-85) 11 O.A.R. 326.
43. Supra, note 13.
44. Ibid.
45. See Northern Helicopters Ltd. v. Vancouver Soaring Ass'n., (1973), 31 D.L.R. (3d) 321 328 (B.C.S.C., Berger, J.)
46. P.E.I. Potato Marketing Bd. v. Willis, (1952) 2 S.C.R. 392.
47. S.O. 1971, c. 86; as amended 1972, c. 106, ss. 1,3.
48. R.S.O. 1970, c. 332 as amended S.O. 1972, c. 1, s. 70.

50. S.C. 1970-72, c. 47.
51. R.S.C. 1970, c. F-14 as amended and regulations made thereunder.
52. See Section II, supra.
53. The Workers' Compensation Act, S.B.C. 1968, c. 59, as amended; Asbestosis Regulation, B.C. Reg. 409/59; Accident Prevention Regulations, B.C. Reg. 409/59 as amended. (Hearings were held in May, 1976 on proposed amendments to the Regulations).
54. The Occupational Health Act, S.S. 1972, c. 86 as amended.
55. The Department of Health Act, R.S.N. 1970, c. 83 as amended s. 23 (oo) (pp) (enabling).
56. The Public Health Act, R.S.M. 1970, c. P210, s. 34 and Industrial Establishments Regulations, M.R.R. P210-R5.
57. M.R.R. P210-R8.
58. Canada Labour Code, R.S.C. 1970, c. L-1 (Part IV); Canada Dangerous Substances Regulations, S.O.R./72-66.
59. Atomic Energy Control Regulations. P.C. 1974-1195 (May 30, 1974).
60. The Radiation Protection Act, R.S.A. 1970, c. 309.
61. E.g. The Public Health Act, R.S.N.S. 1967, c. 247, as amended, ss. 123 (1) a, 124; The Public Health Act, R.S.O. 1970, c. 377 as amended, s. 6-42 and X-Ray Safety Regulation, R.R.O. 1970, Reg. 721.
62. Leaded Gasoline Regulations, S.O.R./74-459; Lead-Free Gasoline Regulations, S.O.R./73-663.
63. Chlor-Alkali Mercury Regulations, S.O.R./72-92.
64. The Motor Vehicle Safety Act, R.S.C. 1970 (1st Supp.) c.26 and Regulations.
65. E.g. Ontario Public Health Act, Food Premises Regulations, R.R.O. 1970, Reg. 706.

66. R.S.C. 1970, c. F-27 and Regulations as amended.
67. S.C. 1974-75, c. 72.
68. Ibid., s. 4 (c).
69. Pollution Prevention Regulations for the Mineral Industry, Sask. Reg. 317/69.
70. E.g., The B.C. Mines Regulation Act, S.B.C. 1967, c. 25 as amended; The Coal Mines Regulation Act, S.B.C. 1969, c. 3 as amended.
71. E.g. The Pesticides Control Act, R.S.N.B. 1973, c. P-8; The Pest Control Products Act, S.N.S. 1970, c. 12.
72. Asphalt Paving Plant Regulations, Ont. Reg. 183/72, pursuant to the Environmental Protection Act.
73. The Canada Shipping Act, R.S.C. 1970, c. S-9, 1970 (2nd Supp.) c. 27; Pollutant Substances Regulations, S.O.R. 73-113; Oil Pollution Prevention Regulations, S.O.R./71-495, 73-500; Air Pollution Regulations S.O.R./64-97 as amended.
74. Pulp and Paper Effluent Regulations, S.O.R./71-578.
75. Petroleum Refinery Liquid Effluent Regulations, S.O.R/73-670.
76. R.S.C. 1970, c. H-3.
77. S.I./72-46.
78. S.O.R./74-355.
79. S.O.R./73-477
80. S.O.R./70-482.
81. S.O.R./70-482.
82. S.O.R./73-402.
83. See Black's Law Dictionary (Rev. 4th Ed.), p. 1451.
84. Schreiber et al, Report of the Asbestosis Working Group, Sub-committee on Environmental Health, Environmental Health Directorate, Department of National Health and Welfare, Ottawa, February 15, 1976.

85. Canada Dangerous Substances Regulations, SOR/72-66, made under the Canada Labour Code, R.S.C. 1970 c. L-1, s. 84 (1)(f).
86. Hazardous Products Act, R.S.C. 1970, c. H-3, Schedule, Part I, No. 9, added by SOR/70-482 (Toys) and No. 15, added by SOR/73-402 (Clothing).
87. Ibid., No. 26 added by SOR/76-342.
88. Public Health Regulations Division 20, Alta. Reg. 298/72, amended by 3/73.
89. Occupational Health and Safety Act, S.A. 1976, c. 40.
90. B.C. Reg. 64/72.
91. B.C. Reg. 409/59.
92. B.C. Workers Compensation Board, Second draft amendments, February, 1976.
93. Source: Dr. D.K. Verma, Alberta, Occupational Health and Safety Division, quoted in Assad and Rajhans, "The Technical Aspects of Asbestos" (paper prepared for Science Council of Canada), at p. 53.
94. Ontario, Ministry of Health, Occupational Health Protection Branch, August, 1976.
95. Industrial Safety Regulations, Ont. Reg. 259/72.
96. Ibid., s. 26.
97. Ontario, Ministry of the Environment, Tentative Guidelines for Asbestos Emissions, ECOLOG, Ontario Sect., p. 219, August, 1975.
98. Asbestos Regulations, Sask. Reg. 58/75.
99. Can. Env. Law, Stats. Fed. 2C, 2D.
100. SOR/76-464.
101. Canadian Drinking Water Standards and Objectives (1968), ECO/LOG, Federal Section p. 84-91.

102. Sec. B. 15.001 and Table 1.
103. SOR/74-356; 71-200; 70-483.
104. Man. Rev. Reg. p. 210-R8.
105. B.C. Reg. 64/72.
106. Franson & Lucas, Canadian Environmental Law (1976) Stats. B.C. 12.1.4 (hereinafter cited Can. Env. Law).
107. Can. Env. Law, Stats. B.C. 12.5.
108. Can. Env. Law, Stats. B.C. 12.6.
109. Can. Env. Law, Stats. B.C. 12.7.
110. Can. Env. Law, Stats. B.C. 12.8.
111. British Columbia Pollution Control Branch, Pollution Control Objectives for the Food, Agriculture and Miscellaneous Industries as reproduced in ECO/LOG B.C. p. 122.
112. Nfld. Reg. 32/74.
113. Letter from N. Holloway, dated August 8, 1975.
114. Can. Env. Law, Stats. Ont. 4F.2.
115. Can. Env. Law, Stats. Ont. 4E.18.
116. Can. Env. Law, Stats. Ont. 4T.
117. Ibid., 4T.4.3.
118. Ibid., 4T.4.5.
119. Ibid., 4T.7.1.
120. Effluent guidelines and Receiving Water Quality Objectives for the Mining Industry in Ontario (1973).
121. Directive of the Quebec Water Board (June, 1969).
122. Water Quality Criteria (June, 1970).
123. Can. Env. Law, Stats. Fed. 7C.

124. Charlebois, "Three Perspectives on Mercury in Canada: Medical, Technical and Economic" (Paper prepared for Science Council of Canada, 1976), at p. 79.
125. Interviews with L. Buffa and C. Alexander.
126. Interprovincial Cooperatives, Ltd. v the Queen, (1975) 53 D.L.R. (3d) 321 (S.C.C.) The Fisheries were closed under the Manitoba Fisheries Regulations, SOR/71-264.
127. Ocean Dumping Control Regulations, SOR/75-595, Sec. 5(b).
128. Can. Env. Law, Stats. Fed. 11F.
129. Can. Env. Law, Stats. B.C. 12.6.
130. Ibid., 12.8.
131. Ibid., 11.9.
132. Ibid., 11.13.
133. Ibid., 12.5.
134. Nfld. Reg. 32/74.
135. Can. Env. Law, Stats. Ont. 4E.18.
136. Ibid, 4F.2.
137. Effluent Guidelines and Receiving Water Quality Objectives for the Mining Industry in Ontario (1973).
138. Water Pollution Control Branch, Water Quality Criteria (1970), ECO/LOG, Sask. 11.405-11.415.
139. Ambient Air Quality Objectives, SOR/74-325, 75-32.
140. Ibid.
141. Canada Gazette Pt. I, August 7, 1976 p. 3897; (1976) 5 C.E.L.N. 43.
142. Alta. Reg. 218/75.
143. B.C. Reg. 64/72.

144. B.C. Pollution Control Board, Pollution Control Objectives for the Mining, Mine-Milling and Smelting Industries, December 1973, Appendix I, Table III, Nitric Acid Plants.
145. Pollution Control Objectives for Food-Processing and Other Miscellaneous Industries, 1975, Appendix Table I.
146. Pollution Control Objectives for the Chemical and Petroleum Industries, March, 1974, Appendix I, Table VI.
147. Supra note 145, Appendix I, Table 2. Objectives for Gaseous and Particulate Emissions from Stationary Industrial Combustion Sources.
148. Mines and Quarries Regulations, N.B. Reg./74-2, Schedule A, par. 4.1.
149. Letter from N. Holloway, dated August 8, 1975.
150. Ambient Air Quality Criteria, Ont. Reg. 872/74, amended by 158/75.
151. Industrial Safety Regulations, Ont. Reg. 259/72.
152. R.R.O. Reg. 15, Schedule No. 62, am. by Ont. Reg. 873/74.
153. Air Pollution Control Act, Air Pollution Control Regulations, Sask. Reg. 211/75, Schedule I.
154. Sask. Reg. 87/71.
155. R.S.C. 1970, c. A-19.
156. Atomic Energy Control Regulations, SOR/74-334.
157. Ibid., ss. 5, 8.
158. Ibid., s. 11.
159. Ibid., s. 19.
160. Radiation Emitting Devices Act, R.S.C. 1970, c. 34 (1st Supp.).
161. SOR/72-43; 72-222; 74-601; 75-638; 76-104; 76-106.
162. SOR/75-638.
163. R.S.A. 1970, c.309.

164. R.S.A. 1970, c. 310.
165. See Public Health Act, R.S.N.S. 1967, c. 247, ss. 123(1)a, 124.
166. B. 23.007 added by P.C. 1976-265, February 10, 1976.
167. SOR/74-367.
168. These exposure limits are set out in E.J. Arnold, "Technical Aspects of Vinyl Chloride in the Environment" (paper prepared for Science Council of Canada), at p. 14.
169. See note 171 infra.
170. B.C. Workers Compensation Board, Second draft amendment, Industrial Health and Safety Regulations, February, 1976.
171. Environment Quality Act, draft regulations, Quebec Official Gazette, February 12, 1975. The existing legal standard is the 500 ppm set out in the Industrial Establishment Regulations, Quebec Official Gazette, Vol. 104, No. 52 B, p. 11933, s. 25. See Part II, Giroux and Kenniff, "Legal Aspects of Vinyl Chloride".
172. Occupational Health Protection Branch Data Sheet, No. 21, Vinyl Chloride Monomer.
173. Public Health Regulations, Divis. 20, Alta. Reg. 298/72, am. by 3/73. This authority has recently been subsumed by the Occupational Health and Safety Act, S.A. 1976, c. 40, proclaimed in force Dec. 1, 1976.
174. In Quebec, the Environment Quality Act contains many of the same powers as the public health acts of other provinces.
175. See Morrison, "The Canadian Approach to Food and Drug Regulations", (1975) 30 Food Drug, Cosmetic Law Journal 632, 637, 639-40.
176. For a good discussion of problems involved in promulgation of contaminant standards see Report of Working Group B in Morley(ed.) Ask The People, Appendix B (1973).

