blic Inquiries in Canada

Science Council of Canada

Background Study 47

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with the assistance of
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by Liora Salter,
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"Those who are experts have no questions. . ."

(from interview with a former member of the Reactor Safety Advisory Committee of the Atomic Energy Control Board of Canada.)

TO THOSE WHO HAVE QUESTIONS

Contents

Foreword

In 1978, the Science Council undertook a major study on "Science and the Legal Process." The goal of this study was not only to examine how the law deals with social issues containing a significant scientific component, but to recommend changes that would enhance cooperation between the two disciplines without diminishing the integrity of either.

The Science and the Legal Process committee was interested in examining the role of public participation in decision making, for decisions with underlying scientific uncertainty often emphasize ethical and moral issues. Therefore the committee commissioned this study to explore how scientific and public considerations are incorporated into the inquiry process.

In *Public Inquiries in Canada*, Liora Salter and Debra Slaco examine six inquiries to determine their value as a scientific assessment, their ability to combine scientific data with policy considerations, and their effectiveness in extending public debate on scientific issues. The authors explore the internal operations of inquiries and, in addition, set them within the context of the larger decision-making process. Their study enabled the authors to recommend guidelines for establishing a sensitive and responsive process. They make recommendations concerning public participation, incorporation of scientific assessment, and the handling of scientific and policy questions in inquiries.

In doing so, the authors have contributed significantly to the existing literature in the area. The Science Council is pleased to make their report available to the public. As with all background studies published by the Science Council, this study represents the views of the authors and not necessarily those of Council.

Maurice L'Abbé
Executive Director
Science Council of Canada

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Summary

In spring 1979, the Science Council commissioned a background study of the way scientific assessments are made. Six inquiries were chosen for intensive study; three on nuclear-related development, two evaluating potentially dangerous products and one, a hearing before a regulatory agency, providing an assessment of problems connected to a new technology. We chose to examine the following questions: How effective is an inquiry in producing a scientific assessment? What combinations of science and policy making occur in an inquiry? And how effective is an inquiry in extending the public debate on scientific issues?

The study located a number of problems connected with inquiries, but concluded that an inquiry is better suited to the task of assessment than most regulatory agencies or parliamentary committees.

It was our conclusion that there is no "best way" to run an inquiry. The nature of the problem to be investigated and the kind of information being sought should determine what procedures are used.

Inquiries cannot resolve every conflict nor satisfy all of their intervenors, no matter what procedures or approaches are used. An inquiry represents a temporary forum that involves institutions and advocate groups that have responsibilities and loyalties elsewhere. What makes inquiries unique is their ability to stimulate research and to involve new groups and individuals directly in policy making; all with a high degree of public visibility.

An inquiry, however, is just one item in the general political lexicon. It may assess applications for projects after most of the decisions have been taken. It may evaluate products already in wide circulation or assess new technologies after their impact has been felt. Again inquiries often react to conditions not of their own making, and therefore mirror debates and decisions made elsewhere.

Several problems connected with using inquiries for scientific assessment can be identified. For example, relatively little science and few unaffiliated scientists were associated with the inquiries we studied. Much of the data presented at inquiries was at the

level of popular science and basic data, thus tending to mask serious scientific controversy.

Scientific information is submitted to inquiries by those having no formal scientific training. Their expertise comes from their evaluation of technical scientific literature, from assessment reports made public through the inquiry and from the media. Public intervenors usually centre their testimony around what they consider to be "the facts of the case." Few unaffiliated scientists intervene, and those associated with corporations or government departments often confine their remarks to policy questions. Their claim to scientific expertise is implicit in their credentials. Frequently scientists discount information presented by non-scientists as being unscientific without confronting what intervenors have suggested are "the facts." Participants, both scientists and non-scientists, are often members of loosely knit information networks or form circles of those with similar attitudes who then circulate selected information only among themselves. The existence of these information networks, even among proponents of projects, can transform an inquiry from an investigation into a debate centred primarily on the credibility of the competing networks. Only a few inquiries carry out original scientific research. The majority provide inadequate resources to analyze or accommodate scientific data. In issues like nuclear development, the multiplicity of jurisdictions involved led to an artificial separation of the issues. When a number of different agencies each carry out separate studies or when judgements are made within a limited framework, then the wider effects of technology on society and the environment are masked.

The comprehensive approach such as that taken by the Ontario assessment procedure or the Porter inquiry, is, in the long run, no more successful for it becomes unwieldy and its conclusions are seldom used or easily ignored. Inquiries produce one-shot assessments. Relationships within those communities that are caught in a process of change, long-term effects of technologies and the problems of changing designs, standards and enforcement are not successfully evaluated in a single assessment. Therefore, inquiries are unlikely to provide an effective understanding of the impact of new technologies.

Inquiries operate under pressure to produce data that is conducive to comparison and, by implication, to simple policy choices. For example, risks are compared, alternative sites for a project proposed and various costs estimated. Such comparisons narrow scientific assessment to that which can be easily quantified. Social questions, therefore, are often studied only through the collection of demographic data. Ethical questions are reduced to a cost/benefit analysis, and the quality of life in a community is

projected through its employment figures or alcoholism statistics. While these figures may be useful in determining how to mitigate the effects of a project they are insufficient to provide an understanding of the effects of technological development.

Many inquiries centre their scientific assessment around the concept of risk for it also allows comparison between clear options and is usually amenable to quantification. In the case of diseases or occupational hazards of long standing, risk assessments can be treated as a scientific question in a quantitative way. But when a new project is being proposed then statistical or probability studies are often inappropriate and risk assessment may involve social and value assumptions.

At best, risk assessment of large projects tends to shift the focus of an investigation into the sphere of engineering so that the overall evaluation becomes problem oriented and pragmatic. Assessment itself tends to be based on a "fail safe" principle. For example, developments are presumed to be safe, and problems amenable to solution, unless proven otherwise. Under such conditions, the burden of proof falls solely on the opponent of the project and this proof may be difficult to establish. For those who seek an open-minded, scientifically-conducted assessment, an orientation towards engineering considerations produces profound dissatisfaction.

Inquiries must choose between centring their work on open research or on arbitration. The latter approach produces clear policy recommendations but has the prerequisite of independent research, competing applications and a high level of scientific certainty. When lacking this base, inquiries taking the arbitration approach often appear to polarize and stereotype issues. Philosophical debate supplants scientific assessment, and, as a result, the assessment suffers.

Generally inquiries make few distinctions amongst participants. But intervenors operate under very different constraints. A layperson, for example, may be intimidated and overwhelmed by the resources required for participation, but does not stand in legal jeopardy for statements made to an inquiry. Institutional intervenors, on the other hand, represent their employers and, because their submissions can later be used in court, they are liable for any statements they make. On the other hand, institutions possess far greater resources for participation. An imbalance, therefore, results: public intervenors often believe that they alone bear the burden of being educated in an inquiry or see the inquiry as being biased because negligence is not clearly identified.

The role of the intervenors is little understood. They are treated as an interest group in a negotiation process, as paraprofessionals in a planning process, as a source of supply for

scientific information, and as a representative sample of public opinion. Only the final role is inappropriate in an inquiry but even then, measures must be designed so that participation is to the best effect. The limits to participation are great and public dissatisfaction with poorly run inquiries runs high for they are held to reflect the powerlessness that most people feel.

Most inquiries result in regulation, or depend upon regulatory agencies to carry out continuing assessment and monitoring. Yet regulation in Canada seldom meets the expectations of inquiries or their participants. Usually, it involves a cooperative relationship between industry and government with the negotiation of interests through a committee structure. Often agencies have neither the will nor the research capability to act as "watchdog" bodies, and thus are unable to perform the tasks assigned to them by inquiries.

Glossary

Abbreviations used in more than one case study including federal bodies:

AECB	Atomic Energy Control Board
AECL	Atomic Energy of Canada Limited
CAC	Consumers Association of Canada
CNA	Canadian Nuclear Association
DOE	Department of Environment (now Environment Canada)
DREE	Department of Regional Economic Expansion
EARP	Environmental Assessment Review Process
EMR	Energy, Mines and Resources Canada
NEB	National Energy Board
NRC	National Research Council
RSAC	Reactor Safety Advisory Committee

Point Lepreau Hearing:

DMA	Department of Municipal Affairs (New Brunswick)
DOENB	Department of Environment (New Brunswick)
EARP	Environmental Assessment Review Process (federal)
NBP	New Brunswick Power Corporation

Cluff Lake Board of Inquiry (Bayda Inquiry):

Amok	The applicant company
DMR	Department of Mineral Resources (Saskatchewan)
DOE	Department of Environment (federal)
DOES	Department of Environment (Saskatchewan)
DOL	Department of Labour (Saskatchewan)
DNS	Department of Northern Services (Saskatchewan)
NFU	National Farmers Union
NMC	Northern Municipal Council
RGNNS	Regina Group for a Non-Nuclear Society
SES	Saskatoon Environmental Society
SMDC	Saskatchewan Mining Development Corporation
SFL	Saskatchewan Federation of Labour

Royal Commission on Electric Power Planning in Ontario (Porter Inquiry):

ACE	Advisory Committee on Energy (Ontario)
DNR	Department of Natural Resources (Ontario)
DOE	Department of Environment (federal)
DOEO	Department of Environment (Ontario)
EAB	Environmental Assessment Board (Ontario)
MOE	Ministry of Energy (Ontario)
NEB	National Energy Board
OCNR	Ontario Coalition for Nuclear Responsibility
OEB	Ontario Energy Board
P/P	Hydro's Public Participation Program (Ontario)
TFH	Task Force Hydro

The Aluminum Wiring Inquiry:

AWHOA	Aluminum Wiring Home Owners Association
CCA	Consumer and Corporate Affairs Canada
CCF	Concerned Citizens Federation
CSA	Canadian Standards Association
DCCR	Department of Corporate and Consumer Relations (Ontario)
EEMAC	Electrical Equipment Manufacturers Association of Canada
UL	Underwriters Laboratory

The Royal Commission on Non-Medical Use of Drugs (Le Dain Inquiry):

FDA	Food and Drugs Act
HWC	Health and Welfare Canada
NARF	Narcotics Addiction Research Foundation (Ontario)
NCA	Narcotics Control Act

CRTC Hearing on the Telesat Canada-TCTS Merger (Satellite Hearing):

DOC	Department of Communications (federal)
CRTC	Canadian Radio-television and Telecommunications Commission
CTC	Canadian Transport Commission
ITC	Industry, Trade and Commerce (federal)

I. The Study

Inquiries have always been used in Canada as a means of determining policy options. The Massey Commission, the Bilingualism and Biculturalism Commission, and the Glassco Commission stand as benchmarks in Canadian political history. In the past five years, however, the operation of inquiries has changed. They are now used for a wider variety of purposes, and as political bodies have attracted greater attention for they sit at the centre of debate on the public's role in policy making. Inquiries have become part of the many newly created forms of environmental assessment and are standard in the consideration of a major development project. Often they are commissioned to bring a fresh approach to questions traditionally considered in the legislature, behind closed doors in government departments, or by regulatory agencies.

Inquiries have become the focus of extensive experiments in public participation for they attempt to bring the public directly into the planning process. In addition, inquiries are still commissioned to respond to the demands of active and often noisy advocate groups.

This background study was commissioned by the Science and the Legal Process committee of the Science Council of Canada as an exploration into the nature of scientific consideration of policy issues through inquiries. The study presents the results of a close investigation of six inquiries and, naturally, begins with the premise that inquiries are useful.

"What is scientific consideration" and "who were the scientists" quickly became problematic. Not all inquiries are "scientific," of course, but most make some claim to be conducting a

scientific assessment. This study focuses directly on those claims and on the nature of the scientific assessment actually done in inquiries. It explores the roles played by scientists and the public. Finally, inquiries are useful because they facilitate an assessment by providing resources and a forum for discussion, and they enlarge and extend both the public and the scientific discussion of an issue.

The Berger inquiry is regarded as a watershed in the history of inquiries in Canada.[1,2,3] Since that time, many people have assumed that a scientific assessment is or should be part of the inquiry process, and that an inquiry is the necessary first step before any major development can take place. Every application for a new pipeline, oil port, uranium mine or power plant now seems to be accompanied by a "scientific assessment" and an inquiry. The research function normally carried out by government or university departments has been supplemented, and occasionally supplanted, by an investigation through an independently commissioned inquiry. Since the Berger inquiry, many people assume that scientific assessment is made possible through inquiries, for they alone permit the incorporation of the full range of information.[4]

It has also been assumed, though often implicitly, that inquiries mesh well into existing procedures of investigation and decision making. Inquiries, it is said, may often cause delay, but the public contribution made possible through them makes the costs worthwhile,[5] and it is assumed that the research demanded by inquiries from the proponents of new projects will be adequate to meet the demands of the interested public.

These assumptions are problematic. How much an inquiry can or will function as a surrogate research team remains to be seen, and the nature and quality of its research remains to be tested. The Berger inquiry may have caught the mood, aspirations and special characteristics of the northern native population, but other inquiries investigating the same or different issues have not been so successful. The quality of the research carried out by the Berger inquiry and its methodology have also come under attack, mainly in the daily press. Indeed the research done by proponents of new products and developments is not always capable of withstanding careful scientific review.

It is important not to mask the relationship between inquiries and politics. Those who participate in inquiries play roles in other political processes and often carry their debate into the inquiry forum. Inquiries are commissioned because governments consider that they will accomplish specific tasks and the public participates because they believe that inquiries have specific uses. Often these two views are not in agreement, and occasionally they stand in stark contrast. Inquiries can be accompanied by government

appointed task forces, advisory committees, and coordinating committees with membership from government departments and industry. All these bodies are used for public consideration of issues and sometimes an issue raised in an inquiry is also discussed by a number of other policy bodies mandated by the same government.

Viewing scientific assessment as an integral part of a public inquiry ties science directly and visibly to its industrial applications. The results of this close linkage have not yet been fully analyzed.

The inquiry involves both the public and scientific community directly in decision making; however the participation of unaffiliated scientists, who are not hired by a proponent, government or advocate group, is rare. The implications of the level or type of participation have not yet been analyzed. While the report of the Berger inquiry was welcomed by some of its participants, in other cases reports have been rejected by participants or criticized harshly. Indeed, the role of the inquiry in the more general political process has not yet been determined.

It is important not to mask the relationship between inquiries and those who participate in them. Governments, proponent companies, government departments and the variety of advocate groups may not share goals or approaches, but for a relatively short period, they are all bound together in a common process and kept in almost daily contact while working under the harsh light of public scrutiny. The impact on each participant clearly affects the discussion of issues.

These topics, emerging in part from the sometimes casual assumptions that accompany the commissioning and use of inquiries, provided the direction for this study. Inquiries were studied in the context of the more general decision-making process of which they are a part. No two inquiries are alike, therefore each was studied individually. They were studied as "scientific assessment" bodies and also as a part of overall policy making.

Our focus is on the various public issues that emerge through a multiplicity of bodies such as inquiries, regulatory agencies and task forces. Because this study was commissioned by the Science Council whose interest lay in finding better ways of bringing science and policy together, the emphasis is on the inquiries themselves, rather than on their participants. The relationships among inquiries, issues, participants and policy making, however, are stressed throughout the study.

Six inquiries were chosen for study.

1. Royal Commission into the Non-medical Use of Drugs (Le Dain).
2. Commission of Inquiry into the Safety of Aluminum Wiring, Ontario.

3. Federal Assessment Hearing for the Point Lepreau Nuclear Power Plant, New Brunswick.
4. Cluff Lake Board of Inquiry into the Expansion of Uranium Mining in Saskatchewan.
5. The Royal Commission Into Electric Power Planning in Ontario (Porter).
6. Canadian Radio-television and Telecommunications hearing for the application for a change in the corporate relations between Telesat Canada and the TransCanada Telephone System.

Some were constituted and formally mandated as inquiries. Others were hearings under an assessment procedure or a regulatory agency. All involved research, assessment, public participation and specific recommendations for policy. The Le Dain inquiry was chosen because it was one of the first inquiries to stress both science and direct public participation. The Commission of Inquiry into the Safety of Aluminum Wiring made an interesting comparison with the Le Dain inquiry for both investigated products that were deemed by some members of the public to be dangerous and both operated in an atmosphere of public controversy. No two inquiries could have been more different.

There is at present a demand for a national inquiry into nuclear development, but should one be called, it would follow many others that have been conducted in Canada during the past five years. The federal assessment hearing for the Point Lepreau nuclear power plant in New Brunswick was probably the first hearing on nuclear-related development. The Cluff Lake Board of Inquiry into the expansion of uranium mining in Saskatchewan was among the most controversial, and the Porter inquiry was probably the most comprehensive. A comparison among the three is therefore informative.

Inquiries are frequently compared to regulatory agency hearings. Indeed many agencies can and do perform identical functions to inquiries. In addition, inquiries usually recommend the writing of new regulations or the creation of a new regulatory agency. Thus, a study of how and when an issue is assessed within an agency indicates the impact of the regulatory process on assessment. The public hearing conducted under the Canadian Radio-television and Telecommunications Commission into the application for a change in the corporate relations between Telesat Canada, Canada's domestic satellite communications company, and the TransCanada Telephone System (TCTS) provides a good example of the nature of regulatory consideration and the relation between a technological assessment and economics.

It was felt that certain issues and some inquiries, for example the Berger inquiry, had been "over-studied" and were unlikely to

reveal fresh insights. The issues chosen were current, and the subject of several inquiries, while relatively unstudied, clearly involved scientific assessment. The Berger inquiry, only to the extent that it is well known, provided a useful point of departure for the discussion of other inquiries.

The question of what constitutes "an inquiry" has not yet been answered. Royal Commissions are created by mandate; other inquiries take place with a minimum of fanfare within government departments. The hearings of some regulatory agencies resemble official inquiries. Some inquiries have excited little public or scientific participation. An inquiry, for the purpose of this study, is an investigation, conducted by a body independent of government departments, which involves both assessment and the opportunity for participation. The distinction between formally mandated "inquiries" and other public assessment procedures is not given importance.

Inquiries leave different records. In part, these documents indicate the practices of the inquiry but they also simply reflect the way that notes were kept. The availability of written records poses a problem when one tries to make a direct comparison between inquiries. In the cases studied, the various records were simply incomparable.

Inquiries differ amongst themselves. Even Royal Commissions of the same government differ with respect to the questions under discussion, the procedures used, the way subjects are treated, and the role of the public. Any comparison that did not focus on the *difference* would inevitably be a shallow study. Yet, it is also important to demonstrate what they have in common.

Each inquiry is treated here as a separate study. The reader has to become familiar with a great deal of background information but a short chronology is included and each case study concludes with an analysis of some points that are unique to that inquiry. Following the case studies, four chapters explore the relationship among inquiries, science, policy, and participants. Because each inquiry is a unique and specific response to particular circumstances this more general analysis cannot be inclusive. Sometimes it applies to the six cases studied; often it does not.

Inquiries are taken to be a forum through which specific public issues are addressed. The history of discussions, consideration, and other assessment of these same issues through other public bodies is also included. It is assumed that policy issues, and the inquiries themselves, should be studied in context and in relation to the decisions and patterns of decision making established. It is assumed that policies are developed through a series of events, decisions and meetings. Some of these meetings are formal and some informal. Some of the decisions are explicit but many are

implicit. Policy making is a continuing activity, the prerogative of governments, government departments, corporations, inquiries, and occasionally, the public.

It is generally accepted that it is easy to interview people who have little access to decision making. People in poor communities have become accustomed to the social scientist who uses their neighbourhood as a social laboratory. However, government and corporate leaders, who may be experienced in giving interviews, are seldom studied. A study such as this, which hopes to bring together the *candid views* of both governmental/corporate and public participants must take these factors into account. It must respect the right of individuals, groups, and communities to protect themselves from outside intrusion, even in the name of science. In addition, it must find ways to study powerful institutions.

Those who were interviewed were promised anonymity and whenever a name has been used in this text, it is with the speaker's express permission. People spoke freely and often at length. This study was dependent on this cooperation, and is the product of their trust.

The study of each inquiry began with a review of the available documents. In the case of inquiries of long duration, some sampling was necessary. Thus, in the case of the Porter and Cluff Lake inquiries, a sample was drawn from the transcripts consisting of the proceedings of every fourth day of the hearings throughout the inquiry. In the case of the Le Dain inquiry, the sample was drawn from written interventions and included one fourth of all interventions, chosen at random. The entire transcripts of the Aluminum Wiring Inquiry, the Point Lepreau hearing and the Telesat Canada/TCTS hearing were analyzed.

In addition to the transcript materials from each inquiry, an analysis was made of other documents including consultant reports, letters, correspondence and, of course, the inquiries' final reports. The questions directing this analysis included:

a) What was the context in which the inquiry took place?
b) What was the nature of the participation?
c) What claims were made by intervenors as being representative of, or expert in, the questions addressed by the inquiry?
d) What was the nature of the issues being raised?

The background material to each inquiry was also analyzed. In all cases, this included relevant legislation and policy documents and, in some cases, reports and documents from other inquiries and other independent studies. The purpose of this analysis was to determine the context within which the inquiry had taken place. In a few cases, these materials provided insight into the way issues had been addressed.

A methodologically sophisticated analysis of the documents was not attempted for the amount of information that could be gained by such an approach would not have justified the necessary time and resources. Care was taken in categorizing the issues discussed, but the tables in this study should be read as an approximation of the nature of the issues raised.

A number of people connected with each inquiry were interviewed. In each case, an attempt was made to interview one or more of the inquiry's commissioners, two or more of the staff, several members of advocate groups and some of the scientists who made contributions. Those interviewed were selected because they appeared, from the transcripts, to have made a significant contribution and because they were available. Interviews ranged from one to three hours and the range of topics covered was broad. Almost all the interviews were taped, with the permission of those being interviewed, and the tapes were transcribed. While names are not used, in almost every case some indication is given of the role played in the inquiry by the person being interviewed, especially with reference to the issue being discussed. Eighty-five interviews were conducted. While further interviews might have resulted in different points of view being expressed, time and resources set limitations on what could be done.

An important question considered in this study is that of the nature of participation in inquiries. Where information was available, and to the extent that it was complete, an attempt was made to categorize the source of participation. Some clarification of the terms used is given below:

- "Affiliated groups" have an on-going relationship with the issues under discussion in an inquiry. Energy Probe is an example of an "affiliated group" for those inquiries that dealt with nuclear development.
- "Unaffiliated groups" interests lie outside the specific subject of the inquiry. A school board intervening before the Porter inquiry is an example of an unaffiliated group.
- Where affiliation was not indicated, the intervenor is categorized as an "individual". Because affiliations are not always given, it is impossible to gauge the full extent of individual or group participation. In each table therefore the figures given are an approximation based on the data available.
- "Advocate groups" are those groups whose common bond is a particular point of view on an issue.
- "Membership or client groups" are those groups who are drawn together primarily by the common status of their members. A church or a union is considered to be a membership group. Membership groups might, by definition, take a range of positions on a number of quite different issues.

• "Voluntary or service organizations" are those groups whose "members" are drawn together because of their provision for, or orientation towards, servicing particular segments of the population.

• "Government bodies" include elected officials, agencies, government departments, schools and school boards.

• "Corporate bodies" include corporations or those representing corporate groups through publicly-oriented corporate interest groups. The Canadian Manufacturers Association is an example of the latter.

The material in this volume focuses on an analysis of the role of inquiries in scientific determination. It is drawn from a longer report, commissioned through the Science Council's Science and the Legal Process study. This report contains a detailed examination of each of the six inquiries chosen for study, the context of the inquiry, the participants, the issues raised by intervenors together with the recommendations and results of each inquiry. The longer report is available from the Council in the form of three case studies: one on nuclear-related inquiries, one on inquiries concerned with potentially dangerous products and the third on the Telesat Canada/TCTS case. These case studies supplement to a significant degree the material included in this present study.

The Science Council commissioned this study because of its interest in how science and scientists could assume a greater and more useful role in the creation of policy. The interest of the authors, on the other hand, has, for many years, focused on the role of the public, advocate groups, of individuals and of political movements, in creating public issues and policy. At first, the study of inquiries seemed to be a useful combination of these two research goals. As it turned out, however, scientific and public issues are impossible to demarcate. What might easily have been two studies has therefore been profitably fused into one.

II. Science and Policy in Inquiries

A fashionable, yet intensely serious debate is raging about the nature of the scientific method. The role of values, assumptions, myths and practices, and even of ideology in shaping what is called science is now being examined as closely as were molecules in the past. New fields have opened up, sociology and philosophy of science, communication and environmental studies, ethics and technology; each addressing the debate within the context of its specialization.

Any study of the relationship between science and policy becomes part of this debate. If science is inherently shaped by the assumptions of its practitioners then its practice can be said to be political in nature. In such cases scientists who testify in an inquiry cannot claim an automatic neutrality. Not only their conclusions, but also their methodology is suspect. The impact of the current debate about scientific models, epistemologies, theories and hypotheses, practices and assumptions (the terminology depends upon the discipline but reflects arguments within and among fields) is also felt in a study of inquiries. There is reason enough to sidestep the debate. Little has been resolved by the students of scientific practice, and active scientists themselves often have little patience with the debate.

Inquiries are partly concerned with reporting, debating, and arbitrating what purports to be scientific material. But an inquiry is one step, or several steps, removed from science. It is "scientific" only to the degree that science is actually reflected in the inquiry proceedings, which are, by definition, not scientific. The progress of an inquiry bears little resemblance to that of a scientific study as

traditionally conceived and executed. An inquiry necessarily functions under different rules, even when it is carrying out the scientific function.

Although they are investigations, inquiries are also focused primarily on making scientific judgements. Judgements which, moreover, may be far reaching and normally unacceptable within traditional scientific practice. In such cases, the attitudes of the commissioners and participants, most of whom have little or no scientific training, are critical. Scientific material is presented in an inquiry by those who support their claim to be scientists through reference to their academic training or current employment. Evidence is also presented by those who make no such claim but believe in their own scientific expertise. Few would argue that only those with "appropriate" scientific training should give testimony on scientific questions to an inquiry.

If those who argue that science is political are correct, and even if they are not, an inquiry certainly makes the political aspect of scientific work explicit. It does so by focusing on the significance to be attached to particular information and by using a process that places emphasis on the public debate of scientific information that is in language the public can understand. To the extent that the assumptions of scientists condition what is or what can be known then inquiries provide a way of identifying conflict between underlying approaches and values.

Debates among scientists, even in the most academic settings, are often fierce. Personal attacks are common. Despite this conflict, scientists do indeed practice "science". However much their findings may be influenced by the approach taken, they pursue their investigations systematically. They study the concrete, whether social or physical, and insist that their findings can be replicated and tested in practice or by experiment. Scientists keep their investigations open-ended so that their work reflects a commitment to theory (design) and rigorous attention to detail. These are the standards of science. They define science for the general public, for those who practice science, and for those who seek to present scientific material in inquiries.

These standards of science and not "science" itself, are the measures against which the practices of inquiries can be gauged and, like science itself, are based on assumptions. Those who participate in inquiries also hold these assumptions about how science operates. This study, therefore, explores the relationship between the scientific contributions people suggest should be part of an inquiry and what is actually the case.

The terms "scientific" and "public" are equally clouded with ambiguities. For example, does the testimony on scientific matters given before an inquiry by a member of the public constitute

"public" or "scientific" input? Is the scientist who gives his or her opinion or policy recommendations acting in a "scientific" capacity? Do scientists have a monopoly on science and the public a monopoly on policy questions?

A series of working definitions were developed for this study. They avoided the assumption that scientists and the public have a monopoly on anything. Although developed as "working" or operational definitions, over the course of this study their significance and meaning became clearer. In the conclusion, a more comprehensive view of these terms will be given.

Scientific input took the form of testimony, results of research, and information presented to an inquiry, which indicated the nature, scope, extent and impact of the phenomenon or problem being studied. It centred on whatever the person making the presentation perceived as the "facts". At times, scientific input was based on extensive original research, at others on a review of scientific literature, on information gathered through personal contacts, or on the basis of personal experience. Both scientists and non-scientists presented "scientific" evidence.

Policy input, on the other hand, was explicitly concerned with recommendations and decisions. It included recommendations about what should have been done in the past, about decisions currently being made in the inquiry, and about decisions that should be made by others, including scientists and the government, in the future. Policy input was presented by both scientists and non-scientists.

What constitutes the scientific community? The answer is not obvious.

- Are scientists who work outside government departments and universities properly called scientists?
- Is the public expert, well versed in technical language and concepts, a scientist?
- Are economists and social scientists really scientists?
- Are those with scientific degrees working in government or industry, but doing little or no scientific research, really scientists?

The term "scientific community" is used only for convenience. We define that community as being composed of scientists in universities, industries and government who have had formal scientific training and who occupy positions for which that training is a prerequisite. We include social scientists and economists who consider their training and work to be scientific, in that they use "scientific methods of inquiry" in their study and research.

For the sake of simplicity, the widest and most comprehensive definition of a scientific judgement is used. A scientific judgement is directed to the determination of what is or has been the case. It

is concerned with determining facts. The determination of fact is a complex matter that involves value-based assumptions. Where different methodologies are used, the choice of what is a "fact" can be based on extra-scientific assumptions. Our definition of what constitutes a scientific judgement, however, focuses on the *intentions* and *perceptions* of the parties involved. Both scientists and non-scientists contribute to scientific judgements.

Policy determination consists of recommendations for decisions that are to be taken. Here, value assumptions, priorities and personal biases are likely to be more explicit.

For the purpose of this study, the creation of a policy is the chain of events, decisions, actions and deliberations through which a "policy" emerges. Policy, in this case, represents both an orientation to decision making and the series of decisions taken within that orientation. Policies can be explicit or implicit for the process usually includes informal and formal decisions.

The term "intervention" has a technical, legal meaning. In this study, however, it is used in the sense of a submission made in a public hearing or meeting by someone other than the staff or members of the inquiry. It is used to distinguish such contributions from those made by staff or the commissioners themselves, although all participate in the inquiries studied. The lawyer in a "three-piece suit," who represents a public utility, and the proverbial "little old lady in tennis shoes" can both make interventions.

The Nature of Scientific and Policy Consideration

It is useful to consider science and policy as employing different methods. Science is evaluative and oriented, for the most part, to the determination of what has occurred and what now exists. Except in the case of highly theoretical studies, scientists generally base their predictions on an assessment of what is or has been the case. Scientific assessment is a continuing process. Theories and hypotheses are debated in journals, work is judged by scientific peers, and the issues are seldom resolved. Even the most well established scientific "laws" are subject to periodic reassessment. Indeed, where conflict between scientists is submerged, through an apparent resolution of issues, it may later re-emerge with greater intensity.

Policy making is also a continuing process, but at some point, rightly or wrongly, definite decisions must be made. Although both scientific and policy decisions may be irreversible, the policy process is directed visibly and specifically towards closure. Policy investigation and debate are directed towards the construction of specific recommendations, actions and decisions. Reassessment is possible, and even common, but it cannot alter what has occurred because decisions were taken.

A reassessment of the safety of nuclear reactors, for example, would be unlikely to result in plant closures. Certainly it could not affect decisions about nuclear development that were made two decades ago. Policy consideration is always oriented to what may happen and to problems that may emerge from future actions or decisions. Policy consideration, therefore, is at heart speculative.

The combination of science and policy in an inquiry, therefore, is unlikely to proceed smoothly. Scientists who work with the proponents of new developments or with advocate groups might be expected to participate but it is not surprising if only a few unaffiliated scientists give testimony. While the public may view an inquiry as the centre of scientific debate it is not surprising that many of them reject the final recommendations and argue that these recommendations are not based on a true "scientific assessment". But the reluctance of some scientists to appear in inquiries and the public's dissatisfaction may turn out to be inevitable given the conflicting pressures that are brought to bear by the inquiry process.

These considerations lead us to formulate the following questions:

- What is the nature of scientific input in policy formation, for scientific contributions can vary significantly and even conflict?
- Science and policy appear to involve different forms of decision making; how can they be effectively integrated into a single process?
- What is the relationship between public and scientific contributions to an assessment process?
- What effect do different processes (for example, inquiries vs. the courts and inquiries vs. regulation) have upon the nature of the assessment or the effect of the recommendations?

Further Questions

The study also addresses a series of questions about the nature and role of science in inquiries by focusing on the history of specific issues as they were faced by inquiries and other public bodies. Because this study is so broad, it has become a vehicle for examining the following supplementary questions:

- Do inquiries usually result in regulation and, if so, what is the relationship between inquiries and regulation?
- How is assessment carried out after an inquiry has reported?
- What is the relationship between inquiries and the courts, inquiries and parliamentary committees and between inquiries and other research bodies?
- What is the relationship between scientific and public input into an inquiry?

- What is the effect of the various practices and procedures adopted by inquiries in order to honour their mandates?

The Nature of Scientific Issues

Scientific assessment emerges in different ways in each inquiry. In this study, three different kinds of scientific assessment were examined:

1. A case in which an inquiry (or, in the case of this research, a regulatory body holding a public hearing) was set up to examine questions arising from the development of a new technology. The questions faced by such inquiries centre on the necessity and desirability of certain ways of developing or applying the technology. The technology itself is often new and its impact, and potential, may not be known. In addition some properties of the technology may remain to be identified.

2. A case where the assessment occurs in response to an application to proceed with a specific project. The assessment is primarily focused on the potential impact of the project and, often secondarily, on measures that might be taken to mitigate negative effects of the project.

3. A case of an assessment of what has been identified as a potentially dangerous product that is available to the public. The assessment centres on an evaluation of the nature of the product and its impact. It may also deal with questions of how the product is or may be used.

In the first case, the assessment occurs in response to the development of a new technology, but that technology may not be the subject of the public hearing. Instead, the hearing may be called to deal with problems connected with the development of that technology. Often such problems are economic in nature.

In the second case, the assessment is a response to a specific application, usually, but not always, from private industry. The assessment may, however, deal with more general questions. In addition to the specific application, the assessment may centre on the question of "developing an overview."

In the third case, scientific assessment is often evaluative, and an attempt to determine the full range of characteristics of a particular product as it is being used.

In the cases chosen for study, the Telesat/TCTS inquiry most closely provides an example of an assessment of a new technology. The first time that questions of communications satellite development came up for assessment before a public body was through a proposal for change in the corporate structure of the Canadian company that owned and operated the satellites.

The development of satellite technology is a matter of pride for Canadians. Innovations have been made through extensive government support and the involvement of private corporations. Communications satellite and related technologies are a cornerstone of Canadian export development policy. But issues raised by the introduction of this new technology have not been considered until very recently.

The first consideration was primarily of economic issues, but regulatory and social questions were discussed at the hearings. Today these regulatory and social implications threaten the structure of broadcasting regulations as well as the social and cultural fabric of northern communities. Although a second hearing has since been held, a seeming paralysis has set in with respect to the implications of the new communications technology.

The case of the three nuclear-related inquiries is a good example of how inquiries can be, and are being, used for the assessment of specific projects. Despite the large number of hearings, public controversy remains and many claim that the assessments have been seriously inadequate. The problems of jurisdiction are complex for both federal and provincial governments claim areas of responsibility. Two of the three inquiries studied were provincial in mandate but dealt with questions that were mainly federal and with agencies whose mandates came from the federal government. It is timely that the federal-provincial relationship involved in assessment of specific projects be studied.

The case of two very different and potentially dangerous substances provides a good study of the role of government in assessing products that are currently available to the public. Although the products in both inquiries differ, the nature of regulations and standard setting and of agency support for public protection from dangerous products becomes clear. Science in these inquiries is of a more traditional kind, involving evaluation rather than prediction. The public becomes a laboratory for the study of effects, although more formal and controlled studies are also possible.

Part One

Inquiries and Technological Assessment

Nuclear-related Development in Three Provinces

Four provinces, Ontario, New Brunswick, Saskatchewan and British Columbia, have conducted assessments of nuclear-related developments through inquiries or public hearings. The British Columbia inquiry, the Royal Commission on Health and Safety in Uranium Mining headed by Commissioner David Bates, had not reported at the time of writing, therefore it is not reviewed here.

For the most part, nuclear-related development is subject to federal jurisdiction and regulation. Agencies like AECL (Atomic Energy of Canada Limited) and the AECB (Atomic Energy Control Board) play a major role in shaping and controlling development, although provinces have also assumed some of the regulatory functions. Each of the inquiries examined here involved primarily provincial actors, although one inquiry was federally mandated. Federal agencies provided descriptions of their activities, or were cross-examined, and federal questions arose where provincial jurisdiction was in question. To some extent the provincial orientation of these inquiries directed the debate away from the central nuclear issue.*

The inquiries were given their mandates under energy or environmental assessment headings. Although the nuclear issue was the underlying subject of discussion, the specific mandate and the proceedings of each inquiry transformed the discussions into a consideration of general energy and environmental questions.

Where nuclear debate was part of the proceedings, the role of the various nuclear-related agencies requires explanation; thus a discussion of the history of nuclear-related development in Canada and of the orientation of the major actors in nuclear development is given below.[1,2,3] *Clarification of the roles and orientation of the major actors provides some indication of the gulf between public expectations, as expressed in these inquiries, and the reality, as indicated by the agencies themselves.*

The orientation of Canadian nuclear policy has shifted dramatically over the past three decades. In each of the three periods that can be distinguished, the style of decision making, the issues discussed, and the nature of the scientific assessment reflect changes in policy. The first period extends from World War II until 1963 when the first feasibility study of commercial nuclear reactors was conducted in Ontario. The second period, until about 1971, is the period when most of the decisions to construct a nuclear generating capacity in Canada were taken. In the third period, from about 1971 to the present, Canada's nuclear debate surfaced publicly.

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*A detailed report on each of the following case studies is available from the Science Council, upon request.

The first period is characterized by an informal, almost invisible, process of decision making involving very few people. Research took place mainly under the auspices of AECL and was directed towards the development of nuclear technology and was not specifically safety oriented. Universities became involved towards the end of the period but only in terms of development. According to those who took part in the early development meetings, questions about the desirability of nuclear development and reactor safety were not discussed specifically. Those who made decisions considered nuclear development to be a promising new technology, and an industrial opportunity primarily, in the early days, connected to the sale of reactors.

This period was characterized by cooperation in terms of Canadian sales of weapon-grade materials to the US, Canadian-British experimental approaches, and AECL relations. When the promised industrial benefits did not become apparent, perhaps because of the high costs of development and the high level of risk involved, governments took over responsibility for promoting nuclear-related development, and for carrying it through. In this phase, industrial development took second place to technological development although it was assumed that they would later be linked. By 1962, the basic decisions which set the direction and the scope of Canadian nuclear policy had all been made.

Decisions were made during the second period, from 1962-1971, to establish each of the major nuclear plants in Canada, including Ontario's large nuclear generating capacity. The CANDU, Canada's nuclear reactor, was seen as a key to industrial development, both for export and for economic growth in Canada. Standards were set and the procedures of the regulatory bodies became entrenched. The validity of the Atomic Energy Control Act was tested in court and affirmed.

The first problems connected with uranium mining also surfaced, but only in a few cases did the safety reports generate public debate. The first nuclear advocate groups concentrated primarily on the nuclear arms race.

During this period both nuclear reactors and uranium mining were developed almost exclusively under the wing of government corporations. Uranium mining, once cut off from lucrative American contracts and restricted through Canadian foreign policy from other markets, fell into a slump. Measures were taken by the federal government to create a market, or at least a steady demand. The legislatures were silent on nuclear development. The nuclear debate still had not begun in earnest by 1971-1972.

The third period, extending from 1971 to the present, was one of response to nuclear development. In 1970, the Task Force Hydro, an Ontario-based, quasi-investigation of Ontario Hydro's activities

and planning processes conducted one of the first studies of nuclear safety. It concluded on the basis of a report co-authored by Arthur Porter and Philip Lapp[4] that nuclear power was safe. The pressure for this review had been financial for the large capital costs incurred by Ontario Hydro through its nuclear and other commitments were in question. Several safety reports carried out in the previous period were finally made public, and the media took note and joined in the "investigation". A great number of committees, agencies, inquiries and other investigatory bodies were then commissioned. Public advocate groups became involved. Their first concerns were environmental, and linked to Ontario Hydro's planning process.

During this period, public groups finally became highly visible. The nuclear safety issue was debated and nuclear policy became an item on the political agenda of various parties and legislatures. The orientation of the nuclear development discussion shifted from a concern about technological or industrial development, which had been largely shortcircuited in the short term by large government involvement in development, to a concern for energy. The oil crisis of 1973 was no doubt responsible for this change.