177. See Thompson, "A Proposal for an Anticipatory Preventive System," Morley (ed.), Ask The People 107 (1973); Dales, Pollution, Property and Prices (1968); Hardin, "Exploring New Ethics for Survival: The Voyage of The Spaceship, "Beagle" 57-65 (1972).
178. Krier, "Environmental Litigation and The Burden of Proof", in Baldwin and Page (eds.) Law and the Environment 105, (1970). See also Hanks and Hanks, "An Environmental Bill of Rights: The Citizen Suit and the National Environmental Policy Act of 1969", (1970) 24 Rutgers L. Rev. 230, 265-68; Sax, Defending The Environment: A Strategy for Citizen Action 136-57 (1971).
179. Ibid., at 107.
180. See generally Cross and Wilkins, An Outline of the Law of Evidence ch. 2 (4th ed., 1975).
181. See e.g. Dales, supra, note 177, Lucas, "Legal Techniques for Pollution Control: The Role of the Public" (1971) 6 U.B.C. L. Rev 167, 183-85.
182. See Lucas and Moore, "The Utah Controversy: A Case Study of Public Participation in Pollution Control" (1973), 13 Natural Res. J. 36, 57.
183. Ibid; Estrin, "The Legal and Administrative Management of Ontario's Air Resources 1967-74" in Elder (Ed.) Environmental Management and Public Participation 182, 193 (1975).
184. Ibid.
185. The substantial problems of proof involved in this type of proceeding are discussed infra.
186. Interview with Dr. D.G. Chapman, Advisor Legislative Policy, Foods Directorate, Health Protection Branch, Department of National Health and Welfare.
187. See Franson, Blair and Bozzer, "The Legal Framework for Water-Quality Management in the Lower Fraser River of British Columbia," Westwater Research Centre, 1974; Estrin. supra note 183, at 177-79.
188. E.g. The Workers' Compensation Act, R.S.B.C. 1960, c. 413, s. 61, as amended.

189. E.g. B.C. W.C.B. orders against Cominco Ltd. See Workers' Compensation Reporter, Decisions No. 15, 36, 167.
190. Food and Drugs Act, R.S.C. 1970, c. F-27 as amended s. 4(a).
191. Interview with Dr. D.G. Chapman, supra note 186; Morrison, "The Canadian Approach to Food and Drug Regulations, (1975) 30 Food Drug Cosmetic L.J. 632; Curren, "Canadian Regulation of Food, Drugs, Cosmetics and Devices - An Overview", (1975) 30 Food, Drug, Cosmetic L.J. 644,646, 650.
192. SOR/70-487, am. 74-407, and Motor Vehicle Emission Testing Guidelines.
193. Motor Vehicle Act, Air Pollution Control Regulations, B.C. Reg. 229/70.
194. Air Contaminants from Motor Vehicles, R.R.O. 1970, Reg. 12.
195. S.C. 1974-75-76, c. 72.
195. S.C., 1974-75-76, C. 72.
196. Ibid., s. 4 (1).
197. Ibid., s. 4 (6).
198. Ibid., s. 3.
199. E.g. The Port Hope radiation contamination controversy: The Toronto lead contamination controversy (sec. Re Canada Metal and MacFarlane, discussed infra); The Duluth Minn. asbestos fibre controversy (see Reserve Mining Co v. U.S., (1974) 498 F. (2d) 1073, 1085 (8th Cir.) and comment, (1975) 59 Minn. L. Rev. 892); The leaded gasoline controversy (see Ethyl Corporation v. Environmental Protection Agency (1975) 7 E.R.C. 1353 (D.C. Cir.))
200. See e.g. Stein v. City of Winnipeg discussed infra.
201. Gelpe and Tarlock, "The Uses of Scientific Information in Environmental Decision-making" (1974) 48 U.S.C. L. Rev. 371
202. Ibid., at 416.
203. E.g. Reserve Mining Co. v. U.S., supra note 199 (asbestos fibres discharged into Lake Superior by Taconite mine).
204. (1974) 1 O.R. 577 (Ont. H.C.).
205. Ibid. at 589.

206. Ibid. at 590.
207. Ibid. at 591.
208. Interview with D.G. Chapman, supra, note 186.
209. See Gelpe and Tarlock, supra note 201, at 416.
210. For more detailed discussion of private law actions as environment protection techniques see: McLaren, "The Common Law Nuisance Action and the Environmental Battle - Well-Tempered Swords or Broken Reeds, (1972) 10 Osgoode Hall L.J. 505; Elder, "Environmental Protection through the common law," (1973) 12 Western Ontario L. Rev. 107; Lucas, "Legal Techniques for Pollution Control: The Role of the Public", (1971) 6 U.B.C. L. Rev. 167, 168; Anisman, "Water Pollution Control in Ontario", (1972) 5 Ottawa L. Rev. 342; Jurgensmeyer, "Common Law remedies and The Protection of the Environment" (1971) 6 U.B.C. L. Rev. 216; Katz, "The Function of Tort Liability in Technology Assessment"; (1969) 38 Cincinnati L. Rev. 587.
211. See Roberts and Sullivan, "The Role of the Technological Expert in Complex Environmental Litigation" (1976), 54 Can. Bar Rev. 65.
212. See generally, Williams, Limitation of Actions in Canada, esp. Ch. 6 & 12 (1972 & Supplements).
213. (1975) 48 D.L.R. (3d) 223 (Man. C.A.)
214. Ibid., at 237-38
215. For a more detailed discussion see paper prepared for B.C. Institute for Economic Policy Analysis Workshop, "Environment Protection Through Class Actions, May, 1974.
216. See Decision-Making for Regulating Chemicals in the Environment 21 (Nat. Academy of Sciences, Wash. D.C. 1975).
217. See Anderson, N.E.P.A. In the Courts (1973); Macdonald and Conway, Environmental Litigation 160-74 (1972).
218. Bolbach, "The Courts and the Clean Air Act", Environment Reporter, Monograph No. 19 (July, 1975).

219. See Lucas, "Legal Foundations For Public Participation in Environmental Participation in Environmental Decision-making", (1976) 16 Natural Res. J. 73, 94-102.
220. Ibid., pp. 89-96.
221. As in Re Canada Metal and MacFarlane, supra, note 204.
222. See B.C. Law Reform Commission, Report on Civil Rights, Part 3, Procedure before statutory Agencies 12-17 (1974).
223. See Western Mines Ltd v. Greater Campbell River Water District, (1967) 58 W.W.R. 705 (B.C.C.A.); Re Application of Hooker Chemicals (Nanaimo) Ltd. (1970) 75 W.W.R. 354 (B.C.S.C.)
224. Supra, part IV. B.1
225. (1976), 69 D.L.R. (3d) 384, 5 C.E.L.N. 39 (Ont. C.A.); affirming (1975), 9 O.R. (2d) 771 (Ont. H.C.)
226. See Decision-making for Regulating Chemicals in the Environment, supra, note 218 at 21.
227. Lucas, "Legal Foundations for Public Participation in Environmental Decision-making" supra note 219 at 102.
228. U.S. Administrative procedure legislation does require prepublication of rules for public and industry comment. This is sometimes done in Canada but generally there are no requirements, see Morrison, "Canadian Approach to Food and Drug Regulations", supra note 191 at 640.
229. Such a ruling was made by the National Energy Board in 1976 in the Mackenzie Valley Pipeline Hearing. See also Canadian Transport Commission, report of Commissioner John T. Gray, adopted by the C.T.C., March 15, 1976.
230. See Alberta Public Utilities Board, Position Paper on Interventions and Costs, February 24, 1977.
231. See Berner, Private Prosecutions and Environmental Control Legislation: A Study: (Environment Canada, 1972)' Burns; "Private Prosecutions in Canada: The Law and a Proposal for Change" (1975) 21 McGill L.J. 269. Some statutes, such as the Newfoundland Department of Provincial Affairs and Environment Act, the Quebec Environment Quality Act, require that the Provincial Attorney-General consent to prosecutions.

232. Berner, supra note 231.
233. See Franson, "Government Secrecy in Canada", (1973) 2 Nature Canada (No. 2) 31; Mitchell, "Access to Information", Report prepared for the Consumer Research Council, 1975.
234. Water Resources Management Act, 1972, S.S. 1972, c. 146, s. 8.
235. 5 U.S.C. Para. 552 (1970).
236. Guidelines on the Production of Papers, Cabinet Directive No. 45 (1973).
237. See Linslead, "The Law of Crown Privilege in Canada and Elsewhere" (1968-69), 3 Ottawa L. Rev. 79, 449.
238. The Canadian position is not completely clear. However, section 41 (2) of the Federal Court Act is more restrictive in that it makes a Ministerial certificate final in certain cases such as inter-governmental relations and National defence. See Landerville v. The Queen, (1976) 70 D.L.R. (3d) 122 (F.C.T.D.)
239. Proceedings of the Statutory Instruments Committee, Supra note 242, Issue, No. 64, pp. 21-22.
240. See Canada Metal Co. Ltd. v. C.B.C., (1974) 44 D.L.R. (3d) 481 (Ont. H.C.), and (1975) 7 O.R. (2d) 261 (Ont. D.C.), affirming 44 D.L.R. (3d) 329.
241. See Canada Metal Co. Ltd. v. C.B.C. (No. 2), (1974) 48 D.L.R. (3d) 641 (Ont. H.C.), aff'd. (1976) 11 O.R. (2d) 167 (C.A.); and Canada Metal Co. Ltd. v. C.B.C., Supra, Note 240.
242. See Proceeding of the Joint Standing Committee on Regulations and other Statutory Instruments (30th Parl., 1st Sess.) Issue Nos. 10, 17, 19, 22, 32, 47, 48, 50, 52, 53, 61, 62, 64, 66, 69, 70, 71, 73, 76, 79, 80, 81. A summary and bibliography is provided in a report prepared by Committee Counsel, reproduced as Appx. RS1-39, Ibid., Issue No. 81.
243. Ibid., Appx. RS1-11, Issue No. 19, pp. 41-51.
244. See Green Paper on access to information, Legislation on Public Access to Government Documents (Dept. of Secretary of State, 1977).

245. Interview with L. Buffa and C. Alexander. Other examples may be found in the Proceedings of the Statutory Instruments Committee, supra note 242, Issue No. 64, pp. 13, 14; Ibid., pp. 21, 22; Ibid., Issue No. 66, pp. 15, 16. See also Ibid., Issue No. 66, pp. 25, 26.
246. Ibid., Issue No. 64, pp. 13-14.
247. See Re Hogan and Director of Pollution Control (1972), 24 D.L.R. (3d) 363 (B.C.S.C.).
248. Some of the cases are reviewed in H. Janish, "Fairness: Confidentiality and Staff Studies" (1975), in Current Issues in Administrative Law, Dalhousie Continuing Legal Education Series, No. 7, pp. 14-29.
249. See Franson & Burns, "Environmental Rights for the Canadian Citizen: A Prescription for Reform" (1974), 12 Alberta Law Rev. 153.
250. S.C. 1970 (1st Supp.), c. 17.
251. Bonine, "The Evolution of 'Technology - Forcing' in the Clear Air Act", Environment Reporter, Monograph No. 21, July, 1975.
252. See Doern, "Regulatory Processes and Jurisdictional Issues in the Regulation of Hazardous Products in Canada".
253. Officials of the Department of the Environment and of some provincial departments have advised the authors that they use the best practicable technology criteria in setting standards.
254. Supra, note 239.
255. Ibid., pp. 13, 14.

PART II
LEGAL ASPECTS
IN QUEBEC
by
Lorne Giroux
and
Patrick Kenniff

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Since 1973, Dr. Kenniff has been teaching in the Faculty of Law, University of Laval and is active on several committees. He has published several articles in English and French journals such as Cahiers de droit and Government Regulation and the Law.

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CHAPTER I

INTRODUCTION

The problems under consideration in this study are definitely not new; in Roman times, some of the toxic effects of mercury were already known. However, it was not until after the industrial revolution that the problem became serious enough to justify government intervention. As a result of industrialization, more workers and the public in general were exposed to substances known to be toxic. As technology developed, the number of substances used as part of production processes also increased, and the effects of these substances on health were often unknown. In the United States, it has been estimated that 3,000 new chemical products appear on the market annually. Often it is only after several years of use, when it is too late to correct the harm that may have been done to a given category of workers or segment of the population, that their toxic effects are discovered.

The identification and control of the effects of toxic substances, and the development of appropriate methods of use for such substances, are very difficult for scientists; these difficulties in turn give rise to serious problems for the legislator. Because of the vagueness and uncertainty of scientific data, it is very difficult to formulate and apply standards in keeping with the requirements of clarity and exactness which are basic attributes of the law. How can an exact standard which is not based on definite scientific data be considered valid? Is it possible to determine accurately the critical threshold of exposure to a given quantity of a substance over a set period? Many scientists feel that this critical threshold is unacceptable as a criterion, since the effects of a substance may vary in different individuals.

These scientific considerations aside, the fact remains that people develop diseases - and sometimes die - as a result of exposure to toxic substances. Should marketing of such substances be permitted before there is at least some knowledge of their effects on health? Some would argue that the burden of proving the absence of toxicity should be placed on those industries that use the substances. It is the responsibility of the legal system to find solutions to these problems.