When nuclear energy is compared to other forms of thermal generation, which depend on fossil fuels, the nuclear alternative looks attractive. A booming market for Canadian uranium, supported at least in part by federal government actions, strengthens the case for the nuclear option. But those who sought what Amory Lovins has called "soft energy options" had never been included in the debate about nuclear power development.[5]

The nuclear development program in Canada was essentially in place by this time. It only remained for the government to incorporate this development into a general energy strategy and to strengthen the ways in which questions of health and safety could be addressed. The alternative, for those outside government who did not support the nuclear options was to block the expansion of the system.

It may be that, as this study is being written, we are entering a fourth phase in which the basic facts about nuclear development are widely known and questions about the nature and directions of planning are being discussed. There are indications that this period will be characterized not so much by investigation and revelation but by advocacy and the adversarial process. If the issue, as some participants in the debate have claimed, is one of values then the debate will eventually move into the political arena.

Regulation

The nature of nuclear regulation has been discussed elsewhere.[6-10]

For the purposes of this study the role and orientation of the agencies involved will be reviewed.

*Atomic Energy Control Board**

Although the AECB is not legally involved in the selection of sites for nuclear development, it might be consulted to discuss unusual features of a particular site and to comment on geology, hydrology or seismology. The AECB might use consultants but relatively few staff resources would be allocated (perhaps half a person-year) to the site selection consultations. One AECB official said,

> "We've never really been involved at the first stage (decision making and site selection). We take the position, 'Okay, if you Mr. Utility or Mining Company, have chosen to build a plant, you have to deal with the local people to see whether or not they are prepared to have you in their township.' We'll only judge whether or not what you proposed to build is adequate."

At the construction stage, the Board moves from a strictly consultative role to the granting of a construction licence. Throughout construction, the Board also maintains a consultative function and continually evaluates the plans. At this point, it makes its first formal request for a fairly detailed design in the submission for the proposed facility (more detailed in recent years), preliminary assessment of safety, and indication of quality assurance.

At the operating stage, AECB grants an operating licence, based essentially on whether the system is built as planned and whether appropriate operating facilities and resources are in place. The process is essentially an engineering audit, for most of the licencing staff are assigned only to go over the advocating company's plans and specifications.

Until the past few years, the design and assessment procedures were carried out almost simultaneously (e.g., Douglas Point, Point Lepreau, and the demonstrator reactor (NDP) at Rolphton, Ontario). The design process has since been "moved up" to some extent.

It is important to note that the Board depends on potential licencees to demonstrate how they will implement their own quality control programs and meet safety requirements. The Board does not have a research capability as such, and depends upon access to the Atomic Energy of Canada Limited (AECL) laboratories at Chalk River in Ontario and the Whiteshell Nuclear Research Establishment in Manitoba. However, the Board does allocate

*The following points do not represent the official position of the AECB, but are based on interviews with several officials, with others working for related agencies, and a number of public statements made primarily in inquiries.

research funds, primarily to universities. Its technical staff is growing and is now in the neighbourhood of 180 people. AECB has some links with the Canadian Standards Association (CSA) and considers standard setting important, but one official notes that they "have been slow on it because of lack of manpower."

The Board takes the position that there is no implied right of licence. Thus, it has significant discretion over what and how it will regulate, but the actual regulations are minimal. Rights to a fair hearing appear to apply only when a licence is being taken away, although this is currently being challenged. And even in such a case, the nature of the inquiry may not be specified. In general, the Board prefers to say an application is "inadequate" rather than say "no". As one official put it, "If we say 'no, we won't give you a construction licence for that site,' it is implicit that if you come up with a better *design* we will reconsider."

Several aspects of the Board's orientation towards licencing should be noted.

The Board does not consider itself to be a traditional licencing body with respect to either energy development or nuclear power. For example, it does not involve itself in either the necessity or the desirability of a project nor does it solicit competing applications. The fact that no other agency exists to consider all facets of nuclear power is irrelevant. To some extent a central assessment role is now being played by the environmental assessment boards and this partially fills the vacuum left by the AECB. Because the assessment of the AECB is technical, public hearings are not held. Other decisions rest with Cabinet, and AECB seeks no such function.

The Board is only indirectly a watchdog agency. Its interest is in the adequacy of design and proposed organizational arrangements for supervision. The Board tends to assume that if appropriate procedures for monitoring are built into a plan then safety will be assured. The emphasis is on the assessment of the process to be followed. Therefore, AECB considers it reasonable that 90 per cent of their assessment takes place prior to licencing. They also consider it appropriate that their assessment is oriented towards engineering rather than financial considerations or the problems of social impact. It attempts to encourage a watchdog approach on the part of the licencees, as one official put it, "Fortunately, we are not dealing with dishonest people."

The Board assigns to each new plant, staff who sit in on meetings and get "a pretty good overview." Once the AECB is assured that the basic start-up problems have been dealt with and the appropriate systems are in place, they do not allocate extensive time to monitoring. They do not perform highly detailed analyses of the monitoring reports submitted by the licencees.

In setting licence conditions, the Board will consider recommendations of an environmental assessment agency but insists on making an independent judgement. Until recently, the Board was highly dependent upon AECL and Ontario Hydro for their expertise. As one person interviewed suggested, "It would be fair to say that Hydro's plans were simply vetted through the Board."

The Board is noted for its dependence on committees rather than on staff. Until recently, it had a large number of committees with perhaps 250 members; staff during this period numbered about 50. These committees met infrequently to review applications, occasionally question prospective licencees, and make recommendations to the Board.

To some extent, this reliance upon the committees is changing, but it is still present in the proposed new Board structure.[11] Committees bring together people, who possess expertise or the power of jurisdiction, from various agencies and departments. Some people interviewed suggested, however, that the political agendas of the various departments occasionally take precedence over the technical consideration at hand. With the jurisdiction over nuclear development split among the AECB, the Department of Energy, Mines and Resources (to whose Minister the AECB also reports), and the departments of the Environment, Health, and Labour at both provincial and federal levels, coordination is essential. The coordinating structure of department-based committees also reduces the pressure for AECB to have extensive research capability even though only some other participating departments are able to carry out their own research.

The new committees will play a less technical role but will have a broader mandate and will provide, according to one AECB official, "a degree of overview, almost a quality assurance check on ourselves [the Board] and also some guidance on technical philosophies." Because the new committees will be advisory in nature, the Board will have to assume greater responsibility for research. At this time, two new committees have been appointed; an in-house committee on security, and one on radiological protection to study standards and requirements. The Board is also trying to organize a nuclear safety committee but had not determined at the time of writing either its function or membership.

Expecting the AECB, even in its new form, to make decisions on nuclear policy, safety, and the questions of necessity or desirability is a mistake. It is also a mistake to expect the Board to become public. There is little question that the reorganization and increased sensitivity of the Board has made it better at its task. But that task is a limited one, and there are no indications to date that the Board wishes it otherwise.

*Atomic Energy of Canada Limited**

AECL acts as Canada's development corporation in the field of nuclear energy. It has been the proponent of nuclear-related developments in Canada and carries the burden for research, financing and, in some cases, operation. AECL reports directly to the Minister of Energy, Mines, and Resources and is an active partner with any utility entering the nuclear field. Its role shifts depending upon conditions and the ability of the utility to carry out the development work on its own.

AECL conducts three kinds of research: basic, industrial and applied. Its research staff in recent years numbers several hundred. In the case of basic research, which makes up about 30 per cent, AECL encourages its scientists to publish their findings. Some of its industrial research has been conducted in conjunction with the AECB, Ontario Hydro, and the universities. Some applied research is contracted-out, usually to consulting firms because they are oriented "more to practice."

Although AECL stresses the importance of its relationship with the public, conducts tours of its research establishments, and promotes the peaceful uses of atomic energy, it has often been considered a close, if not secretive, organization. It appears on the basis of interviews conducted for this study that AECL takes a somewhat activist approach to the public, although it has been suggested by one AECL official that, "AECL has a lot to learn about how to present information to the public; mainly AECL it studies public attitudes to find methods of changing them." AECL appears to have concluded that much of the public is ill-informed and uninterested in the nuclear issue.

There is evidence that AECL regards inquiries as not particularly helpful to the determination of policy. It considers any public forum to have only limited utility, in part because it sees the public as ill-informed, and in part because "any setting that attracts crowds cannot be adequate for transmitting information." As one official stated, "You can't operate a democracy with an ignorant public."

If the current nuclear debate is seen by AECL as replete with misinformation then this makes an inquiry "pretty hard to swallow as a reasonable way to proceed." One AECL official concluded that inquiries sometimes appear to be a trial, although "possibly more of the Ontario Hydro than the AECL." Inquiries can become "circuses" and they are not always good settings for debate, "the whole process may have been overdone."

*Again, the orientation of AECL noted here does not represent the official position of AECL, but has been extrapolated from interviews with AECL, AECB and government officials, others not officially connected to the agency, and the testimony of AECL in the inquiries studied.

Advocate groups are viewed to be "narrowly informed" and the literature they have access to as "controlled." Such groups, it is suggested, are not in the position to obtain information from the scientific community; advocate groups and by inference inquiries, "take scientific material out of context." In turn, it was suggested by an AECL official that the scientific community is reticent to participate in a nuclear-related inquiry because of the length of time that is necessary to prepare a rigorous and defensible position that can be understood by the general public.

From their testimony in the inquiries studied here, it appears that the critical question for AECL is the "comparative risk" of nuclear power generation. As one official put it, "Human life is not without risk. It is important to have a healthy respect for risk, but only if the risks are not taken out of context." This argument is apparently a convincing one for it has been used in the reports of many inquiries.

It seems apparent to AECL that the public does not have enough confidence in the agencies that develop and implement nuclear policy. Part of this lack of confidence is attributed to public cynicism with large institutions and the "small is beautiful mythology" which some in AECL find inappropriate. In part it is also due to AECL's apparent lack of skill in public relations. The corporation appears to feel public relations and public education are preferable to public debate. As one employee said, "How do you convince the public that no one is out to get them?"

Opening the regulatory process to the public is seen as having some merit but also some serious disadvantages, for a change in the relationship between the company and the regulatory agency would result in a watch-dog attitude. AECL has argued that if, as some critics suggest, regulations become specified then the responsibility for ensuring adequate design will shift from companies, who would no longer feel the imperative to take full responsibility for their actions, to an "impersonal" agency.

While the AECB's role is "to set the rules," AECL's function, according to one official, is "to meet or better the rules and to work with utilities" and not, as commonly thought, to act as an "advocating agency." AECL appears to see itself as taking direction from utilities that are responsible to political bodies.

Canadian Nuclear Association

The Canadian Nuclear Association (CNA) took an active role in the Porter Commission and appeared in each phase of the debate stage of that inquiry. CNA was formed in 1960 and includes in its membership consultants, contractors, government agencies, oil, gas and mining companies, and utilities. It maintains liaison with both international and national organizations, and has representation

on several committees, including the Canadian Standards Association committees. It also issues publications.

The Association functions through a committee structure which covers codes, standards and practices, economic development, education manpower, nuclear insurance, technology and safety, and public affairs.

It appears that CNA considers the "biggest obstacle to the development of nuclear power. . .[as] ignorance and distortion of the facts concerning power." One member of the board said that he thought public attitudes were a "spill-over of attitudes from the United States." In his opinion, the problems in the Canadian and American system were quite different and this spill-over was therefore inappropriate. As he put it:

> "The CNA set out several years ago to find out first of all what public opinion was and then what were the things that were leading it in directions that we thought were not logical. It showed that over half the people in Ontario didn't know you could generate power from atoms. Yet that public has a strong opinion about nuclear power."

Until recently, he suggested, AECL played a dominant role in CNA. Now, however, Ontario Hydro is seen as the dominant agency, and AECL as a support service for Ontario Hydro and other sections of the industry.

The relationship between AECL and other CNA members has not always been smooth, according to the opinion of the same informant:

> "It was always edgy because private industry feels that AECL made a great mistake in not turning over the task of designing nuclear reactors to private industry. The most successful design we have in Canada is the one at Whiteshell, Manitoba. It has never given a moment's problem. The reactor was designed and built by Canadian General Electric Company Limited at a fixed price, and they made money on it."

CNA is active on the AECB committees, but this is not seen as a problem:

> "There wasn't really any friction because, contrary to what many people think, industry is not out to build a bad product. They are out to build the best possible product at a reasonable price. This is the basis of a private enterprise society. . .their interest in safety is as great as anyone else's."

A view of the AECB's position on safety is expressed by one of the Board members interviewed:

> "Unlike many of the public, they [CNA] say you don't have to prove that it's safe before you can try it. It just isn't possible."

III. Environmental Assessment at Point Lepreau

For those studying environmental assessment, the public hearing on New Brunswick Power Corporation's bid to build a nuclear generating plant at Point Lepreau is significant. It was the first public test of the new federal Environmental Assessment Review Process (EARP) and illustrated the problems connected with this process and the need for reform. The EARP has been the subject of several comprehensive studies[1,2] and the Lepreau case figures prominently in each.

As far as the citizens of New Brunswick were concerned, a one-day public meeting constituted the only formal "public" phase of the Lepreau project. Both proponents and opponents of nuclear power would agree that the meeting, and even EARP itself, was injected into the development process. The EARP meeting had a limited but specific significance: it represented a new forum and a new focus, environmental concerns in the nuclear debate. By all accounts, however, even this innovation proved unsatisfactory.

History and Context

Provincial interest in nuclear development began in 1961, although for many years nuclear plant construction was considered more than New Brunswick could handle. The technology was appealing, but economically unattractive because the nuclear power reactors used in Ontario were too large for New Brunswick's requirements. During this period, the general manager of New Brunswick Power (NBP) sat on the board of directors of Atomic Energy of Canada Limited (AECL) and was made aware by AECL of the potential benefits of nuclear technology.

Public interest in the nuclear question surfaced during this early period and letters to the editors of New Brunswick newspapers indicated a growing concern about development of nuclear power in the province. A few citizen groups were formed, and in 1969, a provincial branch of the Voice of Women held its first meetings to discuss the possibility of nuclear power development in New Brunswick.

By 1971, NBP was ready to take the initiative. The large power plant at Colson Cove was finished and as one NBP official put it:

> "Our objective was to be able to produce energy for costs that were comparable to the best utility in North America. How could we do that - only by achieving the same level of technical application and facility as they did. New Brunswick doesn't have a Churchill Falls or James Bay."

Between the years 1970-1978 NBP officials met frequently with AECL, and also visited some nuclear plants in the United States. Because they were convinced that, economics permitting, construction of a nuclear plant was the next logical step, their investigations centred only on which model should be used.

The provincial cabinet was heavily involved at this early stage. The chairman of NBP was a member of that cabinet and all developments were vetted through cabinet discussion. NBP is not regulated, but reports through and coordinates its activities with the provincial cabinet. In 1972, Richard Hatfield, then premier of New Brunswick, initiated discussions with AECL and the federal Department of Energy, Mines and Resources (EMR).

Another federal department, Regional and Economic Expansion (DREE), joined in these discussions. DREE argued that any planning should take account of local economic development needs in the depressed area of northeastern New Brunswick. Local political representatives agreed, and mayors and municipal council members in that area passed a resolution urging NBP to consider construction. The premier met with representatives from Bathurst in northeastern New Brunswick and was given to understand that at least some citizens of New Brunswick welcomed nuclear power development. But, because a nuclear facility on the north shore would cost more money to build and maintain than one on the south shore, unless additional financial support came from DREE, the province did not plan to combine its nuclear development strategy with a local development plan.

The original proposals included both a nuclear plant and a heavy water facility. This latter facility would absorb the excess electrical capacity produced by the plant in its initial years until New Brunswick energy needs increased to match ouput.

In 1972, the AECB Reactor Safety Advisory Committee (RSAC) and EMR were involved in evaluating various sites. A proposal for a

joint heavy water plant and nuclear power facility was put together by NBP in mid-1972, and at the same time, NBP applied to the National Energy Board (NEB) for permission to export power to the United States.

The oil crisis in 1973 gave NBP the argument it needed, for nuclear power plants seemed a credible response to the new world of oil politics. By mid-year, in part as a result of a meeting involving AECB, NBP, DREE, AECL and Environment Canada, a site approval process for nuclear development had been set in motion. By October, 26 possible sites had been narrowed to five; Point Lepreau was one of these.

Public response gained momentum and shifted direction during this period and several MPPs raised questions in the House. Groups opposing nuclear power development were formed in Dalhousie and Fredericton and their members wrote letters to local newspapers demanding a public review of NBP's plans. "Man and Resources," a federal program designed to stimulate public discussion and participation, conducted local and regional meetings and considered, among other issues, energy policy. Through these meetings, members of the Voice of Women and the new advocate groups came into contact with each other.

During 1973, negotiations for a heavy water plant in New Brunswick came to a halt. Several provinces had been vying for such a plant and Québec won, leaving New Brunswick without the resources, or an immediate need for a capital-intensive nuclear development.

The federal government, partly in an effort to "to compensate New Brunswick for the loss," instituted a new loan program to provide 50 per cent of the initial funding for the first nuclear power plant constructed in any province. In addition there would be funding for a second, if it could be demonstrated that the plant was required to meet regional energy needs. In the light of this funding program, no other energy option could hope to compete, particularly given New Brunswick's prior interest in nuclear power.

The federal plan had some conditions attached, albeit of an informal nature. As a condition of the funding, NBP would have to agree to an environmental review assessment process (EARP). Although federal environmental assessment guidelines had been passed in 1973 they had not been tested publicly, so New Brunswick provided the perfect opportunity. During negotiations over funding, it appeared that NBP officials saw this as an imposition and part of a compromise. It was to become a test of EARP as much as of the project, for NBP argued that environmental assessment should proceed concurrently with project development.

NBP approached assessment in a pragmatic way. As one official put it, "We said 'fine.' If we are going to be subject to this

environmental process, tell us what we have to do." Detailed plans for EARP research or assessment simply did not exist but were designed after the fact and in an attempt to match the needs of the project. When they were finally set, much of the project scheduling had, according to NBP, already been established.

The first environmental guidelines were wide-ranging and based on the United States model (National Environmental Policy Act). After a series of negotiations an agreement was reached to prepare a *preliminary* environmental impact study for the review and for exposure in public meetings. By December 1974, final agreement on guidelines had been reached.

It is helpful at this point to note the relationships among the various actors involved in considering the Point Lepreau project.

Task	Responsibility and action	Jurisdiction and decision
Nuclear plant decision	NBP/Cabinet with support from AECL	Cabinet with NBP
Initial studies	NBP/Consultants (AECL)	NBP
Public information	NBP/AECL public and advocate groups	AECB (only 2 meetings required) EARP (information made available, may hold meeting)
Site selection	NBP/Consultants public/DOEP/AECL	Cabinet, NBP AECB and *ad hoc* EARP
Environmental assessment	NBP/Consultants DOE/public	*ad hoc* EARP DOE
Construction and project approval	NBP/Cabinet/RSAC	AECB

Throughout 1974, however, work on the nuclear power plant proceeded. Following an energy policy announcement by Premier Hatfield in January of that year, NBP submitted its letter of intent to the AECB. In March 1974, the premier made official the commitment to build a nuclear power plant. A consulting firm, MacLaren Atlantic, was engaged to conduct research for NBP and to prepare a number of interim reports. The Reactor Safety Advisory Committee (RSAC) met during the summer to evaluate the application, and, by the end of the summer the site was approved by the AECB, MacLaren Atlantic's environmental studies were released, $27 million worth of equipment was purchased, and the site was bulldozed in preparation for construction. Late in that year, NBP hired its first staff nuclear engineer. His tasks were

centred mainly on public information, but included licencing responsibilities and the development of a local technological capability outside NBP to support the plant.

Citizen activity, mainly in opposition to the project at this stage, grew during 1974. Community meetings were sponsored by NBP, in conjunction with the AECB licencing procedures. Meetings sponsored by local advocate groups also stimulated and focused public interest. One citizen's group met with Premier Hatfield to inform him of its concern for safety. The Chaleur Environmental Protection Society was formed as the first of a number of coalitions of citizen groups. Several churches became involved, and local residents of Point Lepreau began to complain about the effects of construction in the area. In 1975, the Maritime Energy Coalition was formed. This organization drew together the majority of the groups opposed to nuclear development.

By January 1975, NBP was ready to submit its manpower requirements to AECB. In February the preliminary environmental impact study was written, and then distributed several weeks later. An interdepartmental committee had already reviewed the waste management procedures, but by March of that year concluded that their review was insufficient to permit a complete assessment of the planned project.

On 3 April 1975, three weeks after its announcement and about a month after the release of the impact study, the EARP-sponsored public meeting was held. The purpose of the meeting was to permit public assessment of the impact study. It snowed heavily that day and many people had difficulty in travelling, but thirty-two people spoke in the only public hearing EARP held.

EARP had come into being through the development of federal guidelines in 1973; a creature of an emerging environmental and consumer consciousness and an increasing demand for public participation in decisions affecting development. Its mandate, however, set limits as well as directions on the role of both environmental assessment and participation. The EARP process operates through guidelines, not legislation. It lacks the force of law.

EARP operates under the federal Department of the Environment, a relatively junior ministry. At the time of the Point Lepreau hearing, EARP applied only to federal projects (later it was extended to projects with federal funding). It can only make recommendations to the minister who must then bring recommendations to Cabinet. The final decision is left primarily in the hands of the initiating department, usually a senior department with a sizeable investment in the planning and design of the project. EARP panels are appointed on an *ad hoc* basis. Until recently, they functioned on the RSAC model, drawing their membership from a

variety of departments. EARP is not an independent regulatory authority in any sense of the word.

What EARP has done, however, is to insert within most (but not all) federal development projects a process of environmental consideration. It has raised environmental concern to greater prominence in the planning process and has ensured some level of coordination among departments involved in that process. It has also stressed public participation as an integral part of planning, although in the Point Lepreau case, public participation was relatively limited. It has defined, perhaps more than any other agency, a role for the public. It serves not only as a vehicle for the public to express its views, but also provides a source of information, a means of ensuring accountability, and a mechanism for developing public confidence in the planning process.

EARP guidelines catalogue the predictable environmental consequences of any type of project, pointing to matters that applicants may have overlooked in their initial design process. EARP has forced applicants to move the design process forward, to separate design from construction to the degree that is possible. A few projects have now been rejected because of EARP evaluations, but in general EARP functions as an integral part of planning rather than as a form of project evaluation.

The EARP process has been under development since 1973. Many criticisms of its early implementation, and in one case, of its application at Point Lepreau have resulted in significant alterations in its process.[3] Although EARP panels are still mandated on an *ad hoc* basis, they often include more than departmental representatives, may now have research and public participation staff, and may evaluate applications on a wide range of social as well as natural environmental criteria. EARP panels have also forced delay of major projects, and EARP evaluations have been adopted in one recent case by the AECB. Nevertheless, the EARP process is still advisory and it remains to be seen whether a negative EARP evaluation would force cancellation of a major project or simply resiting or redesign of the project.

The Hearing

Strictly speaking, a public inquiry was not held into the construction or development of the Point Lepreau nuclear power plant. The single public meeting, the EARP public process, focused on environmental assessment. The stated purpose of the meeting was specific and limited: members of the public were asked to comment on the work and recommendations of the preliminary environmental impact study prepared by MacLaren Atlantic for NBP. The EARP panel, made up of representatives from both federal and provincial departments (but not AECB), was not empowered to discuss aspects

of the proposal such as health, safety, and radiation standards, for they fell under the jurisdiction of the AECB. Nor could it discuss the political desirability and feasibility of the proposals. Nevertheless the panel possessed the authority to find "insurmountable environmental obstacles" and to recommend that the project should not proceed.

The panel listened to briefs from the public, but was not empowered to ask questions or respond to points raised. Members of the public were not allowed to ask questions of each other, and in any case they would have found it difficult to do so within the fifteen-minute time limit given to each brief. Every person who wished to speak and who was able to attend the meeting was accommodated in the session. Some members of the public sat through the entire session; others came only to make their presentations.

The inclusion of representatives from federal and provincial departments on the EARP panel posed a problem. According to one panel member, provincial representatives joined the panel to "mitigate the negatives and enhance the positives," for they were convinced the "no-go alternative was extremely remote." Although exchanges among members of the audience occasionally became heated, the meeting was orderly. Project opponents outnumbered proponents and, as a consequence, supporters tended to be somewhat defensive of their right to express an opinion.

After the meeting the panel was empowered to reply to the public, individually by letter and through public statements. Environment Canada reasoned that this procedure would permit a comprehensive and adequate reply because one that was prepared by the departments or agencies was most likely to reflect detailed expertise.[4] Obviously, public education was as much EARP's goal as public participation. Partly in response to criticisms of the Lepreau process, the agency has significantly altered its mode of operation.

Diverse groups of people participated in the meeting:

Private citizen briefs	19
Ad hoc advocate groups	8
Business organizations	3
University	1
Governments	1

Approximately thirteen briefs were submitted from people or groups with a long-term interest in the topic and who had engaged in extensive advocate activities through various organizations. All the briefs were from people who were then living in New Brunswick; two were from the Point Lepreau area. Experts were not brought in to speak by any of the groups. A number of people stressed that their knowledge of the subject had come from material supplied by AECL.

Most of the briefs opposed the plant construction but discussion within the briefs covered a wide range of subjects, including energy policy, alternatives to nuclear power, the EARP process, radiological questions, and the preliminary impact study. Some technical information was presented, occasionally in extensive detail. Participants did not attempt to debate the full range of issues involved in the technological implications of having a nuclear power plant in the community, but used the technical information to evaluate the data that were being used to determine policy.

Two extracts from the transcripts provide an example of the range of detail contained in the briefs:

> "I assume it is [a consulting firm used by NBP] who does the report for MacLaren Atlantic, for he is the only one who makes comments about the questionable late carboniferous thrusting. He calls it Variscan in time, and states that certain overthrusts at Point Lepreau have been sealed since Triassic time. In point of fact, one can only view these faults in a few places. They could have been active up to Pleistocene times, as that is the material which buries them: glacial sands. In Musquash, gravels have been displaced that are observable, and numbers of geologists in the province are aware of this."

And again:

> "Another blatant mistake is that in Map 12, the population of Musquash is stated to be 17. I'm from Musquash, and the population is approximately 225 to 250.
> "In Section 4.16 it says the population of Maces Bay is 275. Map 12 says the population is 133. Apparently they can't even get together on their own figures."

Development policy was also discussed in terms of the assumptions and proposals contained in information supplied by NBP, AECL, and the preliminary impact study. These considerations centred on the questions of growth and development, and the advisability of certain industrial strategies. The NBP's strategy of building large power units as a key to development was addressed by several briefs and the attendant costs of the proposed development were measured against potential revenues over the estimated 30-year life of the plant.

Some of the participants brought together scientific and policy considerations around particular issues, mainly in relation to how facts should be interpreted and used. In general, and this is an important point to note, the proponents and opponents of nuclear power mainly agreed on factual matters and even on specific policies, but when fact and value, science and policy were mixed,

the issues became largely symbolic, discussion became rhetorical, and emotions ran high.

One issue that brought scientific and policy considerations together was that of growth and development. In as much as the proposed nuclear power plant would stimulate development, and some opponents suggested it would not, participants questioned whether this growth would be in the best interests of, and most suited to, the needs of New Brunswick. The position of an official of NBP that, "They want to return to mother nature. Well, I've been there. They should try to live without electricity for a while" was matched against, "We are fools to continue the type of North American society of the quantitative growth that Point Lepreau will promote." At this juncture, proponent and opponent groups lost sight of each other's point of view and the discussion degenerated into empty generalities.

On the issue of risk, some participants took the position that the solution to energy problems should not be based on the calculation of risk. Others suggested that because all energy development involves a measure of risk, then each option should be compared with its alternatives. Such arguments, while important, were often symbolic and imbued with emotion. One person claimed, as noted in the transcript, "You talk about the socioeconomic impacts of this development; what are the socioeconomic impacts of no development at all? Did you ever take that into account?"

A third issue was that of the environment itself. Opponents claimed that any consideration of environment should include the sum total of all living experience. Proponents, on the other hand, claimed the environment is specifically the location in which development will occur and the less desirable effects can be mitigated.

Commentators on EARP have criticized the process at Point Lepreau and although they attempted to present their opinions within the hearing, as it had been established, those in the audience were equally aware of its shortcomings. One intervenor stated, "Is the present public meeting merely a third stage in a mournful minuet?" Several people commented on the inherent cynicism of the process. Without doubt, if the preliminary impact study was to be properly evaluated, then more than a month of public hearings would have been necessary.

Neither MacLaren Atlantic nor NBP were asked to respond in public to criticisms of the consulting firm's report, and NBP did not anticipate having to speak at the meeting. The number of briefs presented surprised NBP, and perhaps the panel as well. EARP constituted the closest thing to an inquiry in New Brunswick. Although detailed criticisms were made of the MacLaren Atlantic study and although research findings on nuclear safety and on

conditions at Point Lepreau were included, in general those connected with the agencies involved and interviewed for this study felt "they had heard it all before."

Nevertheless, the hearing could have resulted in a "laundry-list" of conditions to be imposed on the project. The hearing did identify potential problems and conflicts which could have provided a basis for informal, *private* discussions between the province and AECB on conditions of licence. But any disagreements that might have existed between federal and provincial panel members were submerged in the final public report. The proceedings, although independent of government in some respect, were highly political. As one member of the panel put it, "Once you have the premier of the province saying something is go, you don't have three civil servants saying it is not."

During 1975, NBP began an intensive public education campaign throughout the province, particularly in Point Lepreau. A citizens committee was formed to discuss ways of mitigating the impact of the project and it continued meeting throughout 1976. Protest groups have continued to operate since 1976 and an energy fair is held every year. Following the Three Mile Island accident, these groups have experienced a "renaissance of interest" and are now stronger than at any time before or during the hearing. Meanwhile, construction on the plant continues, albeit slowed by unrelated labour disputes.

Analysis

Those concerns that the EARP panel members considered to be serious were transmitted to the agencies or the minister of DOENB through informal channels. At best, they were negotiated into the conditions of licence and monitoring for the plant. From the public's perspective, however, nothing much changed after the hearing. Development of the plant continued more or less as before and citizen groups pressed on with their advocacy work, using the plant as a symbol of their continuing debate.

Several months after the hearing, members of the advocacy groups requested a meeting with the AECB to discuss technical questions of health and safety. AECB sent two senior staff members to New Brunswick to attend the one-day meeting, but it turned out to be a frustrating experience for most people involved. For the majority of the day, the two AECB staff members listened to a repeat of briefs that had been presented at the EARP meeting and only late in the evening were technical questions discussed. Those who came to present their views must have left with an even greater sense of powerlessness, for the AECB representatives were not empowered to take any action as a result of the meeting. For their part, the AECB were already familiar with most of the

information presented to them. They may well have had cause to "think they had heard it all before." The real demand had always been for a full public inquiry and, for many local citizens, the EARP hearing had been inadequate.

An inquiry necessarily attracts political debate only at one particular period in time. It brings people from all sectors of public life into contact with each other for a short duration and within a particular setting. Even in the best of inquiries and certainly in the New Brunswick case, what is discussed is only a portion of what is at issue. Often left out are the participants' particular perceptions of the issues, the rationality they bring, and the priorities they see for recommendations.

Without understanding this rationality, the issues addressed at a hearing appear superficial, the data inconsequential, the barriers to participation procedural, and the resulting decisions incomprehensible. Intervenors, for example, may raise important and valid questions about nuclear safety only to have their concerns ignored by proponents of nuclear power plants. Conflicting policy options may be offered, but resolution seems impossible. Recommendations that appear to answer the demands made by intervenors only fail to satisfy them. Conflicting data may be subject to cross-examination and remain unreconciled even under the most vigorous questioning.

It is deeply significant for inquiries that issues cannot be properly resolved until the logic that lies behind the various arguments is fully appreciated. Neither the data nor the testimony offered in a hearing are strong enough to carry the assessment through to its conclusions. When each alternative seems reasonable and makes perfect sense, then judgements become impossible.

Under such conditions, recommendations often come from outside the inquiry itself and the testimonies are used as a justification. For example, the value of an opinion may be judged on the grounds of supporting the strength of public opinion outside the inquiry. Alternatively, the value of an opinion may be tied to its practicality and the ease with which it can be implemented. In neither case does scientific assessment play a significant role, for what is taken to be "representative" of public opinion or is politically expedient takes precedence over what otherwise might be recommended on the basis of an assessment.

In the New Brunswick inquiry, the activities of those who worked for NBP, AECB, the Conservation Council or the Maritime Energy Coalition made sense to their members. NBP officials are not blind to the dangers of nuclear power plant operations, although they may occasionally be made to appear so in the press or through accounts of public meetings. Those who deny the truth of AECL information know a great deal about the subjects they

address and often cite AECL's own documents to prove their case. The inability of such groups to come to terms with each other across the inquiry floor is based, to a large extent, on what each participant brings to the inquiry and on the logic of the arguments that underlie his or her presentation. But this logic is seldom made explicit in an inquiry or any public forum.

That New Brunswick has been at times economically depressed is not unrelated to the EARP hearing. Industrial development in the province is largely centred on a few major resource industries. With spruce budworm problems plaguing the forest industries, energy development has assumed critical importance in the province's industrial development strategy. Energy in New Brunswick is a resource industry, a means of reversing the province's image and not simply a means of facilitating development. And, however precarious its financial position may have been at times, NBP is a New Brunswick success. NBP has built plants using the most advanced technologies and is able, in the short term both to import and export extensive amounts of energy.

It is not surprising, therefore, that NBP is not regulated or reviewed in any systematic way but is subject only to the coordinating functions of the provincial cabinet. It comes as little surprise to discover that the premier seems unwilling to allow major decisions affecting the utility's development to be decided by a public forum or through the process of public participation.

Although officials of NBP are careful to deny any intention to develop power for export, their plans call for intermittent exports of electricity and the development of highly sophisticated, major power plants. In the short term then, NBP does plan to export surplus electricity until the province's demand for energy has caught up with the supply. In the long term, New Brunswick plans to use all the energy it produces.

Certain problems exist with the installation of major power developments even if they can be shown to benefit New Brunswick directly. As one official put it:

> "Any normal utility can only install a unit of up to about 10 per cent of the capacity of the system it's dealing with. Our total load [when the current plants were all being considered] was 250 megawatts. By that token, the maximum size of unit we should be installing is 25 megawatts. Unless you find a way to do it, you are restricted technically and financially from putting in large units. If you don't work it financially, you cannot pay off the capital."

As we have already emphasized, New Brunswick has worked with the most developed technologies to produce electricity and takes pride in the range of facilities it has constructed during the past two decades. Using the latest technologies, however, demands

a particular strategy on the part of a utility that operates in a small, underdeveloped province. One official of NBP stated:

> "We put in larger units than we can use internally and sell off the excess capacity to bring the financial expenditures down until our demand increases to meet supply. We are optimizing the New Brunswick situation by what we can purchase or sell elsewhere. Whatever success we have had is due to the fact . . . that we have bought and sold. That is our strategy."

The key to this strategy lies in the connections NBP can make with other utilities. NBP has had arrangements with Québec, Maine and, through the Maritime Energy Corporation, is attempting to develop them throughout the Maritime Provinces as well. Whatever commitment NBP has to exporting power is incorporated in its strategy of buying and selling power as it becomes available.

NBP has recently built a number of new power plants. From the point of view of its desire to use the latest technologies and its strategy of interconnection, the application for a joint heavy water - nuclear power plant facility makes sense. The heavy water installation would have absorbed the excess generating capacity and allowed for system expansion. But when the heavy water plant was withdrawn, federal funding still made the nuclear power project, albeit with one unit instead of two, a financially acceptable alternative.

While some people argued that nuclear technology is dangerous, it was certainly being used in other provinces and in other countries. However, in these cases, the resources to assess safety far outstripped those of New Brunswick. Nevertheless, officials interviewed at NBP assumed that the technology was at least as safe as any other.

Given the cost of the project, the carrying charges on the loans involved and the financial resources within New Brunswick and NBP, it is not surprising that NBP prevailed on questions involving scheduling. It is little wonder, also, that opposing arguments put forward by many of the participants in EARP had little effect. The underlying strategy which made nuclear power a "logical", albeit not necessarily a correct, choice might be open to question but nothing in the policy process would have allowed it to surface and be debated effectively outside cabinet. Even a reformed EARP would have been insufficient for the task.

The federal environmental assessment review process, in which the Point Lepreau plant was considered, is designed on a linear model. Environmental assessment is one of the many steps that a federal project may go through to receive all of the necessary licences, permits, funding and support. As other commentators have noted, the relatively junior status of Environment Canada ensures that environmental considerations, rather than operating

as a focus for planning development, are subordinate to other development priorities.[5,6,7] EARP participants who argue that development should be keyed to priorities that are rooted in an environmental consciousness find themselves straining against a system that considers environmental consideration to be secondary to economic development.

The environmental assessment process is *site specific* and *choice specific*. It responds to a specific application for a particular development and location rather than to the defined need for particular forms of development. Hence, consideration of alternatives, while legally possible in some jurisdictions, is highly unlikely to receive serious attention. In addition, the assessment is *development specific* in that it is tied to only one aspect of change within a total ecosystem. As such, the assessment cannot respond to the demands made upon it by participants who seek a comprehensive view. The demand for a general inquiry into the priorities for development cannot be met by an environmental review which considers the environment as only one factor to be taken into account in engineering a project.

The on-going process of design of a major development, such as a nuclear power plant, runs ahead of actual construction. In New Brunswick, an NBP official indicated the time difference between the design of a part of the facility and its actual construction was at least six months. Therefore, demanding that the environmental impact study should be done before the design was complete was asking for the impossible, as NBP pointed out. Assuming that developers would bear the costs of design (estimated at 25 per cent of the total costs of the project) before they had assurance that the project would proceed was difficult, especially given the economics of the Point Lepreau plant development, which placed a very large burden on a relatively small utility.

Under these conditions, environmental assessment is a negotiating strategy, a means of establishing fundamental data and giving prominence to certain engineering design questions.

Environmental assessment, however, can stimulate research even on a local basis. NBP began research in conjunction with the new provincial Department of Environmental Protection (DOEP), and claims to have spent one million dollars on a series of studies and interim reports that accompanied the preliminary environmental impact study. This was thought by several NBP officials to be "more than Ontario Hydro would have done."

As one NBP official noted candidly:

> "They tried to cover all bases because they didn't have the time to go back. It was an enormous amount of work. Much of it was of no use to them but it did work to tell people . . . to answer questions."

These studies fill a "complete library shelf" and range from the sociological to the highly technical.

However, one government official noted that the studies had little impact on the final cabinet decision. The province and NBP assumed that nuclear power plants would be built. The only analysis required, therefore, was a study of the financial implications of building such plants, in short a cost/benefit analysis. The only other technical issue the cabinet considered was whether New Brunswick was more earthquake prone than Pickering, the site of an Ontario nuclear power plant already in operation.

What, then, was the role of research in the development of a project like Point Lepreau? It is possible that various research contracts enlarged the research capability within NBP, MacLaren Atlantic, and, to a small extent, the University of New Brunswick. *If* this expanded research capacity is now put to use then the preliminary work will have been beneficial. Traditionally, advocating companies develop expertise before the regulatory agencies. In the Point Lepreau case, the work done by NBP could perhaps lead to better regulation in the future, but such benefits are at best indirect and operate within the limitations set by institutional constraints. On the other hand, it is possible that this research will collect dust on NBP's shelves, or could be used as a public relations gesture.

As watchdogs and information monitors, opponents of the nuclear power project operated at a severe disadvantage. The only resource they had for independent research was published literature. They lacked the legitimacy of an agency, and even the facility to ask questions. Their ability to issue reports to the public was constrained by their relationship with the press. For the press seldom reported a full discussion of the issues and information involved. At best, participants in EARP and in the citizen meetings were considered as a group to be satisfied during the engineering design process. At worst they could be easily ignored.

Public interest groups represented at the very least an element of surprise and often a kind of mystery. The fact that they did not always agree on certain points, and that different public interest groups appeared to speak on behalf of the same people, made it difficult for NBP and government officials to understand them. The usual response of officials was to suggest programs of public education.

In general, however, members of advocate groups realised that they were operating a "double-barrelled" strategy. On the one hand, they sought to develop a high level of expertise in particular areas in order to engage NBP and AECB officials in serious debate. On the other, they were convinced the public would respond if it

had access to the basic facts and could make a fair assessment of the competing claims.

At the same time, advocate groups recognized that public awareness, and even participation in their own groups, varies and that the anti-nuclear movement might never truly have mass appeal. Thus, participants argued that they represented "only themselves" and suggested that their contribution should mainly consist of providing information that could alter the priorities of policies.

The process of assessment was estimated by one report prepared for NBP to be 10 to 12 per cent of the total cost of the project. Clearly there was a lack of incentive for listening closely to self-appointed watchdogs, whatever their expertise or points of view. NBP was willing and able to incorporate effective public participation, but only in regard to making decisions about how certain, very limited and specific, aspects of the project should be designed and about the relatively inexpensive, in the New Brunswick case, costs of compensating the local community for the disruption involved in establishing the plant.

Conclusion

Since the Point Lepreau hearing, environmental assessment has been lengthened through the inclusion of significant public participation, and has secured legal rights for intervenors by recourse to the courts. EARP panels have submitted negative decisions or imposed conditions on the projects that significantly restrict what the applicant may or may not do. The most recent example is the EARP decision on uranium refining in Warman, Saskatchewan where local and cultural considerations outweighed the pressure for uranium development, and the EARP panel recommended that the project should not proceed.

The crux of the matter remains how, after reforms and increased environmental consciousness, should EARP be integrated into the decision-making process. The Point Lepreau case was an extreme example of public education disguised as public participation in decision making. Its failures were evident. The conflict then and now is one of expectations, for those who testify assume that they are in part responsible for the final decisions. Governments, however, appear to assume the policy-making prerogative and set criteria that have little to do with environmental considerations. An inquiry, under these conditions, becomes a stage for playing out, but certainly not resolving, conflicts in expectations.

IV. Balancing Development and Risk in Uranium Mining

In some ways, the Cluff Lake Board of Inquiry* in Saskatchewan was faced with conditions similar to those faced by the EARP panel in New Brunswick. Both operated in what have traditionally been considered "have not" provinces - provinces that are dependent upon primary resource exports and subject to the vagaries of nature and world markets. Both Saskatchewan and New Brunswick viewed nuclear-related development as the key to economic and industrial growth. Because they realized that such development was critical, both provinces took actions which, in some eyes, pre-empted the decisions of the inquiry or hearing. In each case, the environmental assessment process occurred during the design stage and the inquiry or hearing became part of the testing procedure. In both cases an indigenous opposition to nuclear power existed before the inquiry or hearing began.

The similarities end there. Saskatchewan is now moving rapidly towards affluence. Although still heavily dependent on primary resource exports, its economy is more diversified. The uranium industry joins the newly established oil and potash industries, and real potential for secondary industrial development exists. In the Saskatchewan inquiry, the federal government played a minimal role; indeed one of the questions addressed by the

*For the sake of convenience, the Cluff Lake Board of Inquiry will be referred to in this text as the "Bayda inquiry" and the Royal Commission on Electric Power Planning in Ontario will be referred to as the "Porter inquiry". It is recognized that each inquiry had more than one commissioner, yet in most interviews, each inquiry was referred to in terms of its chief commissioner.

inquiry was the province's right to control all aspects of resource development.

Both Saskatchewan and New Brunswick have publicly owned utility companies. While in New Brunswick the Power Commission was the applicant for the development permit, in Saskatchewan the application for development came from a private company. Yet Saskatchewan is much more committed to public ownership of both resources and resource development industries than New Brunswick. Recently, the provincial government sought an active partnership between private industry and public corporations. On the other hand, in New Brunswick, both federal and provincial governments have supported private development (or NBP development) with loans and grants.

The Bayda inquiry lasted fifteen months as opposed to the single day of the EARP hearing. In addition, it focused directly on an application for development and not simply on a preliminary environmental assessment study. The Bayda inquiry addressed questions ranging from specific plans for mining equipment to the hazards of nuclear proliferation on a world scale. It focused directly on claims made by various participants about scientific information and its final report was written in the language of a scientific document.

The final report summarizes in some detail the characteristics of nuclear power and deals with the problems of both energy supply and nuclear waste. The EARP panel report did not. Given that it was produced in less than a year and a half, the Bayda report attempts to be thorough and comprehensive in its recommendations. In addition the Bayda report, unlike the EARP report, has been made accessible to the general public, for the inquiry itself undertook the task of educating the public and supplying information.

It is somewhat surprising, then, that the Bayda report has been criticised as strongly as the EARP panel report for its scientific conclusions, perhaps even more heavily by those who took part in the inquiry. This criticism arose despite the fact that the Bayda inquiry had a broad mandate and an innovative process and that social, political, economic and ethical considerations were all taken into account. The interrelationship and complexity of various issues are acknowledged. The final report addresses each point raised by the intervenors, provides a point-by-point justification for its recommendations, and attempts to refute those claims made by intervenors, which were not accepted by the inquiry. Scientists from many disciplines testified before the inquiry and their arguments are dealt with explicitly in the report. Yet critics of the report suggest it is not based on scientific assessment, that the

comments of the intervenors have been ignored or misjudged, and that the report fails to address the complexity of the problems.

The basis for criticism of the Bayda inquiry can be made clearer by comparing it with the Le Dain commission, an inquiry that also investigated a highly public and scientifically controversial issue.

History and Context

Uranium was discovered in Saskatchewan in 1935, but not mined commercially until the 1950s. Two uranium mines were brought into operation in the early period, one owned and operated by Eldorado Nuclear Limited (Uranium City) and the other by Gulf Minerals Limited (Rabbit Lake). Both were established without an inquiry or extensive controversy. They are located in the north of the province, and have resulted in the development of company towns.

In 1967, Amok Ltd., a federally incorporated exploration company whose shareholders are three private French companies, conducted an airborne scintillometry survey in three separate blocks of the Athabasca basin. From 1967 through 1969, Amok received grants in aid of this exploration, totalling $135 000, from the province. In 1971 a high grade uranium deposit had been positively identified just north of Cluff Lake, and in 1974 Amok and the provincial Department of Mineral Resources (DMR) met to discuss the development of the resources. The Cluff Lake development committee was formed by the government to work with Amok and involved both DMR and the Department of Northern Services (DNS).

From August 1974 to September 1975, this committee discussed transportation, utilities, townsite planning, environmental protection problems, manpower and planning, and tax and royalty structures. Those disagreements that occurred centred mainly on tax structure.

The provincial Department of the Environment (DOES) had, since 1973, been drafting policies and approaches for environmental assessment. In July 1974, DOES and the vice-president of Amok announced publicly that an 18-month environmental study on the Cluff Lake proposal would be done by the Canadian affiliate of Stearns-Roger Incorporated, a US consulting firm commissioned by Amok.

Technically, the Cluff Lake development did not have to go through a full environmental assessment, nor were public hearings required. Nevertheless, the proposal generated public controversy, including a debate in the Saskatchewan legislature. In mid-November 1976, five days before the final environmental report was tabled, Amok was informed that public hearings would be

held. A week later, DOES received the Environmental Assessment and Safety Report from Stearns-Roger,[1] and on 24 December publicly announced there would be environmental assessment hearings. The Stearns-Roger report was not made public until the first week in February, after the Order-in-Council establishing the Cluff Lake Board of Inquiry.

In some ways, Saskatchewan's environmental legislation is among the most stringent in Canada. Yet an assessment is only required when proposed developments cannot be handled under existing pollution control programs. The Minister of Environment can halt the assessment at any time if it is considered that further assessment is not required. Also, although the process can take up to two years, projects can start with the permission of the Minister before the assessment is completed. Because the Minister of Environment must submit decisions to an interdepartmental committee and to cabinet for review, other priorities may arise after an assessment is complete. Each assessment can generate its own board of inquiry, and these boards may or may not choose to draw upon the accumulated experience of each other in their assessment. Therefore, at any time, several inquiries may be in progress.

Without doubt, the provincial government considers environmental assessment to be an important factor. In the past, however, a large amount of decision-making power rested with the Department of Mineral Resources, which acted both as the regulator and the proponent of mining development in the province. Although the question of jurisdiction over regulation is now being examined and it is likely that the Department of Environment will assume regulatory functions, it is still true that the relative power of DOES and DMR should be taken into account when evaluating the environmental assessment process in Saskatchewan.

The Saskatchewan government may well have been prepared to receive a negative verdict from the Cluff Lake inquiry and to call a moratorium on mining. However, given the size of the revenues involved, several other serious considerations had to be taken into account. In 1977, the year the inquiry was commissioned, twenty million dollars were invested in uranium exploration with forty million more in the three-month period prior to the release of the inquiry's report in May 1978. In 1979, the development "hit full stride", and more than one hundred million dollars were spent in exploration. The estimated life of the Phase I period of extracting uranium ore from the Cluff Lake mine is expected to be between three and four years. Phase II, which includes open pit mining of other conventional ores as well as maintaining the Phase I annual rate of uranium production, would represent more than nine years of additional production. Only the Phase I operations were considered by the inquiry.

Uranium mines in Saskatchewan pay a basic royalty to the province of 3 per cent of their gross sales on all uranium produced and sold. In addition, a graduated royalty is negotiated with each company. A company is allowed to claim for social capital installed (for example, roads, schools and facilities built in the process of development) but, nevertheless, royalty payments are significant. The Cluff Lake development was only one of many uranium-based developments in northern Saskatchewan, and is probably only the first stage in the full development of uranium mining and milling in the North.

The inquiry considered a wide range of questions, but did not examine the implications of Phase II. Nevertheless, its recommendations attempted to set parameters for both a nuclear policy and for related development, particularly in the North.

The northern population consists mainly of native people, and jurisdiction is divided between the federal and provincial governments. Although social dislocation is common, the traditional economy of hunting, trapping and fishing supports people living in the area. Communities are poor, and social problems are exacerbated by the divided jurisdiction. New mining activity disrupts traditional activities even further. It brings into sharp focus questions about northern control over political and economic development for it increases differences in lifestyles between northerners and others as well as between the native people and other northerners. The Bayda inquiry attempted to face this situation directly.

Uranium mining and milling operations, and particularly those at Cluff Lake, pose additional difficulties. Uranium is naturally radioactive, and the uranium deposit at Cluff Lake is very high grade ore. Without adequate precautions, mining the ore could cause this natural radioactivity to spread through the air or via ground water into a wide area. There is also considerable risk to miners of being exposed to high levels of radiation.

Uranium, unlike other mineral resources, comes under federal jurisdiction; yet the provinces have vigorously sought jurisdiction over its mining. When the Atomic Energy Control Act was passed in 1946, the AECB assumed responsibility for licencing uranium mines with the province controlling prospecting and staking of claims.[2-5]

By 1950, it became clear that AECB's main interest in uranium mining was security of supply.[6] Information on reserves and distribution was, therefore, needed for evaluation of supply. Provincial authorities assumed direct responsibility for the health and safety of miners, and the conditions of licence, as granted by AECB, required compliance with provincial laws. In general, these jurisdictional arrangements are still in force today.

In 1968, the Hon. J.J. Green, then Minister of Energy, Mines and Resources reiterated that uranium mines should be subject to the same rules, except for matters of national security and foreign policy, as those which the provinces exercise over other mines.[7] He stated that wherever possible, the AECB would appoint provincial officers as inspectors under the health and safety sections of its regulations.

Nevertheless, questions of jurisdiction still have profound importance. Actions taken by the federal government, to stockpile uranium for example, have a direct impact on the sale and price of uranium. Foreign ownership is monitored through the Foreign Investment Review Agency. The question of royalties may become critical in the future in discussions of provincial jurisdiction over resources in a federally regulated industry.

Provincial regulations on mining are often more strict than federal regulations appear to be but the question of jurisdiction does not hinge upon the level of protection provided. The legality of provincial regulations could be tested in court if a company were to find regulations too stringent. The companies involved have the resources to launch a landmark case, should they feel it necessary.

Because some questions of jurisdiction over mine development and safety remain, the province's right to set strict mining regulations was addressed by the inquiry. It was proposed that specific regulations on the Amok mine should be included in the contract, between the company and the provincial government, that protected the province's right to pass and enforce regulations. Whether such a contract will be sufficient to circumvent jurisdictional problems remains to be seen.

In general, most standard setting, upon which federal and provincial regulation is based, is done outside Canada and the responsibility for it is as difficult to determine as internal jurisdictional questions. Like all standard setting organizations, international bodies use expert advice but must also balance the interests involved. Provincial governments take an active role within Canada, but do not have the necessary research capability to set or evaluate standards. These are generally established with respect to the concept of "as low as reasonably achievable" and involve cost/benefit analysis. The resulting standards may or may not be adequate.

Standards are set with reference to a variety of criteria, and are subject to factors over which federal and provincial governments have little control. Not all of these factors are related to consumer protection. Often standards do not take performance characteristics of a technology fully into account. *Performance* standards, which include conditions of construction and human factors in operation, are costly to develop and require facilities for

a continuing assessment and monitoring of developments now in place. Few international standard setting bodies possess the facilities for a systematic study of the performance characteristics of nuclear-related facilities.

Because they are based on a balancing of interests, standards are set at minimum acceptable levels. Therefore they do not imply "no risk", but simply a level of "acceptable risk". An assessment of what constitutes "acceptable" and how this should change in response to new technical and scientific information is not usually included in standard-setting procedures.

Standards for radiation exposure levels can be defined by law or guideline. They can be set with reference to the number of hours of exposure to a level of radiation in the environment, or they can be set for radiation received at different parts of the body. Several different types of radiation may be involved, but some standards are set with separate reference to each type. The existence of standards in themselves, does not constitute "protection". Several countries have stricter standards for radiation protection than those in Canada; yet the Canadian standards fall well within internationally acceptable levels. As the Bayda report notes, regulating agencies do not always utilize the research findings of international organizations and those most affected by problems often are not informed about the impact and significance of new research. Some reforms were suggested, but they cannot be imposed at the provincial level alone.

The province of Saskatchewan has imposed relatively stringent regulations. However, many of the factors necessary for a full assessment are unknown. The inquiry report could have proposed changes in radiation exposure standards that would have provided increased protection, but neither the inquiry nor the province could ensure that such protection would be adequate for those working with the uranium rich ore at Cluff Lake.

The Inquiry

At the instigation of the Saskatoon Environmental Society, the Saskatchewan Federation of Labour, the Human Rights Association, some community clinics and the National Farmers' Union demanded an inquiry not only into the Cluff Lake mine but into the broader issue of uranium mining. As one person put it:

> "There was quite a bit of pressure. I think they would have preferred not to have a public inquiry. But other inquiries had been set up, like Porter in Ontario and the Ranger Commission and one in England. There was enough public pressure and the government wanted to prove how safe it was."

In addition, the development of uranium mining and the possibility of an inquiry had come up for discussion at the annual convention

of the provincial New Democratic Party. People felt that "the government had to respond."

Prior to the inquiry, a large public meeting was held in Palmbere Lake in northern Saskatchewan. Apparently, it was not called as an anti-nuclear meeting but "ended up with everyone voting to see what they thought personally about uranium". One person estimated that more than five hundred people attended the weekend-long session, but the meeting was covered by only two newspaper journalists and one CBC reporter and did not receive much press coverage.

An inquiry was commissioned on 1 February 1977 and ordered to report by November of that year. The provincial government wanted a "thorough inquiry" and, although it set no limits on what might be considered, it indicated the inquiry should proceed "with as much speed as the situation permits."[8]

This limited timeframe was frequently questioned by intervenors and occasio ally in the legislature. Many of those who later became particip... claimed that the timeframe was insufficient because the issues demanded public education, serious research and detailed examination. The inquiry chose not to question the timeframe. In the final report, it suggested that public education was beyond its mandate. (It was, the inquiry argued, mandated to assess public opinion *as it was*.) The inquiry argued that the research done by advocate groups was adequate and that detailed examination was possible even within these time constraints. In the end, the inquiry reported several months late.

The inquiry used both formal and community hearings. In the formal hearings, procedures were structured in a modified court-like manner. Those given formal status as intervenors had the right to cross-examine witnesses and to be represented by counsel. In the informal or community hearings, efforts were made to encourage discussion but participants were not permitted to question each other. The inquiry also received some written submissions.

Although the inquiry stressed that all information would be made available to the public, some aspects of Amok's application dealing with the financial status of the company in relation to other companies were considered confidential.

The inquiry sought to develop an extensive information service although it only had a staff of three, including the commission counsel, to carry out this function. It scheduled town hall meetings, and set up debates at the request of individual communities. Those representing different sides (or opinions) of an issue were invited to send speakers so that one person "pro" and one person "anti" would speak at each meeting. These meetings were organized primarily

by intervenor groups acting through a committee but the records of the meetings were not considered part of the official inquiry.

Information centres, essentially depositories of published information and bibliographies, were set up in public buildings and libraries throughout the province. A weekly summary was prepared and distributed both to information centres and through a general mailing list. Extensive use was made of hot-line and local media programs. The inquiry prepared a procedures manual and issued rulings on procedure from time to time. But groups were expected to use the funds granted in preparing testimony and not for general information or education purposes. Some of the oral briefs were available a day in advance, but according to one participant, "most were presented as people got up to speak."

The inquiry made use of a resident scientist in northern areas to ensure that the inhabitants would have access to adequate technical information before the hearings. However, despite the efforts of the individual involved, this experiment was a failure. Few participants consulted the scientist; yet there were many complaints after the inquiry that adequate information had not been made available, particularly in northern communities. The inquiry had conflicting roles in the north for, regardless of its intent, it acted both as educator and inquirer.

The inquiry saw the issues involved as highly polarized, and attempted to generate participation by providing opportunities for the public "to hear both sides" of the issue. For example, the inquiry asked the Saskatchewan Environmental Society to "lead" the evidence for those opposed to nuclear development, Amok to "lead" the evidence for those who were pro nuclear, and the Northern Municipal Council to "lead" the evidence on northern questions. The funding of intervenor groups reflected the inquiry's decision that "the use of leading witnesses would ensure a concentrated approach."

The inquiry itself was not responsible for funding intervenor groups. Instead, groups applied for funding to a committee acting under the Saskatchewan Department of Environment. Many groups received money, but "lead" groups received the largest amount, a decision supported by the government.

The board scheduled hearings from March through September, but intervenors claim that the southern rural hearings were scheduled in the last two weeks of August when farmers had little spare time.

The inquiry sat in formal hearings for 67 days and heard from 138 witnesses. Twenty-three days of hearings were scheduled in Regina and Saskatoon. At the local community hearings, it heard from 260 individuals and 30 groups. The following groups participated in the formal hearings:

Participation in Formal Hearings

	Phases			
	1	2/3	4	5
Governments	26	5	5	8
Individuals*	7	15	10	35
Mining Interest Groups	0	8	7	18
Membership Groups	0	2	4	0
Consultants	0	7	1	0
	33	37	27	61

*Group membership was not indicated for voluntary or advocacy group participants or their consultants. Most individuals came from the voluntary or advocate sector, however.

Many who testified had doctoral degrees or were medical doctors. Many came from outside the province:

Geographical Origin of Participants

Local intervenors	13	
Saskatchewan intervenors (non-local)	26	(including mining companies that may have parent companies elsewhere)
Canadian intervenors (non-Saskatchewan)	30	
Non-Canadian intervenors	26	

Participation in Community Hearings

	Northern Hearings	Other Hearings
Individuals	167	66
Membership groups (including churches)	5	5
Advocate groups	1	5
Social service groups	0	7
Companies	1	0
Governments	1	2

Northern hearings were attended by more than 800 people in total, southern hearings by about 400 people. Northern town hall meetings attracted about 270 people, southern meetings about 370 people.

Since the time of the inquiry, uranium exploration and development in Saskatchewan has boomed. The work at Cluff Lake has begun in earnest, and construction is starting in conjunction with the Key Lake development. Those who conducted the inquiry suggested recently that almost all of the recommendations were adopted by the provincial government. Unfortunately, many recommendations address general problems in regulatory structures and enforcement, over which Saskatchewan has little control.

The lease signed with Amok spells out in some detail the percentage of jobs and the training to be guaranteed to northern peoples. Amok claims that although it was required to hire a workforce composed 50 per cent of northerners, in fact 60 per cent of its workforce consists of northerners.

The recommendations of the inquiry did not satisfy many of the participants. Many now claim that opposition to uranium mining is growing, that more people are becoming involved in the issue, and that an increasing number of groups are seeking the opportunity to participate in the debate.*

In attempting to create a basis for the assessment of policy and value questions, the Bayda inquiry established criteria against which proposals and testimony could be measured. Most involved a modified cost/benefit analysis. Others applied the standards of "common sense" and similar measures, taken perhaps from tort law. The inquiry agreed with many of its participants, however, that ethical and moral questions were also involved in the decision to expand uranium mining in the north. Indeed, much of the discussion in later parts of the inquiry and in the inquiry report centres on moral questions arising from nuclear proliferation and Saskatchewan's role with respect to the spread of weapons. The inquiry made several recommendations on ethics.

Nevertheless, the Bayda inquiry viewed its task primarily as a scientific assessment of the question: How could the overall project be made safe? In answering the question it interpreted safety widely, including the protection of lifestyles.

The inquiry conducted its assessment using three methods. First, it compared key studies already completed and bringing together their authors to testify in the hearings. Second, it received data, centred largely on the mandate and activities of specific government departments and agencies, from those who testified. This information was "tested" in the cross-examination procedure by the inquiry and by intervenors. Third, it used community hearings as a means of collecting data. This was particularly important in light of a paucity of any research on northern communities in the province. The findings of this assessment were not analyzed by scientific staff connected with the inquiry nor were they tested through cross-examination before the more formal hearings.

The inquiry did little scientific work of its own but, because none of the staff had expertise in nuclear development or technol-

*A court case has recently been brought by two participants with reference to the Key Lake development. The plaintiffs seek an injunction against further work claiming that the two mining companies involved "were proceeding without legal authority to divert and drain water" and "were interfering with the waters of the Key Lake chain."

ogy, it was highly dependent upon information brought to the inquiry. With only one applicant, no strong regulatory agency and a few voluntary organizations, the inquiry had the trappings of an adversarial process, but lacked much of the substance of effective adversarial decision making.

It is important to recognize that, before the inquiry, little environmental field work had been done in the areas to be affected by the mine. Neither socio-economic, nor community studies had been conducted in the northern communities affected, and relatively little research had been done on native life in northern Saskatchewan. As one intervenor put it in an interview:

> "That was one of the most interesting things about the inquiry. There was no information on the native economy. There was no information about animal movements. There was no information about the movement of people in northern Saskatchewan, no base-line environmental data, no base-line hydrology data."

As a consequence of its lack of internal research, the inquiry relied heavily upon the environmental assessment study commissioned by Amok and carried out by Stearns-Roger Inc. It found the study basically sound, but identified some weaknesses. The Stearns-Roger report,[9] for example, drew heavily on what one inquiry staff member called "textbook materials", that were in some cases "several decades old." It also relied on information about areas considered similar to northern Saskatchewan but whatever was unique to the Saskatchewan case often could not be fully identified.

The inquiry felt it could not commission further research. As the report stated:

> "Such a study would have meant adding not months but years to the term of the inquiry and involves much more than an evaluation of the expansion of uranium mining."[10]

It did, however, hire a Vancouver consulting firm to help sift through the testimony (with mixed results according to an inquiry staff member). The Vancouver group conducted a six-week study, reviewing the literature, speaking with governmental officials and conducting a few interviews. In addition, when it was decided that the Amok-sponsored research was inadequate, a study was made of plant ecology in the area where the proposed mine was to be sited. No one was hired, however, to do a full assessment of the Stearns-Roger report.

Cross-examination was considered central to the assessment for the inquiry saw itself as arbitrating between the competing claims of groups who took different positions on technical and social questions. Appropriate scientists could be found to testify, in the view of one commissioner, "through networks of contacts on the

pro- and anti-nuclear side of the 'debate'." Within the time constraints, only a few scientists could appear before the inquiry, but the inquiry considered there was sufficient participation from the scientific community to ensure an adequate assessment.

Analysis

Where there is little scientific uncertainty, dependence on external research and formal cross-examination may be reasonable. At the very least, it can produce a healthy, if occasionally acrimonious, scientific debate. But when there is scientific uncertainty, an arbitration process is less appropriate. The lack of information on specific problems leads to philosophical discussion and at this level of debate specificity becomes irrelevant. To this extent, the Bayda inquiry could have taken place in any part of Canada.

In the case of northern communities, where so little is known about the environment, the kind and amount of research carried out by an inquiry is critical. It may be that the mid-north has been studied even less than the far north. The appropriateness of generalizations about communities and regions is impossible to gauge.

Northern communities and native peoples, in general, who are most likely to feel the impact of projects, benefit only indirectly from these developments. There is documented evidence that jobs do not always go to local residents. The "boom and bust" syndrome is common, and there are problems peculiar to company town life. Those who live in urban environments have the means to cushion the impacts of major developments that people in small communities do not have.

Inquiries have often recognized these problems and the Bayda inquiry was no exception. Difficulties arise not so much from lack of good will as from a lack of understanding about the best way to proceed.

Most inquiries, and certainly the Bayda inquiry, seek to emulate the model of the Berger inquiry. The model is appealing because the Berger inquiry resulted in changes in government policy, and was well received by at least some northern people.[11-14] But following the Berger model is difficult because the amount of time, sensitivity, preliminary community work, background research and necessary resources required is great. Communities in the far north are more isolated, and do not have the same outside pressures that mid-north communities have. The Berger inquiry into the Arctic pipeline had several options to choose from, including two corporate applications and a proposed method of approaching development brought forward by native organizations. Yet even under these favourable conditions, the task was complex and demanding.

It has been said that the Berger inquiry acted as advocate to the cause of the native people rather than studying their problems. To the Berger inquiry, the range of views of northern peoples was less important than the nature, depth and scope of those views. The Berger inquiry's most important conclusion was that native people had to be taken as serious advocates of their cause.[15] Understanding the seriousness of their problems and the way emerging political groups might take part in solving them outweighed what might have been a more "pragmatic" consideration of, for example, measures that might be taken to mitigate the effects of change.

Such an assessment can fall prey to criticism that the inquiry was biased towards the native people's views or that it was utopian and unrealistic about the nature of the options available and overly responsive to political pressures in the north. Caught among the choices of presenting a referendum-like account of views, a picture of the north as northerners understood it or a serious consideration of the options for various kinds of development, the Berger inquiry chose the third cause. Caught between providing a glimpse of a new and little understood political reality and a full account, the Berger inquiry concentrated on the former.

The Bayda inquiry did not have the time, staff or resources to conduct a Saskatchewan version of the Berger inquiry. It had one application to consider and was unable to expand the inquiry. The Bayda inquiry was aware of the criticisms made of the Berger inquiry and sought to avoid the same pitfalls and provide what one inquiry staff called "a more balanced view." The Bayda inquiry could either eliminate consideration of the northern issues, reasoning that the inquiry would have limited access to adequate information, or it could rely on whatever groups or individuals might appear at the local hearings. The inquiry chose the latter. Again, it could seek an understanding of northern life or rely on conventional, and not always inaccurate, perceptions of northern problems. Again, it chose the latter. By making these choices, the Bayda inquiry followed a pattern different from that of the Berger inquiry.

The Bayda inquiry addressed some of its recommendations to the problems of northern development. It recommended, for example, a commuter system to avoid the establishment of company towns, and an arrangement for drawing labour for construction projects from native communities. It advocated the creation of a Northern Development Board and measures to provide a greater voice for northern people in planning.

Some northerners, particularly the Northern Municipal Council, were pleased with these recommendations, many of which have been implemented. Yet, the pattern of development in the north and the particular problems involved have not changed despite the

somewhat innovative approaches taken as a result of the inquiry. For some, the message of the northern people to the inquiry had been missed.

Not only the recommendations but also the texture of the report differed from Berger's. After all, the inquiry spent only two weeks in the north and most of its hearings were occupied with requests for information. Little that was new about the patterns of social life in northern Saskatchewan, the levels of dependence on traditional economies or lifestyles and the experience of the one commuter town that does exist, appeared in the final report.

Perhaps the Bayda inquiry properly represented the range of views brought before it but, critics claim, it lacked an understanding of the northern situation. Thus it was unable to make recommendations which were capable of generating significant change in the north.

The final recommendation of the Bayda inquiry gave a green light to both uranium mine development and the Cluff Lake application. As described earlier, the pressures for such a decision were great.

Although the government may have been willing to consider seriously the issues of northern development and health and safety risks, a great deal was at stake. Amok had already invested $30 million in the Cluff Lake development, and the Saskatchewan Mining Development Corporation (SMDC) $20 million in uranium exploration. It was understood that compensation for Amok would be required if the arrangements "were to be broken or renegotiated."[16]

The inquiry was oriented to recommending policy, but its "ultimate recommendation" to go ahead in Cluff Lake was tempered by a number of other recommendations such as standard setting in mining, equipment design, and problems on the nature of the information available to workers and the public alike.

But this tempering of the recommendations attracted relatively little public or government attention. The inquiry staff were upset at this lack of reaction. As one member put it:

> "Basically, you've got to make a judgement call . . . there are no "yes and no" answers. I suppose one of the things that bothered me most after the report was released was that both the government and the anti-nuclear people treated it as a black and white issue. The government looked upon this as an endorsement of going ahead full blast with nuclear development. I don't think that's a fair reading of the report. The anti-nuclear people looked at it as a whitewash."

There is an increasing tendency to produce inquiry reports that are easily readable and supplemented with photographs and graphics. The Bayda report went further by numbering points for

easy reference and explaining in lay language the basic details of some of the technology. Nevertheless, the report was long because it was forced to cover a range of complex matters in some detail. Its recommendations are summarized at the end and, at times, out of context. Questions that remained unsolved, the areas where little research existed, for example, are left behind in the body of the text. Because the recommendations appear so clear cut, they are easily open to misinterpretation by governments and public alike.

Conclusion

Under Saskatchewan's assessment process, every application for a new project could create another inquiry. When the number of inquiries commissioned under other jurisdictions is taken into account, there is a danger that the province will either develop "inquiry fatigue" or it will move to withdraw more and more questions from the inquiry-based assessment by assuming that the issues have been adequately assessed in earlier inquiries. In either case, the public demand for debate is unlikely to be satisfied.

"Inquiry fatigue" does not necessarily reduce the public's participation, but it may preclude intelligent participation by wearing down the participants and demanding, as is the case in Ontario, that government departments create a special staff whose job is to appear before inquiries. Once the participants are weary or have become "professional" then their ability to bring a unique approach to specific applications is diminished, as well as their ability to respond with depth and consideration to the challenge of questioning. Inquiries can easily become "set pieces" or staging grounds for a continual replay of the same debate.

V. An Inquiry and Electric Power Planning

The Royal Commission on Electric Power Planning in Ontario, the Porter inquiry, was commissioned in 1975 but its final report was not released until 1980. As it was still in progress when the Bayda inquiry was commissioned, the recommendations of that inquiry's final report were added to the list of issues to be assessed. During its five-year life, several related inquiries also made recommendations. Studying the Porter inquiry is a bit like reviewing the history of the past five years, a time packed with critical events and changes affecting energy policy.

The Porter inquiry was comprehensive. It incorporated many different modes of scientific participation and almost any topic which could be subsumed under a discussion of electric power planning. The original mandate of the inquiry was wide, and the commissioners chose to make it even wider. It considered public participation a major objective. Some intervenor groups stayed with the inquiry throughout the five years. The inquiry held hearings and public panels, conducted seminars and workshops, and accumulated an enormous amount of evidence.

This inquiry was not originally set up to investigate nuclear development, but ended by incorporating both the nuclear debate and Ontario Hydro's past approach to nuclear development. It was created to investigate proposals for facilities to be built by Ontario Hydro between 1982 and 1990, but it also looked at Ontario Hydro's past record.

The Porter inquiry considered its task as that of electrical power planning, and viewed planning from a social, political, and ethical perspective. Economic conditions might set constraints, and

technical assessment might indicate the nature of the options available, but both of these issues were subsumed in the more general discussion of overall planning. Various alternatives were considered, taking into account the current situation as well as incorporating an historical perspective. The inquiry took the position that specific recommendations should follow from general conclusions.

The Ontario government, which commissioned the inquiry, and the people who would be directly affected by its recommendations were not always pleased with this approach nor the delays involved. The government had asked for a comprehensive approach to electrical power planning, but events and policies posed their own imperatives. While the inquiry was in progress, policy decisions were made that affected areas upon which the Commission was supposed to report and make recommendations.

For example, while the inquiry was in process:

- an environmental assessment policy in Ontario was being implemented;
- Ontario was in the process of developing an energy policy and negotiating aspects of that policy with the federal government;
- nuclear policy and regulation were under review;
- a Select Committee of the Ontario Legislature was looking into aspects of Ontario Hydro activities.

During the final stages of the Porter inquiry, the Select Committee directed its investigation to nuclear safety, overlapping with some aspects of the work of the inquiry. The recommendations of both groups were felt to be competitive, for the Ontario government must now weight the approach and the recommendations of each.

The Porter inquiry has not attracted the strong criticism from the public that characterised the other inquiries studied. It was respected by many of its participants, perhaps because of the inquiry's ability to listen patiently to what everyone had to say and its apparent responsiveness to the people involved.

In Ontario, the Porter inquiry was the last in a long series of inquiries, task forces and committees investigating Ontario Hydro, the siting of transmission lines, the question of nuclear safety, and the role of the public in planning. The Porter inquiry cannot be understood without reference to the many other "inquiries" that went before it or were conducted at the same time.

History

The decision to use nuclear power as a source of energy in Ontario was made many years before the Porter inquiry and long before any form of public discussion was considered necessary. Ontario was already committed to an active partnership with AECL in the

development of nuclear power by the 1950s and by 1964 had laid the groundwork for the development of its nuclear capacity with some of the reactor sites already selected. Until 1965, questions raised in the provincial legislature focused mainly on the potential benefits that individual communities might reap from a nuclear facility. Questions of safety or desirability were not addressed in the legislature until 1965, and then only briefly.

By 1970, Ontario Hydro was well into the planning stage of its nuclear generating capacity and was beginning the construction phase of some new plants. This phase required large amounts of capital, more than was available to Ontario Hydro under its arrangements with the provincial government. The demand for additional capital generated concern in the legislature, which quickly spread into other areas of Hydro's planning and corporate structure. The feeling that the utility had become too large for its method of operating and in particular its manner of decision making led to the creation of an investigatory body, Task Force Hydro.[1]

The report of the task force was quickly followed by a second inquiry into Ontario Hydro's affairs, the Solandt inquiry, at a time when Ontario Hydro was building transmission lines through the heavily populated areas near Toronto. The Solandt Commission made recommendations about the location of transmission lines[2] and, incidentally perhaps, focused upon Task Force Hydro's concern about greater public participation in Ontario Hydro's planning.

The extension of the Ontario Energy Board's (OEB) powers in 1973 also reflected a concern for the activities of Ontario Hydro. Although the OEB acted like a traditional regulatory body, which it was not, it had provision for a public hearing process, and from 1970 onward Ontario Hydro was brought before an increasing number of public bodies to account for its actions.

In 1974, the Ontario government commissioned James Ham to investigate problems connected with safety in mining that had been identified through other investigations and by the media. The Ham Commission studied uranium mining and produced new data to show that it created unacceptable dangers for the workers and, by implication, for members of the surrounding communities. The report drew public attention to the potentially unsafe nature of nuclear-related development and to the fact that reassurances given by those in regulatory agencies had often been based on inadequate assessment.

In 1976, the federal government commissioned the Hare report, again as an "inquiry", to look into the effects of nuclear-related development.[3] Hare concentrated on nuclear waste and did not hold hearings. He concluded that safe methods could be found to dispose of waste materials but left open the question of the availability of these methods. Today, the question of waste disposal has become a

major public concern and the Hare report can be seen as posing more questions than it is capable of answering.

Both federal and provincial EARP procedures were established just before and during the years of the Porter inquiry. The recommendations of the federal EARP in Ontario resulted in one development, Port Granby, being halted in its tracks during the tenure of the Porter inquiry.

In addition, the Select Committee on Ontario Hydro Affairs (Select Committee of the Legislature Investigating Ontario Hydro) held several hearings, each relating directly to questions under examination by the Porter inquiry. The implications of its specific recommendations were felt in the Porter inquiry, for the Select Committee produced information on contractual and regulatory relationships also considered by the Porter inquiry.

When Task Force Hydro was commissioned, the environmental and consumer movements were only beginning to make their presence felt. By the time the Porter Commission was ready to report in 1980, it faced a strong antinuclear movement, a well articulated concern for public participation, and numerous citizen groups. During that period, individual groups may have come and gone, particularly in larger urban centres, but their number and impact had not diminished. Indeed their concerns had been integrated into the planning procedures of environmental, energy, utility and other government departments.

The ground rules have changed dramatically for those who plan and execute strategies for development in Ontario. The Porter inquiry was part of that change but also an outsider to it.

The Inquiry

All of the above events had their impact on the Porter inquiry and, in some way, led to its instigation. For example:

- The OEB hearings had considered Hydro's plans for expansion but it now appeared necessary to carry out a longer and more detailed examination;
- The Solandt Commission started a process in which citizens were involved in planning. The limitations of Hydro's public participation were becoming clear, and the Porter inquiry expanded this participation by taking a much broader approach to citizen involvement in planning;
- Ham, Hare and others identified problems in the regulatory structures, but Porter should have been able to show how regulation could be incorporated into planning;
- The Select Committee was active, but it did not involve citizens directly;

- Both federal and provincial environmental assessment procedures were established, but were tied to specific projects. An overview was needed;
- Every report since 1970 had called for greater public access to information and decision making. The Porter inquiry should have been the perfect vehicle.

As one Ministry of Energy official stated, "One really should be able to go about planning the system in an overall public way, rather than having individual hearings for individual sites."

Three additional factors should be mentioned. Firstly, the oil embargo in 1973 brought energy to the forefront of public consciousness and government policy. Secondly, it was suggested that Ontario Hydro's forecasts of energy demand were too high, and its strategies for development inadequate when demand was not rising sharply. Thirdly, Ontario Hydro had issued a report in 1973 which outlined its long-range planning priorities.[4] In many respects, the Porter inquiry carried out a public review of issues raised in that document, which presented a cost/benefit analysis based on an estimated load growth of 7 per cent per annum, compared various sources of energy, and listed Hydro's plans for expansion. Report 556 SP set the foundation for an inquiry that might have put the technical and economic questions into perspective.

The Royal Commission on Electrical Power Planning was mandated in July 1975 to:[5]

"1) Examine the long-range electric power planning concepts of Ontario Hydro for the period of 1983-93 and beyond and to report its findings and recommendations to the Government, so that an approved framework can be decided upon for Ontario Hydro in planning and implementing the electrical power system in the best interests of the people of Ontario;

"2) Inquire comprehensively into Ontario Hydro's long-range planning program in its relation to provincial planning; to domestic, commercial and industrial utilization of electrical energy; to environmental, energy and socio-economic factors, including load growth, systems reliability, management of heat discharge from generating stations, interconnecting and power pooling with neighbouring utilities, export policy, economic investment policy, land use, general principles on the siting of generating utilization of electrical energy and wise management (conservation) of primary energy resources, power generation technology, security of fuel supplies and operational considerations;

"3) Deal primarily with the broader issues relating to electric power planning, and thus serve to alleviate the need for re-examination of these issues at subsequent hearings of other hearing bodies on specific details such as siting, rates, etc;

"4) Consider and report on a priority basis on the need for a North Channel Generating Station, a second 500 kV line from Bruce, a 500 kV supply to Kitchener, a 500 kV line from Nanticoke to London, and a 500 kV line in the Ottawa-Cornwall area, and other projects as may be directed by the Lieutenant Governor in Council."

The terms of reference were amended in December 1977 to include "issues relating to nuclear power, to prepare an interim report of its opinions and conclusions in this area, including the extent of the need for nuclear as a component of Ontario's future energy supply and the proportion of nuclear power in Ontario Hydro's future generating capacity" and further amended in July 1978 to include examination of "i) the geographic area of Ontario south of Bruce Nuclear power development and west of a line between Essa transformer stations and Nanticoke generating station, to consider. . .load growth in the area up to the end of 1987 and from 1987 to the year 2000, the capability of existing and committed bulk power generation and transmission facilities to supply this load to the area. . . ii) the geographic area of Ontario east of Lennox generating station, to consider. . .load growth in the area up to the end of 1987 and from 1987 to the year 2000, the capability of existing and committed bulk power generation and transmission facilities to supply this load to the area."