Standard setting is only one of the problems facing the legal system. In a given political context it would be unrealistic to believe that simply setting exact standards will ensure adherence to them. For this reason, lawyers must also consider the various

jurisdictional problems liable to frustrate the application of a theoretically effective standard. Effectiveness, one of the basic objectives of the legal system, is ensured not only by a realistic standard, but also, to a greater extent, by the administrative and legal means set up to guarantee that it will be respected.

Standards are created to ensure that workmen and citizens are protected. Along with this objective goes that of ensuring that those affected or apt to be affected by diseases related to exposure to toxic substances will receive the appropriate care, and where applicable, satisfactory compensation. To this end, the law must, insofar as current medical knowledge allows, provide measures which permit early detection and treatment of disease.

These are the aspects we will be attempting to bring out in this study. To illustrate and elucidate the general problem, the Science Council of Canada decided to have this study examine six toxic agents widely used in Canada. They are vinyl chloride, mercury, asbestos, lead, oxides of nitrogen, and radiation.

This study deals specifically with the legal and administrative system of one Canadian jurisdiction, that of the Province of Quebec. We feel that concentrating on one jurisdiction will enable us to elucidate the problem by providing a clearer picture of a particular case. Moreover, some of these toxic substances are very important in Quebec; for instance, out of the fourteen cases of angiosarcoma that have been diagnosed in Canada among workers in plants where vinyl chloride is used, nine were in Quebec. In a paper recently presented by Dr. Michel Pagé to the ACFAS convention, it was stated that 60% of the workers in the B F Goodrich plant at Shawinigan had abnormal amounts of carcinoembryonic antigen in their blood, an early indication of possible cancer (Le Devoir, 14 May 1976, p. 13). The importance of asbestos and mercury in Quebec is well known - asbestos because of the extent of the mining industry that has grown up around the mineral, and mercury because of the consequences of discharges of large quantities of the element into air and water by companies which use it in their industrial processes. The hazard posed by asbestos to worker health (Commission Beaudry, Rapport préliminaire, April 1976) has been extensively reported in the media, as has the impact of high mercury concentrations in fish on the health of native people in Northwestern Quebec (Comité d'étude et d'intervention sur le mercure au Québec, Etude sur les effets médicaux et toxicologiques du mercure organique dans le Nord-Ouest québécois, July 1976). In this document, we shall try to situate these events in their legal and administrative context.

CHAPTER II

JURISDICTIONAL ASPECTS

To determine what bodies in Quebec are responsible for enforcing those standards that apply to the toxic substances under study, two distinct periods must be considered - the years before 1972 and the years 1972 and after. The legislation of each of these periods creates an overlap in jurisdictions in that it gives several bodies responsibility for enforcing various standards that are far from coherent.

Before 1972, three departments had a voice in the control of the toxic substances - Social Affairs (formerly the Department of Health), Labour, and Natural Resources. Safety on the job was the responsibility of the Department of Labour, while worker health fell under the jurisdiction of the Department of Social Affairs (Industrial and Commercial Establishments Act, RSQ 1964, ch 150, s 21). Job safety was governed mainly by the Regulation concerning industrial and commercial establishments (QSR 1972, Vol 5, p. 5-4505), adopted under the Industrial and Commercial Establishments Act. Worker health was the subject of the Regulation respecting industrial establishments (QSR 1972, Vol 7, p. 7-099) which had been Chapter 11 of the Provincial Hygiene Regulations, adopted in 1944 under the Quebec Public Health Act (RSQ 1964, ch 161). At the same time, the Department of Natural Resources had jurisdiction over everything related to the safety and health of mine workers. Unless otherwise clearly stipulated, mines were exempted from the provision of the Industrial and Commercial Establishments Act (RSQ 1964, ch 150, s 3). Mines are mentioned in this act only in section 25(4) which gives the inspectors of the departments of Labour and Social Affairs jurisdiction concurrent with that of the inspectors of the Department of Natural Resources. The Act contains no provision that would permit regulations adopted under it to be made applicable to mines.

This overlapping of jurisdictions prior to 1972 raises another difficulty, which still exists. The 1944 Regulation respecting industrial establishments was adopted pursuant to the authority conferred on the Lieutenant Governor-in-Council by section 99 of the Quebec Public Health Act. For the definition of industrial establishment, this section refers back to the Industrial and Commercial Establishments Act, which, as we have seen, expressly excludes mines from its scope of application. However, under section 1(c) of the Regulation respecting industrial establishments, mines and quarries both constitute industrial establishments. Does this mean that the regulation was ultra vires, insofar as it attempted to regulate mines and quarries and subject them to the authority of the Department of

Social Affairs (before 1972)? We do not think so, because section 197 of the former Mines Act (RSQ 1964, ch 89, repealed) gave the Lieutenant Governor-in-Council authority to enact regulations relating to the safety and health of mine workers. Even though the 1944 Regulation, which was administered by the Department of Social Affairs, seems to derive its authority from section 99 of the Public Health Act (according to the actual preamble of the original regulation, QOG June 3, 1944, p 1230), the definition of industrial establishments which includes mines and quarries must be considered valid if any provision of another Act authorizes the Lieutenant Governor in Council to enact such a regulation. Section 197 of the former Mines Act does just this. To decide whether or not a regulation is valid, one must inquire, not into the intentions of the body that enacted it, but into the objective authority the body had to enact it.

This conclusion amounts to a recognition that before 1972 the Department of Social Affairs and the Department of Natural Resources had concurrent jurisdiction in the area covered by the Regulation respecting industrial establishments. In practice, however, the Department of Social Affairs never intervened in the mining sector, and thus left mines to the de facto exclusive jurisdiction of the Department of Natural Resources. It must also be concluded that the Department of Natural Resources, having little inclination to enforce a regulation that was the responsibility of another department, made no effort to ensure compliance with the Regulation.

Since 1972 there has been little change in the situation described above, except in one respect which will be discussed below. The 1965 Mines Act also enables the Lieutenant Governor-in-Council to regulate safety and health conditions in mines (SQ 1965, ch 34, s 261, 268(a); the Regulation respecting safety and protection of workmen in mines and quarries (QSR 1972, Vol 3, p 3-055) which, as we shall see, contains few provisions on worker health, was adopted under this same section (261) of the Mines Act. We may further note that section 72 of the Environment Act (SQ 1972, ch 49) refers the reader to the Mines Act for all matters related to the regulation of mining and industry operations.

The change that occurred in 1972 resulted from the passing of the Environment Quality Act and the establishment of the Environment Protection Services. Sections 71 to 89 of the 1972 Act gave the minister responsible for enforcing it direct responsibility for the healthfulness of industrial and commercial establishments (except mines); however, the Act did not abrogate applicable regulations in

force. Moreover, in 1974 a retroactive Act was passed bringing the Regulation respecting industrial establishments under the purview of the Environment Quality Act. Armed with this new jurisdiction, superimposed on those already exercised by the two departments, the minister responsible proposed a draft Regulation respecting the quality of the occupational environment to supersede the 1944 regulation (QOG 1975, Vol 107, No 7, p 895).

That three departments are involved in ensuring the healthfulness of the work environment is itself an anomaly. The situation is made worse by the fact that the regulations (including the draft Regulation of 1975) do not respect the jurisdictional limits set out in the statutes, so that each regulation contains a jumble of measures dealing with the health and safety of employees and the healthfulness of the premises. The difficulty in finding out who is really responsible often serves as an excuse for government inaction. For such incoherence to continue is in our opinion unacceptable.

In the view of the Environment Protection Services, the jurisdictional dividing line should be drawn between matters connected with the quality of the work environment, which would come under the Services, and the medical aspects of detection and care, for which the Social Affairs Department would be responsible. The draft regulation on the quality of the occupational environment, which was to be administered by the Environment Protection Services, was drawn up according to this conception, as we shall see later. The problem with such a division is that the Department of Labour claims to be, and in fact still is, responsible for the safety and healthfulness of the work environment and particularly for inspection of the premises. The Environment Protection Services feels that the Department of Labour should be responsible only for ensuring physical safety, in the strict sense, and preventing accidents on the job. The authors have not obtained the opinion of the Department of Labour on this jurisdictional problem.

In our opinion, it is clear that the Environment Protection Services have an exclusive jurisdiction when a toxic substance is discharged outside the working environment. However, there is an overlapping of standards and jurisdictions when toxic substances are discharged within the physical working environment.

CHAPTER III

MEDICAL EXAMINATION OF WORKERS AND DETECTION OF DISEASE

The substances under consideration (asbestos, oxides of nitrogen, vinyl chloride, lead, radiation, and mercury) are dangerous to human health, but medical science cannot yet tell us exactly to what extent. The danger is often more serious for the worker whose job requires that he regularly come in contact with the toxic substance or handle it, but this is not true in all cases. Mercury, for instance, is considered a hazard not so much in the work environment as when it is released into the external environment by industries which use it. The metal then builds up in the food chain, endangering the health of people who are exposed to overly high concentrations of it.

Although these toxic substances are harmful whether they occur in the general environment or the work environment, the special measures devised by our legislators to protect the health of people who are exposed to them apply only to the work environment. For the moment, as far as the general environment is concerned, we are still largely at the stage of realizing the danger; methods of surveillance, detection and protection are still in a rudimentary stage of development.

In the work environment, protective measures must be provided to control the problem of occupational disease both before and after it arises. That is, remedial action - measures to detect and treat cases of disease resulting from exposure to toxic substances - must be combined with preventive action - measures to improve the healthfulness of the work environment in an attempt to reduce the risk of industrial disease. We will deal with the first point in this section, and the second in the following section.

The detection and treatment of industrial disease is a way of protecting the worker against the inherent hazards of his work environment. With this in mind, it is only natural that we should attach importance to medical examinations of workers, or more specifically, to the compulsory nature, quality and uniformity of such examinations, and the use made of their results. However, at the same time we must recognize that from a legal point of view this topic raises rather delicate questions, such as the confidentiality of medical records and the degree of discretionary power given to the attending physician. In Canada the lack of doctors specialized in industrial diseases makes any existing problems in the detection and treatment of such conditions more serious.

There are several sets of regulations in Quebec dealing with this topic. Each of these regulations is administered by a different department, so the previously mentioned jurisdictional overlap compounds the difficulty of dealing with them.

A Industrial Establishments

The Regulation respecting industrial establishments (QSR 1972, p 7-099), despite the fact that it dates from 1944, contains very specific provisions dealing with medical examinations. First of all, in a case where substances are carried by dust circulating inside a plant (asbestos, lead), the industry is subject to sections 31 to 36 concerning enterprises where workers are exposed to dust which may be dangerous to their health. Section 31 stipulates that on hiring each person be given a medical and radiological examination, the results of which must indicate that he is physically capable of working in dust-laden air. Section 32 requires that the examination be repeated annually, and section 33 indicates exactly what it is to include: clinical examination by a recognized specialist in diseases of the lungs, complete medical and work history, fluoroscopic examination, and X ray examination. In section 35, a detailed list of the physical conditions which must be met by the worker in order to be hired or kept in his present position is given. These conditions serve to limit the doctor's discretionary powers when he makes his diagnosis. The wording of the regulation leads one to believe that this medical examination is intended mainly to detect asbestosis, silicosis and other pneumoconioses, rather than diseases such as cancer, which have recently been linked to work in dust-laden air, particularly in the asbestos industry.

Elsewhere in this regulation, in sections 27 to 29, it is stipulated that the attending physician must report any cases of occupational disease which come to his attention. Specifically included in this category are diseases associated with exposure to mercury, asbestos and lead. The report must be submitted to the public health doctor who has been designated by the Minister (called "director" in section 1(a) of the Regulation) to ensure compliance with health standards in industrial establishments. A 1975 Order-in-council (No 1778-75, April 30, 1975) designates the heads of public health departments in hospital centres as public health doctors.

There are also special provisions (sections 52 to 54) applicable to industries which use mercury or lead in any of their processes. Under section 52, the director of the industrial health division of the Department of Social Affairs, acting through any official of his Department or any inspector of industrial establishments of the Department of Labour, has the authority to require any employee whose

work is considered to be dangerous, and who has been doing this work for a six-month period previous to an inspection, to undergo physical examinations at intervals specified by one or more qualified physicians.

The underlined words in the sentence above illustrate the lack of clarity in the wording of the Regulation. Who decides whether or not a process is dangerous? What criteria are used to make this decision? What is meant by "qualified physician"? Because such questions are left unanswered, the regulation becomes vague and consequently difficult to enforce.