It may have been the intention of the government to come to some resolution of the public debates that had been springing up, like mushrooms, around and after each inquiry or committee that had been commissoned. It certainly is significant that the Porter inquiry was at least the eighth public proceeding in which the issues defined in its mandate were discussed. In fact almost any issue that was addressed by the Porter inquiry had already been discussed elsewhere. For example:

- The Porter inquiry could re-examine the nuclear debate (although Dr. Porter had himself been instrumental in the development of nuclear policy). It could not, however, alter the existing contours of Ontario's energy map. Indeed it was unlikely that the Porter inquiry would come to any startling new conclusions;
- The Porter inquiry could look at the expansion plans of Ontario Hydro and its problems in locating the transmission lines that would complete the grid. In this case, the inquiry could pick up where the Solandt Commission left off. The Solandt Commission, however, had already set in motion a particular pattern of development;
- The Porter inquiry could expand the plan to include an examination of social factors and the links between development and economic growth. But in doing this, it would

supplement a newly established environmental assessment authority that was directed to the same ends. It could only overlap with a planning process instituted by Hydro and the deliberations of OEB, although it considered a later time period;

- The Porter inquiry could look at problems in regulation but do no more to solve those problems than other inquiries had already done. Indeed the situation had already been well-documented by previous inquiries, and would later be examined before the Select Committee.

Ultimately, the primary task of the inquiry was to institute a public process that would satisfy the demand for information and participation, and provide some resolution of public controversy.

If all this was to be the "mandate" for the Porter inquiry then it was to face a difficult task indeed. Almost all previous inquiries had resulted in more public controversy, a greater demand for information, more debate over the adequacy of planning strategies, and an increase in the number of participating groups. The Porter inquiry may not have considered the increase in public debate and controversy a problem in itself, but the government created this inquiry to alleviate the need for future inquiries.

The Porter inquiry took the question of public education and participation very seriously, to the extent that a consulting firm was hired to study awareness, attitudes and expectations with respect to energy. The Public Interest Coalition was set up to provide information to the public and to those groups not already identified as "interest groups".

The Coalition, with its own staff and information program, was originally intended to be independent and capable of carrying out its educational function without jeopardizing the inquiry's credibility. It was run, at first, by a steering committee made up of advocate groups already participating in the inquiry. But as an experiment, it was undermined by the death of its organizer. The Public Interest Coalition continued for a short period independent from the inquiry but apparently, according to one interview, in response to the conflict among its staff and its steering committee, it was eventually brought under the umbrella of the inquiry itself.

A large number of "issue" papers and background materials were prepared and distributed to the public. A media consulting firm was hired to prepare written material and to function as a communicatons resource for the inquiry until 1977. A guide to participation was available, library and information centres were set up, transcripts were indexed, hearings were widely advertised, and panel discussions were open to the public and the media. For a short period, a newsletter was published and TV Ontario produced some special programs. A panel of public speakers was maintained with the commissioners taking part.

In each area prior to the hearings, the inquiry took great pains to find local organizers who ensured that information was available, that meetings were held to stimulate interest, and that members of the public were assisted in participating and re-imbursed for their travel costs. During its sittings, the inquiry travelled extensively, and held hearings in many locations.

The inquiry funded intervenor groups extensively. Some of the funding was allocated for research because the inquiry took the position that interest groups should be able to prepare their own research materials and be able to enlist experts. Interest groups were able, therefore, to prepare reports, hire staff, follow the progress of hearings and maintain contact and information flow over the duration of the inquiry. Groups took their responsibilities as funded intervenors very seriously. Several comprehensive reports were prepared and the depth of the cross-examinations reflected the research done by the groups. Funding was applied for at the end of each year under certain formal criteria.

The inquiry was scheduled in three stages. According to interviews conducted at the end of the inquiry, the first stage (the preliminary public meetings) was designed to develop a comprehensive view of the issues to be addressed. The second stage (the public information hearings) was designed to elicit the basic information that all parties would need to address the issues in an informed manner. The third stage (the debate stage hearings) was seen to provide an opportunity for a systematic issue by issue consideration of the problems identified in the first stage of the inquiry.

The preliminary hearings were conducted as meetings and not as hearings so there was no cross-examination. The information hearings attempted, not always successfully, to confine questions to points of information. Cross-examination was used in the debate stage hearings, and several groups attended seminars run by advocate support groups to learn the best way to participate in cross-examinations. In this third stage, two groups were represented by counsel and, in addition, the inquiry counsel was available to help all intervenors. Yet, the emphasis was on informality for the inquiry determined that "legalities would not be used to interfere with discussion." Participants were not "granted standing", they did not have to prove they had a direct interest in the proceedings. The Commission counsel did very little of the questioning.

The Porter inquiry placed particular emphasis on participation; thus it is interesting to note in the opposite tables who actually took part in the hearings. These tables indicate that the inquiry was used extensively by government departments and agencies, Ontario Hydro, AECL, and various corporations. Advocate groups were active in the inquiry, but their participation was not significantly higher than the combined appearances of Ontario

Participation in Preliminary and Information Hearings*

	Preliminary hearings	Information hearings
Individuals	70	0
Groups with no affiliation to issue:		
Advocate groups	11	4
Client groups	13	1
Social service organizations	2	0
Governmental agencies and educational	21	3
Corporate groups, including lobby groups	8	7
Groups with affiliation to issue:		
Advocate groups	38	11
Client groups	11	2
Social service	0	0
Governmental agencies and educational	27	7
Corporate groups	9	10

*Figures taken from internal working documents of the inquiry. The inquiry did its own calculations after this study was written, and although specific numbers differ they reflect the same pattern of participation.

Participation in Debate Stage Hearings

	Number of Intervenors				
	Not Affiliated		Affiliated		Total
Individuals	35		n/a		35
Advocate Groups	8		72		80
Client Groups	47	(no unions)	3	(Ontario Hydro union)	50
Social service organizations	1		0		1
Government and educational	62		104		166
Corporate, including lobby groups	53		29		82

Hydro and AECL. Only the preliminary hearings attracted a significant number of individual intervenors. Almost half the intervenors, other than individuals, appeared more than once.

The nuclear issue may not have been part of the original mandate of the Porter inquiry, but it attracted significant attention throughout the hearings. Likewise, the question of general energy policy was considered important. But there is evidence that government departments used the inquiry mainly to explain their activities and mandates. Although the Porter inquiry stressed the importance of social and value considerations, these issues were

addressed relatively infrequently by intervenors. Similarly, the question of the role of the inquiry and of the public in nuclear planning was discussed infrequently and only in hearings not specifically designed to focus on those questions.

The orientation of the inquiry's staff and commissioners to their task was never technical; yet Ontario Hydro often presented highly technical information. The inquiry used technically competent expert examiners in an attempt to deal with the problem. One staff member claimed, however, that "only in the regional hearings were questions competent, technically speaking" and often "Hydro would attempt to 'snow' everybody with the technical data." The seminars and panels also provided an opportunity for scientific information to be discussed at length and questions to be raised by the public and advocate groups.

The inquiry research staff answered questions for the three commissioners, and a scientific coordinator and experts were used in the examination process. Yet to a large extent, the "real" inquiry centred in the give-and-take discussions that took place through many forums. The research was never indexed, and some of the internal staff reports were never formally brought to the attention of the inquiry.

The scientific work was influenced by the social approach of the inquiry and much of it was directed to a broad economic analysis. Policy implications of each study were usually made clear by their authors, but these studies read like briefs from intervenors rather than scientific reports. The relationship between economic and social factors was not often discussed; on the other hand, cost/benefit analysis was applied to almost every question addressed.

In a very real sense, the Porter inquiry was not a scientific inquiry despite the number of studies it commissioned. For Porter himself, the questions were clear. He had been involved in the original assessment of nuclear safety and electrical generation problems, and had been a witness in other hearings where he had argued that nuclear power was safe. If questions still remained, he suggested in an interview for this study, they were based on the differences in priorities and values that one brought to the task of assessment. From such a viewpoint, the technical and scientific material submitted to the Porter inquiry was unlikely to be considered highly significant under these conditions even though Ontario Hydro, a major participant, presented mainly technical information. The role of economic analysis, however, which indicated the nature of the constraints through cost/benefit analysis, was seen as particularly important.

The inquiry devoted many sessions to the role of the public. Lord Ashby, an English expert in public participation, asked the questions "who should participate" and "what process should be

used." He stressed the different kinds of problems that would emerge once access to information was available and how interpretations of that information would differ. His view was that:

> "The human race has liberated itself from the pressures of natural selection but in doing this, the price is to accept a certain kind of authoritarianism and putting ourselves in the hands of experts. We have to make the choice clear that it is experts or natural selection."[6]

It is interesting to contrast his view, which regards participation as a *technique* in planning, with the view expressed by the intervenors before the EARP hearing in New Brunswick who saw participation as "power sharing". It is clear that these two views of participation are not compatible.

The Porter inquiry leaned towards, but did not always fully accept Lord Ashby's view for the inquiry focused largely on the benefits and costs of participation and on the range of techniques that might successfully be used to engender participation. Again the intervenors in New Brunswick would not have agreed with this interpretation.

Analysis

Regulation of nuclear development in Ontario is a complex business because Ontario Hydro, the main proponent of nuclear development, is an unregulated public corporation, although its activities are reviewed by several bodies.

Because Ontario Hydro is a public corporation and appoints its own board of directors, it assumes that its actions are taken "in the public interest." Board members talk about "the lack of profit motive" and "a drive for excellence." Thus, the pressure for review and the public controversy over the corporation's role often seems inappropriate to some. These people note that the actions of private companies, many of which have equal impact on development in Ontario, are not often subject to scrutiny or review.

Ontario Hydro can legitimately claim to place greater emphasis on assessment than any other corporation of similar size and allow for greater public input than any other Canadian company. Ontario Hydro is not the only public corporation engaged in activities that have national or provincial implications. AECL, for example, a proprietory Crown corporation, is under no similar pressure for review although it is also a major actor in nuclear development. CN-CP Telecommunication (CNCP) may take actions that alter the social and economic conditions of the North; yet it does not come under a direct review process with public input with respect to the social and economic implications of its activities. Air Canada operates under the direction of its board and with scrutiny by Parliament and the Canadian Transport Commission, primarily

in terms of rates and service. Saskatchewan corporations respond to the direction of their cabinet to the extent that they are held publicly accountable. NBP does the same, although political accountability to cabinet is direct in its case. Yet none of these public corporations come under direct public pressure for review. Where, then, does the pressure for review of Ontario Hydro originate?

It is possible that assumptions about the role of regulation and review are changing, and that Ontario Hydro, being highly visible and engaged in matters of public debate, has become a focal point for the change.

In the past, it was assumed that public corporations would inevitably act "in the public interest". The fact that public corporations might, by virtue of their size and power, have a vested self-protective interest was simply not given credence. But in recent years, with increased public awareness of the significance of institutional factors, such as size and power, it has been realized that corporations take actions to protect their growth and importance. The demand for a review of Ontario Hydro may be rooted in this recognition of the importance of institutional factors in planning.

It has also been assumed that public corporations act differently from private companies but, in fact, many public corporations have been mandated by government, and by their own boards of directors, to act like private corporations in seeking to maximize profit. Many public corporations attempt to provide service at the lowest possible cost to themselves, regardless of the social and environmental consequences. Only recently has there been pressure for public corporations to embrace more socially beneficial goals. Since 1970, public corporations have been seen as a cutting edge of social policy in the field of electrical power planning and Ontario Hydro is, without doubt, under review because of new expectations being made of public bodies.

To some extent, the corporation's own actions and decisions took it "front-and-centre" into the public debate. Ontario Hydro chose to align itself with a high growth model of development, and to proceed with nuclear development knowing that it would demand more capital than had previously been available from the government.[7,8] But when this high growth model was questioned the projected demands were found to be inaccurate. As costs soared, a government review was sought and public demand for a scrutiny of Ontario Hydro's judgement and decisions was inevitable.

The pressure for a review of Ontario Hydro's activities has another aspect worth considering. The corporation is large and visible, especially with the construction of nuclear generating stations and 500 kV transmission lines. Ontario Hydro is public and omnipresent. It is considered to be an essential key to the

province's development. It is not surprising that it has become a *symbol* in a debate that centres on development, lifestyles, environment and energy.

Unlike many other corporations whose activities also affect planning, energy policy and the environment, Ontario Hydro is relatively accessible. Its public participation program, rather than mitigating this pressure, contributes to its visibility and accessibility. In attacking Ontario Hydro or even in calling for a review, advocate groups are therefore able to take actions which *can be seen* to have direct impact. With Ontario Hydro, these actions have at least limited success. But that there are limits to this success, in that energy and planning policies remain directed to ends which are counter to those of the advocate groups, and that Ontario Hydro officials are viewed as cynical players in an inquiry, only reaffirms the perceived need for public pressure. The fact that the corporation is relatively responsive, on the other hand, also ensures that even limited success is worth the effort. The extent to which change may or may not be necessary or a reform is adequate does little to remove Ontario Hydro from the centre of the debate.

Concurrent with the Porter inquiry, a Select Committee of the Ontario Legislature proceeded along parallel tracks and operated with similar questions, timeframes and witnesses. Both held hearings and private seminars and sought to influence policy with reports to the same government. Both concluded that nuclear power was "acceptably safe" although future development should be tailored to meet demand. Both concluded that Ontario Hydro's projections for this demand had been unreasonably high. The question only remains as to how high.

Nevertheless there were differences between the two inquiries. The Select Committee pursued its task as if there were something to be uncovered. It grilled Ontario Hydro and AECL about accident reports. It demanded and obtained full public disclosure of correspondence and documents from Ontario Hydro and AECL. Although its major report was not highly critical of Ontario Hydro, the general tone of the committee proceedings ensured publicity for the issues raised and ensured a more detailed review and follow-up of charges against Hydro made by advocate groups and others.

If the purpose of such "inquiries" is the disclosure of full information to the public then the Select Committee was most successful for the tools of investigation were designed to fit the task and its approach was tailored to the specific issue under consideration. The Select Committee's deliberations were also a successful exercise in public education; albeit conducted through the release of documents, the funding of advocate groups to enable experts to assess the materials, and through the interest of the media. In addition, the Select Committee involved planning, in this

case tied directly to legislative debate and representative political process. Although public participation was not a goal, public involvement was a result.

The Porter inquiry, on the other hand, may have come closer to gauging the mood of the people, a critical element in any planning process. Freed from the constraints of party politics, the inquiry considered issues in their widest context. Without an investigatory approach, it worked as a mediator between Ontario Hydro, AECL and the advocate groups to achieve a better understanding of how priorities should be set. To the extent that Ontario Hydro and AECL brought a genuine cooperative spirit to the process, this mediation could be effective.

To some extent, the inquiry was weakened by the government's addition in 1977 of nuclear considerations to its mandate. The nuclear debate was highly polarized, demanded a technical assessment of what had already been done and focused implicitly upon questions of liability and blame. Although this debate may have been both necessary and desirable, it diverted the inquiry from its future-oriented approach towards problems.

The inquiry failed, to some extent, to achieve its goals of public education and participation. It did not attract media attention during its more serious phases; indeed, it went on long enough to tire the press, and perhaps the public also, with its proceedings.

The inquiry formed close links with a series of advocate groups who stayed with the inquiry throughout its tenure, but these same links frustrated the inquiry's attempt to reach a more general public. For example, the Public Interest Coalition, designed to reach the general public, fell apart partly because its steering committee was made up of advocate groups whose priorities were first the inquiry, second their members, and third the public. Thus, after the preliminary and local hearings, public education mainly affected the inquiry's own participants.

Although many participants experienced significant change, the inquiry failed to reach many of those whom it sought to educate. If the purpose of the inquiry was to explore and demonstrate the role of advocate groups, of all kinds, in a planning process, then it met its goal. But if the purpose was to establish a means whereby the general public might become involved in planning, as inquiry staff and others interviewed claim, it was no more successful than the Select Committee.

It is important to note how the Select Committee differed from other parliamentary committees. It was headed by a member of the opposition, a former leader of the NDP, and its members were known for their perceptive probing and willingness to take sides in a political debate. The committee was long-standing. It had a small but highly competent staff, with a commitment to innovative

"inquiry" practices all of which led to the production of a significant report. Thus, the Select Committee was able to take actions that were not available, for a number of reasons, to other parliamentary committees.

Conclusion

The interim report of the Porter inquiry constituted at least a partial endorsement of the nuclear option for Ontario. It located problems in the regulation of nuclear development, but accepted the view that regulation should be based on a cooperative working relationship between industry and the regulating agency. Like all previous inquiries in Ontario, it argued for greater public participation.

None of the intervenors interviewed for this study considered the Porter inquiry "unfair". At the time of the interim report they believed that the final recommendations would adequately reflect the concerns raised by advocate groups. They argued that if the Ontario government had viewed the interim report from the Porter Commission as a "green light" for nuclear development, it was because they had not understood its implications. Groups felt they had been part of an adequate assessment process.

The final report of the Porter inquiry comprises several volumes and the coherence of the analysis of the inquiry is not easily apparent from reading the volumes available at the time of writing. The problems of energy supply, of Ontario Hydro's possible over-capacity in electric power, and of falling demand rates are all taken into account. Public participation is endorsed as are the concerns of the farmers from southwestern Ontario who sought policy that would regulate agricultural land use. The nuclear option is also endorsed, although it is suggested that further development should wait until sufficient demand is established. Further recommendations, similar to those offered in the interim report, are made about possible regulation. A proposal for a comprehensive single assessment process to be conducted under the Ontario Ministry of Energy is also made. It is not likely to be widely popular or even acceptable, for if it was accepted by the provincial government, it would mean that the many newly established assessment procedures, operating under various departments, would be subsumed under the assessment conducted in the jurisdiction of the Ontario Ministry of Energy. The final report has something for everyone. As far as the Ontario government was concerned, the inquiry provided a green light for continued development.

The problems the Porter inquiry faced stemmed not so much from its limitations as from its excesses. It was given a mandate so broad that a clear discussion of alternatives became difficult. It

was expected by many to end the nuclear controversy at a time when that controversy was just surfacing in the public arena. It was expected to become involved in planning yet it was dependent upon the good will of advocate groups to ensure this planning function. It did everything possible to generate participation and operated with unusually good faith with respect to its intervenors; yet witnesses from Ontario Hydro, AECL and a variety of government departments pre-empted most of the technical discussions. According to the transcripts, AECL and Ontario Hydro's contributions were rarely centred on scientific questions although they submitted technical data and sometimes used scientists as spokespeople, and were more often "defensive" in nature. The inquiry took pains to avoid anything approaching adversarial proceedings even when others felt that such proceedings would be more appropriate.

The Porter inquiry attempted the first comprehensive examination of electric power planning in Ontario, but it was commissioned as the last in a series of similar inquiries, each of which had addressed at least some of the same questions. Its recommendations, demanding a major reallocation of departmental powers and jurisdictions and a dismantling of new assessment services, were unlikely to be welcomed by many vested interests such as other government departments and certain advocate groups.

The inquiry examined nuclear regulation yet, because of jurisdictional problems, it was hamstrung even where it sought to suggest new rules of the game. It took time, set its own agenda, listened carefully, was innovative, and saw economic and technical questions in their social context. Yet, for all that, it would be difficult to claim that the Porter inquiry has had much effect.

Despite five years of consideration and debate, there is little chance the Porter report will end the nuclear controversy in Ontario. Now pressure is building for a national inquiry, although such an inquiry seems a remote possibility. To be sure, a national inquiry might address questions that the Porter inquiry could not, for much of the responsibility for energy policy and nuclear development rests with the federal government and its agencies. In short, if the Porter inquiry is taken to be the final inquiry in the process of consideration of electric power planning in Ontario, it has failed in its task and this failure was inevitable.

Table A — Issues for Consideration by Porter Inquiry

Issue	Who Considered Issue	Recommendation or Decision	Problems Remaining	Why Became an Issue	Role of Porter Inquiry
Nuclear safety	TFH[1] (Porter) ACE Select Committee	was safe plans should proceed Select Committee consideration remained	none	public controversy	reconsideration
Nuclear plants (siting)	AECB (minimal) Hydro Hydro P/P[2]	all plants, including Darlington, sited	expansion and new facilities	expansion plans public controversy	plans for North Channel
Transmission lines (siting and need)	Solandt Hydro P/P	portions of lines built in environmentally conscious way	further lines to connection	system not complete until grind complete	siting for lines
Waste management (safety and siting)	CAFS Hare/other studies EARP[3]-Port Granby continuing coordination with gov'ts involved	experimental program in stages set existing short-term process adequate	none	public controversy	safety and its reflection on nuclear
Sources of energy	ACE[4] TFH Select Committee OEB[5]	nuclear energy critical component	none	public controversy about nuclear energy	location of
Energy need (demand)	OEB Ministry (NEB)[6] Hydro report 556 SP	first seen as rising and critical, later questioned	what was demand picture	changing public values	what was demand and procedure for forecasting

Table A — (con't.)

Issue	Who Considered Issue	Recommendation or Decision	Problems Remaining	Why Became an Issue	Role of Porter Inquiry
Social impact	Hydro P/P EAB[7] Ham	should be considered	lack of methodology	controversy over Hydro's public process	what were social impacts and how could they be measured
Environmental impact	Solandt Ham Hare EARP/EAB Hydro Hydro P/P	processes and methods of study in place	none	public cynicism	overview
Economic impact	ACE OEB Hydro Select Committee Solandt	energy key to development	none	changing public values and public controversy	link between development and growth
Planning process	OEB TFH Solandt Ham Hydro P/P EARP/EAB	detailed process designed and implemented	none	public cynicism	overview
Public information	TFH Hare Ham Solandt Hydro P/P EAB/EARP OEB (some) Select Committee	better disclosure and notice more information	information on nuclear issues still not available	public cynicism and controversy	make information available conduct education process

Table A — (con't.)

Issue	Who Considered Issue	Recommendation or Decision	Problems Remaining	Why Became an Issue	Role of Porter Inquiry
Public participation	TFH Hare Ham Hydro P/P EAB/EARP Solandt OEB (funding) Select Committee (but elsewhere)	process in place	none	public cynicism and controversy over public role	extensive public participation in planning style generally oriented inquiry
Regulation and monitoring	TFH ACE Ham Hare Select Committee	process identified problems identified	regulatory problems existed particularly in terms of role of AECB and jurisdiction	public controversy problems recognized	role for province in setting and directing regulatory goals
Review of Hydro	TFH OEB Hydro P/P Solandt Select Committee Ministry	process in place, but Hydro not regulated	relationship to Ministry and Select Committee	public controversy	overview

[1]TFH: Task Force Hydro
[2]Hydro P/P: Hydro's Public Participation Program
[3]EARP: Environmental Assessment Review Process, federal
[4]ACE: Advisory Committee on Energy
[5]OEB: Ontario Energy Board
[6]NEB: National Energy Board
[7]EAB: Environmental Assessment Board (Ontario)

Part Two

Inquiries and Potentially Dangerous Products

On the surface, no two inquiries could differ more than the aluminum wiring inquiry in Ontario and the federally commissioned inquiry into the non-medical use of drugs. Yet both inquiries, discussed in this section, faced similar tasks.

Both sought to determine the nature and the effects of particular products and their assessment demanded research based on scientific fact and on traditional methodologies. They also included some social research. In the case of the aluminum wiring inquiry, this research was directed to the regulatory and supervisory institutions that would conduct research and assess problems that might develop in an aluminum - copper connection. In the case of the Le Dain inquiry into non-medical uses of drugs, social research lay at the heart of the inquiry since an evaluation of the effects of drug use could not be determined by scientific facts alone. The Le Dain inquiry, however, used a variety of research techniques to elicit much more social data than the aluminum wiring inquiry was able to muster.

Both inquiries were commissioned in the wake of a significant public demand and both worked in an atmosphere of polarized opinions. The aluminum wiring inquiry, however, did not attract as much public controversy as the Le Dain inquiry for even if houses were burning down, potentially dangerous wiring seemed less socially explosive than drug use.

VI. Aluminum Wiring and the Determination of Risk

One might expect the aluminum wiring inquiry, a provincial inquiry commissioned in 1977, to have been an ideal case for the easy integration of science and the legal process. Its commissioner, J. Tuzo Wilson, is a scientist of world renown, and the inquiry hired two technical consultants, both scientists in their own right, to sift through the large body of scientific and technical literature and recommend selected questions. In addition, two other unaffiliated scientists gave freely of their time to participate in the debate. The subject of the inquiry, the potential problems and dangers of aluminum wiring in residential homes, seemed eminently suited to scientific and technical investigation through an inquiry for it was neither too broad nor too technical for public consideration.

Yet some people have argued that the marriage between science and the legal process did not succeed in this case.[1] Indeed some of those who participated in the inquiry were dissatisfied by the comprehensive set of recommendations submitted to, and largely accepted by, the government.

The aluminum wiring inquiry provides some indication of the underlying problems that generate public dissatisfaction. Perhaps it is indicative of these problems that one can trace not one, but two chronologies of events. The first centres on the wiring itself, its use, dangers and the measures taken to deal with these problems. The second is a history of the political decisions surrounding not only the inquiry but also some of the research on aluminum wiring.

History

In the late 1940s and early 1950s, aluminum wiring was introduced and approved as an alternative to copper wiring for branch circuits in residential homes. Builders were slow at first to use the new wiring. Only two communities in Canada were wired with aluminum, on an experimental basis, during that period (Arvida in Québec and Kitimat in British Columbia).

Given the economics of home construction and the decreased availability and rising cost of copper, aluminum wiring came into extensive use in the late 1960s and early 1970s. Aluminum wiring has been installed in about one quarter million homes in Ontario and a similar number in the rest of Canada, most of this installation being in the pre-1976 period.

Minor revisions were introduced into the Canadian Electrical Safety Code, first in the late 1950s and then in the late 1960s, to accommodate the particular characteristics of aluminum wiring. These revisions centred on the mode of termination of aluminum conductors. In general, however, aluminum was treated in a similar way to copper.

During the period 1967-1976, reports of problems with aluminum wiring increased and evidence suggested that aluminum wiring was less reliable than copper wiring. To find out how widespread the problems were and to define the precise causes resulted in a program of research and investigation.

Alcan, a manufacturer of aluminum wiring, indicates the following problems with aluminum:[2]

- In the presence of oxygen an oxide layer is formed between connections of aluminum and other metals. This layer acts as an insulator and increases resistivity and can therefore cause overheating and breakdowns.
- Aluminum "creeps", or moves in response to stress and therefore loosens the contact between wires.
- Aluminum and copper have different co-efficients of thermal expansion; in other words, they expand to different extents when exposed to heat from an electrical current.
- When the above factors interact, they produce an effect known as "thermal ratcheting".

Where aluminum and copper are joined, sparking may occur with shorting on the inside of the junction box, and this can produce a hole in the box. Heat generated at an outlet may ignite flammable materials located nearby. Since fires often start in nearby materials, and not the outlet itself, it is often difficult to pinpoint the cause of the fire. For example, heating of screws in a terminal can ignite flammable materials inside the outlet box, such as wallpaper, splinters of wood or wallboard. Overheating of binding screw terminals can also ignite certain types of plastic

faceplates. In the latter case, smouldering may result until flammable materials in contact with the faceplate are set alight, or the faceplate may fall off and ignite the carpet or other flammable materials.

The first warning signs of these problems surfaced in the United States, and drew the attention of the American insurance investigatory laboratory, Underwriters Laboratories (UL). After 1968, the Canadian Standards Association monitored UL's research reports. At this time, UL developed a safer receptacle, CO/ALR, that underwent extensive testing from 1971 to 1974.

In the United States, reports of problems with aluminum wiring led to public hearings. Between 1972-1974, the Consumer Product Safety Commission, a US regulatory body, investigated the circumstances under which fires were linked to aluminum wiring. The issue generated widespread publicity and lawsuits were initiated on behalf of owners of homes wired with aluminum.[3]

In Ontario, Ontario Hydro is the public utility responsible for the generation, distribution, and *regulation* of the electrical system. It is also responsible for electrical safety. In response to a number of complaints, the utility conducted a comparative study in its laboratories on the performance standards of copper and aluminum. It also performed specific tests on aluminum-copper connections, partly in response to requests by technical advisers hired by the inquiry, and partly as a result of their own assessment and testing.

By 1972, the utility had received numerous reports of failures in homes where aluminum wiring had been used. In 1973, it set up a task force to investigate the problem.

From 1972 to 1974, Ontario Hydro worked in close liaison with the Canadian Standards Association, which is an independent organization that conducts research, creates standards and monitors problems in products and procedures in Canada. Standard setting is not a regulatory process although the recommendations of the CSA often result in regulations that are then legislated and enforced by government. CSA functions as a service to government, preparing information and offering recommendations. In most industries, standards constitute voluntary guidelines, or are simply a part of the contractual arrangement with industries that use the CSA mark. As a result CSA is highly dependent upon cooperative arrangements with government agencies.

In response to the problems reported with aluminum wiring, Ontario Hydro increased its inspection systems, issued public notices about the warning signs of danger with aluminum wiring failure, and set up a hot line for complaints. CSA also modified some aspects of its standards and set up its own committee to investigate the problem. By 1975, CSA was prepared to recommend

specific revisions to the electrical code for aluminum wiring and its use. Ontario Hydro's report in 1975 called for the mandatory adoption of the new CO/ALR receptacles.[4] CSA responded with a preliminary approval standard, certified in 1976, to cover the CO/ALR device. But within a year problems appeared in the CO/ALR receptacle and it was recalled by CSA. Before an adequate CO/ALR receptacle was developed, another compromise receptacle was approved.

In the Brampton area, concerned citizens, stimulated by the CBC program "Market Place", formed the Aluminum Wiring Homeowners Association (AWHOA), which lobbied for and took active part in the inquiry on aluminum wiring. Members of AWOHA had been active within advocacy groups dealing with problems of home ownership and land tenure before their involvement with the aluminum wiring issue. The Concerned Consumers Foundation (CCF), an Ottawa group, was also involved. The major citizen activists all had personal experience with troublesome, if not always serious, electrical fires.

The Brampton group wrote to the federal MP, Norm Cafik, who had participated in the CBC program. He referred the group to the CCF. Then came a request to the Brampton City Council for an investigation. The next step was increased publicity, attempts to set up meetings with Ontario ministers, and an assessment of the Ontario Hydro reports, particularly the actions of its task force. On the basis of this assessment, the citizens determined that there were problems related to the "push in" receptacles used in the Brampton area, to workmanship, and to differences in aluminum and copper wiring.

The first citizens meeting, in April 1976 at a Brampton high school, was very well attended. This meeting, according to one account, turned into a clash between Ontario Hydro and the director of the CCF. The utility argued that the problems with aluminum wiring were "nuisance" problems but because Ontario Hydro had previously sent out a special notice about warning signs of possible problems, the response to its presentations was unfavourable. CCF argued that aluminum wiring constituted a "time bomb", and cited evidence of fires that they believed to have been caused by wiring failures.

After the meeting a flyer was sent to citizens of the local community association and local MPP's were approached. The Ontario Legislature considered the issue and, at one point, the Ontario Department of Corporate and Consumer Relations (DCCR) proposed to Consumer and Corporate Affairs Canada (CCA) that a moratorium be placed on the installation of aluminum wiring.

No action was taken, however, and the issue was diffused into a more general discussion of jurisdiction and responsibility.

Though some government departments had discontinued the use of aluminum wiring in their own building projects, neither the federal nor the provincial government was willing to impose a ban or moratorium. Nor were they willing to institute other specific actions against the use of aluminum wiring because, they argued, the case against aluminum wiring had yet to be proven. The federal minister also stated that the problem would have to be dealt with by the provinces.

Estimates of the cost of replacing the wiring or fixing the problems differ. According to a *Toronto Star* article, the cost of replacing the wiring ranged from $1200 to $1500 (allowing $15.00 per hour for labour) for the average home. Another *Star* article stated it might cost the "defendants" (Ontario Hydro, Hydro Quebec, CSA, building contractors and suppliers) up to $250 000 000 to correct the faults. Later estimates suggest the cost of replacing a single faulty receptacle might be between $25 and $50. One homeowner got an out-of-court settlement of $72 for work done to repair a defective outlet in his home. The Brampton group estimated the cost of replacement of *all* devices and receptacles at $800-$1000 per home. The loss in value of homes wired with the controversial aluminum wiring would be a factor taken into account in the event of any class action in the courts for settling liability costs.

In testimony and interviews, officials from CSA indicated that they felt the organization fulfilled its responsibility by notifying the appropriate authorities. Hydro felt it had fulfilled its responsibility by undertaking a study, issuing warnings, providing inspections and a hot-line, and making recommendations for new standards. Hydro noted that the number of complaints had declined and that whatever problems might occur had probably already surfaced. CSA and Hydro considered the problem "solved", but the homeowners did not see how it could be solved if they still had aluminum wiring in their homes.

Political pressure to investigate and ban aluminum wiring continued from 1975-1977. Much of the activity was centred in the riding of the premier of Ontario, Bill Davis. AWHOA representatives met with the premier's staff on several occasions and media coverage of the issue continued, in part, because of the activities of those who later became intervenors. It was clear that the issue would not die down, even after CSA had issued new standards. An inquiry was commissioned in April 1977.

The Inquiry

The difficulties inherent in the inquiry can be traced back to its mandate. The inquiry was empowered and instructed:[5]

(1) To investigate all matters relating to the safety and

reliability of aluminum-wired electrical circuits for residential use, relative to the safety and reliability of copper-wired electrical circuits for residential use;

(2) To hold public hearings to enable groups and organizations, individual citizens and representatives of industry to present evidence and other pertinent information on the subject;

(3) To make appropriate recommendations, if warranted, on any measures that should be taken by the government of Ontario, by other levels of government, by the general public and by the industry.

This mandate led to a comparative investigation of aluminum and copper wiring. However, the groups who had requested an inquiry believed the problem to lie in the *connections between copper and aluminum*, and felt the inquiry should investigate the possible dangers of these connections and what could be done to correct the situation. The mandate, however, shifted the orientation of the inquiry to a cost/benefit consideration of different kinds of wiring.

The inquiry was asked to hold hearings and make appropriate recommendations even of a broad nature, spanning agencies, departments, government, industry or anybody else. Faced with this mandate, the inquiry could have returned to the government seeking clarification, or could have widened the stage of assessment beyond the actions of CSA and Ontario Hydro. It chose not to do so.

Given this decision, the inquiry could have interpreted the wording of its mandate ("all matters relating to the safety and reliability. . .") broadly. It then could have launched a series of specific investigations in order to identify the responsibilities of all parties, the extent of the problem, and the measures each body might take to redress the situation. With such a choice the inquiry could have addressed the question of liability and the problem of compensation. This was the approach requested by those who lobbied for the inquiry. Instead the inquiry chose to interpret its mandate as calling for a *specific* investigation and one which would disclaim any attempt to deal with compensation and responsibility. The inquiry emphasized that it was "not empowered" to assign blame or liability, or "to discuss compensation."

The inquiry was also asked to look at residential circuit wiring. It defined the residential circuit as that which "commences at the connection of the house wiring at the panelboard," and did not include the internal workings of the board itself.[6]

Intervenors were later to argue that the separation of the panelboard from the rest of the electrical system within a house masked many of the factors that had caused problems, for example,

those within the panel boxes. They argued that the operation of the household system as a whole should be examined.

The inquiry took the position that the restrictions were stated in its mandate but intervenors argued there was room for interpretation. Certainly Ontario Hydro, CSA and other companies that might face court or other actions as a result of a wide ranging inquiry would favour the narrower interpretation. In choosing to go with a lawyer's perspective and, implicitly, with the view of the institutional intervenors, the inquiry set itself up against the public that had initiated it.

The inquiry lasted about a year and a half and spent just under one-half million dollars. For a total of 32 days, from the fall of 1977 until early in 1978, public hearings were held in Toronto, Ottawa, and several Ontario communities in which problems existed.

Anyone could give testimony in the public hearing, but only groups or individuals who could demonstrate substantive and direct interest, were given status as intervenors. Those with status were required to file a written statement indicating the nature of the evidence that would be given, and were required to give evidence only through a "duly qualified expert." They were permitted to cross-examine other witnesses, and were subject to cross-examination themselves. Those given status were not required to have legal counsel, but certain intervenors did. Status, however, did not clearly distinguish the intervenors from other participants. One person with status never spoke, and did not return to the inquiry after the first hearing. At least one person without status appears to have asked questions in a modified form of cross-examination. Because all parties with status were not present all of the time, the opportunities for cross-examination were limited or, at least, unused in many cases.

The Commission staff submitted a series of exhibits before the inquiry, but their own technical consultants never testified in public. Commission staff appear to have interviewed some, but not all, witnesses before they appeared at the hearings and to have conducted a number of external interviews to develop questions and ensure that evidence would not be repetitive.

Despite its strict legal interpretation of the mandate and the use of cross-examination techniques, the inquiry was conducted under the guidance of a counsel in a quasi-court rather than in true court setting. In the communities most affected, some evening sessions were conducted to give citizens the opportunity to testify. In these meetings, efforts were made to make the proceedings accessible to the layperson.

In the eyes of some of the inquiry staff and many of the intervenors, this quasi court-like approach caused problems. For

example, some witnesses felt "intimidated" by the cross-examination (particularly as it reflected on their credibility) by the wrangling, the use of lawyers, and the pre-interviews. Even though the inquiry made significant attempts to encourage the public to attend, the feeling that the inquiry was like a court apparently discouraged participation. But, as another participant claimed, if the inquiry had been more court-like, it would have avoided "wrangling" and "statements made with substantiation."

Ontario Hydro, CSA, Alcan and several government officials appeared before the inquiry a number of times, and Ontario Hydro maintained counsel at all of the day-time sessions. Several witnesses from local municipalities or townships that had banned aluminum wiring also appeared. The organized citizen groups, CCF and AWHOA, represented the citizen complaints, although some members of the public appeared on their own behalf.

Two over-riding scientific issues faced the inquiry:

- In what timeframe did the intermetallic problem occur?
- To what extent had failures and problems already occurred? What was the nature of these problems? How likely were future problems in houses wired with aluminum?

The inquiry's technical staff considered a more significant technical problem to be "how to make a good connection between aluminum wire and connectors designed for copper." At one point, a debate occurred over the timeframe within which the intermetallic problem could occur. For the most part, however, technical discussion was confined to a review of experiments conducted by one of the intervenors, submission of media, scientific and technical reports mainly from US sources, personal testimonials, reports from Ontario Hydro's field officers and presentation of raw data, in this case burnt-out electrical receptacles. The technical information submitted by the non-institutional intervenors was not referred to in the final report of the inquiry.

Most of the testimony centred on the mandate and responsibility of the various authorities responsible for ensuring safety. It was, by implication, a discussion of potential liability, although this was contrary to the stated intention of the inquiry. In addition, some discussion focused on jurisdictional questions, and on potential and current regulations. The debate in the hearings seemed directed more to the problem of who should be dealing with the problems should they be deemed serious rather than the nature and seriousness of the dangers involved, although the latter questions were also discussed.

Views of the inquiry and some of its public participants diverged sharply. Those who had sparking or smoking receptacles, or even fires, wanted someone to be held accountable and to have the problem solved. According to officials from Ontario Hydro,

these problems had already been solved through new standards for electrical wiring in *new* house construction and by actions already taken which were reflected by the drop in complaints.

In general, the inquiry's final report agreed with Ontario Hydro that measures had already been taken by the appropriate authorities to ensure the future safety of aluminum wire and to locate and rectify problems in existing wiring. The report concluded that a variety of problems, including poor workmanship, rapid construction of homes, economic conditions and careless use of electrical wiring had caused many of the difficulties, and recommended caution in the use of aluminum for house wiring. No provision was made for compensation to homeowners for replacement or other costs caused by difficulties with the wiring.As the report states:

> "Those householders who suspect or know of weaknesses or failures in their wiring systems should follow the advice of the Brampton Home-owners' group to seek professional advice and have repairs made as necessary."[7]

The inquiry made more than 40 recommendations covering many of the intervenors' concerns including procedures to be used in standard settings, the continuation of Ontario Hydro's public information program, further facilities for inspection and additional laboratory tests.

Many of the intervenors were dissatisfied with the recommendations and the issue still surfaces from time to time through the media and in municipal politics. Some dissatisfied homeowners are seeking court action through the Concerned Consumers Foundation. The lawsuits seek the allocation of liability and compensation for homeowners from Ontario Hydro, CSA, the installation contractors, and the electrical inspectors.

Analysis

The inquiry considered three components in the task of assessment: judging the seriousness and extent of the problem, assessing actions already taken, and locating the appropriate areas of responsibility for continuing supervision. The extent and seriousness of the problem were judged primarily by the number of complaints made to Ontario Hydro and the inquiry and from the level of participation. The institutional intervenors provided an indication of actions taken to rectify problems, and the inquiry selected the appropriate areas of responsibility by balancing the interests of the institutional intervenors.

The inquiry did not attempt to compare the wiring situation between complainants and a control group by carrying out a random survey of homes in the Brampton area. Nor did it submit the testimony of institutional participants, with respect to their

actions or the responsibility taken, to rigorous cross-examination. Rather it relied on the technical consultant to assess the information. Some of the preliminary evaluations of scientific claims being made by intervenors were done through the inquiry's non-scientific staff. A volume of the final report provides a summary of scientific information on the problems under study, but much of the material in that volume was not discussed in the hearings.

Unlike the other inquiries in this study, the aluminum wiring inquiry attracted the participation of "unaffiliated" scientists who were experts in the areas being studied, and experienced in the development of science policy. It is surprising, therefore, that their experience with the inquiry was not, from any point of view, entirely satisfactory.

Some people thought these scientists did not receive the respect they should have commanded at the inquiry. They suggested that testing the credibility of a witness through cross-examination may play an important role in a court room but when established scientists are involved, then a rigorous cross-examination centring on the credentials of the witness becomes a form of intimidation and shows a lack of respect. On the other hand, others suggested that the research presented by the scientists was irrelevant and lacking in "hard scientific evidence." Part of this difficulty stemmed from a problem-directed orientation of the inquiry. As one person put it:

"They [the scientists] were theoretically correct, but we were concerned with the practical . . . would it [the wiring] last the length of time of the house. It [the facts presented] was true but irrelevant."

The inquiry viewed its task as an engineering problem, i.e., rectifying identified and identifiable problems in the use of a product. As such it found the evidence submitted by engineers to be compatible with its aims while that submitted by scientists much less useful.

In general, however, the inquiry seems to have taken the position that all participants, including the unaffiliated scientists, were speaking, if not with a vested interest, then, at least, from a point of view that coloured their assessment. To some staff, this meant that testimony could be discounted. To other staff or its commissioner, the identification of "interests" was part of the necessary assessment. Some intervenors, however, thought the assessment should have included the "interests" of the inquiry staff themselves. One stated:

> "People who have never been on the side of a minority have no conception of how you conduct yourself in front of a power greater than yourself. They have always been in a position to impose their values . . . [they] never imagine themselves to be

under constraints where the system doesn't work for them. The inquiry staff never understood."

The role of the layperson in a scientific assessment is a matter of some concern. Photographs of black-stained wall outlets or burnt-out receptacles, presented by intervenors may constitute evidence, but even if the photographs indicate that a serious fire has occurred, nothing in the receptacle itself could prove that the origin of the fire had been the aluminum-copper connection. Nothing could indicate how many serious fires had or would occur. Unless the inquiry was prepared to develop a proper sampling procedure to investigate the intervenors' contribution, or take the evidence as an indication that problems *could* occur, or provide money for others to conduct a proper study, the material presented was of little scientific use.

To some extent, and within their time constraints, the public intervenors saw themselves as monitoring the research and data used by the inquiry. They believed that information presented by the Ontario Hydro inspectors had been based on visual inspection alone, that the Fire Marshall's statistics were incomplete (as they were) and that research done by Ontario Hydro was limited in scope. Nevertheless, none of the public intervenors, or even the unaffiliated scientists could divert the resources to the inquiry to monitor the assessment fully or *prove* that their conclusions were accurate.

The inquiry assumed that assessment was properly carried out by Ontario Hydro and CSA. Ontario Hydro maintains laboratories and field inspection facilities. CSA has laboratories and conducts research, although it often works through consultants who analyze CSA findings. It is commonly assumed that assessment goes hand-in-hand with regulation, and the inquiry shared that preconception.

Ontario Hydro is a regulatory agency. Formally, CSA is not, although it is tied closely to regulation through a variety of its functions. For example, CSA investigates new applications and the problems of new products and technologies, it formulates codes that are often adopted, without revisions, as regulation, and it works closely with Ontario Hydro and the provincial inspection agencies. Ontario Hydro and CSA, therefore, can be seen as one regulatory authority.

Ontario Hydro and CSA function without a public forum, but the latter is publicly accountable through its committee structure, which has a wide and balanced membership including users, producers, government and labour.

Both Ontario Hydro and CSA consider themselves to be independent bodies, the former of government and vested interests because of its public utility status and the latter from vested

interests through the balance of interests in its committees which ensures cooperation and negotiation.

Standard setting is based on the principle of mutual concern and trust and on striking a balance among interested parties. Those whose interests have not been identified or who cannot maintain full participation in the committee structure do not enter into these considerations except to the degree that government or consumer groups act for them. The questions that are raised in CSA committees are constrained by the nature of their membership and the consensus approach to decision making.

To ensure an unanimous decision on standards, standard setting organizations place heavy emphasis on cooperation. Standard setting is tied to "standardization" in product characteristics, to safety and reliability, and is oriented towards export trade and the protection of manufacturing industries. Standards are, by definition, minimum product or installment characteristics. They are not identical to "high standards" or "high quality", despite what the public may think. Standards do not state how a product *should* be built nor indicate the best or maximum possible performance that can or should be attained by a product.

CSA should be viewed as a management system. The recent addition of consumer representation to its deliberations, indicates CSA's response to growing public demand, but consumer involvement has not altered the basic character of standard setting.

Almost all regulation is produced in reaction to either applications from the corporate sector or problems identified with products or services. The onus for identifying problems falls on the public and if the public lacks the necessary technical knowledge, fails to recognize problems, or compounds them through its own actions, then it assumes major responsibility. Clearly, those who live in poorly constructed "cheap" homes were asked to share a large portion of the blame in the present case. The citizens involved in the aluminum wiring issue had just emerged from a battle over housing and land tenure, thus they were particularly angered by this assignment of responsibility.

CSA, like many other agencies, has no formal process for public identification of problems other than through its consumer panels. Indeed many people do not know about CSA's function or even that it exists. Ontario Hydro has for its part only recently upgraded its process of problem identification.

In contrast to the United States where large voluntary consumer groups exist to conduct testing, to collect information and to represent the interests of all the individuals in combination, people with electrical problems in Canada are more isolated. Problems surface in individual households. Information is not often shared, and few established, advocacy groups exist.

It appears that the Ontario ombudsman's office considers that questions with respect to the regulatory jurisdiction of Hydro fall outside its mandate. If, then, the burden of proof lies with *ad hoc* groups, it is little wonder that the problem with aluminum wiring persisted for so long and that so few people complained. Neither is it surprising that those who did complain were upset by the commission's final allocation of responsibility.

Conclusion

Those who took issue with the recommendations of the aluminum wiring inquiry had expectations of regulation that few Canadian agencies and certainly neither Ontario Hydro nor CSA would be likely to fulfill. Without doubt, those expectations had been conditioned by the US experience with the Consumer Product Safety Commission, which was also involved in the investigation of aluminum wiring.

The intervenors expected research to have been done at the development stage of the newly-applied technology, proper monitoring procedures to have followed the progress of the new technology, and support to have been given for the widest possible scope of regulation with maximum standards of quality. They assumed that the public goals of safety and reliability would take precedence over corporate well-being and cost considerations. In *any* regulatory process, it is very unlikely that these goals would be met. A typical agency would have no call to investigate a product, other than drugs, food and products producing or using radio-active materials, prior to the identification of problems in its use, and certainly no call to monitor and evaluate all applications of new technology. Any agency working within a cooperative process would not be likely to argue for the maximum possible standards. Ontario Hydro and CSA were no exception.

Certain fundamental problems would remain even if inquiry recommendations had instigated a more comprehensive form of regulation, taking into account performance and not prescriptive standards and ensuring that all unsafe products would be taken out of use and off store shelves.

Many criticisms of the aluminum wiring inquiry stem from what might be seen as a "regulatory" orientation on the part of the inquiry itself. It used the hearings as a regulatory agency would by applying similar standards for the evaluation of interventions and of evidence. Those with complaints had to prove their case and the onus was on the intervenors to produce much of the evidence; balancing of interests was seen as a key in determining public interest. The continuing relationships with responsible regulatory agencies such as Ontario Hydro and CSA were also seen as a key to enforcement of better standards. Perhaps, if the aluminum wiring

inquiry had acted more like an inquiry and less like a regulatory agency, it might not have attracted the strong dissent of some of its participants.

Balancing interests in negotiation may, if all interests are equitably represented, result in a fair decision. However, the process does not necessarily result in an adequate decision based on a clear minded assessment of the problem as a whole. Because of the underlying constraints where liability was at issue and because some intervenors represented institutional concerns such assessment was difficult to make.

Those who prepared the report were convinced that they had carefully listened to the concerns raised by the intervenors. They were also convinced that the recommendations answered those concerns that could be justified on the basis of a scientific assessment. Taken on a quantitative basis, they were correct for the report did address most of these concerns.

Those who had problems with aluminum wiring did not, however, make such an assessment of their demands. For them, the major questions remained - before, during and after the inquiry. The inquiry, however, did raise even more questions; about the nature of the inquiry process, about the way scientists and scientific material were handled, about the nature of the evaluation of risk and about the institutions, like Ontario Hydro or CSA, who might, from some perspectives, be responsible for the problems in the first place. The public intervenors wanted a different kind of assessment and a better kind of public inquiry process.

VII. An Inquiry in the Light of Public Controversy

In some ways, the Le Dain inquiry into the non-medical use of drugs, commissioned by the federal government in 1969, inaugurated the transition between an older, somewhat established inquiry practice and a newer inquiry style.

Like the Berger inquiry, which is noted for changing both public and government expectation about inquiries, the Le Dain inquiry incorporated both the general public and the clients of proposed services directly into the inquiry through its public hearings. Like Berger, the Le Dain inquiry took the role of scientific determination seriously. Also like Berger, the Le Dain inquiry interpreted its mandate to encompass a complexity of social and scientific issues. Both saw the inquiry as a forum through which issues of science, policy and public concern could be brought together. The Le Dain inquiry saw the need for innovation in its practices. Without doubt Mr. Justice Thomas Berger was able to draw upon the Le Dain experience in developing his own pioneering inquiry.

Unlike Berger however, the Le Dain inquiry functioned without a specific application for assessment. Unlike the inquiry on aluminum wiring, the products (in this case, specific drugs) were of secondary concern. Instead the inquiry attempted to address the social upheaval caused by a radical shift in values within a sector of the population. The Le Dain inquiry rode the crest of a social movement. It did not generate controversy; it responded to it. The scientific problem requiring assessment changed as the inquiry took its cue from the context within which it operated. It responded to fear, worry, paranoia, misinformation

and even to hysteria on the part of those who commissioned the inquiry as much as on the part of those who participated.

The inquiry saw its task as providing information that would allow both individuals and society at large to make decisions about non-medical drugs and their use. A dispassionate analysis conducted in the light of public controversy was difficult so part of the job of the inquiry became the isolation of its work from the public it wished to study and from whom it sought participation.

History and Context

There was little in the literature from which to draw.[1] Some research into the non-medical use and effect of drugs had been carried out in Canadian universities, supported by grants from the Medical Research Foundation, the National Research Council and the Department of Health and Welfare, and also in government laboratories and by government agencies. During the 1960s, a decade of turmoil, one former inquiry staff member suggested that the Canadian government actively discouraged scientists from doing research in the area and until 1970 Canadian drug research was mainly centred on alcohol.

Canada's first drug-related legislation centred on the control of traffic in opium and was instigated by a report by W.L. Mackenzie King, then federal Deputy Minister of Labour, on the anti-Asian riots in Vancouver in 1907. Gradually more drugs were brought under the control of the Opium and Narcotic Drug Act and the severity of penalties increased. During this period, however, drug laws in Canada were associated with particular attitudes and policies towards people of Asian origin living in Canada.

In 1923, marijuana was included in the Act. The decision was influenced by the publication of *The Black Candle* by Emily Murphy, a police magistrate and judge from Edmonton.[2] Marijuana was seen as a "new menace" which caused insanity and a loss of moral responsibility. There is no evidence that the extent of marijuana use or the public's concern were factors in developing the new provisions in the legislation. In addition, there was no attempt to justify the decision on the basis of scientific evidence.

In 1955, a Special Senate Committee considered the question of legal restrictions on drug use. It was chiefly concerned with narcotics, particularly heroin, and recommended more severe penalties for trafficking and possession for the purpose of trafficking. In 1961, the Senate recommendations were implemented in some measure by the passage of the Narcotics Control Act, replacing the Opium and Narcotic Drug Act. The new act imposed a minimum penalty of seven years for importing drugs, but did not adopt the Senate Committee's recommendation of a severe minimum penalty for trafficking.

Canadian legislative policy on the non-medical use of drugs must be viewed in relation to Canada's international agreements with respect to drugs. In 1961 the Convention on Narcotic Drugs, developed in part through the Narcotic Drugs Committee of the United Nations Economic and Social Council, specifically provided for a system of strict controls over heroin and marijuana. Federal drug legislation is based on the criminal law powers of the federal government, for both the protection of health from injurious substances and the prevention of adulteration as a threat to health come under criminal law.

Violation of both the Narcotics Control Act and Part IV of the Food and Drugs Act, is a criminal offence. Essentially the Acts are similar, although the maximum penalties under the Food and Drugs Act are less severe than those under the Narcotics Control Act. Prosecution at present proceeds by summary conviction or by indictment with a summary conviction used in those cases involving only possession of drugs under the NCA and in all cases under the relevant sections of the FDA. Unlike indictments, people with summary convictions are not fingerprinted and criminal records are not kept.

- The Narcotics Control Act applies to opiate narcotics and includes heroin, cocaine and marijuana. Penalties for importing and exporting these drugs range from seven years to life imprisonment. Penalties for trafficking involve a maximum of life imprisonment. The penalties for cultivation of these drugs range to a maximum of seven years.
- The Food and Drugs Act provides for controls on the availability of drugs as specified by the international Convention on Psychotropic Substances (1971). Hallucinogens are included under its designation of "restricted drugs," as well as other drugs like LSD, DET, DMT and STP. Penalties for trafficking vary. With a summary conviction for trafficking, the penalty may include imprisonment for a term not exceeding eighteen months. With an indictment, the penalty is up to ten years imprisonment. Controlled drugs include barbituates and amphetamines and offenders convicted under the Act are subject to the same penalties for trafficking.[3]

The social crisis precipitated by the increasing use of drugs by young people, often middle-class young people, and by the large number of convictions for drug-related offenses fully surfaced in parliamentary debate in early 1967. At that time, a number of concrete proposals, centring mainly on the control of LSD, were made by individual MPs who suggested that the government should refer the question of drug-related legislation to a joint committee "in order to have professionally competent people available to give expert opinion on this very complicated matter."[4]

The first reading of a Bill introducing changes in the Food and Drugs Act took place in December of that year.

In 1968, the Minister of Health and Welfare submitted a report to the Privy Council on the problems of drug use and the apparent legal inconsistencies in the control of drugs. Statistics from the report indicated growing non-medical use of drugs, especially among the young. The 1968-69 *Annual Report* of Health and Welfare Canada noted that the number of prosecutions under the Narcotics Control Act had increased from 54 in 1964 to 2830 in 1968. Of these, 2400 were of people under the age of 25. The number of known heroin addicts had also increased. These numbers took another great leap between 1968 and 1969. Convictions under the Narcotics Control Act increased from 1779 in 1968 to 3338 in 1969. By far the largest group were marijuana users, 82 per cent of which were under the age of 25. The number of cases involving marijuana had almost doubled in one year.[5]

In February 1968, MPs requested once again, the appointment of a special Parliamentary committee with powers to investigate and the authority to convene hearings in various locations in Canada. In May 1969, an inquiry was mandated through an Order-in-Council.

In 1969 the government made provision for the option of a summary conviction rather than indictment for a first offense of possession and as a consequence the number of indictments dropped. In 1972, provision was also made for an absolute or conditional discharge for a first offense of simple possession of marijuana, where the accused had no criminal record. The Narcotics Control Act of 1961 remained in force, although these provisions altered the impact of its enforcement.

The period from 1966-1973 was characterized by a great many social changes. Some parents saw their offspring becoming "flower children", and young people became increasingly involved in political action. On television, large groups of young people could be seen, dressed in strange clothing, sometimes smoking marijuana, sitting in on City Council meetings or demonstrating on the streets of cities such as Toronto and Vancouver.

Youth appeared to be challenging not only the law itself but the right of authorities and established institutions to determine laws and policy in social questions. The times were changing, and jargon was adapted to reflect this rebellion and the drug-based culture.

The federal Department of Health and Welfare was certainly aware of the growing problem, for it had responsibility for the administration and enforcement of the provisions of both the Food and Drugs Act and the Narcotics Control Act. Shortly after the inquiry was commissioned, the department published a booklet

called *Drugs of Abuse* and its Drug Dependency Unit developed a considerable number of information packages on drugs, along with a number of educational programs.[6] Municipal, provincial and federal (RCMP) police were aware of the problem, which was also examined by the federal Department of Justice. When the Le Dain Commission was established, the Drug Dependency Unit was discontinued pending the outcome of the work.

The available literature on drug use and drug effects was vast, despite the paucity of reseach done in Canada. But little could be concluded from this research with respect to policy guidelines. The Narcotics Research Foundation, an Ontario agency, had the most complete library and facilities for research. In 1969, it released a major report on drugs and their non-medical use. This report was frequently criticised before the Le Dain inquiry.

The Le Dain Commission found great disparity in sentencing patterns across Canada. It also discovered that sophistication in judicial response increased with the experience of the judge and that appeal courts tended to be more severe than trial courts with respect to drug offenses.

Before and during the inquiry, arguments about the legal status of drugs and their use were put forward. Objections were raised about grouping marijuana and heroin under the same law and about the severity of penalties for marijuana use. Some people argued, in the press and elsewhere, that the use of amphetamines for non-medical purposes should also be prohibited under the law. An argument was made for the decriminalization of marijuana or for moving marijuana under the Food and Drugs Act so that lesser penalties would be imposed by the courts without changing the drug's status. Some contended that penalties for marijuana use should be lightened if not dropped altogether. Many argued that a distinction should be made between heavy and light use, and between users and traffickers.

The question of jurisdiction was important. Provinces have jurisdiction over "trade and commerce" within their boundaries and over health. If decriminalized, drug use would necessarily come under provincial jurisdiction, but the federal government could also maintain some control, through the RCMP and by assistance to drug control programs. Were the provinces to assert jurisdiction, it is likely that penalties would become more severe in some areas of the country.

In the case of drug use, the law is used as a general instrument of social policy. Whether it should be used in this manner and whether it achieves the desired ends was a matter of some concern both for the Le Dain Commission and for the policy makers who have considered the matter since the commission released its final report. In addition, the right of the state (the law) to coerce

individual behaviour if that behaviour affects only the individual is at issue. Because drug use is now controlled under criminal law, these questions have been addressed, at least temporarily, within the more general framework of criminal law itself. Were drug use to be removed from criminal law and placed under some form of regulatory authority, these questions would surface again.

By the time the Le Dain inquiry submitted its final report in 1973, many considered that the dust had settled. One inquiry staff member noted that the issues that generated the inquiry were no longer the focus of such intense public concern and,[7] whether or not patterns of drug use changed, the public was accustomed to the problem. Changes in legislation are still under debate today, but the question of non-medical use of drugs is no longer pre-eminent in the public mind.

The Inquiry

Several specific conditions set a framework for the inquiry. The government was interested in how drug-related legislation had evolved in Canada and how it was being applied, in Canadian drug laws and their relationship to law in other countries, in the impact of these laws on "tomorrow's leaders", in uneven sentencing patterns, and in the jurisdiction of the federal government in altering the dimensions of the problem. At the heart of the matter, however, was the question of whether criminal law was the appropriate way to deal with the non-medical use of drugs.

The inquiry saw its task as determining the government's role in prohibiting potentially dangerous products. It suggested that a balance would be necessary between harm to individual rights caused by enforcement of drug laws and harm to individuals and society resulting from drug use. The areas for assessment were:

- The enforcement of law to determine the costs and benefits of existing and potential methods of dealing with drug use;
- The possible dangers or effects of drugs in terms of the individual user and society in general.

Its mandate included drugs prescribed under both the Narcotics Control Act and the Food and Drugs Act, "glue sniffing" and household substances used for hallucinogenic purposes.

The inquiry was asked to collect data and information from studies already conducted and report on the state of medical knowledge about drug effects. It was asked to investigate the motivations that underlie drug use and to examine the social, economic, educational, philosophic and age factors relating to the non-medical use of drugs.

Despite its generality, the terms of the mandate seemed to focus the inquiry on non-medical drug use, the reasons for

increased use and their actual effects. The Commission was asked to go beyond recommending specific federal legislative changes, for the range of actions any government and other groups could take clearly extended beyond legislative or legal remedies.

Several questions were not addressed by the mandate. Alcohol and tobacco, both non-medical drugs, were not mentioned in the legislation. The distinctions between medical and legal use of drugs were not made clear, because drugs could be used both for medical and non-medical, legal and illegal purposes, and in addition non-medical use could not always be equated with non-legal use. The mandate did not make clear whether the inquiry should conduct its own primary research, nor did it deal with legal implications of investigating illegal use of drugs.

In these areas, the inquiry made its own decisions. In its study it included both medical and social effects of drugs. It conducted some primary research on drug effects but relied heavily on the literature. It decided to include all drugs that produce altered psychological or behavioural states:[8]

> "The Commission understands drug to mean any substance that by its chemical nature alters structure or function in the living organism. The psychotropic drugs are those which alter sensation, mood, consciousness or other psychological or behavioral functions."[9]

Thus, to a limited extent, it considered tobacco, alcohol, solvents, minor tranquilizers, and non-barbituate sedative hypnotics. It concentrated, perhaps implicitly, on drugs prevalent among the middle class, conducting little research on problems such as glue-sniffing, a kind of drug use more firmly entrenched among the poor.

To some extent these decisions left the inquiry open to public criticism. Tobacco and alcohol, for example, were commonly used by those who had solicited the inquiry to investigate the drug-use habits of others. The inclusion of social concerns and the decision to address the full complexity of issues surrounding drug use meant that the inquiry might function somewhat like the youth culture it was set up to examine through commentary on social mores and institutions. If, as some intervenors later claimed, the inquiry was co-opted by its young participants, the problems were rooted here.

The inquiry faced two immediate problems. First, it was investigating a largely illegal phenomenon where research was constrained by the difficulty of obtaining the drugs to study and by the even larger problem of experimenting with human subjects. Other than through the statistics of law enforcement agencies, little could be known about the actual patterns of most drug use. Those who consented to be interviewed were in many cases a

special and unrepresentative population, for example, those who had sought treatment, were incarcerated, or were actively advocating changes in legislation.

Second, the inquiry sought the cooperation of the drug using population, but could not provide an absolute guarantee of "safety" to those who were willing to give testimony or be studied. The Order-in-Council made provision for anonymous or in-camera testimony with the option that it could be given under oath. Without the oath there was additional provision to certify the testimony as truthful. Although the inquiry functioned as a court of record and kept a court-like transcript, only a shorthand record was made of in-camera or informal hearings and anonymous testimony. The inquiry also received a number of anonymous submissions by mail.

The inquiry sought to deal with the legal problems by an agreement with the RCMP that no one would be charged or even questioned ("exploited") as a result of their testimony. The survey research teams assured the public they interviewed that the results of questionnaires would not be released in such a manner as to identify groups of people or to endanger those who participated in the study. The commission asked anyone with a complaint to come forward and suggested that it would be prepared to function as an unofficial ombudsman for those who felt their activities had fallen under the scrutiny of law enforcement agencies as a result of participation.

The agreement with the RCMP, and by implication with other law enforcement agencies, was informal. Although it appears to have been scrupulously maintained, legal problems haunted the hearings, and the atmosphere generated a certain amount of fear and paranoia. Some of the interviewers in the field were seen as "spies". No specific complaints were actually reported, but, here too the legal situation constrained the inquiry.

To some extent these problems were countered by the attitudes of the young people who testified. As the inquiry staff later noted, young people often considered drug use to be a means of altering social values and prohibitions in general. They were advocates of a new lifestyle, and spoke with the assurance of those who never consider their activities illegal. In another context, the legal problems associated with participation might have paralysed an inquiry. In the context of the late 1960s, however, many were willing and even enjoyed talking and being observed.

The hearings were conducted on a fairly informal basis. Although a counsel had originally been appointed, he left the inquiry at a later date and was not replaced. No form of cross examination was used, people were encouraged to ask questions and the commissioners would sometimes engage in discussions

with the intervenors. Some who spoke did not give their names or submit a formal presentation while others presented a formal brief.

The commission also held a number of "informal hearings" at university campuses and even coffee houses, where young people and drug users were most likely to be present. These hearings were not recorded for the inquiry transcript although a stenographic record was kept. They were characterized by open discussion and the exchange of frank opinion, occasionally they were used as a "confessional". Without doubt, these informal hearings allowed the commission to consider the full nature of the arguments being presented and to gauge the depth of feeling on many issues.

The commission encouraged communication *among* the participants. The hearings were perhaps the only opportunity many people had to discuss the questions of drug use and the youth culture with others who did not share their views. The large degree of participation from service agencies and their clients also brought together those whose interests were similar, but whose opinions and orientation were sometimes in direct conflict. Although the inquiry hearings have been characterized "as a circus," these confrontations, or "happenings" went to the core of what some commissioners and staff thought the inquiry and its research process, should be about.

Because each hearing was used as a means of gathering information, each submission stood on its own merit. Any other procedure would have created what one staff called "an adversarial relationship." The inquiry had the power of subpoena but chose not to exercise it, suggesting that its use would only cause the media to portray the hearings as a confrontation.

In all, the hearings, held in every major city in Canada and in a number of smaller centres, attracted over 12 000 people. The commission advertised widely. Seven hundred and fifty invitations for submissions were sent to organizations and 639 were received, about half from organizations and the rest from individuals.

The material from the hearings was subsumed into a larger research effort which was kept separate from the public process. Over 120 research projects were developed by commission staff or through those on contract. Private consultations provided detailed information, and seminars allowed researchers to meet with experts and discuss particular questions. A "steady stream of experts and consultants" provided a means of "checking the work of the research staff and feedback on the development of the research." A commissioner puts the role of seminars in perspective:

> "The Commission's informal seminars to which we, from time to time, invited outstanding researchers from various fields, were important to us in order to construct and support a

rational and scientifically up-to-date model for our thinking and our discussions among ourselves."

A full time staff was considered essential, and they viewed their task as the identification of research needs and the integration of research findings. Priority was placed on in-house research, mainly to ensure that research would be tailored to the needs identified by the staff. At one point, the inquiry had about 200 people on staff, mainly involved in research projects.

Because the questions involved were considered complex, the inquiry staff felt that they had to be appraised of the literature and keep a flexible approach. They maintained an extensive library and considered their continuing consultation with experts as critical in establishing scientific "facts," which could later be published in scientific journals.

The inquiry was requested to submit an interim report, but it chose to prepare much more than a simple progress report. A summary of the literature on the causes and effects of drug use and the commission's preliminary recommendations, or at least research questions were included. Criticism of this report claimed that it prejudged the issues. As one public intervenor put it:

> "It was clear the decisions had already been made; they had made up their minds and they only wanted proof they were right."

In part the decision to produce a substantial interim report was shaped by the public expectations generated in the first public hearings. The inquiry regarded its task as deciding the questions for the *next* round of hearings and making "public" their assumptions and the framework in which their research was being conducted. The report was also to be a form of public education, a means of providing some accurate information on the problems under study, and a shared basis of information and background for the participants. The practice of using an interim report in this manner has since come into more extensive use but has not avoided criticism. For example, it has been said that this style of interim report makes the process too formal and, perhaps, intimidating. The Le Dain inquiry staff still feel, however, that the report gave focus to the discussion and provided the public with something concrete to which they could respond.

The interim report pointed out that society does not condemn all non-medical uses of drugs, even where social or physiological harm may result. It proposed that the criteria used for judging the effects of drug use should also incorporate a discussion of the set of values, which was to be protected. For the inquiry, those values were the vitality of the individual (i.e., his or her ability to control his or her own actions) and the opportunity individuals should

have for the full development of their potential. It rejected the idea that users of drugs are all mentally ill.

By the time the inquiry was ready to make its recommendations, the use of amphetamines, "speed", had declined so significantly that it was no longer considered a public problem. The drug culture had dissolved into the more general cultural scene, and the new social problem was the multi-drug user. In the case of marijuana use, the content and application of criminal law had become more important than the question of treatment, for whatever its effects marijuana use seldom results in the need or desire for treatment. In the case of use of opiate derivatives, however, treatment is a major concern.

The inquiry developed a concept, which it called "social response," to indicate the way in which segments of society react to drug use. The inquiry argued strongly for informed freedom of choice rather than for suppression of drug use through coercive measures.

In the interim report and more markedly in the final report, the five commissioners were divided in their response to the information they had gathered. Three were in favour of a continuing policy to discourage marijuana use and recommended that restrictions should be placed on the distribution of drugs like marijuana, but that sanctions be reduced to fit the crime. They recommended that the courts should have the freedom to proceed with either a summary conviction or indictment, and that the onus of proof in trafficking cases should rest with the law enforcement agencies.

The opinions of the two dissenting commissioners were divided. One recommended the elimination of prohibitions on the use of marijuana and, in her dissenting view, noted:

> "The probable consequences of legalization seem to me less harmful than the evils of prohibition. Prohibition is expensive economically, socially and morally . . . . The majority of my colleagues, though they would remove the prohibition against simple possession, do not take into account that the necessity of dealing in an illegal market will foster criminality among users." [10]

She suggested that government regulated distribution of the drug would eliminate most illegal trafficking. The other dissenting commissioner took the opposing view and argued that the repeal of penalties for possession would be regarded as a judgement "that the drug was safe."[11] He recommended a fine for the possession of marijuana.

Since the inquiry, the law has not changed. While a number of revisions have been proposed, none have been brought before Parliament in the form of a Bill. Only the enforcement of the law

has been altered by admitting the possibility of summary convictions. But this change occurred during the tenure of the inquiry, and may have had little to do with the inquiry's recommendations.

Analysis

All of the activities of the inquiry were subsumed under the research process, as a means of producing scientific data and analyzing it. The hearings, various inquiry-sponsored research projects, seminars and scientific literature were all used extensively to gather data. Every aspect of the inquiry's activities took on a research orientation. As one commissioner put it:

> "Policy questions never took precedence over research. We were all resigned to the fact that we were appointed by politicians and that research findings and scientific facts, as well as rationality in general, played an extremely limited role, or no role at all, in politics and, alas, in government . . . . To repeat the important point: policy questions and research went, almost independently, side by side throughout the life of the Commission."

The inquiry's research project was much larger than most major social science research projects in Canada, and the inquiry's findings were more than could be discussed in a scientific article. Its report, considered to be a scientific document, contains 1148 pages.

As one of the commissioners put it in discussing the research:

> "Much of the medical-scientific evidence which was presented during our inquiry was quite comparable in quality to that which might be found in an academic medical journal - not infrequently it was of superior quality."

As a consequence of their research orientation, public opinion was not considered a critical matter in the determination of either fact or recommendations. Public testimony might have given the commission an indication of the range of attitudes, feelings and sentiments, but the public hearing was not a means of determining the facts either about drugs or about their patterns of use. Most research staff did not attend the hearings.

Similarly, because of its research orientation, the inquiry paid little attention to what had been done by previous investigatory committees and task forces, even those which had operated in areas bordering the inquiry's mandate. It was noted again by a commissioner, that:

> "Those kinds of policy instruments are only concerned with constituent opinion. When you have a research project, you cannot work in a politicized situation."

The idea of the type of expert panel that was used relatively successfully to investigate marijuana laws by the LaGuardia Commission was rejected. A commissioner noted later that research was seen as having a "multi-disciplinary character," one which would have been impossible for a panel to assess.

As was mentioned before, the research of the inquiry was restricted by the illegal status of most of the drugs, and this inevitably affected the report.

The inquiry was also affected by its own actions. As the inquiry engaged in assessing a set of attitudes these attitudes changed: first, by the commissioning of the inquiry; second, by its manner of conduct; third, by its coverage in the press; and fourth, by its interim report. Some thought that the inquiry had a liberalizing effect on public attitudes by diffusing panic as people began to feel that the problem had come under serious study.

In addition, the pressure of time affected the inquiry. Evidence suggests that studies were adopted and then dropped when they failed to produce results within the time available or when other research goals took precedence. One participant suggested they kept "looking for the one key piece of research that would answer all their questions." Some of the studies were not completed or lacked a systematic analysis of the results. It is commonly agreed that social research demands a flexible approach but the research of the Le Dain inquiry may have had to cope with more than its fair share of flexibility.

Quite early in its tenure, the inquiry gave a contract to a research group at a major university to use survey methodology to study actual patterns of drug use. The group responded first with a review of the literature on drug use, which they suggested should be included in the interim report of the inquiry, and then with an additional paper made clear that no survey *could* answer questions about why people used drugs or how the drug culture was rooted in a society. Their conclusion was that a survey could only indicate the pattern of use.

The inquiry staff provided few guidelines, and gave little response to the survey team; occasionally its response was inconsistent. The survey team planned three separate surveys of high school students, university students, and households. Its report[14] was seen by many of those interviewed as a sophisticated and competent job. Nevertheless, it was not well received by the inquiry and very little of its data were included in the final report. The inquiry staff complained that the study was attitudinal rather than demographic, that it failed to trace drug use historically and chronologically. They suggested that the results from the three survey groups should not have been combined, that the survey questions indicated insufficient knowledge of the drug culture, and

that the data had not been brought together and properly analyzed. The survey was seen as "an outsider's view of where a specific culture fits in."

If the survey had been a waste of money, as several people from the inquiry claimed, it came about because a survey methodology was unlikely to produce the kind of results that the inquiry felt was needed. The survey could not illustrate any of the reasons why people used drugs or how the drug culture was sustained or grew. Neither could it indicate the nature of the relationship between drug and non-drug cultures. Even with more guidance, the survey team could not have produced the kind of "soft" or qualitative data the inquiry really wanted.

From the point of view of those who conducted the survey, the information contained in the tabular form was useful as a basis for the extrapolation of conclusions, and could complement the findings in other parts of the study. From the inquiry point of view, only a correctly analyzed study of the data could demonstrate the value of the work. In relation to other research, the inquiry staff argued that the information was meaningless when taken on its own.

The problem of combining hard and soft data is common to all inquiries. In the Le Dain inquiry, the conflict and problems were made explicit and visible because the survey research "stuck out like a sore thumb" from other research conducted. Nevertheless, a more comfortable combination would only have disguised what was an inevitable problem in the use of different research methods and approaches to develop policy recommendations.

Because the issue was controversial and highly visible, opinion on drug use and the youth culture were strongly polarized. It is not surprising therefore that many participants expected the inquiry to function like a judge, or perhaps even a parent, with respect to their submissions and to make a moral justification for one side or another. These expectations were entrenched on both sides of the issue. Many of the young people sought a blessing on their lifestyle and values. The inquiry was seen on the one hand as a possible champion of the youth cause, against the press, politicians, service agencies and parents. On the other, it was seen as the champion of morality and common sense.

For some, the solution to these problems would have been to centre the inquiry exclusively on policy determination. One person stated that the inquiry should have focused *only* on how to control drugs. Another said that the issue was not drug use, but the youth culture, and that drug use was basically "a symbolic issue"; an observation that met with the agreement of some of the inquiry staff. One staff member suggested that people were not concerned with the scientific realities but with the social realities, "what

their kid did and whether or not he or she was on drugs." Even criminal law, he suggested, has a healthy subjective element.

For others on the commission staff, however, the distinction between science and policy was a difficult one to make, for policy orientation fitted neatly within their view of the inquiry as a research body. As one commissioner later put it, "the policy recommendations were simply the conclusions of the research." They came "from the analysis of the data and the process of understanding the implications of what had been learned."

For one commissioner, the inquiry recommendations "made the scientific material make sense." They lent significance to the facts. They grew out of the weighting process that naturally occurs when the piecemeal work of many scientists is brought together. In applying scientific judgement, this commissioner argued that policy options become clear and decisions can be made when scientific judgements are brought into a public forum and explained to those with responsibility for policy. He noted:

> "When an issue is complex from a scientific point of view and the data must be arrived at by a large number of people working in different disciplines, the problem is to maintain the attitude of a judge. A judge cannot say anything is too difficult for him to understand. He has to force people to make it understandable to him."

An easy integration of science and policy has certain prerequisites. Firstly, information from scientific studies has to be made intelligible without loss of meaning. The translation process from scientific to layperson's language cannot impose unstated values or approaches, nor can it transform the content of the science itself.

Secondly, the process of integrating the material requires the allocation of significant resources from the inquiry itself and careful judgement in the design and direction of the research.

Finally, using this approach, the successful integration of science and policy demands that an inquiry shall have a large degree of control over the research that is carried out. The original research has to be able to be translated into layperson's terms and be conducive to policy recommendations. In addition, its design has to mesh with the needs of policy.

The Le Dain inquiry met some, if not all, of these prerequisites. Firstly, it insisted that scientific information be intelligible and provide a variety of forums through which policy consideration could occur. Secondly, the inquiry allocated a major portion of its resources to research and gave its research director significant authority in designing projects that would be both scientifically sound and amenable to policy recommendation. Because all of the research was filtered through the research director, the success of

the inquiry depended on his skill. Finally, the inquiry commissioned most of its own research, relying only secondarily on existing literature and, to a very limited extent, on "experts" in the field.

Conclusion

When the integration of science and policy is successful, an inquiry becomes a filter through which the scientific data must pass and its commissioners bring policy considerations to bear on the research by their insistence that scientific material must be made intelligible.

Many involved in the Le Dain inquiry argue today that the inquiry was successful in these terms. Yet the Le Dain inquiry has been criticised by some of its participants because it failed to make a significant impact upon policy. Such a critical view may be short sighted. In the first place, government response to the Le Dain inquiry may well have been conditioned by the changing social and political climate with respect to issues under discussion. Secondly, few issues could generate as much controversy as that of drug use and the government necessarily responded with caution, albeit perhaps no more than was necessary in light of the potentially explosive nature of the issue. Few inquiries could match the Le Dain inquiry in this respect except perhaps an inquiry into abortion. Of course, the actual recommendations and conduct of the inquiry may have had an effect and the inability of the five commissioners to reach consensus on some of the major recommendations may have been significant in shaping the government response to the inquiry.

Finally, and most important, all other inquiries studied in this report form part of a long policy history that involves committee deliberations, other inquiries, usually parliamentary debate and always many decisions taken before, during, and after the inquiry itself. The Le Dain inquiry, on the other hand, had little "policy history" for it was commissioned to respond to a crisis and there were few changes in legislation or policy deliberations before the inquiry was commissioned. It is not surprising, therefore, that the inquiry had little relationship to policy during its tenure or after it had submitted its report.

Part Three

Scientific Assessment and a New Technology

Not all decisions about the application or use of new technologies are made after an inquiry. Most decisions are made without comment and the new technologies introduced without public notice. In other cases, regulatory agencies carry out the functions that have now come to be associated with inquiries.

Regulatory agencies have always considered new technological developments as a matter of course through their licensing powers. Some agencies even hold inquiry like-hearings before granting licences. Thus, a study of the nature of scientific assessment in policy making would be deficient if it did not include a discussion of agency consideration as well as of inquiries.

The case of satellite development has been chosen as an example of a regulatory consideration of a new technology. The agency involved is the Canadian Radio-television and Telecommunications Commission (CRTC) and the hearing we investigated was called to consider the application by the domestic satellite communications company, Telesat Canada, to join the TransCanada Telephone System (TCTS), an association of telephone companies operating in Canada.