The details of the examination and the diagnostic criteria are not set forth in this Regulation as they were in the case of workers exposed to dust. Sections 53 and 54 do, however, specify that the report must be prepared according to the instructions of the Department of Social Affairs and sent within forty-eight hours to the director of the Department's industrial health division.

Other more specific measures are set down in sections 67 to 71 to protect workers who are exposed to the danger of lead poisoning. Under these provisions, the industrial establishment must designate a doctor whose duty it is to conduct regular medical examinations of these workers and immediately notify the Department of the doctor's name (section 67). Any worker to whom these provisions apply must have a medical examination once a month or whenever he feels ill (section 67). The designated doctor is required to take blood samples for analysis at regular intervals, the length of which may also be determined by the director of the Department's industrial health division. Section 68 clearly stipulates what is to be included in these analyses and in other tests which anyone with a suspected case of poisoning is to be given. The head of the establishment is required to keep a detailed record of all workers exposed to potentially hazardous concentrations of lead and to send the applicable excerpts from this record to the Minister whenever there is a confirmed case of poisoning.

In these provisions, therefore, two categories of workers are considered: those exposed to dust (sections 31 to 36) and those who work at a process considered dangerous to health (sections 48, and 52 to 54). Consequently all the provisions can be applied simultaneously, except when one worker falls into more than one category. In this case, the most stringent provisions would apply.

But the Regulation respecting industrial establishments has given rise to two jurisdictional problems. First, this Regulation is now administered by the Environment Protection Services, since in 1972 it was brought under the purview of the Environment Quality Act

(Act respecting protection of the Environment, SQ 1974, ch 51 s 1). In the Regulation, however, references to the director of the industrial health division and to other officials in the Department of Social Affairs, and to Department of Labour inspectors have not been changed. The Environment Protection Services and these departments have agreed that the Social Affairs Department will continue to be responsible for the medical aspects of industrial health. The only result of this administrative incoherence would seem to be that now the standards established are not being enforced as they should be.

The second jurisdictional problem has not yet arisen but it seems likely to do so. The draft Regulation respecting the quality of the occupational environment (QOG 1975, Part 2, Vol 107, No 7, p 895) provides for the abrogation of the Regulation respecting industrial establishments. However, this draft regulation, in accordance with the agreement between the Environment Protection Services and the Department of Social Affairs, contains no provisions dealing with the medical aspects of industrial health. Thus the present incoherence will be replaced by a vacuum, in the hope that in the near future the Department of Social Affairs will enact new regulations to deal with the problem. In order that this vacuum could be filled, section 50 of the Public Health Protection Act was amended (SQ 1972, ch 42; amended 1975, ch 63) to give the Lieutenant Governor-in-Council authority to enact regulations dealing with medical examinations, medical records, and to adopt measures for the protection of worker health. This authority, which is general in scope, could even, in our opinion, be used to give the Department of Social Affairs jurisdiction over the mining sector, as explained below (see (B) Mines).

Compared with the Regulation we have just discussed, the Regulation concerning industrial and commercial establishments (QOG 1972, Vol 104, No 52B, p 11933) is very brief and vague with respect to the detection of industrial diseases. In section 14.21.1, it stipulates that, in establishments where there are unusual risks to worker health, the inspection service designated by the government (section 1(16) and (25)) may require medical examinations before workers are hired, and periodically thereafter. This provision seems out of place in a Regulation mainly concerned with worker safety. Furthermore, if the provisions of this Regulation are analyzed with section 21 of the Industrial and Commercial Establishments Act (RSQ 1964, ch 150) in mind, it becomes clear that the previously mentioned inspection service is under the jurisdiction of the Department of Social Affairs and not under that of the Department of Labour. In practice, therefore, it would seem likely that the Social Affairs Department will use the more detailed provisions of the Regulation respecting industrial establishments with respect to detection of disease.

B Mines

The healthfulness of mines constitutes a separate area of concern over which the Department of Natural Resources has jurisdiction (Industrial and Commercial Establishments Act, RSQ 1964, ch 150, s 3; Environment Quality Act, SQ 1972, ch 49, s 72). In view of the general scope of the amendments made to sections 48 and 50 of the Public Health Protection Act in 1975 (SQ 1972, ch 41, amended 1975, ch 63), there is a possibility that the Lieutenant Governor-in-Council will, at some point in the future, adopt a regulation concerning disease detection and medical examinations that would apply specifically to the mining sector and that would be enforced by the Social Affairs Department. We base our interpretation on the fact that the mining sector is not exempt from the provisions of the Public Health Protection Act and the regulations adopted thereunder, whereas in the Industrial and Commercial Establishments Act and the Environment Quality Act, mines are viewed as a separate matter. However, no general regulation has as yet been enacted on the basis of the broader powers conferred by the 1975 amendments.

Detection of disease in mine workers now comes under the Regulation under the Mining Act respecting the medical certificate of workmen (QOG 1975, part 2, Vol 107, No 18, p 2078). In this Regulation, a compulsory annual medical examination is stipulated as a condition for being hired and keeping a job in the mining sector (as defined in section 1(2) to include all types of transformation processes carried out on a mining site). The doctor conducting the examination need not have any special qualifications. The examination must include a lung X-ray and must be performed according to the standards and requirements of the Workmen's Compensation Commission (s 2,3). However, the WCC has not set down definite standards and requirements aside from employer's responsibility to pay the costs, which is stipulated in the Regulation Number 56 (1974) respecting the medical examination as provided for at Section 22 of the Workmen's Compensation Act (QOG 1975, Part 2, Vol 106, No 3, p 105). Neither has the Commission issued any guidelines or recommendations, which means that, in practice, referring to the "standards and requirements" of the WCC adds no further requirements to that of the lung X-ray.

Once he has completed the examination, it is up to the doctor to decide whether the worker is fit, from a medical point of view, for employment in a mining or quarrying operation (s 2,5). There are no criteria that limit his freedom in making this diagnosis; he simply deems (a subjective mode of evaluation) the worker fit for employment from a medical point of view. The doctor's diagnosis is final - there is no way of having it changed. The only control mechanism is that the fitness certificates are issued by the Director of the

Pneumology Service of the WCC on the form prescribed in the schedule and furnished by the Department of Natural Resources (s 7). The director's role is limited to verifying that the worker has in fact been examined and that, from a medical point of view, he is fit for employment.

In another section it is stipulated that the employer must keep a list of all the employees of the operation, and that a Department official may, at any time, compare this list with the medical certificates which the employer is required to keep. The medical records are not submitted to the government; thus they cannot be used as a source of information for epidemiological research.

C The Special Case of Radiation

As the federal government has jurisdiction over atomic energy, it is not surprising that the Quebec regulations are silent on the subject of health of workers in uranium mines or in establishments where radioactive substances are handled. Such is the case with the Regulation concerning industrial establishments (R.A.L. 1972, Vol 7, p 7-099) with the exception of the stipulations requiring the attending physician to notify any occupational intoxication or disease, infectious or not, occurring among his patients (sections 27-29).

As we have already indicated, the draft Regulation respecting the quality of the occupational environment does not mention the medical examination and the monitoring of workers' health, for reasons deriving from the jurisdictional agreement concluded between the Department of Social Affairs and the Environment Protection Services.

Curiously enough, a stipulation of the Regulation concerning industrial and commercial establishments (QOG 1972, Vol 104, No 52B, p 11933) requires that workers exposed to ionizing radiations must go through medical "examinations at more or less frequent intervals, according to the duration of exposure" (art. 10.3.4). This very brief and vague article is to be found in a part of the Regulation dealing with dangerous radiations, the other articles of which (10.3.1 and 10.3.2) mention intense sources of infrared radiation and dangerous emissions of ultraviolet radiation. Concerning the utilization, handling and transportation of radioactive substances, article 10.3.3 simply refers to the Regulations adopted by the Atomic Energy Control Board of Canada. It is impossible to conclude from an analysis of these various provisions that the health of workers exposed to radiation is monitored under the Quebec regulations as efficiently as the health of workers exposed to dust, lead or other dangerous substances.

With respect to mines, the Regulation respecting safety and protection of workmen in mines and quarries (R.A.L. 1972, Vol 3, p 3-055) and the Regulation under the Mining Act respecting the medical certificate of workmen (QOG 1975, Part 2, Vol 197, No 18, p 2078) could apply equally to uranium mines or to other substances used by the nuclear industry. Their provisions are apparently of a general nature, and they apply to mines and processing facilities located on mining land. However, these regulations should be read once more in connection with the regulations already adopted by the Atomic Energy Control Board, and priority should be given to the latter.

Although we do not intend to discuss the Regulations of the AECB, a few words about them are in order. Indeed, the Atomic Energy Control Regulations (DORS/74-334, C.G. Part II, Vol 108, No 12, p 1783, 26/6/74) make rather detailed provisions concerning medical examinations and the monitoring of the health of workers in plants where "stipulated substances" (i.e. radioactive substances) are handled in nuclear facilities, and in businesses employing "workers under radiations". Precise requirements concerning medical examinations are usually incorporated into the license granted to these businesses (art. 7,9,11,17), but the Regulations contain a provision forbidding the hiring of a "worker under radiations" whose health is not satisfactory according to the medical adviser of the Board (art. 17(1)).

CHAPTER IV

PREVENTION OF CONTAMINATION

A Quality of the Work Environment

The jurisdictional confusion to which we have previously referred is also encountered in any investigation of measures to prevent contamination of the work environment by asbestos, mercury, and oxides of nitrogen, because the applicable provisions are found in the same regulations - the Regulation respecting industrial establishments (QSR 1972, Vol 7, p 7-099), administered by the Environment Protection Services, and the Regulation concerning industrial and commercial establishments (QSR 1972, Vol 5, p 5-405), administered by the Department of Labour. Here again, we must take into account the possible enactment of the draft Regulation respecting the quality of the occupational environment, (QOG 1975, Vol 107, No 7, p 895), the effect of which would be to clarify the dividing line between the respective jurisdictions of the Environment Protection Services and the Department of Labour. However, in the case of asbestos, the situation is more complicated because the Department of Natural Resources has considerable authority to regulate the handling of this substance.

We have divided this study of Quebec's regulations to control toxic substances in the work environment into five sections. The topics discussed will be: general emission standards, provisions concerning the ventilation of the work environment, special measures applicable to establishments where such substances are handled, provisions applicable to foundries, and lastly, regulations dealing specifically with work in mines.

Where necessary, we shall briefly discuss the special provisions which apply to one or the other of these substances.

1 Emission Standards

The Regulation respecting industrial establishments requires the employer to take necessary measures to ensure that concentration of the following substances in the air of a workroom does not exceed the limits indicated:

asbestos	5 million particles/ft ³
oxides of nitrogen	25 ppm
mercury	1 mg/10 m ³
lead	1.5 mg/10 m ³

vinyl chloride	500 ppm
gamma radiations	
X-rays	0.1 roentgen
radon	
thoron	10-8 curies/m ³

These standards constitute the maximum permissible concentration; however, the Regulation does not stipulate a precise time period over which the concentrations should be measured.

The draft Regulation respecting the quality of the work environment prescribes the following standards (Schedule C):

asbestos	5 fibres/cm ³ > 5 um in length
nitrogen dioxide	5 ppm or 9 mg/m ³ (maximum concentration)
nitrogen monoxide	25 ppm or 30 mg/m ³ (average concentration)
	37.5 ppm or 45 mg/m ³ (maximum concentration)
mercury (all forms except alkaline)	0.05 mg/m ³ (average concentration)
mercury (organic and alkaline compounds)	0.001 ppm or 0.01 mg/m ³ (maximum concentration)
skin	0.003 ppm or 0.03 mg/m ³ (maximum concentration)
lead	0.15 mg/m ³ (average concentration)
	0.45 mg/m ³ (maximum concentration)
vinyl chloride	1 ppm (average concentration)
	5 ppm (maximum concentration)

The draft regulation does not contain standards for radiation emission, but it stipulates a standard of concentration in air of soluble or insoluble compounds of natural uranium: 0.2 mg/m³ (average concentration) and 0.6 mg/m³ (maximum concentration). The minimum duration for the maximum concentration is stipulated only for vinyl chloride (15 minutes); the maximum concentration of other substances can be reached any time, provided that the average concentration, computed for an eight-hour period, does not exceed the permissible level.