The CRTC is widely regarded as one of the most publicly conscious and publicly responsive regulatory bodies in Canada.[1] *It maintains a significant research capacity and tends to interpret its mandate as broadly as possible so that it is able to consider social and other factors. The CRTC conducts a relatively thorough assessment, even when the case under consideration simply involves a change in rates or corporate structure. If any regulatory agency is capable of a full scientific assessment, one that incorporated both public and scientific and technical input, it is the CRTC. If there are problems in the nature of the assessment, those problems may well stem from difficulties in regulation itself.*

VIII. Regulation as Assessment: The Communications Satellite Case

A communications satellite is an artificial satellite used to relay radio, television and telephone signals around the earth's surface. A communications satellite system consists of a satellite or a station in orbit and at least two ground receiving/transmitting stations. Signals are beamed to the satellite, which receives, amplifies and transmits these signals back to earth. Satellite systems can carry a large number of signals and are limited only by their channel capacity and their links to land-based communication distribution systems.

Like cable television, communications satellites do not create the programs they carry: they are not broadcast facilities. Like cable television, communications satellites are simply a technical or hardware system, and they must have access to broadcast programs and a connection to a receiving system (in the case of cable television the cable connection into the home) in order to function.

Other technologies exist to distribute sound and pictures across large distances. In Canada, microwaves are often used. Microwave towers are stationed at intervals, and amplify and transmit signals in a leap-frog manner across the country.

Satellite communication systems have certain advantages over microwave and other land-based transmission systems because geography or terrain does not constitute a barrier to the transmission of signals, and the cost of signal transmission is independent of distance. These advantages make them an excellent system for use in Canada. Nevertheless, there are problems connected with their increasing use.

The development of communications satellites has had a profound impact on both Canadian life and policy.[1] Satellites have been used to bring television into Inuit communities in the far North, without regard for the social consequences. They have facilitated the importation of foreign broadcasting signals, making the development of an indigenous system in this region extremely difficult. They can be used to transmit personal and corporate data across national boundaries; thus raising problems for policy makers about individual privacy. They help to erase boundaries between individual homes, villages and cultures. Most importantly, satellite development has raised questions about the role that new technologies will be allowed to play in setting the agenda and activities for individuals, corporations and government action.

As early as mid-1960, satellites and other new communication technologies were seen as crucial to an industrial strategy that would put Canadian industry on a competitive footing abroad, and as a means of shoring up the Canadian economy at home.

At the same time, satellites were tied to a shift in science policy. Key people, among them O.M. Solandt who was chairman of the Science Council in the mid-1960s, argued that scientific research should be "mission oriented", tied to its technological application and developed in close cooperation with industry. Government support was seen as critical in the development of mission-oriented research, involving the use of government laboratories for research and development, and contracts to industry for R&D work.

Ironically, the very strategy designed to put Canada on its feet economically also helped to produce a situation that now threatens national and cultural sovereignty. The new satellites, some components of which are sold abroad as Canadian exports, so far bring only the CBC and US religious and commercial programming into most remote communities; in addition, such communities operate unlicenced satellite receivers. All of this undermines the regulation of the Canadian broadcasting system.

Similarly, other new communication technologies, developed with government sponsorship are creating major problems for Canadians employed in local industries by forging strong technological links along north-south axes and making jobs redundant. The new information technologies, Telidon for example, are Canada's pride in the export market, but at home are now recognized as giving rise to various problems. Again, although developed under the wing of government, these technologies are basically unregulated so that assessment of their impact and control over their development and application is exceedingly difficult.

Communications satellites are used extensively for military purposes, and some experimental work has taken place under Canadian military directive, out of the view of a public assessment process. In addition, a great deal of the work with satellites is done by the Department of Communications in Ottawa. The assessment, conducted by this department, centres primarily on the technology itself through a series of experiments conducted in remote communities. Satellites are also a commercial proposition when used by private companies and government alike to deliver specific communications. This study will centre on the policy and assessment process connected with the development of commercial communications satellites.

History

Canada began its satellite work in the area of ionospheric radio communication, but also worked closely with NASA's Telstar and Relay 1 satellite programmes.[2,3] Canada's first satellite effort of any significance was the Alouette I, designed primarily for testing radio communication in the ionosphere. Alouette I led to a joint Canada-US effort on the Alouette-Isis program, with Canada contributing the major work on the project. The actual satellites for the joint program were built in Canada, and represented 20 years of Canadian research and development. Planning for satellite development often involved Canadian and US agencies, although tasks were divided between the two countries.

Canadian participation was approved by Cabinet on the condition that the technology and the capacity would be transferred to industry. At this time, satellite development was seen as the key to building a space industry in Canada. Nevertheless the military significance of satellites was still emphasized. Interest in the implications of satellites in the North, for example, was first tied to their military role rather than to their potential contribution to economic development. The Department of Transportation (DOT) played only a small role, and even then the Defence Research Board served as its adviser.

During this period, Canada signed an agreement to be part of the International Satellite Corporation, Intelsat. Canada became one of 18 founding members, and was represented by Canadian Overseas Telecommunications Corporation (COTC). The United States dominated Intelsat through Comsat, the US communications satellite corporation, which was also a founding member. Several of the major American communications corporations were also heavily involved in Comsat.

With RCA involvement, Canada set up an earth receiving station in Nova Scotia at Mill Village as part of its contribution to the experiments. In 1965, Northern Electric and Bell Canada

cooperated with the DOT in establishing an experimental earth station in the Arctic. The Hughes Aircraft Corporation, another American company that was to play a major role at a later date, contributed to early research.

The lack of a coherent satellite policy was felt as early as 1966 when Bell Canada applied to set up two experimental earth stations. The Bell Canada application was the first that would have brought the technology directly into the service of industry rather than research-oriented goals. One year later, an application was made, quite independently, before the broadcast regulatory agency of the Board of Broadcast Governors (BBG), when the Niagara Television and Power Corporation sought to use satellites to form a broadcast network which included an educational television channel. According to one person interviewed, this application shook up the telephone companies who then intervened. The BBG announced a special one-day hearing in March 1967 to consider applications to use communication satellites in broadcasting. Bell's application was soon followed by proposals from TransCanada Telephone System (TCTS) and Canadian National/Canadian Pacific Telecommunications, and RCA.

The question of how communications satellites should be developed went to Cabinet, which considered a number of policy options. First, the satellites could be viewed as a system of hardware much like a telephone system, which simply transmits messages, or as part of the broadcast system, taking into account the message, its content, and impact. Second, the Cabinet could view satellites as an extension of telephone services, for they facilitated the transmission of similar communications over which the telephone companies have a monopoly, or as a potential competitor of telephone companies because they might lower the cost of long distance calling. Third, Cabinet could define satellite facilities on earth and in space as a total system of communication, owned and controlled by the same company and acting as a monopoly, or as separate components with the earth stations owned by any number of companies. Finally, Cabinet could choose to develop satellites under the auspices of a Crown corporation, or leave the field open to private ownership and development.

The development of policy guidelines took three years and involved many policy agencies. An interdepartmental committee, a task force, a private hearing process and a special consultant were all involved. A White Paper was released, debated and, finally, legislation was introduced into Parliament in 1968, which established Telesat Canada as the Canadian domestic satellite communications company.[4]

The legislation did not answer all the policy questions. It proposed a mix of public and private ownership for Telesat Canada

without referring to any potential conflict in objectives that might result. It left the question of earth station ownership in abeyance, although it implied that satellites would operate as a single system with respect to their ownership. It left the relationship with the telephone companies muddy, for Telesat Canada was treated as independent of the telephone companies. Yet the legislation proposed that the telephone companies would be part owners and major users of the system. The legislation suggested that Telesat Canada should return a profit, but indicated that it should not offer services competitive to the telephone companies on all the profitable routes. Finally, it took no cognizance of the changes that might be introduced into broadcasting when the new technology was introduced.

Like most new technologies, satellite development has occurred largely outside the regulatory and the inquiry arenas and without public participation or input. The federal government task force hearings, for example, had the character of private consultations although they were scheduled in cities across Canada. When the issue of satellite development surfaced in Parliament after legislation had been introduced setting up Telesat Canada, discussion centred on the means of implementing satellite development. The question of whether Canada wanted a communications satellite system or the kind of system that might be developed was never asked.

In public, the debate centred on the form of ownership of the proposed communications satellite company. In private consultations, TCTS and others argued that competition between the new system and existing telecommunications services would harm "the national interest". When the bill establishing Telesat Canada was passed, it was heralded as an answer to key Canadian problems: unity, the development of the North, industrial development, and Canada's international stature. But how and in what way the new entity would meet its social objectives, objectives which had justified the investment and development in the first place, was anyone's guess.

> A former cabinet minister interviewed put it this way:
> "The use of satellites made the telephone companies' land lines obsolete. They [the telephone companies] had to protect that investment. The government knew, therefore, that Telesat Canada was going to require heavy government investment in the initial stages. The 'opening up of the north via satellites' was just rhetoric."[5]

Telesat Canada's new management read the legislation as a licence to proceed as a commercially viable enterprise, with limited recourse to government financing. They set out to meet the terms of the legislation by building a profitable commercial entity, based

on the new technology. They did so under conditions that would make it difficult if not impossible to meet their social objectives.

As early as 1975, Telesat Canada and its customers were considering new arrangements for the use of satellites, for the original user contracts were nearing their expiry dates. Satellite development had continued without regard to the limitations imposed by low demand factors, and the decision to build even more satellites would therefore require financing.

Problems with the conflicting mandate came to a head in 1976. Telesat Canada faced financial problems; it was not the profitable commercial venture its designers had envisioned. In addition, satellite broadcasts of American programming through northern Inuit communities had created a public backlash.

Northern service was constrained by Telesat Canada's policy not to allow non-commercial service on its system in order to maintain the best financial position. Thus, northern service had been extended *only* through the CBC, through DOC's experiments, and to the extent that private companies chose to make use of the satellite system.

Conflicting pressures were placed upon Telesat Canada as a result of its activities, or lack of them. To meet these problems, Telesat Canada proposed a new form of cooperation with the telephone companies. Rather than maintain their "non-competitive" relationship, they would join forces, arguing that their economic position would be improved by the merger.

An arrangement with the telephone companies would ensure at least limited profitability for the satellite system, as it was brought into operation. But the telephone companies for their part were not about to lease from a company acting like competitor when, at least in the short term, their own facilities were adequate. Without telephone company participation on a major scale Telesat's problems would remain unsolved, and Telesat Canada's large satellite system was likely to be seriously underutilized.

The Minister of Communication's response, however, was generally favourable, as the original intention of the government had been to see the satellite and telephone companies as non-competitive. Telesat Canada, however, would have to meet certain conditions before approval could be granted. The company met these conditions, and the agreement proceeded towards ratification by Telesat and TCTS. Over a month after approval by the Minister, Telesat Canada was informed of its obligation to have the agreement submitted to the Canadian Radio-television and Telecommunications Commission for approval.

The chronology of events which led to this decision is useful in establishing the background conditions of the CRTC hearing.

As early as 1975, TCTS undertook an examination of possible

applications of satellites assuming either that the telephone companies would be able to arrange a bulk leasing arrangement or that Telesat Canada would become a member of TCTS. Following discussions between Telesat and TCTS in February 1976 on "some type of membership arrangements," another TCTS study on satellite use was undertaken. In July of that year, Telesat Canada approved in principle the TCTS membership proposal.

CN/CP Telecommunications were not impressed by the membership plan; they saw it as an extension of TCTS control and as a means of excluding CN/CP Telecommunications in potential competitive opportunities. In August 1976, CN/CP Telecommunications approached the Minister of Communications asking for policy clarification and submitted an alternative proposal, for the creation of a new entity which included CN/CP Telecommunications, TCTS and Telesat Canada, to the Telesat Canada Board. On 1 September 1976, TCTS rejected the proposal on the grounds that it would not provide guarantees of Telesat Canada's expansion or profitability.

Late in November 1976, Cabinet accepted the proposal for membership involving TCTS and Telesat Canada, subject to certain considerations and "without prejudice to the role of the CRTC."

In early December 1976, TCTS's board of management accepted Telesat Canada as a member. The agreement was endorsed by Telesat shareholders, and a press conference was held on 1 January 1977. The agreement became effective subject to CRTC approval and was submitted to the Minister and the CRTC. In February, the CRTC scheduled a public hearing to commence on 25 April 1977, on the subject of Telesat's membership in TCTS.

The CRTC Regulatory Arena

The CRTC was created in 1968, through a new Broadcasting Act that was far reaching in its provisions. The new agency was to oversee all aspects of the broadcast system and ensure that broadcasting contributed to the "social, economic and cultural fabric of Canada."[6] The agency acquired jurisdiction over cable systems, despite the arguments presented (before the agency and in court) by "cablecasters" that cable was simply hardware. The CRTC's claim to jurisdiction over cable was based, in part, on the idea that the system, including cable and broadcasting, should be considered as a single unit. At the time cable systems only delivered television programs, although they later began to provide additional information services.

Before 1975, the CRTC was not directly involved in communications satellite development. Satellites were considered as hardware, as a distribution system, regulated under the jurisdiction of the Canadian Transport Commission in a manner similar to

the telephone companies. The CRTC could consider the implications of satellite development on broadcasting, but only *indirectly*. However, members of the CRTC never questioned that satellites would have an impact on the broadcasting system.

In 1975, with changes in the legislation, the CRTC added telecommunications to its jurisdiction, thereby gaining regulatory control over communications satellites. With telecommunications, they had a different mandate than with broadcasting. The provisions of the National Transportation Act[7] and the Railway Act[8] prevailed. The CRTC's regulatory power was confined to the question of "just and reasonable" rates and the provision of service "without undue preference." The CRTC could not address directly the social, cultural or even the economic implications of different uses of satellites.

The CRTC also inherited the rules of procedure from the Canadian Transport Commission (CTC). Although it intended to change the rules to facilitate greater discussion, more release of information and greater public participation, these new procedures had not been adopted at the time of the Telesat Canada-TCTS hearing. Informal changes were made to facilitate the hearing, but for the most part it resembled other regulatory tribunals. Lawyers were used by all participants, cross-examination was permitted, expert witnesses were called, material was presented in an adversarial style and the hearings concluded with final arguments from the applicants and intervenors.

Nevertheless, the CRTC hearing attracted new participants to the discussion of communications satellite development. Joining the telephone companies, equipment manufacturers and cable industry were the Consumers Association of Canada and Inuit Tapirisat. Although these last two groups were not strangers to the regulatory process, nor to the CRTC, the Telesat Canada-TCTS case provided the first formal opportunity for their intervention into satellite policy development.

During the hearing, Telesat Canada argued that retaining Canada's leadership in the communications satellite field would demand sufficient financial resources to obtain prime orbital parking spaces for the satellites themselves. Intervenors suggested the parking situation was not critical. Telesat argued it needed access to east-west markets if it was to become profitable and that access to these markets demanded cooperation with the telephone companies. Intervenors countered that a merger would result in serious anti-competition forces that would prevent innovation and adequate financial planning. Telesat argued next that the merger would permit attractive economies of scale, but the intervenors suggested that specific needs of northern areas were not likely to be met by an integrated, larger unit. Telesat argued for an

integrated network planning approach to minimize what it called "costly duplication." Intervenors suggested that "integrated network planning" simply meant TCTS control and that other methods existed for achieving comparable economies of scale. Clearly intervenors thought that the agreement was anti-competitive and that it would permit little regulatory scrutiny in the future.

The CRTC had little guidance in making its decision. Although the hearing was an independent tribunal, the Department of Communication had been directly involved with satellite development and with policy proposals.[9,10,11] Even though the department chose not to make its views known formally, the CRTC could surmise that the DOC wanted the financial position of the regional telephone companies (BC Tel, the Prairie companies, etc.) safeguarded. After all, the federal government had *not* contracted with Telesat Canada for its own long haul telephone traffic, preferring instead to work through the network of the regional telephone companies and TCTS. Provincial opposition (from the prairies and maritimes) to an increase in competition from Telesat Canada seemed to weigh heavily in the DOC approach.

The CRTC could also surmise that the DOC was anxious to preserve the existing relationships between Telesat Canada and the telephone companies, or at least to avoid situations that might provoke confrontation between them. Finally, it appeared that the DOC viewed Telesat Canada as providing services to the telephone companies. It was, therefore, reluctant to have Telesat Canada become a retailer of telecommunication services in its own right.

In addition the CRTC had to weigh the real costs of ensuring separation between telephone and satellite services, in other words, the costs of competition. If TCTS was subsidizing the satellite service already, then the cost of telephone service might decrease through integration of the two companies. On the other hand, additional uses for satellites might never be fully explored if the link with the telephone companies were more firmly entrenched. For example, because the telephone companies were not in the broadcasting business, they would have no reason to promote broadcast services.

The CRTC was not in a position to evaluate the alternatives, and it could only accept or reject the application before it. It chose the latter course and left the door open for competition, and alternative proposals which might provide a better opportunity for northern communities and consumers in general. It based its decision on "the public interest" by using two criteria. First, the agreement might prejudice the agency's ability to provide effective rate regulation, and second it might jeopordize the availability and expansion of services and the possibility of competition in telecommunication services. It considered the onus to fall upon the

applicant, Telesat Canada, to prove that the agreement would be in the public interest. In the absence of such proof, and considering the problems of effective rate regulation and other questions detailed above, the CRTC denied the application.

The corporate intervenors were probably shocked by the decision. Regulatory agencies in the United States might have taken actions like the CRTC, but Canadian agencies had never taken such a direction before, at least not in telecommunications. The wider definition of public interest, the key role played by consumer interest, and the use of general public policy criteria all appeared to have changed the rules of the regulation game.

The intervenors took their case to Cabinet under section (64(1) of the National Transportation Act which allowed that body to vary or alter a decision of the CRTC.* There, one intervenor, the Consumers Association of Canada, argued that the Cabinet should decline jurisdiction in the case, and suggested that Telesat Canada could take the matter to the Supreme Court. Another intervenor, CN/CP Telecommunications, began its own preparations for a court case with an argument on the illegality of the agreement. CN/CP's appeal to the court was still pending when this study was written.

Cabinet's decision was quick and decisive. It overturned the decision of the CRTC. It was, as the then Minister of Communications stated, "the only way to go." The Cabinet based its actions on what they considered to be "the public interest", in this case the broader national concern.

Analysis

Regulatory agencies in Canada lack the rigorous independence that, theoretically, characterizes their American counterparts, for their deliberations are subject to political pressures. The Cabinet, and apparently the Department of Communications, have critical powers over agencies and their right to overrule decisions made by an agency is not based on a public hearing, or an assessment. In fact the right lies in the specific nature of the parliamentary system in Canada where legislature powers are supreme.

The decision taken by the CRTC was unusual. The Cabinet overturn of that decision was not. The Cabinet acted well within its mandate, given the Canadian parliamentary system and its own policies, however poorly articulated and understood by the public, that had existed since satellite communications were first considered. Cabinet's implied support for the position taken by the telephone companies reflects a long-standing commitment to use satellites for industrial development with the telephone companies

*Although the agency's decisions may be appealed to Cabinet, the agency cannot be taken to court, as in the United States, except in matters of law and jurisdiction.

providing research on new communications technologies designed for the export market. The view that satellite development was "in the national interest", was therefore well established, as were the relationships between the telephone companies and government departments. The question that remains is: What was it about the regulatory process in general and the CRTC public hearing in particular that allowed the agency decision to be so out of line with government policy?

There are three possible answers. The first is simply that the CRTC brought new people into the assessment process.[12,13] Advocate groups presented their case and a government department, (DCCA, Bureau of Competition) acting with unusual independence, intervened and argued publicly against a position taken by another government department (DOC). It appears that the CRTC was unusually sensitive to questions raised by advocate groups.

Second, the CRTC hearing brought the policy-making process into the "light of day" in a situation in which the relationship between those making the decision and their constituents had previously been unclear. Long-standing relationships, built on what might be "a cooperative and trusting basis"[14] between government departments and industry were necessarily altered in the highly visible decision-making forum. The public could watch, and to the extent that technical terms left the debate intelligible, could exert pressure for a more widely responsive system.

Third, the CRTC itself had a record for considering social and cultural questions and a mandate to consider these questions in broadcast regulation. Although they could not transpose their broadcasting mandate into the telecommunications sphere, they could shape their decision within this mandate to reflect economic, social and cultural goals. In doing so, they would be pushing against limitations generally imposed on, and by, regulatory agencies with respect to policy making.

None of these approaches were likely to endear the agency to the government and its relevant departments. The growth of a strong advocate sector may be a fact of political life, but it is hardly welcomed by those whose actions and decisions involve well established routines and assumptions about how things should be done. Nor could increased visibility be considered desirable for it is unlikely that the "independence" of the agency would be seen as beneficial, particularly when it encroached on policy-making prerogatives of various government departments. Much discussion has occurred recently about regulatory agencies overstepping their powers in making policy.[15,16,17] The CRTC's Telesat Canada decision could easily be seen by some as the beginning of an undesirable trend.

Those who develop new technologies or provide funding and

support for innovation know that a series of decisions, primarily of an economic nature, underlie the growth of a new technology. The assessment of markets, regulatory constraints, potential costs and benefits and the availability of credit and government subsidization all play a critical role in the industry decisions that govern the development of a major technological innovation. In both Canada and the United States most of the research and development costs in the early stages of satellite development were borne by government. The government had at least as strong a vested interest in satellite development as any corporation.

It is common to talk of a technological imperative, arguing that, once developed, technologies have their own momentum and set constraints on action and policy. Implied is the suggestion that the technology itself is the driving force. In the satellite case, the technological imperative was seen to derive from the limited availability of orbital parking spaces and radio spectrum space, which when combined with Canadian initiatives in establishing a high-technology export industry, made decisions about whether and how to proceed with satellite development seem irrelevant. The possibility of alternatives, even alternative technologies to meet the same social and economic goals as were given in Parliament to support the Telesat legislation, was discounted once satellites were seen as posing imperatives for specific policies. The decisions leading up to the choice offered Parliament originally, or the Cabinet after the CRTC decision, were masked, not the least important of which was the high level of government investment in the development of the technology itself.

One of the main policy actors of the time commented on the concept of a technological imperative with respect to satellites by suggesting that an issue, once perceived as imbued with technological considerations becomes "too complex, far more than is justified given the decisions that have to be made."[18] This apparent complexity discourages members of the public, and on occasion even members of the regulatory agency, from taking a close look at the problems involved.

Yet in some sense, a regulatory agency is the ideal body to examine an issue like communications satellites. The agency possesses, in theory at least, a monitoring capacity. Information from previous hearings can be analyzed in light of actual developments and can be fed into the new hearing process. The agency knows the full scope of the problems to be examined and can relate recommendations in one policy area to implications for another. In the case of communications satellites, the integration of issues arising from satellite development spanned the complete scope of CRTC's jurisdiction. And although specific considerations, from broadcasting for example, could not be introduced formally into the

hearings, the agency could consider the implications of a decision in light of a variety of other considerations.

In the case of the Telesat Canada-TCTS merger, however, the limitations of a regulatory agency were very clear. The CRTC did not have the research capacity nor the ability to monitor developments, in part because its jurisdiction was so new in the area, in part because of budget restrictions, and in part because of the limited nature of its mandate regarding telecommunications. As one member of the CRTC staff put it, during the Telesat Canada hearing:

> "We had very little flexibility. The statute was deficient. We couldn't attach conditions. We could only say yes or no. We could not suggest amendments."*

It is worth considering what might have happened if the CRTC had been given jurisdiction over communications satellites in the manner and at the time they were given jurisdiction over cable television. The new technology could have been included within the mandate of the CRTC when it was first created, and the implications of communications satellites could have been taken into account in *all* of their aspects.

In fact, there is no evidence that a decision about *how* to regulate communications satellites was ever made or that anyone ever considered regulating communications satellites under the broadcast system. The original application to the then broadcast regulatory agency, the Board of Broadcast Governors, was dealt with superficially and the matter quickly passed to Cabinet and the Department of Transport. Although the new satellite technology was supposed to contribute to northern development and Canadian unity, it was in its industrial and export applications that communications satellites received the most attention. It was the telephone companies that maintained a vigil for the early policy development. The question of how the social contributions of communications satellites might be made was never given more than rhetorical mention, except in DOC experiments in the North and in educational experiments using primarily non-commercial satellites.

The CRTC moved to interpret its mandate broadly and leaned on a broad definition of the public interest. It encouraged all forms of public participation and was considered an innovative agency by many. If, then, limitations became apparent in the way the case

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*The National Transportation Act and the Railway Act defined the mandate for the CRTC as centring on the assessment and approval of agreements, contracts and mergers. The agency was only allowed to approve or disapprove. It could not place conditions on the agreement. The agency was mandated to act "in the public interest," but public interest had traditionally been defined in terms of just and reasonable rates and no undue discrimination in the provision of service.

was considered before the CRTC, those limitations must therefore, at least in part, stem from the nature of regulation itself.

Conclusion

The agency began its consideration, as all agencies do, with an application, not an issue, to be considered. It operated in a regulatory atmosphere that supported a narrow interpretation of a regulatory mandate and allowed for what euphemistically has been called "management prerogative" in determining what information to solicit, make public and consider.[19,20] The CRTC could consider the internal management practices of Telesat Canada in as much as they might affect rates and services. It could act to facilitate the introduction of new services, but it could not require them as a condition of licence. It could take into account the claim that Telesat Canada was in financial difficulties but it could not reassess, in any effective way, the decisions that led to this problem. Nor could the CRTC address questions arising from the impact of the new technology on broadcasting or on the social and cultural life of communities that might receive new services as a result of Telesat Canada's operation.

Since the Telesat Canada-TCTS hearing, communications satellite policy has been brought before the agency again.* In its second consideration the provision of service to the North through communications satellites was balanced against the demand for pay television by southern cable TV operators and the needs of the Canadian broadcast system as a whole. The consideration of satellites, the second round, was not tied to a specific application but was broad and linked to social questions.

The decision of the CRTC to withold the introduction of new services until northern needs could be satisfied within the framework of the Broadcast Act, has caused little satisfaction. Yet northern communities have purchased and installed illegal satellite receivers, to obtain broadcasting from US, and not Canadian, satellites.

Southern operators continue to press for the introduction of new services, threatening to circumvent CRTC regulation if necessary. In turn the CRTC has solicited applications from the private or public sector to provide the North with full service, but can do little except work with the proposals made by the applicants. Politically it cannot demand that northern communities give up access to full US service unless a Canadian "package" with similar range of programming is available. Legally, it cannot prevent those seeking

*A third hearing, centring on applications to extend television service via satellite to remote areas, has been held. Again, the CRTC strained against the policy decisions inherent in their decision on a specific application.

to introduce new services from finding ways around CRTC regulation, perhaps through jurisdictional rearrangements. Socially, it cannot halt the incursion of northern communities by mass, southern-oriented programming. Because it is a regulatory agency, it cannot fund, or even facilitate directly the development of a proposal that would more adequately respond to concerns raised in its hearing.

In as much as the original Telesat Canada-TCTS merger was proposed as a means of solving the problems generated in the early stages of satellite development, the original negotiation of interests requires re-examination. Because this re-examination must take into account the technical capabilities of communications satellites, it becomes a technical matter. However, because regulatory considerations are usually framed as evaluations of applications from industry to provide specific services, they do not easily allow for consideration of scientific and technical questions. If Jeanne Sauvé, then Minister of Communications, was right "that the CRTC closed its eyes to all sorts of experiments," the regulatory process itself makes her statement true. Regulation, no matter how imaginatively practiced, is highly reactive. It solidifies rather than responds to "a technological imperative."

Part Four

Inquiries in Perspective

IX. Science and Inquiries

The Scientific Question Addressed by Inquiries

Most of the inquiries chosen for study took as their scientific question the determination of risk. Nuclear development was compared to other forms of energy production. Particular products were seen to impose certain risks, but the level of risk was judged acceptable. The number of fatalities that have resulted from nuclear-related development was compared with those in other industries and with the risk to the public from automobile accidents on the highway. The effects of 500 kV transmission lines were compared with other "linear land uses" such as railways.

It is not surprising that risk is seen as the scientific question in many inquiries. Measuring the level of risk allows for a relatively easy collection of information, usually of a statistical nature. Once compared, levels of risk can be translated into policy recommendations. The public can be presented with a clear delineation of options. Risk, even in the hands of those who advocate its importance as a scientific measurement, is a double-edged assessment; first in its effect on a particular product or development and second through the implications or impact of the development.

Risk assessment is a problem-oriented concept. Its use implies that developments *should* be allowed to proceed, and products used, unless serious problems have been identified. Risk assessment implies an assessment of financial costs (of delay, for example), health costs, social costs, and, thus, an assessment of *socially and politically acceptable* levels of danger or problems. Risk assessment implies social assumptions about what constitutes a serious prob-

lem and to whom. It implies that both costs and burdens can be, if not quantified, then, at least easily compared.

To a large extent, the model for risk assessment is taken from epidemiology, where comparisons of rates of disease or fatality are based on statistical information. Rates of disease in different locations or under particular conditions provide clues about the relationships between factors like nutrition and disease. The methodology used in epidemiological studies involves sampling and probability theory, and, although based on an assessment of existing conditions in various localities, provides a measure of prediction and an indication of potential dangers.

In inquiries investigating the impact of proposed developments, however, the use of risk assessment is fraught with problems. In the first place, measurements of the effects of a specific project in one locality cannot be made until that project is developed, for experience with similar developments in other locations is seldom fully applicable. Neither the sample size nor the timeframe make prediction of potential dangers amenable to study using precision or probability theory, and attempts to use computer modelling techniques have only been marginally successful. Secondly, using risk as a measurement tends to reduce social questions to what can be quantified or compared easily with economic or other factors. In this way scientific considerations of a problem are reduced to engineering decisions.

It would be helpful to make the distinction between science and engineering here. Engineering data can be predictive and can contribute to a scientific debate. Nevertheless, science and engineering are characterized by a different orientation. Science is tied to systematic investigation, while engineering is concerned with empirical problem solving, always with reference to a particular project. Science is exploratory. Engineering is pragmatic, oriented to identifying specific problems and their solutions in the design of a specific project. At their best, scientific questions are open-ended while engineers seek a single, finite answer to a particular problem in order to proceed with construction of the project.

Scientists may be engaged, as they were in the Point Lepreau hearing, in the site selection process but only from the point of view of engineering studies. Engineers for their part may be involved in scientific research studies like the ones conducted by MacLaren Atlantic for that project. Although interaction between engineering and pure science is both necessary and beneficial, differences in orientation create problems.

Engineering operates, as it must, largely on a "fail safe" principle. In doing so, it implies the existence of a technological imperative; those with an engineering view may easily assume

that technology acts as a blind but benevolent force towards progress, for the necessity and desirability of a project is often taken for granted. Under these conditions, the onus is placed on those who perceive or fear risks, usually members of advocate groups, to prove that problems created cannot now or in the foreseeable future be solved. This burden of proof is insupportable. It is little wonder that advocates usually fail to present a sufficiently convincing case to halt a project. Assuming that they have, in fact, identified real problems and have access to scientists who will testify, or to publicly available scientific and technical literature, few of them would argue the case that solutions *could not* be found, or that proposed monitoring or regulatory processes could not identify and control problems as they develop.

The Bayda inquiry provides an excellent example of the way risk is used in a scientific assessment in an inquiry. In spite of the care that was taken to conduct an adequate assessment, problems clearly emerged. It is useful to list what might have been assessed as risk by the Bayda inquiry and compare it to what was actually done.

A. *Risks* can *be seen as necessary or not, desirable or undesirable. A variety of standards can be used to judge necessity and desirability, none of which are related to risk directly and all of which depend, at least in part, on who is conducting the assessment.*

The question of necessity or desirability of the particular project under consideration was only addressed by the Bayda inquiry[1] in terms of projected energy needs and demands, particularly as they would be felt in the Third World. The direct and causal link between the necessity to find new sources of energy to meet the needs of the Third World (which has since been debated) and the development of uranium mining in Saskatchewan was not addressed except to the degree that the production of uranium would contribute fuel for energy production in general.

B. *Risks* can *be seen as counterbalanced or offset by other risks, or they can be viewed as separate and incomparable.*

The Bayda inquiry attempted to counterbalance the risks of developing uranium with a series of other risks, including those of energy shortage, food shortage, lack of development, etc. Again the causal link was not discussed except in a very general way.

C. *Risks* can *be seen in terms of whom they affect. Some people, by virtue of their social and economic position, their degree of choice and opportunity, may be unable to sustain risks that others might bear directly and easily. The question of how knowingly or voluntarily a risk is assumed has relevance.*

The Bayda inquiry assumed that the main risk would be born by the miners and a secondary, but nevertheless real, risk would be to northerners. The miners' risk was compared to that which workers might have in other occupations and left aside measures being taken in those occupations to deal with or compensate workers for dangers. The nature of possible injuries, other than fatalities, was not discussed at any length. The question of whether northerners, and particularly native people, should be asked to sustain the risk in light of their history and social position was relegated to a discussion of northern development options and participation. Measures for mitigating social costs were proposed.

D. *Risks* may *be judged in terms of the nature or timeframe of the consequences, in the short or long term. They may be assessed in terms of the ability of those assuming risks to take direct responsibility for any problems that might develop.*

To date, the number of fatalities from nuclear-related development is low, assuming fatalities are counted by accidents and considered in the short term. The full nature of the consequences of various other kinds of accidents, even minor ones, and the scope of other possible damage was not considered at any length. The timeframe used for comparisons could well have been debated.

E. *Risks* may *be assessed in terms of providing maximum* possible *or maximum* practical *protection.*

Some attention was given to setting levels for standards to provide the maximum possible protection from radiation, but the inquiry leaned heavily on maximum practical protection, although such a consideration necessarily involved both value and economic questions. Maximum practical protection involves a cost/benefit analysis and is the standard used by international standard setting agencies. The nature of standard setting has been discussed, in the case of the aluminum wiring inquiry.

The Bayda report centred its determination on comparison of risks, using several other studies as a basis for discussion and recommendation. Although the value of these studies has been debated elsewhere and will not be addressed here, it is important to note that they, like the Bayda inquiry, centred on single variable comparisons that did not take into account the range of relationships between variables, the problems of time span, necessity, desirability, the nature of the possible failures, and the degree to which the risk is spread among those who assume it voluntarily.

Clearly there is room for debate within a discussion of risk even if the facts and figures by which risk is being assessed are taken to be accurate or adequate. Those who criticize the Bayda report do so, primarily, on the basis of questions about risk that were not addressed. They argue that the wrong or inadequate tools

were used to assess the problem, that causal linkages were assumed but not demonstrated, and that social and political assumptions were hidden in what purported to be a strictly scientific assessment.

Of course, the Bayda inquiry could not have come to terms with all the questions in a risk assessment. To a very large extent, it necessarily abrogated its responsibility to other bodies and made the assumption that their methodologies were adequate and scientific. No provincial inquiry, even one as well funded as the Porter inquiry, could take on the full responsibility of assessing standards in nuclear development without heavy reliance on international bodies. Yet, as Doern and others have pointed out,[2,3] international standard setting bodies do not overcome problems simply because they are international. They too are subject to pressures, some greater and less responsive to science than the Bayda inquiry.

One further problem exists with reference to risk assessment. The Point Lepreau hearing provides the best example. Developments or products may be considered safe until proven otherwise. Alternatively, they may be considered dangerous until identification of potential problems is complete and solutions to serious problems found. The criteria used and the onus for proof shift dramatically depending on which orientation is taken. Similarly, risks may be assessed as they exist in the present or in terms of perceived capacity to handle them should they arise in the future, in terms of current or potential monitoring or regulatory processes. In the latter case, the assessment of the monitoring or regulatory process is part of the assessment of the product or development. Often this capacity does not exist at the time of the inquiry, and the inquiry's assessment is contingent upon a process being implemented fully.

At Point Lepreau, for example, New Brunswick Power (NBP) considered that it was working with a standardized model of a nuclear reactor (from Gentilly II in Québec), and simply adapting that model to the New Brunswick situation. It assumed that the reactor design would reflect the correct technological considerations and could function concurrently with and under the same pressures as project development itself. NBP knew that waste management would create problems but they assumed that for any set of problems, engineers would find the solutions. NBP understood that monitoring would be essential but assumed that it was sufficient to rely upon AECB for this function. However, the criteria established for the Point Lepreau research and even the technical work done for the environmental studies, were from an engineering perspective. This was reflected in the significance attached to the data.

The opponents of the Point Lepreau project, on the other hand, called for a scientific approach to data and sought an independent evaluation of the variables before the project began. They did not understand that a scientific investigation of the environment could be done concurrently with the construction of the plant. Nor were they convinced that solutions to the problems of waste management could be found for they did not subscribe to the view that "science always finds answers". These opponents were not convinced that the AECB had effective monitoring and regulatory capacity, and they called for a detailed review of previous studies on nuclear regulation. Thus, their proposals for research seemed out of place in the utility company's planning process.

Measuring Risk

Unfortunately for inquiries and their participants, there are no standard yardsticks for the measurement of risk. As one participant put it, "how safe is safe?"; or as another noted, "by whose standard do we judge risk?"

A number of yardsticks might be used, but three stand out as part of the current assessment practice. The first is used in reference to the aircraft industry. Airplane safety is judged by measuring the technical performance of an airplane against the maximum possible performance given the state of the scientific and technical knowledge. Maximum possible performance implies maximum possible protection above and beyond that required for general safety or reliability. Using this yardstick, one takes the position that *any* harm or risk is too great if the scientific and technical knowledge is available to prevent it or if alternative means of meeting or altering public needs are available. In 1978, after a number of air disasters involving DC-10 aircraft, the problem was identified as metal fatigue of the wings. Despite the significant financial losses involved for companies operating these aircraft, all DC-10 airplanes were grounded until the situation was corrected. Those township councils who imposed a moratorium on the use of aluminum wiring within their jurisdiction were measuring risk by the standard of the maximum possible protection that did not lead to a serious disruption of service.

The second yardstick often used in assessment is tied closely to the regulatory process. It argues that risks can be determined through the balancing of interests involved in any decision. A pipeline route is determined, a CSA standard is set, and conditions of a licence granted to a company to build a gas line are determined through a process of balancing interests. One of the interests, of course, is the "public interest", as represented by the agency making the decision and, perhaps also, by some of the participants in the process. Other interests, the need for invest-

ment or the financial costs of delay, are also taken into account in a process of judgement or arbitration.

A third possible yardstick, now being applied in most inquiries, centres on technological assessment. It uses the standard of best possible performance or protection given the alternatives. An oil port is weighed against the possibility of an oil pipeline. In turn, nuclear technology and its attendant problems are weighed against continued dependence on oil, oil pollution is weighed against the possibility of an energy shortage, and a statistically sophisticated study compares the risks of nuclear accidents with those of other energy producing technologies.[4]

Each type of risk measurement appears to be based on a different approach. The first is clearly value-based; human life is taken to be sacred and even a single unnecessary risk is one too many. The second appears to be based on the prerequisites of policy considerations, for the interests of all parties are considered within the framework of the politically determined public interest. The third appears to be scientific through its measurement of known characteristics of a situation against a clearly indicated standard of comparison. But in fact, all three combine science, policy, and values.

The first case (the measurement of risk), although invoking values, draws heavily upon the scientific process through its open-ended approach to questions. The current state of scientific and technical knowledge is assessed as a part of a continual process of assessing new possibilities for protection. Risk measurement operates within a policy framework to the extent that it ensures continuation of essential services, e.g., electrical wiring in new houses; yet it centres the assessment clearly on an evaluation of a particular product, technology, or development itself.

In the second case (measuring risk through a process of balancing the interests involved in the decision), scientific and technical material is critical. It is introduced to support the positions taken by the various interest groups in the process. The inquiry itself operates as the agent in assessing the competing claims of data. The inquiry process is one of arbitration and part of what is being arbitrated is the scientific basis of each argument being presented. Of course, those who participate in an inquiry base their actions, at least in part, upon a set of assumptions or values about what is in the public interest (as well as what is in the interest of the party making the presentation).

In the third case, the link to science is itself more tentative than it appears. Measuring the known characteristics of any product, development, or situation against a clearly indicated standard of comparison lends itself easily to the use of quantitative data, and hence proceeds under the guise of science. Often,

however, many of the variables are not known and others cannot be measured or quantified by known techniques in social or economic science. Comparisons are made between variables of different orders or are drawn from different levels of analysis. When the risks are not easily quantifiable, questions of policy and values are introduced. Often here, the introduction of non-scientific bases for comparison is implicit.