The major difference between the present Regulation and the draft regulation lies in the terminology used. Section 13 of the draft regulation requires that every establishment be designed, equipped, or provided with a treatment or exhaust system so that the average concentrations previously mentioned are not exceeded. Section 14 prohibits the operation of an establishment when this results in the emission into the air therein of amounts of gases, dust, or vapours (listed in Schedule C) which exceed the standards, unless the employees are wearing protection equipment in compliance with the

NIOSH (National Institute for Occupational Safety and Health) and ACGIH (American Conference of Government Industrial Hygienists) standards made applicable by virtue of section 17. Section 11 makes a similar stipulation.

In cases where several types of gases, fumes, vapours, or particulate matter with additive effects are simultaneously present and concentrations exceed the 1974 ACGIH standards (Threshold Limit Values for Chemical Substances and Physical Agents in Workroom Environment with Intended Changes for 1974), section 15 also prohibits operation of the plant unless protection equipment is worn.

When the draft regulation is enacted, the standard it sets will apply to any new establishments, or an alternation or redesigning of an existing establishment, where the substances contemplated in the regulation are handled, or to any enlargement of an existing building (section 3). Existing establishments are not otherwise required to comply with the standards until 1 January 1978 (section 4).

At first sight, the suggested standard seem stricter than existing standards, except for asbestos. This is especially true in the case of lead, even if the maximum standard is the same, because the suggested standard applies both to lead arsenate and to inorganic lead in dust or fumes. The draft regulation, however, is deficient as to the means of its enforcement. According to section 18, the operator of an establishment is required to take samples in order to check compliance with the standards only once a year, or each time an industrial process is modified in any way. This requirement seems inadequate. As for the method of taking samples, section 19 simply prescribes the American NIOSH standard procedures (Industrial Hygiene Operation Manual, Chapter V).

A problem arises here because aside from the existing standard and the new standard proposed by the Environment Protection Services, there are other emissions standards applicable to the work environment. These are set down in the Regulation concerning industrial and commercial establishments enacted under the Industrial and Commercial Establishments Act (RSQ 1964, ch 150), which is administered by the Department of Labour. Under section 5.1.5 of this Regulation, airborne impurities produced inside buildings must be removed at their source so that the concentration will be less than the permissible levels given in the 1971 edition of the Threshold Limit Values of Airborne Contaminants published by the ACGIH. Section 10.2.1(3) stipulates that if gases, dust and so on cannot be removed in the manner prescribed in section 5.1.5, the head of the establishment must provide protective breathing equipment, as described in section 12.6.1 - which stipulates the apparatus approved by NIOSH - to the workmen, who are required to use it. (Section 12.6.1 amended: QOG 1976, Part 2, Vol 108, p 4009).

Obviously the problem is determining which standard is to be applied in cases where the provisions of the Regulation respecting industrial establishments or the draft Regulation respecting the quality of the occupational environment differ from those of the Regulation concerning industrial and commercial establishments. In our opinion, the authority to make regulations as provided under sections 87(a) and 88(b), (d), (i), and (j) of the Environment Quality Act (SQ 1972), ch 49) is a great deal more precise than that set down in section 5 of the Industrial and Commercial Establishments Act. Therefore, we feel that the standards prescribed in the regulations which are the responsibility of the Environment Protection Services should take precedence in cases of conflict. Our interpretation is supported by the terms of section 4 of the Industrial and Commercial Establishments Act, under which, "The industrial and commercial establishments...shall...in a word, fulfill all sanitary conditions necessary for the health of the persons employed, as required by the regulations made in virtue of the Public Health Act". As we have already seen, these regulations are now administered by the Environment Protection Services as provided in section 1 of the 1974 Act (SQ 1974, ch 51).

2 Ventilation

There are a certain number of provisions concerning workroom ventilation in the existing Regulation respecting industrial establishments. Section 13 authorizes a public health doctor to require ex officio that artificial ventilation be used in cases where he feels it is necessary for the protection of worker health. Under section 19, toxic fumes and dusts must be evacuated directly to the outside of the workrooms to the doctor's satisfaction. The Regulation concerning industrial and commercial establishments also contains general provisions with respect to ventilation, in sections 5.1.1 to 5.1.6.

The most complete and specific provisions on this topic, however, are given in sections 20 to 31 of the draft Regulation respecting the quality of the occupational environment. This draft regulation prescribes specific standards applicable to both natural and mechanical ventilation systems. It stipulates that a local exhaust ventilation system must be installed for localized emissions of gas, dust, and vapour and sets design standards (sections 14 and 15). It prohibits the use of systems for recirculating the air unless gas, dust, and vapour concentrations following recirculation and treatment of air from local ventilation systems are less than or equal to 20% of the previously mentioned permissible average concentrations (section 31).

3 Special Measures

Both the existing Regulation and the draft of the new regulation contain special provisions which apply to industries where the toxic substances dealt with in this study are prepared or used. For mercury or lead there is a general rule in section 48 of the Regulation respecting industrial establishments specifying that "special precautions" must be taken to protect effectively persons who use mercury, lead or its compounds or come into contact with this industrial poison. In section 49 of the same Regulation, there is a stipulation that containers or vessels containing mercury, lead or its compounds destined for use in industry as an ingredient or raw material must be so labelled. An industrial establishments inspector or an official of the Department of Social Affairs may require manufacturers, distributors, or importers to post signs in their establishments indicating the dangers of these substances and precautions to be taken against them. They may even be required to provide exact information on the percentage of the toxic substance contained in each component sold for industrial purposes (sections 50 and 51).

Special provisions deal with construction specifications for workrooms where any substance liable to be a source of danger for workmen is handled. Mercury and lead are among the substances mentioned. Under section 2 of the Regulation respecting industrial establishments, no such establishment may be constructed without the plans having previously been submitted to the Minister for approval. In practice, however, this requirement is considered met when the information needed to obtain a certificate of authorization from the Director of the EPS has been submitted in accordance with section 22 of the Environment Quality Act, and sections 2 to 9 of the General regulation respecting the administration of the Environment Quality Act (QOG 1975, Part 2, Vol 107, No 32, p 4801).

This requirement is continued and made more clear in the draft Regulation respecting the quality of the occupational environment. Because asbestos and mercury, lead, and even uranium are among the dangerous substances listed in section 1 (p), this draft regulation in effect requires that, for any construction or alteration of an establishment where one of these substances is produced, stored, or used, all plans and specifications be approved by the Director in accordance with section 73 of the Act (section 6 of the draft). Effective 1 January 1978, any existing establishment where asbestos or mercury is produced, stored, or used will be required to obtain an operating permit. In some cases, it may even be necessary to obtain permission from municipal authorities (section 7 of the draft).

Sections 61 to 65 of the Regulation respecting industrial establishments contain a set of provisions which apply not only to the layout of the workroom, but also to the work methods used in industrial processes involving the handling of lead. Sections 66 and 72 of the same Regulation prescribe requirements which must be fulfilled by the heads of establishments and employees in order to minimize the risk of poisoning. Section 73 requires that the previously mentioned requirements and prohibitions be posted in the workrooms along with the doctor's name and address and his office hours, to provide for emergencies. Some of these special provisions are reiterated in sections 118 to 121 of the draft Regulation respecting the quality of the occupational environment. Similar protective measures are prescribed for the storage and handling of toxic substances (including lead) in section 10.1.5 of the Regulation concerning industrial and commercial establishments.

In the case of radiations, article 91 of the Environment Quality Act should be taken into account. It requires the user of a radiation or other energy source to declare it to the Director, according to a procedure which has not yet been fixed by regulation (art. 92 (c)).

Other special provisions for protection against dangerous radiations are set out in the Regulation concerning industrial and commercial establishments. These provisions deal first with intense sources of infrared radiations which, according to article 10.3.1, must be covered by heat-absorbing shields, water shields, or other devices for the protection of workers. Article 10.3.2 stipulates the precautions to be taken in premises where the work carried out entails dangerous emissions of ultraviolet radiations, as during electric welding. As for radioactive substances as such, article 10.3.3 requires them to be used, handled, and transported according to the Regulations adopted by the Atomic Energy Control Board of Canada.

4 Laboratories

Since the passage of the Public Health Protection Act (LQ 1972, c 42) in 1972, all measures for the control of laboratory services are administered by the Department of Social Affairs. This respects the agreement concluded between the Environment Protection Services and the Department concerning the division of jurisdiction, as well as the wording of section 93 of the Environment Quality Act (LQ 1972, c 49). Paragraphs (a) and (i) of section 50 of the Public Health Protection Act empower the Lieutenant-Governor-in-Council to pass regulations concerning laboratories and radiation emitting equipment - after consulting the Provincial Medical Bureau. This power has

been used in the case of the Regulation under the Public Health Protection Act (QOG 1974, Part 2, Vol 106, No 10, p 1827; amended 1975, Part 2, Vol 106, No 26, p 3323), which, although it requires a license for all laboratories (art. 7.001 "laboratory" being defined in art. 1, para. b of the Act), especially in the case of an establishment for radioisotopic and radiological examinations (art. 7.001a), contains few criteria for the issuing of licenses: cost, required insurance, date of application, etc. (art. 7.008, 7.010). The Regulation contains nothing on the subject of workers' safety.

5 Foundries (Smelters)

It is difficult to determine the exact extent to which the Regulation respecting safety and health in foundry works (QOG 1973, Part 2, Vol 105, No 28, 10 October 1973, p 5533) applies to the substances under study here, and especially to mercury. Specific substances are not mentioned in the Regulation, which seems to be mainly concerned with safety in the handling of molten metals. However, section 14.2.1, which concerns the trimming of large castings by hand, prescribes the use of an exhaust system to prevent dust concentrations exceeding the maximum value allowed by the standard, Threshold Limit Values for Substances in Workroom Air, published in 1972 by the ACGIH.

6 Mines

The definition of an industrial establishment given in the Regulation respecting industrial establishments and in section 72 of the Environment Quality Act may leave some doubts as to whether the former applies to the mining sector, but in practice this regulation is not applied in mines. The Regulation concerning industrial and commercial establishments does not apply to the mining industry; section 3 of the Industrial and Commercial Establishments Act contains a specific provision to this effect.

In Chapter II we discussed the validity of section 1 (c) of the Regulation respecting industrial establishments of 1944, which states that its provisions do apply to mines and quarries. Our position concerning this question would seem to be argued here for the first time - the Minister of Natural Resources has always considered that this Regulation, adopted under the purview of the former Public Health Act, does not apply to the mining environment any more than would the draft Regulation respecting the quality of the occupational environment, assuming it is eventually adopted.

This brings us back to the Regulation respecting safety and protection of workmen in mines and quarries, which contains provis-

ions that could be applied to asbestos mines and possibly to other mines also. We draw attention to section 15, which requires the operator to provide protective respiratory masks or equipment for workers who are exposed to irritating or dangerous fumes or vapour, or to unacceptable concentrations of dust or gas. It is the employer's responsibility to ensure that his workers wear the equipment. In addition to the requirement to post warnings in shops where ore is dressed, in laboratories, foundries, and metal works where workers are exposed to the hazard of poisoning (section 32), sections 59 to 68 and section 110 stipulate that fumes, dust, and noxious gases must be eliminated or controlled so that workers will not be exposed to unhealthy concentrations.

However, this regulation does not contain any general emission standards that currently apply to asbestos in mines, similar to the one contained in the Regulation respecting industrial establishments pertaining to asbestos treatment and processing plants (excluding those located on the actual site of the mining operation). To correct this situation, and because the Department of Natural Resources has always considered that the 1944 Regulation respecting industrial establishments does not apply to the mining industry, a new subsection 68 (a) (QOG, Part 2, Vol 107, No 26, p 3471) was added to the Regulation respecting safety and protection of workmen in mines and quarries in 1975. This new provision stipulates that effective 1 January 1978, the standard will be five asbestos fibres greater than 5 µm in length per cubic centimetre of air. It also stipulates that any mine whose operation is liable to emit asbestos dust must be designed, built, or provided with a treatment or exhaust system which will ensure that the concentration of these dusts in the air in the mine will not exceed the established standard during a given eight-hour period. It is also worth noting that the terms of this provision are far less stringent than those of section 14 of the draft Regulation respecting the quality of the occupational environment, which prohibits the operation of an establishment unless the emission standards set down therein are respected.