Each method of risk assessment, therefore, has its usefulness provided that one assumes that risk must be measured in order to determine directions for policy. However, when used in combination, or when not clearly understood, problems of risk assessment are magnified. The aluminum wiring inquiry provides a good example. The public participants wanted the first yardstick used and, of course, would not have been satisfied with any other for they demanded maximum possible protection. The mandate of the inquiry called for the third measures: the comparative assessment of the risks of aluminum wiring in comparison with copper while the institutional participants were experienced in and tended to favour the second. As a member of the Standards Council staff put it:

> "[It] seems to me it's a trade-off. Somebody has got to make those judgements. Frequently there are economic judgements and a consensus of experts is the best you can do."

To a great extent, perhaps because of the scientific experience of its commissioner and certainly because of the mandate of the inquiry, the inquiry saw itself performing the third method of assessment, comparing risks of using copper and aluminum wiring, but in practice leaned very heavily on the second - the attempt to balance the interests involved.

The use of two different measures of risk was bound to cause problems. The inquiry could be seen, as it was by some, as politically motivated and serving the vested interest of the institutional intervenors, because it worked within a balance of interests to determine the extent and the seriousness of the problem. It was also open to the charge of incompleteness because copper and aluminum wiring were never fully compared within the inquiry itself. Again, as in the Bayda inquiry, these criticisms were based on disagreements about the nature of criteria to be used and not necessarily on the assessment itself.

One person interviewed raised an interesting question: "What if Berger had addressed his inquiry to the problem of "risk"?" Under such conditions would Berger have listened so closely to native people talk about their aspirations for a different kind of future? Would he have placed great weight on the clearly unquantifiable and perhaps unproven assumptions about the possibility of implementing the vision of the native peoples? It can be argued

that the Berger inquiry's sensitive reading of the mood, perceptions and culture of northern peoples constituted a form of scientific assessment, in fact, recognized that social scientists were involved in major social studies. But such an assessment could not have been embraced within an engineering perspective, nor would it have been amenable to the cost/benefit analysis that so often is implied in a discussion of risk.

The public's reaction to risk can be viewed as indicating the level of *acceptable* risk and the limit of public tolerance. Of course, public perception of what is acceptable can be conditioned by scientific and technical information and by media presentation of events. This state of affairs is both political and necessary.

Yet to those who seek to identify serious problems in a proposed development and wish to become part of a scientific discussion, rather than an engineering study, the act of limiting their participation to a discussion of "what is acceptable" is profoundly dissatisfying.

An Inquiry as Research or as Arbitration

Those who conduct inquiries have two distinct ways to proceed. They can frame their work in terms of a research study or as a process of arbitration.[5] In the former case, hearings are not the only means of collecting information for a variety of other studies may be conducted. The final report provides mainly an assessment of the conditions existing in the area where development is proposed and identifies problems associated with a technology or characteristics of a particular product under various conditions of use.

When an inquiry is viewed as an arbitration, the research conducted by the inquiry and presented by its participants, constitutes "evidence" to be arbitrated. The hearings become an arena for arbitration where this evidence is weighed and tested through cross-examination.

Although it conducted relatively little rigorous scientific research, the Porter inquiry in fact leaned towards the research model, while the aluminum wiring inquiry sought a form of arbitration. Adversarial relations were stressed in the latter inquiry and underplayed in the former.

Perhaps the two best examples of difference in approach, however, are the Bayda and Le Dain inquiries, for no clearer contrast could be drawn than between them. For Bayda, the inquiry was similar to a court while Le Dain constituted an opportunity for critically needed research. For Bayda the hearings were central and evidence was garnered primarily from witnesses, while in the Le Dain inquiry a research staff supplemented the hearings.

When an inquiry takes the form of a research study, the processes of research and of reaching policy recommendations become separate and distinct. Each has value in its own right. Research is directed to determining the nature of the problem while policy recommendations are directed towards solutions. The latter are derived through the process of "making sense of" research data and of considering the "implications" of what is known.

When an inquiry is viewed as a process of arbitration, policy recommendations develop through the consideration of issues presented in testimony. Policy recommendations, therefore, constitute judgements about the relative merit of conflicting assessments and recommendations. With such an approach, research is viewed only in light of its contribution to the development of policy.

Finally, pressures on an inquiry, including its duration and the current political climate, influence the choice of orientation. A simple comparison of the two approaches highlights their differences.

Inquiry as a Research Study	Inquiry as Arbitration
An inquiry that views itself as a research study must have some means, either within or separate from it, of generating independent data.	An inquiry that uses the arbitration model is highly dependent upon the quality of research brought into the process.
An inquiry that uses the research model can take the complexity of information, the inter-relationship of variables and the conflicting views of scientists into account.	An inquiry that uses the arbitration model forces scientists to speak a language that lay people can understand. It reduces complexities to problems which are manageable and translates science and technology into something which is seen to have important public effects.
An inquiry that uses the research model is sensitive to that which is not known and it becomes as open-ended as science itself.	An inquiry that uses the arbitration model forces closure on issues.

To the degree that scientific information is available and scientific uncertainty is not great, the inquiry can call upon scientists to testify. In these cases, the arbitration model is appropriate. And further when seminars are included, then the complexities of the situation and the conflicts between scientists can be taken fully into account. To the degree, however, that the information necessary for arbitration is not known, scientific uncertainty is high, or important research remains to be done, the research-oriented model has strong advantages.

The arbitration process, as carried out by inquiries, is quite different from peer review in scientific journals, for the former reflects a need for closure on scientific debate. However, arbitration is useful to the degree that it reflects the "state of the art" with respect to specific issues.

Problems in Research

An *ad hoc* inquiry begins in an open-minded way, for it has no investment in accumulated experience and knowledge. Instead, many hours must be spent documenting facts. For example, what is uranium? What are the characteristics of a uranium mine, and what is a tailing? What is the nature of the rock formation under the tailing ponds? What are radiation standards and how are they measured? Are different radiation standards required for different parts of the body and for different levels and kinds of radiation?

The above are indeed technical questions, but they constitute *only the base line* from which a detailed, often complex and conflicting technical literature springs. To the extent that scientific controversy remains after the inquiry only indicates the complexity of the original issues. An inquiry may master the "basic" science of a problem, and here the Bayda inquiry is a good example, but this does not mean that the scientific controversies have all been laid to rest.

The same problems exist within the policy sphere, for political matters are equally controversial. The nature of regulation and its effects, the nature of the standard setting process, the administration of policy, the relationship between policy setting and its administration are no less complex than what are usually seen as the scientific factors of a case. The debates that characterize the fields of economics, political science, public administration and sociology do not emerge in an inquiry. But the basic facts, as presented by the administrators themselves (in the process of the inquiry) are no less controversial than, for example, the nature of the waste management problem. Much of the science within an inquiry is tied to the presentation of basic facts.

The Berger inquiry is often used as an example of how an inquiry can conduct research through hearings. In the Berger

inquiry, there were two applicants, each with their own research capacity, involved in the debate. Intervening groups also had resources and called on those who had carried out original field research to counter the claims made by scientists and engineers hired by the two applicants. The scientists and engineers not only gave expert testimony, but also provided an analysis of the original data. The Berger inquiry, therefore, brought scientists who had conducted *several* different research studies on the same topic together in a forum where the claims of one group could be tested against the claims of another. In each case, scientists who had conducted similar research but had drawn different conclusions, debated with each other *as equals*. The commission was witness to the debate and, only secondarily, acted as arbitrator.

The Berger, Porter and Bayda inquiries were primarily dependent upon their staff and the expertise of their commissioners to make sense of the scientific and technical material presented, although the Porter inquiry did commission a number of economic studies. The Bayda inquiry, however, relied heavily upon its witnesses, lay scientists for the most part, to ask perceptive questions relating to the scientific claims made by the proponent. Operating under these conditions, it is unreasonable to expect an inquiry to master all the intricacies of scientific and policy research, as that research applied specifically in the jurisdiction of the inquiry.

The Berger inquiry may have done better than most because it involved competing applications, strong advocate groups and adequate resources. On the other hand, it would have been unreasonable to expect the Porter inquiry to reach radically new conclusions about nuclear development whatever the evidence might have been for a re-evaluation of Ontario's policy. Although this was the goal of at least one of the commissioners involved, neither the Porter nor the Bayda inquiries were able to reproduce the necessary conditions to write a local version of the Berger report.

Inquiries have generated a large amount of research. In a country like Canada where research funds are limited, this contribution should not be minimized. The research is done by proponents, by advocates, and occasionally by the inquiry itself. In fact, inquiries have been called a research industry.[6,7] There are problems, however, in using an inquiry as a granting or grant stimulating agency:

- It is commonly agreed that research is shaped by the explicit and implicit questions written into a study. In addition, those who fund research have some impact on what will be studied and how. Inquiries, like other funding bodies, set specific directions for the research they facilitate.

• There is pressure on proponents or applicants in inquiries to conduct "research for research's sake". The very existence of a study is taken as its own justification. If this "research for research's sake" leads to a new form of research funding, independent of the pressures imposed by corporate applicants or governments, then there is no problem. In practice, however, the research may have little application to real problems but it is shaped, if not biased, by its lack of independence and orientation to limited and *specific kinds* of policy recommendations. As such, the research sometimes represents the worst of what many critics have suggested social science can be.
• Although those who participate in inquiries often have scientific or technical expertise, it is evident from a reading of inquiry transcripts that very little of the discussion in hearings is either scientific or technical. Scientific discussion in inquiries is at the level of popular science, of raw data yet to be analyzed, or the presentation, without critical comment, of agency and departmental mandates. Inquiries receive as evidence burnt out electrical receptacles, newspaper clippings, testimonials and summaries, without an accompanying analysis of their scientific or technical significance.
• Only a few of the issues raised in an inquiry can lay claim to the term scientific or technical. Most people testifying, including scientists, appear to be drawing from unreferenced scientific literature, but, in fact, focus on the policy implications of particular options. In fact, publicly hired or lay experts seem significantly more concerned with the determination of fact than do institutional and professional scientists and engineers who seem to testify mainly on policy questions.
• Inquiries conduct "one-shot" assessments, yet their work is often viewed as both predictive and dynamic. For the most part inquiries, at best, establish base-line data from which later changes can be measured. But this measurement, if it occurs at all does so through a monitoring process instituted after the inquiry. Thus, predictions in an inquiry are superimposed upon data and often reflect nothing more than the policy goals of the applicants, planners or advocates.
• Because inquiries are investigations, a phenomenon which might be called "dumping" is common. In "dumping" a large quantity of technical data is provided by some of the participants without analysis. Often this information is not amenable to analysis for it has been collected for other purposes and is made available without reference to its usefulness. This information satisfies a public demand for full disclosure without being informative. It further suggests that the problems being addressed are too technical for the layperson to

understand, and it ensures that an inquiry turns from a scientific assessment to a more pragmatic or policy one. Few mechanisms have been designed as yet to protect inquiries from "dumping", possibly because the problem is only recognized at an informal level.

Other serious problems associated with research in an inquiry go to the core of controversies among scientists and engineers themselves. It might be useful to list a few of the controversies that are particularly relevant here and to use the Le Dain inquiry as an example to illustrate how problems and conflict develop.

1. *Can research be conducted as advocacy or does such an approach push scientists to make conclusions that their data do not support? Those who would argue that research can be conducted through advocacy go so far as to suggest that all research is conducted that way. They argue that by the nature of the question being posed, the choice of particular methodologies, and the paradigm or explanatory concepts used to interpret the data, researchers always take a position that is based on an orientation to political questions. From this perspective, research in support of a cause is research with its assumptions made explicit.*

Although the Le Dain inquiry staff claim that they took pains to hire people who were not advocates, they argued that research was being conducted through advocacy. By releasing their interim report, they considered that they had made their own assumptions explicit and asked nothing less of those whose research they studied. Others, however, claimed that the Le Dain inquiry research was biased and directed by the policy imperatives of the inquiry itself. They argued that the analysis imposed by the inquiry staff, and their technique of constant evaluation pushed the report beyond what was actually known and the information collected or developed through the inquiry.

2. *Do the facts speak for themselves or are they conditioned by the manner, and in this case the haste, in which they are collected? Can research respond to a demand for relevance?*

The Le Dain inquiry staff argued that their research findings could meet the test of any scientific publication and that the conditions of the inquiry, including the haste with which the research proceeded, had not affected the conclusions. Some participants, however, suggested that science has its own rhythm, a rhythm which may or may not be consistent with that of the inquiry. The pressures of an inquiry, they suggested, "were not conducive to thoughtful research." They further argued that an inquiry could proceed scientifically only if the data base already existed, for in such a case the input for analysis would come quickly and be full

enough to be useful in constructing recommendations. If rushed, they argued, an inquiry research team "would be too influenced by the hypothesis of the day" to think through the question and methods adequately.

3. *Does the scientist take responsibility for the use made of his or her findings, or should that role be left to others?*

The Le Dain inquiry appeared to take the position that it was an individual decision whether scientists should take responsibility for their findings and participate actively in the development of policy. Some participants, on the other hand, suggested that scientists should not be involved beyond the point of providing data and analysis, except to the extent that their studies were being misinterpreted or misunderstood. They argued that the inquiry had gone beyond its capabilities by re-analyzing the data collected and analyzed in certain research projects. They suggested that the information should have been allowed to stand on its own, independent from the policy conclusions that were being drawn.

4. *Can scientific answers to particular questions be isolated through careful research or are there multiple "sciences" producing a variety of different, correct (although not necessarily conflicting) answers to the same question? Those who would argue there are many scientifically justifiable answers to a single question also suggest that, within any discipline, there will be several schools of thought. Those who belong to one school do not always share findings, read literature, or hold discussion with others. Members of each school will read or publish in favoured journals. In this way, science produces several answers but few single conclusions.*

The Le Dain inquiry and some of its participants suggested that they had identified the body of scientific expertise necessary to provide answers to a variety of questions about drug use. Some participants, on the other hand, suggested there were at least two major schools of thought on drug use as evidenced in the scientific literature. One was person/problem centred and focused on reform and treatment; while the other saw drug use as a form of social organization and recreational activity. It was suggested that the inquiry drew its experts only from the latter school of thought and that those who vetted the research and consulted extensively did not read and keep up to date with *all* of the literature. By their implicit membership in one of the schools, they provided only one of the possible sets of answers to the questions under examination.

A participant in the Le Dain inquiry noted that inquiries constitute a particular kind of research project:

"The inquiry worked, as all inquiries do, with the implicit

assumption that something was wrong or that something must be changed. Sometimes that hypothesis works for science and sometimes it does not."

Those who worked with the Le Dain inquiry's research staff did not see this orientation of "something that must be changed" as a problem. In fact they regarded it as self-evident. Some of those who did research for the inquiry took quite a different view.

Special Problems with Social Research

Some aspects of social life are not amenable to quantification. Often critical information is lost in translating social experience into data that can be measured accurately or compared easily. The most sophisticated and systematic studies, which involve empirical methodologies similar to those used in physical sciences, may contribute a body of information about social life but they seldom capture the essence of that life as people in the situation understand it. In journals and as the subject of academic debate these limitations are discussed openly but as guides to public policy, available freely to the public, their shortcomings are more evident.

In the first place, inquiries like the Porter Commission (or the assessment done by Ontario Hydro under its public participation program) have treated social questions primarily as if they were technical questions. Social impact studies, carried out by proponents of projects, usually provide simple data on the population characteristics of a community. An assumption is made, usually implicitly, that communities are basically static and that change is something *imposed* upon a community by a proposed development. To reinforce the assumption base-line data are collected (primarily demographic in nature) as groundwork for estimating the effects of the imposed change, and the effectiveness of measures taken to mitigate these effects.

Of course, projects do impose changes on communities and mitigating measures are indeed often necessary. But the approach taken in social impact studies often reflects an inappropriate commitment to an engineering orientation. At its worst, for example, social impact studies focus only on the changes in service loads that local agencies may bear as a result of population shifts, and mitigating measures are limited to grants to cover, for example, additional beds in the local hospital. Sometimes recognition is given to possible dislocation, but this is perceived only in terms of statistical information, social work caseloads, or numbers of alcoholics. Measures are simply extended to alleviate the problems by providing more social workers or a detoxification centre.

However necessary, these measures seldom come to grips with the problems they address, and related studies have made little

visible contribution to the small but developing body of social science literature in Canada. Social impact studies are seldom included in a bibliography of community studies, for example, nor have advocate groups in any inquiry endorsed their conclusions as being reflective of community life. Instead, because advocate groups often insist on carrying out their own social studies, a gulf develops between social impact literature and social research in scientific, discipline-oriented journals.

It may be useful to isolate some of the reasons for the difference between community studies and the social impact literature created for and used by inquiries.

First of course, communities are constantly in a process of flux. Social, economic and family relationships are highly dynamic and complex. Demographic studies may provide some useful indicators of trends, but they seldom capture the essence of the pressures within a community, nor are they likely to provide much insight into the effects of a major development. To the extent that a technical approach is used, it fails to capture the dynamics of relationships among the multiplicity of variables that affect community life. Any one variable, even the introduction of a major development, cannot usually be isolated for study. Communities with and without a major development cannot usually be compared. The methodologies for examining the relationships between various aspects of community life, changes in the economy, the emergence of public issues, and the introduction of new technological developments simply do not permit the easy identification of the single factor that caused particular changes. However systematic it becomes, sociology will probably always lack the tools necessary to provide quantified answers to the question of how a whole community is altered by the introduction of a major development. Thus, social data is not easily combined with economic data.

Second, each community is unique. The location, history, regional culture and composition of each community all affect how a development will be received and what impact it will have. Even the existence of advocate groups in one community but not another will have a critical effect. In addition, much less work has been done in the field of community studies in Canada than in the United States. The ability to generalize about the nature of community life is considerably more limited as a result.

Third, the subjective element is critical in a study of social or community life. How people perceive, understand and explain their problems has direct bearing on the problems themselves and on their solution. Many factors shape perceptions, some are linked simply to chance, others to historical events or cultural predispositions.

Finally, the study of social situations acts to change them. Communities are altered by the very fact that they are being studied. They are also changed by reading reports of these studies. Social study is by its nature "reflexive", for the impact of the study and of the research is felt directly in the study itself.

Although a systematic study is possible, inquiries may or may not have the resources to conduct one that can identify needs, aspirations, values, culture, history, and all of the factors that make up "social impact". The use of a community hearing as a means of interviewing the people (a technique used in the several inquiries) may give some feeling for the mood of the people but by itself, except under unusual circumstances, it is not a systematic research tool. It can reflect only the mood captured within a short period of time, affected by the inquiry, portrayed by those who chose to participate, and understood by those who conduct the inquiry. In the case of hearings conducted under pressure of time or political events, without access to other more systematic research, in settings where only a few or select people participate, hearings cannot act as a substitute for social research.

If social research presents difficulties for an inquiry, it presents all the more when the community involved is neither poor, remote, nor undeveloped. Point Lepreau in New Brunswick is such a community. It is close to St. John so the workers can commute to the project. Once the nuclear power plant is complete, the community will remain unchanged; unless of course there are serious accidents, changes in fishing conditions, or radiation leakage. Citizens may have been inconvenienced during the construction, but they participated fully in design of measures to protect their community. What then is socioeconomic or community impact?

It is a question neither NBP nor MacLaren Atlantic could answer easily. In its reports, MacLaren devotes fully one-third of the content to a discussion of socioeconomic data, but those data include only population distribution and land use (neither of which are likely to be permanently affected by the plant). Point Lepreau and the surrounding communities, as an official from the Department of Municipal Affairs noted, were not communities in need of community development activities. Intervenors understood the problems well, but still argued for a study of the socioeconomic impact on the human environment.

In part, the problem stems from the role attributed to technology. MacLaren Atlantic, NBP, or even the AECB saw the project in terms of its technology, that is, the effects of imposing a particular technology on a given landsite or community. Thus they saw the solution to any problems in terms of mitigating the negative effects of technological development. The opponents of the project did not agree. As one put it:

"In any hearing process, what criteria do you use. . . ? For us it is: how in the hearing or development process can people share power? The proponents have the power; we are seeking to share power. It is a hard thing to work out. How do you judge the resources involved?"

For many of those who oppose the project, the question was not one of alleviating the effects of development (or even choosing another alternative), but of asking who makes the decisions, under what criteria, and to satisfy whose interests and priorities? From this perspective, the socioeconomic impact must be measured in terms of the ways in which the project was planned and the final destination of any of its benefits. This kind of socioeconomic impact cannot be measured by population studies, of course, but demands a different form of planning and a rearrangement of decision-making power. In demanding a public inquiry or review, the opponents of the project were demanding nothing less than this. For them, such an inquiry, if it were possible, would act to force a "power sharing" and would address the socioeconomic impact of the project.

Scientists' Participation in an Inquiry

Few scientists participate formally in inquiries as experts. The Point Lepreau hearing, for example, did attract scientists, but they came to the hearings as citizens, and few carried the discussion back to their colleagues at the end of the hearing. In fact, scientists have some reluctance about participation.

Part of the problem, assuming scientists should be involved, is tied to the nature of scientific work as it is practiced in most universities. As one scientist interviewed noted, research is specific, and usually confined to a very narrow field, "scientists hesitate to publish anything they cannot prove." As she put it:

"Writing a brief on the general effects would require a great deal of extra reading and would end up being largely opinion in any case. An overview reflects a deflection of efforts and a reversal of roles."

The same scientist showed caution:

"People who know a great deal, know how wrong they could be if they step out from under their real expertise, therefore they don't want to give an analysis."

One scientist interviewed was hostile to the process of an inquiry and suggested that they were purely verbal exercises centred on semantics and opinions. By contrast it was unimportant in science if three scientists agreed or disagreed, for truth was not to be found in their consensus. But an inquiry, by its very nature seeks consensus and not truth. Inquiry testimony and cross-

examination is centred on personal credibility while scientific assessment in a journal is based on the content of the work alone. Inquiries polarize issues, while science seeks to be open ended in its approach and is necessarily tentative. Therefore, the assumptions that underlie all scientific work are never brought out in an inquiry.

Scientists, the participant suggested, resent the feeling of being "on trial", and in a situation where questions that have little bearing on their work might be asked. They have responsibility for their findings alone and should therefore participate only when their findings are being distorted, and then solely to correct that information. Of course, scientists, he argued, are also members of the community and participate in inquiries like anyone else. But that kind of participation, he suggested, is not scientific.

Whatever the merits of his case, and there are some who would argue it was a nullification of responsibility, it is clear that a fusion between science and the legal process would not be an easy one. For the partners, or at least one of them, would approach the relationship with a high degree of caution, if not negativity. The problems to be faced would often seem to outweigh the possible social contribution.

If scientists are increasingly reluctant to participate, especially after the Berger inquiry, then the citizen has assumed the role of the scientist. The public advocate often sees himself or herself as presenting scientific information. And, if inquiries are viewed as scientific debates, then the citizen advocate represents one position in that debate.

Problems emerge when citizens become scientists for the purpose of an inquiry, for example, the way information, when presented by advocates, is received by the inquiry even by those with scientific training. No matter how expert or well prepared, citizens seldom have scientific credibility. Without access to large amounts of money, citizens frequently draw their research from literature which circulates in amongst advocate groups. While this literature may well be scientifically sound, its sources make it suspect for the same reason that advocate groups are accorded little credibility.

Citizens also believe that the contribution of their testimony to a scientific debate lies in the presentation of raw data. In the Berger case and with other northern hearings, this kind of information has been given great significance. But, without some form of analysis, either by the inquiry staff acting as scientists or though the use of scientific experts, the data lack significance. All this "evidence" provides is an indication that a problem exists. Further work is necessary, however, in order to understand the full nature of the problem, its causes, its scope and the range of

possible solutions. The Berger inquiry did perform an analysis of the raw data taken from hearings, but most inquiries do not.

When an inquiry fails to provide the resources for a systematic analysis of the data submitted, advocate groups often take up the task, with the help of hired scientific experts. However, there is a danger that these outside experts will be seen as taking over from the citizens, as making the citizens' contributions somehow less genuine because it is presented by an expert. Several commissioners have suggested that advocate groups that use outside experts no longer represent their constituent public.

It may well be that citizens have a contribution to make to the scientific debate in an inquiry. That contribution may centre on experiential data presented in hearings, on materials garnered from scientific literature, or from research conducted by scientists under the auspices of citizen groups. The contribution ultimately depends on the credibility of the information and on the ability of the inquiry to bring this material systematically into a scientific debate. This credibility is sometimes in jeopardy through the assumptions, practices and occasionally the mythologies of science. It also depends, in the first place, upon an inquiry taking the form of a scientific debate.

According to its commissioner, the aluminum wiring inquiry was not interested in theoretical questions. Other inquiries were seldom the centre for scientific debate and their transcripts belie their claim to be scientific bodies. It became apparent in this study that proponents and opponents of specific projects draw their information and analysis from very different information networks. For all practical purposes, these information networks work as closed systems so that analysis from within any one network is always self-validating. In such cases arguments are addressed and answered by the same experts who produced them in the first place. The range of sources used is narrow, and only compatible sources and "friendly" experts are consulted.

In New Brunswick, the information network was most strongly established on the proponents' side. A member of the Reactor Safety Advisory Committee (RSAC) stated, for example, "We work on consensus; there is very little controversy among experts." The chairman of the EARP hearing introduced members of his audience in a way which indicated that *only some* were experts. "These people are *the* experts in the field of the effects of radiation on human health," he said, referring only to officials from AECL and EMR. Other members of the audience thought AECL was not the only expert, for expertise existed even among those other members of the audience. The Legislative Energy Commission in New Brunswick, in turn, drew its witnesses from a list put out by AECL, and checked all possible witnesses with NBP and EMR. One person

suggested that the strength of the RSAC process was that "all [its members] shared the same mind set, looked at things in similar ways." And, of course, NBP drew heavily on the experience of AECL and Ontario Hydro in assuming the technology was safe. Community leaders were taken to see the Pickering plant. AECL staff and consultants were used in the public meetings to provide commentary to support NBP's position. AECB's research and the experience of AECL and Ontario Hydro, all figured heavily in the approach taken and in the information presented by NBP to support its case.

Information networks were much less well established amongst the New Brunswick opponents of the Point Lepreau nuclear power station at the time of the hearing. Those who intervened presented material from a variety of sources, but concentrated primarily on an assessment of the MacLaren Atlantic Report and AECL materials. Contacts with other anti-nuclear groups were not yet established. No group considered the use of expert witnesses in the hearing. Participation was clearly local in origin.

Nevertheless, pressure existed for local groups to join with an information network among the growing number of anti-nuclear groups, for only by joining could advocate groups gain access to sophisticated technical expertise. With meagre resources, contact with an information network meant access to media coverage, literature, resources, and friends. Information networks, therefore, extended the power of the local advocate groups.

By 1977, the nature of the advocate response in New Brunswick had changed to reflect these pressures. Local offices stocked literature drawn from other groups. Although an attempt was still made to develop local expertise, the resources of national experts, such as David Brookes from Energy Probe and Gordon Edwards from the Canadian Coalition for Nuclear Responsibility, were invaluable. The approach had become more "professional", or at least more sophisticated. Advocacy work was less *ad hoc*, more formal, and less dependent upon the resources of a few people with other jobs. The establishment of a Maritime Energy Fair, held annually, reflects the growing professionalism of the advocate groups.

Although professionalism may have been important and necessary in the development of advocacy in New Brunswick, it was not without cost. Gradually local people from New Brunswick, the opponents of the project, were drawn into an information network which paralleled but did not cross that of the proponents of the project. Links with an information network provided support for small advocate groups, but also cut these same groups off from other sources of information. To the extent that they become entrenched, the "experts" (as defined within these networks) take

on the role of spokespeople for advocacy groups. Public recognition, through events like inquiries, becomes a means of establishing credibility of information.

When intervenors, applicants, and advocates are integrated into information networks, an inquiry quickly becomes a locus for the arbitration not of specific data, but of the way these data are distributed and handled within each network. In other words, the *credibility of the network* becomes the issue and this is often judged by non-scientific criteria. Finally, the commissioner(s) are left to determine which network holds the key to the truth. But not all commissioners want to see their role in this light, nor do they wish to act simply as arbitrators of the value of the networks. The existence of separate information networks, however, creates its own pressures on the inquiry process.

A number of other pressures force the creation of information networks. Extensive media coverage of an inquiry promotes the creation of "experts", recognized authorities who can easily respond to questions in the short space of an interview. When the issues become highly technical, often unnecessarily technical, those who have mastered the language of translating technical jargon into convincing polemic are considered invaluable. Finally, inquiries may exert their own pressures when they seek an easy identification of the points of view on an issue.

The development of strong information networks has serious consequences for scientific debate. Their presence limits the range of discussion, and tends to ensure that only well-established points of view are accorded authority. They constrain debate in the hearings, because spokespersons defend a point of view rather than discuss the issues. They also shift scientific debate into a discussion of conflicting policy recommendations. In essence, information networks institutionalize positions in a debate to the point where inquiries become predictable.

Conclusion

For the most part, an inquiry is not a scientific debate. It does, however, make a good research body under specific conditions, often only at the cost of sacrificing its policy orientation. At best, scientific and technical contributions are evaluative in providing a collection and analysis of new data on a technology, product, or social situation. When they are successful, they go beyond "popular science" by drawing upon sources that extend information networks, thus permitting genuine debate and resolution of some issues.

To be successful, the scientific assessment within an inquiry needs several independent and credible sources of information as well as a detailed examination of controversial issues in a forum

where their complexities and the controversies can be fully taken into account. This requires clear demarcation between science and policy issues, to the extent that policy assumptions are recognized and accounted for *as assumptions* in the conclusions drawn. Success occurs when several competing applications for development exist, and each party brings a variety of different materials into the hearings to support its case. It can also occur when the inquiry elects to conduct a major portion of its own research or when there is a source of independent data. Funding of advocate groups, to the degree that they can introduce scientific material and original studies into the inquiry, also helps. In every case, however, the scientific value of material presented to the inquiry can only be established when adequate resources are allocated to permit its analysis.

At worst, an inquiry represents a simple, if not simplistic, debate and arbitration of issues that are, by nature, complex. It easily becomes a staging ground for groups, advocates and proponents alike, who draw their information and conclusions from different sources and talk "past" each other.

In this chapter, it has been argued that inquiries usually centre their assessment on risk and choose between a research and an arbitration model. Both points of view pose problems. The inquiries chosen for study can be placed along a continuum between a research and an arbitration approach. Their view of what constitutes science, of risk and its significance, and of the relationship between science and policy correspond to the approach they have taken:

		Point Lepreau	Bayda
Le Dain	Porter	Aluminum wiring	Communications satellites
research ◄----------			----------► arbitration

A research-oriented inquiry views science as investigatory and risk analysis as having little relevance even though effects are investigated that may, in policy recommendations, be undesirable. Such an orientation is exploratory and science and policy are taken to be separate. Science and policy come together only at the stage when recommendations are to be fashioned from the study. They are seen as necessarily distinct functions, requiring different procedures for determination and a clear demarcation between the activities and conclusions involved.

Inquiries like the hearing at Point Lepreau or the Porter Commission attempt to function midway along the continuum.

They combine the investigation of science and policy into a two-pronged but singly directed process. Risk assumes a central role in such inquiries, and incorporates both scientific and policy considerations. In the process of assessment, however, technological considerations are necessary in determining the acceptable levels of risk. Ethical issues may be involved, but such questions, if addressed at all, are usually the last item on the agenda of these inquiries.

An inquiry oriented to arbitration is concerned with policy questions, but tempers the discussion of policy with a technical approach. Problems raised by those conducting studies or presenting briefs are seen as necessitating both technical and policy recommendations. Here, consideration of the balance of interests involved or the alternatives is crucial. Risk assessment is, therefore, central, but it is measured with reference to interests and alternatives. Only in the most narrow sense could these inquiries be considered scientific assessments.

X. Inquiries and Their Participants

Who Participates in Inquiries?

In examining the six inquiries it became evident that they attracted little participation from the scientific community. Those scientists who appeared, came largely from government and industry. Scientists who were willing to testify often participated in a number of inquiries and, in addition to their scientific expertise, developed skills as expert witnesses.

Inquiries have attracted limited participation from corporations that have no direct interest in the inquiry. They seem willing to let one applicant represent a generally held corporate position. In early inquiries, representatives from government departments were rare, but in later inquiries they have been on hand to explain their departmental mandate. In one inquiry, Porter, representatives from relevant departments appeared many times.

Inquiries have attracted some participation from people with experiences to share. These people are not "representative" in the strict sense of the word. Their contribution is tied to the information they may present, which includes specific evidence of a problem to be addressed. Where community hearings have been held and the issue is of local concern, significant numbers of people attend the hearings.

Inquiries have attracted significant participation from citizens who claim scientific expertise drawn, in part, from a reading of scientific literature, in part from an evaluation of scientific assessments presented by the proponent, and in part from materials circulated among advocate groups. Only a few have specific training and the resources to conduct original research. In recent

years, inquiries have attracted little participation from the voluntary sector.

Those who appear in inquiries seldom present themselves as representing the public at large. They may indicate the size of their group, even without being challenged to do so, but they emphasize that they "only represent a point of view." In addition, public intervenors seldom see themselves as representing a direct interest. Sometimes their participation is linked to a local concern ("people are more concerned with issues in their backyard," one person claimed) but they often express views that focus on general, national, or regional issues.

Participants in inquiries and other policy bodies are often seen to represent a "conservative elite" who are protecting the interest of their neighbourhood or the value of their house. In the inquiries in this study, however, there was little evidence to support this contention. For example, farmers from southwestern Ontario, who participated in the Porter inquiry as part of what they believed was a land-use planning process, expressed many more general concerns in their testimony and in interviews after the inquiry.

In the inquiries chosen, there was little overlap in the material presented, with the exception of expert witnesses used by several advocate groups. Often these expert witnesses were called by the inquiry and used as spokespersons of the various positions in a debate. There is, however, a fair degree of overlap among both institutional intervenors and ironically, those who conduct the inquiries themselves.

The Government as Intervenor

Until recently, government departments have chosen not to appear before inquiries and agencies to explain their mandates and perspectives. But with the increasing number of inquiries demanding such appearances government response has been to send a representative to indicate the nature of the mandate and the responsibilities of the department. In the three nuclear-related inquiries chosen for study, representatives from a wide variety of government departments intervened, but, for the most part, limited their remarks to explaining the activities of their departments.

The communications satellite case illustrates the older practice of government departments. The Department of Communications was a key participant in the development and application of communications satellites, but chose to remain silent during the hearing. It seems to have taken the position of monitoring the activities of the CRTC and preparing an alternative submission for consideration by Cabinet.

The communications satellite case also illustrates an innova-

tive new practice. Consumer and Corporate Affairs Canada possesses a unique legislative mandate, for the director of the competition bureau may testify independently before agencies. He may represent the research of his bureau independent of the policies of his department as a whole. Thus, the director has considerably more freedom than officials of other departments. He can and does act as an intervenor rather than a source of information. He can and does take an advocacy position.

This role is unique. The provisions for departmental officials to assume an advocacy role, respective of the overall policy of their department, simply has not been made in other government departments. Expecting other officials to act as independent advocates unless subpoenaed, is unrealistic.

A case could be made that officials from all government departments should have the ability to function in the manner of the Director of the Competitions Bureau in CCA. The advantages are obvious. The critical policy debate normally confined to Cabinet would be brought into the open and become public debate. The disadvantages, of course, would be the possible fragmentation of the government's policy among what would appear to be competing departments.

What Constitutes Public Involvement?

Few people turned up for hearings or meetings of the Bayda inquiry. The inquiry report stated:

> "We estimate the vast majority of the people in the province are onlookers - some interested but most disinterested . . . . Many in this group, we surmise, consider decisions about uranium and its uses to be political ones and the responsibility of the government. Some, but not many we expect, would be amenable to tackling the issues and assisting in making the necessary decisions."[1]

Several inquiry staff "were a bit disappointed with the response from the public." Some staff from the Porter inquiry, on the other hand, were pleased with the level of public participation, although that inquiry may, in fact, not have attracted many more of the general public than did the Bayda inquiry. The aluminum wiring inquiry staff felt that low participation indicated people were not worried about problems with their house wiring. Those who conducted the Point Lepreau hearing were surprised at the high level of interest. What, then, constitutes "public involvement"?

Those who consider the level of participation low thought the public had little interest in the issues involved. As one person from the Bayda inquiry stated:

> "I don't think that the public gets to know very much about it. Frankly they don't have an in-depth understanding. They may

be aware of the issue and that is healthy . . . . How do you get people to listen to something they are just not interested in?"

He was convinced, as were officials from AECL, that "there was a lot of misleading information being given out to the public" and "inquiries [were] simply means of getting the government off the political hot seat." Viewing inquiries in this manner probably does not encourage participation.

A second response has been to suggest that expectations have been set at unrealistic levels, in part because northern hearings have been able to attract most of the members of a community. However much people care about an issue, it is argued, they have reasons for not choosing to participate. It may be that an inquiry is rushed, the hearings scheduled at inappropriate times, or information not easily accessible. People may decide that the time required is greater than the impact their individual participation might justify, or that the inquiry and its participants do not really welcome newcomers or they may believe that the public interest is already well represented, by voluntary organizations, advocate groups or even the inquiry itself. Finally, the "disinterested citizen" may have no experience in public meetings and feel intimidated by the idea, much less the form, of participating in inquiries. They may feel they have no civic duty to participate in every, or even some, inquiries, even when they consider the issue important.

None of these questions has been researched to any extent in Canada so there is little basis for a judgement about the level of participation. In the present study, only inquiry participants were interviewed and they, by definition, are an unrepresentative sample of the public. In their opinion, however, all the inquiries discussed in this study had been well attended, given the limitations posed by the inquiries themselves. They suggested that those who saw the level of participation as an indication of citizen apathy were simply indicating that they did not take the public's contribution seriously enough.

It is not surprising that the motivation of those who participate through advocate groups has also been questioned. Those who work for Amok, AECL, NBP or Ontario Hydro have rights and legitimate roles in an inquiry established through the institutions of which they are a part. Their interest is sustained through the performance of their jobs, their perspective is reinforced by colleagues at conferences, and their opinions often supported by those with political power.

Advocate group members are usually not paid, but work in small groups with little communication between members or other groups of like mind. They are continually being questioned about the adequacy of their views. Obviously members of advocate groups

develop their own networks of friends and coworkers within which prestige and competence are established. Nevertheless, the dedication of members to the mundane tasks of advocacy is worth noting. A statement by one of the main participants in an early inquiry gives fair indication of how people get involved in advocate groups:

> "I just felt myself getting dragged in unwillingly. It just seemed that at the local level, if you don't do it yourself, no one else is going to. Luckily I saw an ad in the paper. I was so thankful someone had formed a group, so I contacted them and it turned out they were just a struggling bunch themselves. They were parents and had full-time jobs. I was really the person with the time and the access to the media . . . . I had access to a lot of business machines then. Boy, a Gestetner gives you quite a feeling of power. I was brand new, but I figured I had to do something."

Or, as another participant put it: "We participate in these inquiries because it's the only way we can have a little influence. It is not necessarily the best way."

The Role of Public Participation in an Inquiry

How one views the roles of public participants in an inquiry is very much a product of perspective. For officials from NBP or Ontario Hydro, the picture is radically different than that of public intervenors or by those who conduct inquiries. It is useful to illustrate three views.

1. In the last decade, participation programs have been included in the planning process of many jurisdictions. New Brunswick is no exception. Officials from NBP noted that the commission had added a public participation component to their development planning, as a result of their successful experience with the citizens' committee at Point Lepreau. As far as the NBP officials were concerned, the citizens have "a valid argument" for they have access to valuable information that engineers need, and they constitute potential opposition if not consulted.

Adversarial relations, however, were considered by these NBP officials to be antithetical to real participation. If the regulation of nuclear development, for example, is seen by agencies like AECB as a cooperative process[2] then they would like to see members of the public as participants. A cooperative process, however, does not require an independent inquiry, but demands instead a series of informal and, wherever possible, private meetings. As one official of NBP stated:

> "If everything has to be public, you have to be able to prove everything you've got on paper. That is not always easy to do. And it doesn't always lead to frankness."

Making information public may be risky and the real problem, as an NBP official noted, lies in jeopardizing the negotiations between citizen groups and the utility company. Once positions are made public, they solidify and attitudes become polarized. Thus, NBP officials argue, public inquiries may actually be an obstacle to participation. The implicit model is that of labour negotiations which are conducted among interested parties behind closed doors. The public, from the perspective of NBP, is an interest group involving those who are directly affected by the decisions to be made. In the Point Lepreau case, the direct cost of satisfying demands of the interested public was seen to be less than $50 000 a year.