B Ambient Air

1 General

By virtue of the Environment Quality Act and the regulations adopted thereunder, the discharge into the atmosphere of the toxic substances dealt with in this study, other than into the occupational environment, can be controlled. The general provisions of the Act prohibit the "emission, deposit, issuance or discharge into the environment of a contaminant...likely to affect the life, health,

safety, welfare or comfort of human beings" (section 20 et seq.). There are other more specific provisions contained in sections 47 to 53 of the Act, including a stipulation that the authorization of the Director must be obtained for the installation of any device intended to prevent atmospheric pollution, and the possibility of setting standards for pollution caused by motor vehicles. (For a general discussion of the provisions and full significance of the Act, see P. Kenniff and L. Giroux "Le droit québécois de la protection et de la qualité de l'environnement", (1974) 15 Cahiers de Droit 5 (to 71); for the English version, see "The Law Relating to the Protection and the Quality of the Environment in Quebec" in P. Elder, Ed., Environmental Management and Public Participation, Toronto, C.E.L.A., 1975, chap 7, p 213).

Quebec currently has no regulation in effect to control ambient air pollution aside from the General regulation respecting the administration of the Environment Quality Act (QOG, 1975, Part 2, Vol 107, No 32, p 4801). There are two regulations in the draft stage, and they will be analyzed as such here. These are the draft Regulation respecting the quality of atmosphere (QOG, 1975, Part 2, Vol 107, No 47, p 6501) and the draft Regulation respecting motor vehicle emissions (QOG 1974, Part 2, Vol 106, No 25, p 4195). A third draft regulation, the draft Regulation respecting quarries (QOG, 1975, Part 2, Vol 107, No 16, p 1895) could also have been of interest to us because of the provisions it contains with respect to air and water pollution, but the definition of "quarry" in section 1(c) expressly excludes open pit asbestos and metal mines.

In this section we shall initially examine points common to the three substances to be studied, and then review the specific provisions which apply to each of the substances. Even if readers keep in mind that the regulations we are examining here are often only in the draft stage, a note of caution is still in order, since there is no guarantee that any of these provisions will be adopted. During recent meetings of the parliamentary commission of the Quebec National Assembly responsible for studying the draft Regulation respecting the quality of the atmosphere, the opposition accused the government of having lowered several of the standards even prior to publishing the draft (Le Devoir, Wednesday 15 September 1976, pp 1,6). It was thus being suggested that the government was once again willing to lower its standards before final passage of the draft. This charge would seem at least partially justified by the fact that more than eight months went by between the publication date of the draft and the start of hearings by the parliamentary commission. On the other hand, the very fact that a parliamentary commission was set up - a procedural precedent with respect to proposed regulations under the Environment Quality Act - suggests that the government is inclined to pay closer attention to the demands of "pollution consumers".

concentration of contaminants beyond the maximum limits previously mentioned in section 5. Particulate matter is not mentioned in section 7. Since section 5 refers to the entire Province of Quebec, and not to a specific geographical location, we must conclude that the provisions of section 7 could apply to any stationary source, regardless of its location in Quebec, that is likely to exceed the standard emission levels within any given unit of measurement. Contaminant levels are measured in accordance with the methods explained in section 8: for nitrogen dioxide, subsection (h) refers to an Environment Canada publication (Standard reference method for the measurement (chemiluminescence method) of nitrogen dioxide in the atmosphere, EPS-1-AP-742).

Section 20 of the draft regulation prescribes rates for the emission of particulate matter into the atmosphere for all stationary sources, with the exception of those covered by special provisions in the draft. These rates, appended in Schedules A and B of the draft, are expressed in kg/h of emissions per metric ton per hour of process weight. If the draft regulation were adopted in its present form, it would apply to new stationary sources immediately, and to existing stationary sources on 1 December 1978.

2 Asbestos

In addition to the general ambient air standards set down at the beginning of the draft Regulation respecting the quality of the atmosphere, there are other provisions in the draft dealing specifically with asbestos. Section 46 stipulates that atmospheric emissions from treatment operations and for crushing, drying, stocking, and ore milling processes in the primary industry, shall not exceed 2 asbestos fibres per cubic centimetre of air, effective 31 December 1978. An asbestos fibre is defined as any particle greater than 5 μm whose length:diameter ratio is greater than or equal to 3:1 (section 1(i)).

Reading this standard, one might be led to think that it is general enough to apply to the quality of the air in the workplace of asbestos mines and asbestos processing operations. Such is not the case, however, since the word "atmosphere" as used in the regulation is interpreted according to the definition given in the Environment Quality Act, section 1(2): "the ambient air surrounding the earth, excluding the air within any structure or underground space".

Section 66 of the draft regulation, which deals with methods to be used for measuring emissions of substances which come under the provisions of the draft regulation, makes no mention of asbestos fibres.

A certain ambiguity arises when one reads Division VI of the Environment Quality Act (sections 47 to 53) and the General regulation respecting the administration of the Environment Quality Act (s 3 (e)). Under the regulatory provision, "structures, works and activities for which an authorization is already provided for in Division V or VI of the Act" need not obtain a certificate of authorization in accordance with sections 22, 23 and 24 of the Act. In section 48 of Division VI of the Act, however, it is provided that plans and specifications must be submitted to the Director of the Environment Protection Services and that his authorization must be obtained before installing any equipment destined to prevent or reduce atmospheric contamination. The problem, therefore, is as follows: once pollution-control equipment has been installed by an enterprise which emits contaminants into the atmosphere, does section 2(e) of the General Regulation exempt the entire enterprise from complying with the provisions of sections 22, 23 and 24 of the Act, even though the overall contamination caused by the enterprise may not be significantly reduced, or does the section apply only to the pollution control equipment? Even if the first interpretation is the correct one, which in our opinion would be out of keeping with the spirit of the Act, section 10 of the General regulation respecting the administration of the Environment Quality Act must still be taken into account. This section states what information must be furnished on the application for a certificate of authorization submitted in accordance with section 48 of the Environment Quality Act. One of the stipulations of section 10 is that a list of all points of emission and of the nature and quantity of contaminants emitted into the atmosphere must be submitted.

Once the draft Regulation respecting the quality of the atmosphere (QOG, Part 2, Vol 105, 30/12/75, p 6501) is enacted, it will be applicable to contaminants covered by the present study. This draft regulation first of all prescribes ambient air standards for the province of Quebec in general. For particles in suspension in the atmosphere (under section 1(q), a particulate matter is any matter except water in uncombined form that exists in a finely divided form as a liquid or a solid), the permissible average concentration is from 0 to 150 mg/m³ for the annual geometric mean (sections 3 and 5). It stipulates a standard of 0-7.5 t/km² for a 30-day average of dust fallout. For nitrogen dioxide, this average concentration is from 0.0 to 0.2 ppm (mean over one hour), from 0.0 to 0.11 ppm (mean over 24 hours), and from 0.0 to 0.55 ppm (annual arithmetic mean).

Effective 1 January 1980, section 7 will prohibit the construction or alteration of a stationary source of atmospheric contamination (that is, other than a motor vehicle as defined in section 1(t), or increased production of a property or a service whose emissions of dust particles and nitrogen dioxide are likely to raise the

3 Mercury

There are no special provisions in the draft Regulation respecting the quality of the atmosphere dealing with mercury. Such is also the case for the other draft regulations to which we referred in General Remarks.

4 Nitrogen Oxides

Aside from the specific mention of nitrogen dioxide in section 5, the draft Regulation respecting the quality of the atmosphere contains no special provisions dealing with nitrogen oxides. It is especially concerned with stationary sources, which by definition excludes motor vehicles (section 1(t)).

The draft Regulation respecting motor vehicle emissions (QOG, 1974, Part 2, Vol 106, No 25, p 4195) was intended to apply to every motor vehicle identified as a 1975 or subsequent model (s 2). As a result of the slow pace at which the government is proceeding with the implementation of this draft regulation, an amendment will eventually be required to readjust the scope of the regulation.

Under section 4 of the draft regulation, the nitrogen dioxide content of the exhaust emissions shall not exceed 3.0 g per vehicle mile for a light-duty vehicle. There is no standard for heavy-duty vehicles (defined in section 1 (1) as any vehicle having a designated seating capacity of more than 12 or a gross weight of more than 6,000 pounds). The measurement method presented in the draft is that described in Motor Vehicle Safety Test Methods of the federal Department of Transport, Highway Safety, approved on 1 September 1973 (section 7).

We would also point out that section 3 of this draft regulation prohibits any person from offering for sale, displaying for sale, selling, using or permitting the use of a motor vehicle not equipped with an apparatus designed to reduce exhaust emissions exceeding the concentration prescribed in section 4. It is also prohibited to modify or remove such an apparatus if such modification or removal results in an increase in the emission of contaminants in excess of the concentration prescribed in section 4 (section 10). Under section 12, the owner is required to maintain the apparatus in good operating order at all times. This draft Provincial regulation will serve to complete federal regulations (Motor Vehicle Safety Regulations, SOR/70-487; Canada Gazette, Vol 104, Part II, No 22, pp 1245 ff and amendments) passed under the federal Motor Vehicle Safety Act (RSC 1970 (1st Supp.), c. 26, section 2 (1)) which sets emission standards that apply to exhaust emissions from vehicles manufactured, imported or distributed by wholesalers in Canada.

5 Vinyl Chloride

Neither present Quebec regulations nor the draft Regulation respecting the quality of the atmosphere (QOG 1975, Part II, Vol 107, No 47, 30/12/75, p 6501) contains any precise provisions on the presence of gaseous vinyl chloride monomer in the ambient air. However, one may wonder whether the provisions of section 11 of the draft regulation, which deals with gaseous organic compounds, and of section 52, which deals with storage tanks for organic compounds, are applicable to vinyl chloride monomer, since the definition of an organic compound given in section 1, paragraph (d) is "any compound made up of carbon or hydrogen combined together or in one or several other elements". The high level of emission allowed (1.3 kg/h) leads one to believe that the provision is not intended to apply to vinyl chloride, despite its very general terms.

6 Lead

In addition to these general emission standards for particulate matter from a stationary source, section 40 of the draft Regulation respecting the quality of the atmosphere also establishes special emission standards for secondary lead foundries as defined in section 1(j) of the draft. In the event that the draft regulation is adopted, therefore, the maximum standard for secondary lead foundries which handle metals and scrap metals, an important industry in Quebec, will be 23 mg/m³ of dry gas under standard conditions. The standard would take effect immediately for new secondary lead foundries, and on 1 December 1976 for existing foundries. Since the draft regulation has not yet been passed, this date could change. The methods of measurement to be used in determining compliance with the standards given in section 20 to 40 are listed in section 66.

Lastly, we should mention that the draft Regulation respecting motor vehicle emissions (QOG, part 2, Vol 106, 25/9/74, p 4195) does not list an emission standard for motor vehicles using leaded gasoline. This problem is dealt with by two federal regulations passed under articles 22 and 23 of the Atmospheric Pollution Control Act (S.C. 1970-71-72, c 47): Regulations on leadless gasoline (D.O.R.S./73-663, G.C. Part II, Vol 107, No 21) and Regulations on leaded gasoline (D.O.R.S./74-459, G.C. Part II, Vol 108, No 15).

7 Radiation

A careful study of present Quebec statutes and regulations shows that very few provisions are applicable to the protection of ambient air and water against radiation.

The Environment Quality Act does contain section IX, entitled "Protection against radiation and energy sources". Under section 90 of the Act, the Minister of Environment is entrusted with the monitoring and control of radiation sources, plasmas, fields, waves, pressures and other energy sources (as defined in section 1, clauses 13 to 17). Anyone owning or using a radiation or other energy source must notify the Director of the Environment Protection Services, as required by section 91. The same provision requires that the source be used according to the methods and standards stipulated by the regulations. Such regulations have not been passed up to now, under either section 91 or section 92, but even though the procedure for notifying the Director according to section 91 has not yet been determined according to section 92(c), it is submitted that the wording of section 91 is mandatory and requires that the Director be notified.

Curiously enough, the only Quebec regulation dealing with the control of radiation emissions in the general environment is the Regulation respecting the transport of explosives and other dangerous substances through the tunnels in the Montreal region (QOG, Vol 107, No 36, October 8, 1975, p 5301) issued under section 5(a) of the Transport Act (1972, c 55). According to section 4(h), any substance giving off radiation at a level greater than 0.002 mCi/g is a dangerous substance, and section 6 prohibits its transport by vehicle in the Louis-Hyppolyte Lafontaine tunnel and the Ville-Marie Autoroute.

It is clear that this regulation is not intended to protect the environment, although its effect might well be to prevent the discharge of a contaminant into the ambient air. Its objective is the protection of travellers.

C Water

1 General

At the present time, Quebec legislation aimed at preventing the contamination of water by the substances with which this study is concerned, is spread over a number of regulations and draft regulations dealing with other specific topics. Although Quebec does have general air quality standards, no general standard for water quality is in effect or even in the draft stage.

In fact, the substances here studied are not specifically mentioned in these regulations or draft regulations, which means that we have to determine whether or not a given regulation applies on the basis of provisions which are often very generally worded. Obviously

the most serious pollution problem is caused by mercury which has been discharged into water and is thus allowed to contaminate sources of human food such as fish. Thus we shall deal with mercury in the following section, bearing in mind however that the texts being examined are often general enough to be applicable to asbestos and lead in water as well. Since this study deals with nitrogen oxides and vinyl chloride monomer in the gaseous state, provisions dealing with the discharge of solid or liquid effluent into water do not apply to these substances. Nonetheless separate sections will be devoted to lead and vinyl chloride.

2 Mercury

We should emphasize from the outset that the problems which arise with respect to mercury pollution are complicated. The Environment Quality Act, especially in sections 32 to 46 dealing with the quality of water and waste water management, is inadequate in that it does not offer a complete solution to the problem. Under existing provisions, the source of contamination can be identified and the contamination stopped. These provisions, however, do not contain any useful measures for reducing the dangers caused by earlier contamination or even for correcting its effects, especially once it has entered the food chain. Worse yet, a statutory bar has been set up to seeking an injunction against polluting industries established for more than five years in a municipality, if such industries have been authorized by municipal by-law (Cities and Towns Act, RSQ 1964, c 193, section 427 (18) paragraph 3). This measure was adopted to override a judicial precedent which resulted in an injunction being granted in similar circumstances (Canada Paper Co v Brown (1922) 63 S.C.R. 243). A similar provision for the protection of foundries, refineries and other ore plants located in Rouyn, Holland and McKenzie townships was contained in section 121 and 122 of the former Mining Act (RSQ 1964, c 89 repealed).

In view of the above, the government is limited to prohibiting people from eating food which is known to be contaminated by mercury. This power, however, is confined at present to the consumption of contaminated molluscs and is exercised by the federal Minister of National Health and Welfare, acting in accordance with the terms of section 38 of the Quebec Fishery Regulation (QSR 1972, Vol 7, p 7-653) enacted by the Lieutenant Governor-in-Council. The statutes and regulations are silent on the consumption of other contaminated foods.

After this preliminary general view of the problem, we return to an examination of regulations and draft regulations established under the Environment Quality Act.

In section 3 of the Regulation respecting liquid waste management (QOG 1975, Part 2, Vol 107, No 36, p 5291) all dumping of liquid waste in the environment is prohibited, unless it is done by an establishment holding a permit to operate a liquid-waste management system. Thus the standard is set at the zero level and the liquid waste becomes a contaminant prohibited under section 20 of the Environment Quality Act. In cases of unlawful dumping, section 106 of the Act makes the offender liable to a fine not exceeding \$5,000 for the first offence and \$10,000 for any subsequent offence. The regulation applies to mercury if it is contained in any liquid or semi-liquid waste product at 20°C, even when diluted with water (section 1(b)), and if the volume is such that it may be transported by truck for elimination purposes (section 2). If such dumping should occur in the environment, even by accident, the person responsible must clean up the dumped product in accordance with section 9. We should point out that the Regulation respecting liquid waste management deals mainly with substances which are not normally dumped in the environment in a continuous manner following a given industrial process (effluents).

The draft Regulation respecting discharges into sewer networks (QOG 1974, Part 2, Vol 106, No 24, p 4133) prohibits the discharge of waste waters containing concentrations of mercury greater than 0 mg/l into a sanitary or combined (that is, sanitary and storm) sewer network if the network serves a population of 5,000 persons or more, and 0.01 mg/l if it serves a population of 20,000 or more. There are proportional intermediate values depending on the population served (sections 3 and 6(g)). Under section 6(i), moreover, the discharge of mercury, even if not contained in sewage, is prohibited at all times.

Section 7 of the draft regulation sets the standard for the discharge of mercury ions into a storm sewer network at 0 mg/l. Paragraph (f) of the same section prohibits the discharge of mercury even if it is not contained in waste water.

By virtue of both the Regulation respecting liquid waste management and the draft Regulation respecting discharges into sewer networks, therefore, the standard is set at 0 mg/l, except in the latter, where the standard for combined or storm sewers is set at 0.01 mg/l for a network serving a population of 20,000 or more. In this case the standard contained in the draft regulation becomes applicable, in accordance with section 3(2) of the Regulation respecting liquid waste management:

Subject to the provisions of the regulation respecting discharges into sewer networks made under the Act, the same prohibition shall apply to the discharge, deposit or dumping of liquid waste into a sewer network operated by a

municipality or person contemplated in the third paragraph of section 32 of the Act.

There is one other point with reference to the Regulation and the draft regulation which should be mentioned. Whereas the Regulation does not specify a method to be used to measure liquid discharges (aside from viscosity, flash point and percentage of water in the dust-control oil in section 6), the draft regulation does stipulate one. The method to be followed is given in the thirteenth edition (1971) of Standard Methods for the Examination of Water and Waste, published jointly by the American Public Health Association, the American Water Works Association, and the Water Pollution Control Federation.

Insofar as mercury or one of its compounds could be used in a paper or pulp manufacturing process, the Regulation respecting pulp and paper mill effluents and waste (QOG 1975, Part 2, Vol 107, No 43, p 5883) should be taken into account, and especially parts II and III concerning effluents and impact studies. Thus, under section 20, in addition to the requirements of the General Regulation respecting the administration of the Environment Quality Act, the application for a permit to build a new pulp and paper mill must be accompanied by an environmental impact study of the project. According to section 1, para. (1) of the same draft regulation, a new mill is one which will start to discharge contaminants into water after the publication of the regulation as passed in the Quebec Official Gazette.

As for effluents, the draft regulation stipulates quantitative standards in terms of kg/t of matter in suspension in process water discharged into the environment, and also standards of 5-day biochemical oxygen demand, also expressed in kg/t. The standards are specific for each process, and are different for a new mill or for an existing mill the production of which is modified or increased. These standards will also vary for other existing mills (without modification or increase in production) according to a time scale set out in the draft regulation (sections 2 to 5). In addition to these effluent standards, the draft regulation contains a set of provisions applicable to the manufacturing process itself, with a view to reducing the possibilities of discharge. These provisions will become mandatory according to a time scale (sections 8, 11, 14).

The disposal and management of water from pulp and paper mills are governed by provisions of Part IV, which stipulate precise standards of disposal and burying for the protection of streams and groundwaters.

In the draft Regulation respecting public swimming pools (QOG 1974, Part 2, Vol 106, No 30, p 4721), there is one further prohibition with respect to mercury. In section 36 of this draft, the use of a flowmeter or a thermometer with a column of mercury in any swimming pool (using the definition of "swimming pool" given in section 1(f), is prohibited.

3 Lead

The first priority of the Quebec government appears to have been the presence of lead in drinking water, as is indicated by the adoption of the Regulation respecting bottled waters (QOG, Part 2, Vol 106, 9/9/74, p 3). Section 4 of this Regulation prohibits the bottling, selling, or distribution of water if it does not meet the quality standards and the production and distribution conditions prescribed in the Regulation. In practice, however, this prohibition is more limited in scope than the general terms of section 5 would seem to indicate. This is because the only quality standard applies uniquely to bottled water designated as "spring water". To qualify for this designation, "spring water" must contain less than 0.05 ppm of Pb ions. There is no provision preventing bottled water from containing a greater concentration of Pb ions; such water would merely have to be sold under a different name, either "mineral water" or "treated water". There is a set of provisions in the Regulation concerning the distribution of bottled water; under section 18(i), the Pb-ion concentration must be indicated on the container in ppm. We feel that these provisions are intended to protect the consumer through regulation of the scale of bottled water rather than to prevent water contamination.

When lead is present in liquid or semi-liquid water at 20°C even when mixed with water, its discharge is prohibited under section 3 of the Regulation respecting liquid waste management which is also applicable to mercury, and with the same consequences (see section above).

In the case of lead, the Regulation respecting liquid waste management will also come into conflict with the draft Regulation respecting discharges into sewer networks should the latter be adopted. This draft regulation prohibits the discharge of waste waters containing concentrations of lead greater than 3 mg/L into a sanitary or combined (that is, sanitary and storm) sewer network if the network serves a population of 5,000 persons or less, and 10 mg/L if it serves a population of 20,000 or more. There are proportional intermediate values depending on the population served (section 3 and 6(g)). Under section 6(i), moreover, the discharge of lead not contained in sewage is prohibited at all times.

Section 7 of the draft Regulation respecting discharges into sewer networks concerns discharges into storm sewers but does not mention lead as one of the prohibited substances. From this we must conclude that under the draft regulation, it is not prohibited to discharge lead into storm sewers. However, section 3(2) of the Regulation respecting liquid waste management reads as follows:

Subject to the provisions of the Regulation respecting discharges into sewer networks made under the Act, the same prohibition shall apply to the discharge, deposit or dumping of liquid waste into a sewer network operated by a municipality or person contemplated in the third paragraph of section 32 of the Act.

There are two possible interpretations of this. If we are concerned with the discharge of lead into a storm sewer network under conditions where the Regulation respecting liquid waste management (section 1(b)) does not apply, then under section 7 of the draft Regulation respecting discharges into sewer networks, which is the only applicable regulation, the discharge is permissible. On the other hand if we are dealing with the discharge of lead into a storm sewer network and the nature and amount of the discharge are such that the Regulation respecting liquid waste management applies, then both regulations are applicable, and one of them prohibits the discharge while the other permits it. It is our opinion that in such a case, the draft regulation, if it is adopted, would take precedence, and thus it would be permissible to discharge liquid wastes containing lead into a storm sewer network. This conclusion is based on the following two reasons: first, the use of the expression "subject to" in section 3(2) of the regulation and second, the fact that the more recent special provision in section 7 of the draft regulation takes precedence over section 3 of the Regulation respecting liquid waste management.

4 Vinyl Chloride

According to the scientific literature consulted, vinyl chloride is essentially insoluble in water. When mixed with other liquids such as alcohol, however, it can be introduced into water; it would thus fall under the definition of liquid waste given in section 1, paragraph (b) of the Regulation respecting liquid waste management (QOQ 1975, Part II, Vol 107, No 36, 8/10/75, p 5291).

If this interpretation is correct, then the emission of vinyl chloride into the environment is fully prohibited, unless the establishment emitting the chemical holds an operating permit for a liquid waste management system. The prohibition contained in section

3 sets a standard of zero emission, and makes the liquid waste a contaminant prohibited under section 20 of the Environment Quality Act. The penalties for infractions of the regulations will therefore be those provided for in section 106 of the Act - a maximum of \$5,000 for the first offence and \$10,000 for all subsequent offences - rather than the lighter penalties provided for in section 109.

CHAPTER V

PROCEDURE FOR SETTING STANDARDS

In Quebec, standards for the quality of the work environment are set by regulations adopted under the authority of general enabling statutes. When the Environment Quality Act was passed, the minister concerned promised that before regulations were adopted under the Act, they would be discussed by a committee of the legislature in public hearings and study sessions (Kenniff and Giroux, op cit, p 70, note 159). This promise has not been kept and until now the procedure followed has been that set out in section 124 of the Act. Under this provision, the minister publishes a draft regulation in the Quebec Official Gazette sixty days before it is to be submitted for enactment by the Lieutenant Governor-in-Council. The minister is obliged to hear all written objections sent to him within the sixty-day period. As yet, it is difficult to make a concrete evaluation of the practical implications of this procedure. We do not know which individuals or groups have made use of this consultation mechanism, or the nature and scope of the hearing given them by the minister. However, we do know that the sixty-day deadline can be considerably extended, because, for example, the draft Regulation respecting the quality of the occupational environment, published 12 February 1975, has not yet been enacted.

In addition to the statutory procedure, the minister has recently submitted the draft Regulation respecting the quality of the atmosphere to the Standing Committee of the National Assembly on municipal affairs and the environment (Journal des débats, commissions parlementaires, 14, 15 and 16 September 1976, No 140 to 142). It is important to note that only one organization for protection of the environment - STOP, the Society to Overcome Pollution - has appeared before the Committee during its three days of public hearings. The other interveners were private consultants or industry representatives.

CHAPTER VI

RESEARCH ON INDUSTRIAL DISEASES

Whatever the value of the research done by manufacturing concerns on the detection and prevention of industrial diseases, their efforts are often criticized. The two main reasons for this are, first, that access to the findings is often difficult for those most concerned - the employees and the unions - and second, that business is suspected of a biased attitude which undermines the objectivity of any scientific investigation. A parallel research effort, mainly carried out by the government but sometimes pursued in co-operation with industry, could be proposed to reduce the dominant role of private research. In addition, the government could play an important role in the area of promoting information exchange among research organizations. It might even go as far as requiring such organizations to make their findings available to a central co-ordinating body. The government could also intervene to require that the effects of a new substance on the human body be evaluated before its introduction for use in a manufacturing process.

There is no confirmation in the statute law of Quebec, or in its regulations, of the government's desire to have research into industrial diseases serve these objectives. There are very general texts which, when freely interpreted, could authorize the government to adopt such objectives without introducing new legislation, but in the face of these vague provisions, inaction seems more probable. By way of example, the Department of Social Affairs is authorized to take necessary steps to promote the health of the population and among other things, to create a health research council (Social Affairs Department Act, SQ 1970, c 42, s 3, 10a). No regulation has been issued under these provisions.

The Public Health Protection Act, although most of its provisions deal with contagious or venereal diseases, contains some general provisions making the Department of Social Affairs responsible for the detection and treatment of disease, the collection and analysis of medical and epidemiological data and data on the occurrence of diseases (section 2). The Lieutenant Governor-in-Council, for his part, is empowered to adopt regulations obliging employers to divulge the contents of the records they are required to keep (section 50, paragraph q). The Regulation under the Public Health Protection Act (QOG 1974, Vol 106, No 10, p 1827) mentions nothing about the collection and analysis of data or the content of records. For the moment, therefore, these provisions of the Act remain a dead letter.

There is also the Centre de recherche industrielle du Québec, established in 1969 (SQ 1969, c 62), one of the objectives of which is to conduct "research in applied science" (Charte du CRIQ, art 17). Aside from this all-encompassing formula, nothing empowers this body to carry out research on industrial diseases.

Lastly, the criticisms directed at the Workmen's Compensation Commission over asbestos-related industrial diseases could probably also be made with respect to the effects of vinyl chloride. The Commission is accused of neglecting research and prevention, and of concentrating on its functions of compensation and insurance (Comité d'étude sur la salubrité dans l'industrie de l'amiante, Rapport préliminaire, April 1976, pp 15-16; Rapport final, October 1976).

How, then, is the government's research effort directed? Assuming that it exists, it is being carried out by the agencies which enforce measures for the monitoring and control of known dangers. In legal terms, preventive research is of little account, and the lack of legislative recognition makes it impossible to appropriate public funds for such endeavours in the field.

CHAPTER VII

WORKER COMPENSATION

The problems associated with the compensation of workers suffering from industrial diseases and those who are victims of industrial accidents stem in both instances from the difficulty of using private law remedies, and therefore Quebec legislation considers the two areas together. The main difficulties lie in establishing the proof and a causal relationship.

If an industrial disease prevents a worker from earning full wages at the work at which he was employed, or if it causes his death, and the disease is due to the nature of the work performed within the twelve months previous to the date of disablement, then section 105(1) of the Workmen's Compensation Act (RSQ 1964, ch 159) entitles the worker or his dependants to compensation for the accident, as provided in the Act. On the other hand, the Act deprives him of his right to a civil remedy against his employer.

To make it easier to prove eligibility for compensation, the Act stipulates that, if on or immediately before the date of disablement, the worker exercised an occupation identified in the Regulation, and if the disease from which he suffers is one of those specified in the Regulation as being linked to that occupation, the disease shall be deemed to have been caused by his employment (Workmen's Compensation Act, section 105(8) and the Regulation determining industrial diseases, QSR 1972, Vol 6, p 6-811). A residual provision creates an identical presumption for any disease which is characteristic of a given occupation. The industrial diseases listed include lead and mercury poisoning, diseases resulting from exposure to X-rays or other radioactive substances, and asbestosis and other pneumoconioses. Diseases linked to vinyl chloride and oxides of nitrogen come under the purview of the residual provision.

The presumption is, however, of no benefit to any worker who wilfully and falsely represents himself in writing as not having previously suffered from the disease for which he is claiming compensation. In such case, he loses all right to compensation (s 105(1)).

One of the problems with the way the present Act deals with industrial diseases is that the period during which the disablement must become apparent is very short. Under section 195(1), the disease must develop in the twelve months following the performance of the work liable to cause the condition in question. For asbestosis and silicosis, the development period is extended to five years. Once this time has elapsed, the Commission may still accept a

claim if it feels that the claim is justified (s 108). These time limits are too short to allow for the appearance of some insidious diseases associated with the substances under study here.

It was partly to deal more equitably with the victims of asbestosis and silicosis that a 1975 statute (SQ 1975, ch 55) established a special compensation plan for workers who contract these diseases in mines, quarries and related industries operating on the site. This plan, which supplements the provisions of the Workmen's Compensation Act, is administered by the Workmen's Compensation Commission.

CHAPTER VIII

CIVIL LAW REMEDIES

As we have seen, the difficulties encountered by workers in establishing their claims before the courts for damages resulting from industrial accidents or diseases led to the creation of a special compensation plan. However, this plan does not cover damage suffered by persons exposed to the contamination resulting from the discharge of toxic substances into the environment when the victims are not employed by the industry responsible. A glaring example of this is the mercury poisoning among the Indians and Inuit of northwestern Quebec. For such victims, the only remedies must be based on civil law.

Under civil law, there are only a limited number of remedies available; we will attempt to define their scope below. Private law recognizes two types of remedy against the industry responsible: the injunction and the action for damages. An injunction may be treated as an independent remedy, or may be joined to an action for damages.

The injunction is a drastic remedy. If granted, it will either result in the closing of the plant, or necessitate considerable expenditure in equipment and labour. The court does not concern itself with the practical difficulties that an industry might have to face in complying with the court order. Some famous decisions have thus simply ordered companies to stop polluting the atmosphere: Canada Paper Co v Brown (1922) 63 SCR 243; McKie v KVP Co, (1949) SCR 698. In 1926 the Quebec legislature reacted to this legal precedent by providing, under the Cities and Towns Act, that injunctions may not be granted against pulp and paper mills and other industries established for more than five years, if the industry has been authorized by municipal by-law to operate in the community. Once such a regulation is adopted, it cannot be repealed (SQ 1926, ch 37, which became section 427(18) of the Cities and Towns Act). Under the former Mines Act (RSQ 1964, c 89), foundries in some townships in northwestern Quebec were also protected from injunctions (sections 121, 122).

However, the balance of convenience must be taken into account when the injunction requested is an interlocutory injunction. The judge hearing the claim has to determine which of the two parties will be most adversely affected during the trial period - the respondent, if the injunction is granted, or the applicant, if his claim is dismissed. (For Quebec law, refer to Beaulieu v Brique Citadelle Ltée (1971) CS 181; Gros-Louis v SDBJ (1974) RP 38, pp 203-204). When a permanent injunction is requested the judge must

limit himself to considering the merits of the claim (Fasano v Pierrefonds, (1974) CS 460).

The other type of remedy, the action for damages, is based on Article 1053 of the Civil Code. In Quebec, liability is based solely on this provision which, as a prerequisite for reparation, requires the applicant to establish the fault committed by the respondent, the damage incurred, and the existence of a causal relationship between the fault and the damage. For the matter which we are considering, the courts have added a particular gloss to the rule based on the theory of troubles de voisinage (roughly analogous to the common law of private nuisance). An enterprise (regardless of its title to the land) is considered responsible for any damage to adjacent areas caused by its activity when such loss exceeds the normal inconveniences of the area (J-L Baudouin, La responsabilité civile délictuelle, Montreal, PUM, 1973, No 80 et seq). We should point out, however, that each new set of circumstances must be independently evaluated, since normal conditions may vary from one district to another (see Drysdale v Dugas (1896) 26 SCR 20).

In the case of diseases resulting from environmental contamination, liability suits at civil law are inadequate in several ways. Often it is difficult to identify the author of the damage since several industries may contribute to the contamination. The fundamental difficulty, however, lies in establishing a causal relationship between the damage incurred and the conduct of a given industrial activity. Sometimes it is difficult to prove fault, since in many cases contamination results from the normal operation of a given type of industrial plant, and often the enterprise is protected by administrative authorizations or at the very least is not breaking any regulations. Furthermore, the special rules applicable to situations of troubles de voisinage are often inoperative when the source of contamination and the place where the damage is incurred are geographically separated. Lastly, the one-year time limit which applies to bodily injuries resulting from a wrongful act may give rise to problems in cases where the damage appears gradually or not for several years, even if it is generally accepted that the time limit begins when the damage first appears (Civil Code, section 2262(2); Baudouin, op cit, Nos 731, 732).

For water pollution, civil liability rules are supported by certain provisions of the Civil Code with respect to natural or legal servitudes. In such cases, a special remedy, the action négatoire de servitude exists to prevent an enterprise from discharging a contaminant into a water course upstream from the plaintiff's property (for a general explanation, see P. Kenniff, "Le contrôle public de l'utilisation du sol et des ressources en droit québécois - I", (1975) 16 Cahiers de Droit 763, pp 818-821).

The inadequacies of the existing legal system with respect to protecting individuals against the hazards of environmental pollution should be obvious. (For a detailed analysis of this problem in French law, see Patrick Girod, La réparation du dommage écologique, Paris, LGDJ, 1974). The insufficient protection of the individual in his occupational environment has already come to general attention, and to remedy the situation, the legislator has introduced a special compensation plan in the form of workmen's compensation. It is imperative that consideration now be given to the advisability of providing comparable redress for victims of pollution of the general environment.

CHAPTER IX

GENERAL CONCLUSIONS

After going through this paper, the reader will doubtless be struck by the multiplicity of regulations that may apply to the toxic substances discussed herein, both in the work environment and the general environment. The effects of this multiplicity of regulations, which sometimes overlap, are aggravated by the fact that there are too many agencies involved in their administration. As a result, the regulations are occasionally difficult to enforce. In our opinion, simply adding new provisions to the regulations is no solution in the absence of some clarification and redistribution of administrative responsibility among the various departments and agencies involved in the fight against industrial pollution. Such a redistribution initially requires a precise definition of the role and objectives of each body. In particular, the protection of worker and public health must be dissociated from the functions of industrial and economic promotion.

Existing regulations concerning the detection and treatment of diseases and toxic effects produced by the substances under study are often inadequate because they do not provide for the standardization of medical examinations or the availability of epidemiological data. As mentioned, the best Regulation dealing with this matter is the 1944 Regulation respecting industrial establishments, which unfortunately is soon to be repealed. It is imperative that a new regulation under the jurisdiction of the Department of Social Affairs be passed to ensure continuity in the disease detection system. At the same time, provision must be made for research to be conducted parallel to that being carried out by industry, so that epidemiological and experimental data can be collected and centralized when a given dangerous substance is being investigated.

It was during our study of asbestos that the seriousness of the problems related to mining contaminants was most clearly brought home. If we consider the fact that according to the Department of Natural Resources, the Regulation respecting industrial establishments and the draft Regulation respecting the quality of the occupational environment do not apply in mines and ore processing and treatment plants, we might well wonder whether Quebec workers are adequately protected against the dangers of this Province's leading industrial contaminants. Instead of creating numerous special regulations to compensate for the inadequacies of existing legislation with respect to mines, it would seem preferable to solve the problem once and for all by extending the application of existing

regulations concerning safety standards for industrial establishments to the mining sector. It is high time to change the traditional policy in Quebec which favours the development of the mining industry without subjecting it to the controls which apply to other sectors of the economy.

The effects of certain other contaminants (especially mercury), which are as harmful on a long-term basis as are those of asbestos, are more subtle - they have repercussions on the food chain and the general environment. Today Quebecers are being forced to face a painful reality which they have ignored far too long: it is fundamentally wrong to judge the merits of a policy aimed at preventing contamination uniquely on the basis of a cost-benefit analysis that considers only the short-term economic effects and places little emphasis on the possible long-term social consequences. Dumping large amounts of mercury into the environment was once no doubt a simple way of keeping production costs down. But the savings made at that time are now resulting in social costs which have to be paid by the whole population: closed fisheries, serious diseases, loss of the use of public lands, and a constant, invisible threat to public health. In view of these facts, can yesterday's savings still be justified today?

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