From this perspective, those who have no direct interest in a decision can be "an awful nuisance" and, according to NBP and other agency officials interviewed, do not merit the same welcoming approach. One person from New Brunswick (but not NBP) put the case most clearly: "The experts could do the work in one-tenth the time, without having to answer a lot of silly questions." If members of the public who have no direct interest seek involvement, NBP officials reason, then they should assume some of the responsibilities traditionally handled within an institutional context by professionals and elected representatives. They should be held accountable for their words and actions, sworn in before giving testimony and required to state, under oath, the nature of their interest in the case. Some officials suspect that people with "no direct interest" may indeed have an interest but that they disguise it by talking about the general good.

2. The intervenors at the Point Lepreau hearing, on the other hand, clearly do not share the view of NBP, but differ amongst themselves about the role of participation. The importance and integrity of the "cooperative development process" is recognized by many. Advocate groups state that they took pains to ensure a separation between their actions and those of local citizens. Others, however, suggest that an inquiry should be a critical forum that permits the detailed examination of the methodologies and the data base being used by those in positions to make decisions.

The inquiry provided the opportunity for the dissemination of information to match that being dispensed through the public relations program of NBP. It brought those who disagreed about development priorities into direct contact with one another, forcing a confrontation of positions. In the view of one intervenor, it provided the opportunity for developing an understanding of the "systemic conditions underlying development." As he put it: "What we need is not participation in what exists, participation by way of facts and opinions; we need some means of critical analysis."

Intervenors suggested that there had never been a true inquiry in New Brunswick: "politicians do not know what an inquiry could or should be." They had, they believed, few illusions about inquiries nevertheless. As one person said:

> "We wouldn't boycott it, no matter how bad it was. If you boycott it you would be ignored. It is not always, or even often, a good forum, but we have nowhere else to go."

A full inquiry would demand, they argued, full cross-examination and expert witnesses, funding for intervenors and the right to subpoena witnesses. A poorly conducted inquiry "only emphasizes the powerlessness that most people feel."

3. Inquiries also have views of the role of public participation. Some inquiries have seen the role of the public as being limited to the provision of information and a contribution to the assessment. They argue that the public is often the repository of necessary information on the effects of development and the implications of certain approaches or orientations. From such a viewpoint, hearings can provide a guide to the strength and depth of public sensitivities, and supplement, if not replace, an inadequate social science. They suggest that the public can be most effective in planning how to implement a project. From this perspective, inquiries substitute the judgement of their commissioners for that of the professional planner and the input of the citizen for the data upon which plans will be based.

Other inquiries have argued that they serve best when they indicate the limits of public tolerance and the nature of the consideration that should be made. They recognize the non-representative nature of inquiry participation, but suggest that those who feel strongly enough to make their views known are also those who are likely to form a strong opposition to any plans being proposed. They argue that citizen mastery over technical detail is unimportant, for citizens set the boundaries within which technical considerations can take place.

Other inquiries suggest that citizens can function as planners in conjunction with the inquiry. They emphasize the importance of informed participation and of citizens versed in technical and other considerations. They emphasize the importance of ongoing participation as planning develops and ask citizens to become familiar with conditions that exist outside their own experience and communities. Their implication is that planning can perhaps best be done by those with experience, but little professional training.

The Le Dain inquiry leaned toward the first option, but the Berger inquiry would be a better example. The Bayda inquiry generally followed the second, although it was also dependent on advocate groups for expert examination of the application to develop the uranium mine.

The Porter inquiry chose the third option and sought to function as an exercise in planning and to encourage maximum public participation. Without doubt, electrical power planning is difficult; it takes expertise, attention to detail, thorough review and assessment as well as imagination and skill. People with regular employment are not likely to have the time or energy to become paraprofessionals in this field.

The Porter inquiry attempted, therefore, to encourage participation by means of a widespread public education program, and specified the contribution that participants could make through the release of "neutral" issue papers. It countered "misinformation" with the information stage hearings. It reached beyond the advocate groups by funding the Public Interest Coalition to assist in educating the public. It also attempted to educate the public in the technical details through seminars, workshops, panels, its interim report, and the testimony of Ontario Hydro and AECL. It funded groups so that members could continue participating over a long period of time, without jeopardizing their jobs. It provided funds for research so that alternatives could be considered. To some extent, these measures worked until the traditional hearing procedure of the debate stage hearings, with cross-examination serving as a forum for a debate of opinions, frustrated the attempt. Unfortunately, the whole process became an end in itself, and many significant sectors of the affected population did not participate.

Each approach sets its own requirements for success. An inquiry that uses the public to gain information must provide, as has been discussed in another section of this study, the facilities for an independent assessment and analysis of the information being collected. An inquiry that uses citizens to set the boundary conditions under which development will be allowed to proceed, must ensure adequate representation from all segments of the affected community and ensure that issues are made sufficiently clear to permit choices. Technical detail must be subsumed under more general consideration at each stage of the inquiry. Finally, an inquiry that attempts to use the citizen as planner must provide the resources to ensure continuity of participation and the development of citizen expertise.

The Question of Representation

It is important to note that none of these approaches to the role of the intervenor suggest that he or she should be representative of the public at large. Indeed, the use of an inquiry as a referendum is an approach that is fraught with problems. Likewise, none of these approaches demand that the citizen should provide more assistance than lies outside his or her normal capabilities. The number and

kind of people who might become involved in an inquiry like the Porter Commission, which emphasized the citizen as planner, might be limited but their contribution might be significant in any case.

The question, then, of who represents the public interest in inquiries becomes crucial. The claims of large voluntary or lobby organizations of being representative is based upon their membership; yet few would expect their membership to be consulted before a submission was prepared. That membership is represented by an executive, which creates policies within the broad framework of resolutions passed at an annual convention. Briefs are usually vetted by staff and/or an executive committee. Where the issue is closely tied to the nature of interest that binds the membership, few problems arise. But when a wider issue is involved and is quite distinct from that which constitutes the basis for membership, those who represent members do so in name only. Nothing in the structure of a voluntary organization provides for representation of member opinion before a wide variety of inquries or hearings. Yet, executive members do present briefs and usually receive support for doing so. The membership in this case is more like a veto group and a brake upon the actions and statements made in their name. Their connection with the executive is through internal communications, the press and finally internal elections.

Some voluntary organizations represent simply an interest. Their actual membership consists of those who provide services to client groups. The Canadian Council on Social Development [The Canadian Welfare Council as it was called at the time of the Le Dain inquiry where it was an intervenor] is a good example. Participation represents a point of view, regardless of the size of the membership, which includes individuals, groups and corporations. These organizations stand in for the people they claim to represent, and act as a lobby group by using the inquiry as another forum.

Those who participate in inquiries from government or industrial corporations often consider they represent the public interest and the public will. They argue that they operate with a mandate, which, in the case of the corporations, is tied to claims of the "public good". Advocate group participants stress that the validity of a point of view is independent of the number of people who hold it. Their claims of being representative are based on the fact that they raise important questions, questions that on examination may be most closely allied with a scientific assessment.

These different claims can be understood if one makes a distinction between a public interest and a consumer interest or between the public as a collective and as an aggregate. Some people intervene because they are directly affected by an issue, like

others in a similar situation, they intervene as an interest group or aggregate. Their interest is what they have in common; in other words, the situation or relationship in which they find themselves. The group's strength is measured by the number of people involved, the importance of the issue to each of them, and the degree to which the issue is critical to the society in which they live. This kind of interest might be called a consumer interest, for its power depends upon being representative. It also relies on the strength of the group and its economic, social or political position. Many, or occasionally all, of a group's demands can be accommodated within the framework of an inquiry or decision-making process. The public, in this case, is simply one more interest group to be taken into account in a planning process.

Others, however, intervene because of a more general concern about the nature of society. They are affected by the issues being discussed, but primarily indirectly and as a collective. These people constitute a group when they get together with others of like mind. They are advocates but they do not represent specific people or an interest, instead they portray a collective interest and a point of view in a political debate. The strength of their position is related, firstly, to the explanatory power of their argument, and, secondly, to the value they and others attach to it. Their power is based on intellectual, social, and moral persuasion. Such a group cannot so easily be accommodated in an inquiry, indeed it tends to use the forum as a place where other members of the public can be reached and policymakers can be persuaded, if not challenged.

To some extent, most people fall into both camps. They have, on the one hand, a local or direct interest and, on the other, a general concern based on their perceptions of the social and economic world they inhabit. When asked to specify whom they represent, they cannot answer easily, partly because they have never addressed the question of how representative their actions are, but mainly because their intervention is based in two very different orientations to the issues being addressed by the inquiry. Differences between advocacy groups are often rooted in differences in emphasis or orientation.

The Limitations of Participation

The level of participation in an inquiry varies significantly over its life. Inquiries generate what might be called a conference effect, as the internal reality of the inquiry takes precedence over perceptions of external reality. In time, the inquiry becomes a small circle of friends and friendly opponents bound together, somewhat artificially, by the process of participation. The same process occurs in regulatory hearings, although such hearings may take place over a matter of years, not weeks. Newcomers have the feeling that they

have stepped into a private party when they attend a hearing for the first time.

Intervenors have raised a number of other problems:

- An extensive commitment of time and energy is necessary for participation until personal or family commitments sooner or later tend to take precedence;
- Inquiries face issues that are also addressed in other policy forms. The decision to participate in any one inquiry is often a strategic one, involving an assessment of the relative importance of that inquiry in relation to other political forums;
- The number of issues on which any person can reasonably expect to take action is limited. The importance of any one inquiry is weighed against political debate on other issues so they must chose between a wide variety of issues and are seldom able to take action on all of them;
- The unusual nature of the inquiry process means that most people do not know how to participate. People often feel intimidated even by inquiries that welcome participation, for the medium is foreign to them;
- Inquiries make little distinction between different kinds of participation or the basis for that participation. An individual may be brought into debate with the representative of the long standing advocate group. The advocate group, on the other hand, debates with the representative of the multinational corporation as if they both represent similar constituencies and are subject to the same constraints.

Given these limitations and the diverse nature of participation, an inquiry cannot provide a means of assessing public opinion. It is not a public poll, nor does it provide systematic information on a specific range of questions. It may be less costly than a referendum, but it cannot fulfill the same function. For those who believe that political decisions should reflect, nay mirror, the attitudes of the public at any one time, an inquiry is a poor tool.

An Evaluation of Techniques

Because the Porter inquiry took such care with the development of its public process, it would be useful to evaluate the strengths and weaknesses of the various techniques used. The inquiry initiated several innovative techniques, following other equally innovative inquiries:

Expert Witnesses

None of the *inquiries* in Ontario leaned heavily on expert witnesses although committees did so extensively. Expert witnesses were felt to be useful by intervenor groups and inquiries, but in the Porter

inquiry, more emphasis was placed on advocate groups developing their own expertise. The problems with expert witnesses were easily recognized: their "set" performances, the inappropriateness of the public hearing for detailed discussion of the subtleties of studies, the high cost. At the same time, several advocate groups stressed the way experts gave credibility to information that might have been presented in other ways.

Expert Examiners

Both the Royal Commission on the Health and Safety of Workers in Mines and the Porter inquiry used an expert examiner. The Ham Commission used staff members who acted as advisers and designed questions. The Porter inquiry brought in those who had been suggested as expert witnesses and used them to develop questions. Both procedures were credited, by their respective inquiries, with being extremely successful. Others have suggested the use of expert examiners brings problems; economists, for example, may use a specialized language or be drawn off into irrelevant debates when questioned by other economists.

Cross-Examination

Details of evidence or the credibility of a witness is often not under consideration; thus what passes for cross-examination in inquiries is often informal questioning by other participants. Frequently such cross-examination is used for elucidation of opinions and not to establish factual answers. Under these conditions it has limited utility. Cross-examination certainly "livens things up," and in the Porter hearings provided some opportunity to gain information from groups like Ontario Hydro and AECL. Nevertheless, it sometimes imposed an unnecessary formality or judicial tone. In no case was it seen as critical for the determination or arbitration of issues. Rather it was an information gathering technique, used with some effectiveness to ensure credibility and to force the release of information.

Use of Consultant/Research as Mediation

The Solandt inquiry used a research consultant as a means of developing a plan for the siting of one transmission line, and sought consensus among its participants. Some have argued the research suffered, others have suggested that it was not only sound but clearly useful. Certainly, in this manner, the inquiry avoided contributing to the research for "research sake" phenomenon, which is characteristic of many inquiries. But the use of a researcher/mediator has its limitations, for not every issue can be isolated or is amenable to mediation. In the Solandt inquiry, it was possible to isolate the issues and to arrive at a workable compromise. In later inquiries, the technique was less useful and

compromised the research agenda through the political pressure of the contributing groups.

Funding Groups
The Porter inquiry funded intervenor groups more heavily than other inquiries. This created a permanent advocate constituency that followed the work of the inquiry. To its credit, funding permitted informed participation and some very useful research. But at the same time it encouraged the formation of an "in group" and the development of what might be called a "conference effect". Groups became attached to the inquiry and took as "reality" the events within the inquiry rather than those outside it. The credibility and effectiveness of both the inquiry and the advocate groups may have suffered as a result.

Public Interest Coalition
The attempt to create a quasi-independent information arm of the Porter inquiry failed for a number of reasons; some of which had nothing to do with the coalition itself. It has been suggested the coalition was insufficiently independent, and was too responsive to the demands and differences among the funded advocate groups. Others have concluded that only the inquiry could have ensured the presentation of accurate information to the public.

Seminars, Workshops and Panels
For some, the multiplicity of sessions on the same problem produced a "wearing out" of the issue and of the participants. They suggest that the hearings themselves took a backseat to these more "visible" events. Others have pointed out that the informal, longer presentations encouraged discussion and honesty, and the seminars fostered an examination of the complexities of the issues.

The Three-Stage Model
The Porter inquiry was divided into three stages: preliminary hearings, information, and debate hearings. Some have argued that this three-stage model was confusing and that the public could not differentiate between information and opinion. Certainly it lengthened the inquiry, but did not necessarily ensure more informed participation.

The Role of the Public Interest Advocacy Centre
The Public Interest Advocacy Centre, a national public interest group providing advice and legal counsel to citizen and advocacy groups, published a book[3] on how to intervene in hearings (usually regulatory hearings) and conducted seminars for witnesses from advocate groups. Many people stressed that the workshops had been very useful and gave rise to more effective participation. Several suggested, however, that the centre stressed a legal

approach, which tended to stretch out the cross-examination for no constructive purpose and forced intervenors into a mode of presentation more suitable for an adversarial regulatory proceeding. It has been suggested that public groups were caught up in trying to be "more technical" than Ontario Hydro and "more legal" than the lawyers. In this way, their unqiue contribution may have been downplayed in the process.

Conclusion

The inquiries studied here used an incredible array of techniques to generate scientific debate and participation. In the final analysis, however, there is no "best way" to conduct an inquiry. The techniques that work well in one inquiry, cause problems in another. Cross-examination, expert witnesses, seminars, examiners and hearings only succeed if they are used in a sensitive way and if the techniques are matched to the kind of information being sought.

Often the success or failure of an inquiry rests upon its mandate which includes both the formal instructions setting out the inquiry and the conditions that give it shape. The mandate gives an orientation to the task and, at least in its interpretation, indicates a direction for the commissioners.

The most formal process may produce an inquiry that satisfies its participants or one that fails to offer a substantive scientific assessment; the most informal procedures can produce conflict or a highly successful examination of issues.

A mandate, on the other hand, sets expectations, limitations and possibilities. It indicates, at least implicitly, to whom the inquiry should consider itself accountable, the standards of assessment to be used, the relationship of public and scientific communities and the general direction procedures should take. Too general a mandate causes an inquiry to lose focus while one that is too narrow distorts the assessment process. Inquiries appear to function best when they have a specific task and a great deal of flexibility in the design of methods and the approach taken to achieve their goal.

At present significant pressure is being exerted by advocate groups to strengthen consumer interest before regulatory tribunals and in inquiries. These conclusions appear to be drawn from the American experience and assume a court-based backup for the efforts of these groups.

In the United States, those who do not get satisfaction from the regulatory process may take their case before the courts and seek a reversal. Rules of procedure in hearings are laid down by statute in an Administrative Procedures Act. The financial costs of litigation are high, but the number of people who may be involved

in any group and the relative ease of accessibility to class action make the court-based strategies appealing.

In Canada the difficulties are much greater. Although attempts are being made to use the courts, legal procedures are still in their infancy. Canada lacks an Administrative Procedures Act, and may only now be granted a limited Freedom of Information Bill. Although, technically speaking, procedural rights are similar in the two countries, securing those rights appears more difficult in Canada. The grounds for class action in Canada make it considerably harder to prepare a case, and in addition the role of the judiciary is different. In most cases, appeals to decisions made by administrative bodies usually can only be brought on the grounds that these bodies have exceeded their jurisdiction or erred on questions of law.

Some would argue, then, that the legal situation should be reformed to match the American situation more directly and that consumer interest should be strengthened by a similar approach to and provisions for court-based review.[4,5] This argument has obvious merit, but should be considered with caution. The use of a US-style, court-based "oversight" proceeding is not without its problems when applied in the Canadian context. Here the advocacy sector is smaller and even the most successful groups lack a population base that could finance major court actions. The regulatory agencies program of the Consumers Association of Canada (CAC) is one of the most successful advocate programs in the country and the CAC enjoys the strength of a large membership. But members of that organization are quite clear that membership resources would never be sufficient to finance a comprehensive advocate strategy involving both appearances before hearings and actions in court. Current cutbacks, therefore, force a re-evaluation of even the level of participation in hearings. Other advocate groups have a much smaller membership than the CAC, and such groups are less numerous than in the United States. The possibility for launching successful court-based actions, therefore, is highly constrained.

XI. Inquiries and the Legal Process

Inquiries and Liability

It is commonly asserted that inquiries are not courts for they operate outside the strictures of a court-based process and without reference to legally defined questions of negligence or wrong doing. This assertion is correct only if the nature of "evidence" considered by an inquiry is taken into account. Inquiries can take "evidence" in almost any form they choose, for they need not account for facts in their recommendations. Indeed they can go beyond facts presented and evoked in cross-examination when developing their recommendations. Inquiries can listen to any member of the public, regardless of his or her status, and choose not to swear in that witness.

Nevertheless, inquiries are not freed from the pressures of a court. Under specific conditions, information, given as testimony, can be used in a court of law. Even in more informal circumstances, mechanisms exist for introducing statements from an inquiry into a courtroom. In addition, statements made before an inquiry can provide the grounds for a later court-based investigation. Inquiries are, in themselves, instruments of the legal process and often relate to more formally constituted courts.

Some inquiries are set up specifically to determine the extent of wrong doing and liability. Others, such as the ones chosen for study, seek to avoid the discussion of liability and function in areas where the courts have been reluctant to intervene. Yet, an inquiry into what has been done or decided is, to some extent, always an inquiry into potential negligence and wrong doing. Few inquiries can avoid at least the implicit question of liability.

Those who testified about their decisions on nuclear-related development and regulation before the Porter or Bayda inquiries were fully cognizant of the legal implications of discussing how their agency or department might have erred or been tardy in dealing with problems. Possibly the best example of how liability surfaces in an inquiry comes from the aluminum wiring inquiry.

In the United States, the investigation of aluminum wiring had led to a class action taken by the agency involved in the investigation. In Ontario, questions about the legal responsibility and financial liability for problems with aluminum wiring dominated the debate. Without doubt, the spectre of legal action hung over the aluminum wiring inquiry in Ontario. Although recommendations made by an inquiry are not legally binding upon a court, the statements made before the aluminum wiring inquiry by those potentially negligent may find their way into later court proceedings.

Any action taken in the courts as a result of the aluminum wiring inquiry would probably have centred on the charge that one or more of the organizations involved had been negligent. If charged with negligence, Ontario Hydro for example would have had to demonstrate that when it had formed a judgement about the dangers of aluminum wiring it had done so with reasonable care. The existence of a standard or even the measurement of performance against a standard would not usually be considered as sufficient in an independent assessment of aluminum wiring. Standard setting provides guidelines, but it does not fully protect companies who use standards from all court actions. To examine the question of negligence, a court might assess the state of knowledge in the field and the nature of actions taken. It could call its own scientific witnesses and feel at liberty to use the assessment from an inquiry report.

Ontario Hydro's original conclusions on the possible problems with aluminum wiring might well have been inaccurate. If, however, they could convince the court that they had taken appropriate measures to examine research in the field, assess the seriousness and scope of the problems once identified and correct them, then they would probably *not* be considered negligent. Because the "facts" about the basic properties of the aluminum-copper connection were well known through scientific and technical literature and because Ontario Hydro had received complaints by 1972, it would have had to build its case carefully, even if it might have been apparent on close examination that it had acted properly and with haste.

Those acting for Ontario Hydro, CSA, Alcan and EEMAC (the electrical manufacturing lobby organization) were therefore highly constrained in their statements before the inquiry. *Whether or not*,

with more freedom, they would have said anything different is debatable. They were forced by the situation, and not by the inquiry itself, to protect themselves against charges of negligence by indicating that they had acted quickly on the basis of information they had made serious efforts to collect.

A great deal of emphasis in the aluminum wiring inquiry was placed on avoiding a discussion of liability, despite the legalities of the situation. As the commissioner noted later:

> "We didn't have to decide who was responsible or who would pay. We just wanted a general impression."

Nevertheless, institutional intervenors were acutely aware of the reality. One noted: "If we went in without a lawyer we would have been 'killed'. A lawyer was protection." Another intervenor suggested that Ontario Hydro was involved in the inquiry "because of the implication that we hadn't done our job properly."

The aluminum wiring inquiry recommendations supported Ontario Hydro's view that no negligence had been involved. Ontario Hydro was praised for its "vigorous actions" in dealing with the problems. The inquiry found that problems in aluminum wiring were due mainly to cheap construction and to faulty workmanship on the part of contractors who were, by then, out of business. One inquiry staff member put it:

> "People wanted cheaper houses . . . they didn't give enough thought to the fact that aluminum and copper have different co-efficients of expansion . . . it was the pressure to build quickly and cheaply . . . shoddy workmanship."

Other factors responsible for the problems were cited, such as overloaded circuits, do-it-yourself wiring and unnecessary public panic. If poor construction methods and the incorrect use of home electrical systems were responsible for the problem then institutional intervenors could not be found negligent and nothing could be done to compensate the public for their loss or anxiety. Thus, public intervenors had some basis for considering the final report as biased, as supporting only Ontario Hydro.

The testimony given by public and institutional intervenors, therefore, was by nature unbalanced and no amount of reassurance given by commissioners could restore it. Institutional intervenors knew the facts and were usually represented by counsel when controversial issues, especially dealing with potential negligence, were discussed. Public intervenors do not testify without risk, however, although not legally accountable for statements made to the inquiry. The personal credibility of a citizen who testified about his or her burnt-out electrical receptacle was judged in the public forum.

Institutional intervenors have little latitude in the opinions they express. Corporate or departmental representatives speak for

their company or department and not for themselves. On the other hand, nothing but advocate group loyalty prevents public intervenors from changing their minds as a result of new information. For their part intervenors from the general public are open to the arguments of new evidence.

Here, the imbalance between different kinds of participants causes advocate groups to think of an inquiry as co-opting public dissent, and to become cynical about the inquiry process. If an inquiry is presented to the public as a new form of planning or as educational, then intervenors have reason to believe that they *alone* bear the burden of being educated. If inquiry recommendations fail to acknowledge, where necessary, that institutions have erred or been negligent, then public intervenors call this a "whitewash".

As one participant from the Porter inquiry put it: "No one expects AECL to change its mind about the desirability of nuclear plants as a result of an inquiry: they expect we will."

Evidence and Due Process in an Inquiry

Inquiries rely upon evidence as do the courts. But the nature of this evidence and the way it is incorporated in the final report differs significantly. Several problems specific to the way inquiries, as opposed to courts, use evidence should be noted:

- Inquiries lack well established provisions for the disclosure and availability of information, although some procedural rights are established in common law. Information is not generally made available, even where inquiries seek to maximize informed participation because no formal means of distributing or testing the information has been established.
- Inquiries lack guidelines on how information should be weighed in the development of recommendations. Partly, the high degree of scientific uncertainty and the inconclusive nature of many scientific arguments creates this problem. In addition, inquiries are usually *ad hoc* and their officers seldom have experience with inquiry-based evidence. Thus, inquiries often use their "evidence" in ways participants and others find unfair, even when care has been taken with the "facts".
- Inquiries obtain their evidence in written and oral form, through testimony, internal research, reports and interviews. Little work has been done to ensure that the information from one source is fully and fairly integrated with information from another. When hearings are emphasized in an inquiry, some of the more important scientific evidence in the documents may be downplayed. Under these conditions, the hearings themselves may assume unwarranted importance, with the drama

of presentation taking precedence over factual content. Alternatively, information may be contained in reports that are never the subject of public discussion. (Parties at hearings have no general right to disclosure from each other.) When this documentary "evidence" is given critical weight in the inquiry report, the public participants feel they have been denied proper process.

Several recent court decisions have set limits on how inquiries will hear and use evidence. Nevertheless, inquiries are still highly dependent upon the sensitivity and goodwill of their commissioners.

Courts have established traditions that define and protect due process. Inquiries, on the other hand, depend upon the fairness of their proceedings and the familiarity of their commissioners with ways due process considerations can be incorporated into the inquiry. Due process in a court involves an order of hearing, the rights to due notice, the proper filing of evidence and correspondence between what is said and what is written in the record. In an inquiry, fairness is largely a matter of point of view, although in some jurisdictions specific provisions may be made for due process.

Obviously, funding of intervenors, full disclosure of information and the careful compilation of a written record that is easily accessible to the public contribute to the fairness of an inquiry. We now turn to those factors that intervenors have suggested are "unfair".

a) Some participants are interviewed before they have made their presentations, but not all intervenors are interviewed and some presentations are discouraged.

b) Some inquiries depend upon proponents or established institutions to disseminate information and do not make this information easily accessible.

c) Some intervenors from established institutions are treated with more credibility than the general public.

d) Some inquiries take their agenda from the implied intentions of the mandating government, in order to "justify" certain policies or actions already taken.

e) Some inquiries appear to "court" certain advocate groups or have no independent basis for the evaluation of the information presented.

f) Some inquiries have limited patience with the presentations made by citizens, including those who appear overly emotional or frivolous.

Simply stating that an inquiry will act fairly does nothing to ensure "fairness". Similarly, clear procedural guidelines do not ensure that an inquiry will appear fair to the public or other groups.

Of course, those who oppose the final recommendations of an inquiry are likely to be more critical than those who support the recommendations. Perceptions of "fairness" seem at least partly independent of the positions taken by the intervenors. Intervenors, like those in the Porter inquiry, have disagreed strongly with the final recommendations of an inquiry, yet believe the proceedings to be fair.

The Use of a Court-like Procedure in Inquiries

Several inquiries have chosen to deal with the confusion that exists between inquiries and courts, and have approached problems of evidence and liability by proceeding in a fair and court-like manner. Ironically, in this study, these court-like inquiries generated the most public criticism. Both the Bayda and the aluminum wiring inquiries were conducted in such a manner, but both came under serious attack from their participants although the participants themselves often held differing views on other matters being discussed. The Porter inquiry reached many of the same conclusions as the Bayda inquiry, yet was received much more favourably.

A comparison between the Le Dain and the Bayda inquiries illustrates the problems with a court-like approach. Both inquiries were faced with problems that demanded a scientific assessment and on which there was an extensive, if not adequate, body of literature. Both were operating in an atmosphere of extreme public controversy and were under pressure to make recommendations that would lend themselves easily to political decisions, decisions that would be acceptable to the electorate. Both rode the crest of a social movement. In the Le Dain case, the social movement was revolt by young people. But in the Bayda inquiry, the social movement was tied to a notion of a conserver society and a new environmental consciousness. Both faced questions of serious social importance, and each was led by a sensitive person with legal training. The Le Dain inquiry was not attacked as "unfair". The Bayda inquiry was.

As noted elsewhere in this study, the Le Dain inquiry considered its task in light of the scientific data involved and used the entire inquiry as a type of research study in which the public hearings were incorporated as a means of gathering data. Those who testified were allowed to use whatever form of expression most able to convey the nature of their views, so the material submitted was not considered as "evidence". The inquiry commissioned many research projects and had a large research staff.

The Bayda inquiry, on the other hand, used a quasi-judicial process in which testimony was treated as "evidence" and was dealt with point by point in the report. The research staff was

minimal and oral testimony was used as a means of drawing out the facts, especially in terms of their possible implications. Testimony was also used as a means of judging the credibility of the witnesses, although in the community hearings, informal procedures were used and witnesses were not cross-examined.

A number of comments from participants in the Bayda inquiry are worth repeating as they give some indication of how criticisms of the inquiry developed:

> "To put a moral and ethical issue into a quasi-judicial inquiry process with a justice [Mr. Bayda] heading the Board [inquiry] is ridiculous. I do not think whether it is formal or not makes any difference. If people think that it [the inquiry] is open and that someone will listen, that is what is important."
>
> "I don't expect political parties to agree on everything, but the inquiry treated everyone who had concerns as if they opposed uranium mining. I don't see in the opposition to any issue why there has to be one point of view."
>
> "Most of the information was presented [in the inquiry] by the proponents. The public didn't understand most of it and neither did the Board. The inquiry ignored critics and just stuck with the Rasmussen bible [a comparative study of risk]."
>
> "About the judicial process [used by the Bayda inquiry] . . . an inquiry would not have to be judicial. Sometimes a judicial process is real and you have to go through it to some extent, but it [the judicial process] doesn't deal with what is happening in the community."
>
> "When you have people trained in the legal process, which most of the people who head commissions are, they don't understand not knowing. They can't hear. They think in structures and structured language. When you deviate from that, they simply don't understand."

The Bayda inquiry was not directed towards "understanding" or knowing what was happening in the community. Rather, it was directed towards reaching a set of recommendations that would be acceptable to the government. If anything, the failure of an inquiry like the Le Dain Commission to have its recommendations accepted, reinforced the orientation chosen by the Bayda inquiry.

The use of court-like standards requires that criteria for assessing evidence be established. In a court system, the criteria may be vague, for example, something is judged to be adequate because it is the action that "a reasonable man" might take. A judge does not however, possess individual or total discretion in the application of standards of evidence, even in civil or tort procedures. In an inquiry no such precedents exist, and the tradition and protection of the court system are absent. Given this situation, an inquiry functioning with a court-like procedure will often attempt

to specify its own criteria in reaching a decision. In the Bayda case, criteria like "common sense" were used. However, what constitutes "common sense" to some, may appear as negligence to others. The problems of developing criteria are far from simple and cannot be taken for granted.

More important, the use of a court-like procedure *forces* a polarization of the issues. Perhaps, as Bayda has argued, polarization occurred in response to the issue before the inquiry. Even so, the inquiry might have been used to diffuse polarization and shake up those who held firmly to one or another view by presenting a multiplicity of approaches and alternatives. This was the approach taken by the Le Dain Commission.

In the case of the Bayda inquiry, polarization was entrenched in the procedures and practices of the inquiry itself. Groups were seen as pro- or anti-nuclear. Expert witnesses were chosen to represent "the two sides of the nuclear development question." In the fifth phase of the inquiry, in order to facilitate "the debate," groups were asked to combine into single units, speaking for one or the other side of the issue. The report was written as a judgement of the evidence presented by each side, and the inquiry remained unshaken in its view that there were essentially only two sides to the issue. It was, therefore, seen to provide a forum for a choice between only two options.

Those who testified before the inquiry did not perceive the issue in the same way. In interviews for this study, they emphasized serious differences in approach among themselves, the lack of coordination or a joint strategy among groups, the variety of experts of different opinions that could have been brought to testify, and the range of options that could have been considered. They considered that not only the nuclear question but also the issues of the North, its development, and the problems of energy had been polarized in inappropriate ways by the inquiry.

The northern issue, they suggested for example, had been seen as only a choice between industrialization and the traditional way of life. Because everyone agreed that the traditional way of life had been disrupted, the Bayda inquiry seemed to conclude that northerners faced the problem of when and how fast they would decide to industrialize. As the report states:

> "The social costs associated with a uranium mine/mill are part and parcel of a much larger question - the general question of industrialization, modernity and technology being introduced, and often foisted upon people not quite ready for such an onslaught. The solution is not cessation of all industrialization, modernity and technology flowing into the North. In the first place a solution like that is wholly impractical. To contend otherwise is to shut one's eyes to reality. It is plain for all to

see that the intrusion of the twentieth century into all parts of Canada is inexorable and the accompanying force of industrial expansion, in its diverse and sometimes subtle forms is irresistible. Snow toboggans and outboard motors are now a way of life in the North. So are television and Coca Cola. In the second place, the northern people now seem to have the worst of both worlds. On the one hand, their traditional way of life has been sufficiently disrupted and strained to give cause for grave concern for its ultimate survival. On the other hand many have not much more than the crumbs of the technological modern industrialized world to content them. To maintain that the Northerners are going to be satisifed with the worst of both worlds is unsound in the extreme. It was inevitable that the northern society would either move in the direction of traditionalism or in the direction of modernity. Our hearings in the North and our many contacts with Northerners have convinced us that the course has been set. Whether that course was set for them or whether they themselves chose the course or whether it was a combination of these two factors is arguable - and academic. The important fact remains: Northerners are clearly moving toward a lifestyle which entails technology, modernity and industrialization."[1]

It is clear from some of the interviews, and from the response to the inquiry, that many northerners do not see their future in such terms.

Later in the report, during the discussion of the work of Amory Lovins, the same kind of polarization of issues occurs. Modern industrial growth is posed against a "back to nature model". Future development, the Bayda report claims,[2] must allow for those who might wish to go "back to nature," but cannot abandon the drive towards modernization. Again, many of the intervenors who have been impressed by the Lovins' argument did not see the issue as a simple choice between industrialization with nuclear development and "back to nature."

The effects of polarization can be summarized:

- It leads to a clarification of issues, but also masks their complexity;
- It ensures clarity in the representations of points of view, but sometimes forces coalitions that mask the differences between advocate groups;
- It lends itself to easy arbitration of issues and, to the extent that a clear decision is required, it lends credibility to the inquiry process. At the same time, the conditions imposed on the recommendations and the uncertainties in the evidence tend to be masked or given less importance than they merit;
- It forces an adversary debate rather than a discussion. Issues

become stereotyped ("pro- or anti-development or progress") as do the attitudes of groups and individuals who participate ("young and idealistic vs. established in their field").

This last point, the motivation of the intervenors, requires further examination. It is fair to suggest that the Bayda inquiry viewed some of its participants with what might be termed a "healthy scepticism". Certainly, staff of the Bayda inquiry thought there had been some "stage managing" of public opinion in the hearings in southern Saskatchewan. "Stage managing" implies not only coordination, which indeed all participants including the proponent were encouraged to do, but an attempt to delude the inquiry into thinking that there was more opposition than in fact existed.

The inquiry clearly believed that it could and should pass judgement on the motivation of the participants. They considered that participants should be considered in terms of who, in the general population, they might represent. As might be imagined, the *process* of passing judgement itself, was perceived as an insult by the intervening groups, as well as highly inaccurate.

To many public intervenors, "passing judgement" is a synonym for stereotyping. An example from the inquiry report is illustrative:

> "Who are the opponents and who are the proponents? On the world level, opponents include some pre-eminent scientists, although in fairness one should add that most are not nuclear scientists. They include existing organizations such as church groups and also groups especially established to combat the spread of nuclear energy. We do not know the composition of those groups outside Saskatchewan. Within Saskatchewan, the average opponent who appeared at the formal and southern local hearings before us would be under 30 years of age, with some recent university training, articulate, intelligent, sincere, idealistic, and one who is a political activist and is committed to his view of human betterment. To be sure, not all fit each part of this description; in fact, some do not even remotely resemble the average. They are, however, the exceptions.
>
> "The proponents, on their side, count most of the pre-eminent nuclear scientists in the world as well as many in other fields. We do not know the profile of the average proponent outside Saskatchewan. Within the province, and judging by those who appeared before us at the southern local hearings (at which they were in the minority), the proponents were older than the opponents, appeared to be established in their respective fields of endeavour, and practical in their approach. The proponents also include those persons who work in the various segments of

the nuclear industry, both in the government and the private sectors."[3]

The inquiry considered that such judgements are not only acceptable but necessary if the weight of evidence is to be assessed. In a court-like procedure this is a reasonable assumption, for the appearance, demeanor and background of the defendant are factors which influence judgement and are an integral part of sentencing. In an inquiry, however, these judgements are less appropriate. Participants in the inquiry considered that their portrayal was not only inaccurate, but also indicative of bias. If those who opposed uranium mining expansion were seen as "young and idealistic", they argued, and the proponents of nuclear development as "experienced and professional", what judgement remained to be made? In the assessment of scientific fact, the credibility of the methodology is more significant than the credibility of the witness, for disreputable, dogmatic, idealistic or youthful persons can also raise critical points for consideration. One is tempted to wonder what would have happened if the Le Dain inquiry report had been written in the style of the Bayda report.

Advocates were also convinced that by passing judgements, the inquiry had also stereotyped the arguments presented in the hearings. An example from the report is useful:

> "Primarily, Lovins is generalizing from the American situation. Even if his conclusions are restricted to the United States, there are serious weaknesses in his argument for he has neglected the disparities in social and economic conditions within his nation. For example, he has assumed that all future electrical needs could be met by 'today's installed electricity,' and that the year 1960 is a suitable standard for a 'luxurious' conserver society. Conservation is assumed to be publicly acceptable. Yet historians can find little evidence of voluntary self restraint. Recent history has shown that only for a brief period of time during a perceived national emergency will a country's people accept legislation to reduce consumption of consumer needs, to say nothing of basic needs."
>
> "The assumption that complexity is the root of all evil is another pivotal point in his proposition. In his energy supply model, he uses overall national averages without building in geographic differences in natural and human resources in the various regions. Then he proposes that society return to simple living in local communities."
>
> "Lovins is dogmatic about the superiority of the way of life that he says will follow from doing without nuclear power."[4]

Obviously, Lovins, the advocate of "soft energy paths", would not have appreciated being called "dogmatic". More serious, it is unlikely that he would have recognized his analysis from the precis

in the Bayda report. In passing judgements on the arguments presented to the inquiry, the basis for, and complexities of, the analysis were lost. These are the very factors that gave Lovins' argument its persuasive power amongst, at least, many advocate groups.

The use of an adversarial proceeding is not the same as polarization, or using a court-like approach in an inquiry. There may be many adversaries, each representing different perspectives on an issue and many ways of inserting an adversarial process in an inquiry. Cross-examination in hearings is only one method; formal debates or a panel of experts, who disagree, is another. Neither exhausts the range of possibilities.

Adversarial approaches, unlike court-like procedures, have clear benefits in an inquiry. They bring out the full range and nature of interests involved. They identify important areas of information that might otherwise pass unnoticed. They indicate areas of conflict in the information. They ensure that those who appear go beyond the "dutiful" in their presentations and that inquiries are effective in putting new information before the public.

Adversarial approaches may sometimes be unavoidable for if the issue is a subject of public controversy, or involves a conflict of interests then, sooner or later, the discussion will turn adversarial in tone. Again, if the media report regularly on the inquiry, they are likely to present the issue as adversarial.

Several inquiries in this study attempted "to go beyond" an adversarial approach by arguing that it would bend issues towards a legalistic orientation and promote conflict. To the extent that the avoidance of the adversarial approach aided compromise, assisted the design of solutions, and extended discussion, these inquiries were successful. But to the extent that the absence of adversarial style discussion masked interests and information, the avoidance of the inherent conflict in this type of approach backfired.

Conclusion

Le Dain provided an interesting analysis of the nature of the legal relationships in inquiries. "Inquiries", he suggested in an interview, "bring together a tricky mix of the legislative and adjudicative processes." He noted that the public usually expects an inquiry to function in an adjudicative manner, as a judge passing moral judgements, but mandating governments use inquiries as an extention of the legislative process.

The adjudicative function is necessary, he suggested, but not because of the decisions that need to be made. Inquiries might, in fact, have little to adjudicate and yet still proceed in a modified adjudicative manner in order to give credibility to the process, to

encourage people to testify frankly, and to present the process as "fair" and the final assessment as "sound". The legislative function, on the other hand, requires that an inquiry should go beyond a reasonable expectation of fairness to those whose interests might be involved. It demands that, in order that a full assessment be completed, an inquiry should consider issues that do not necessarily emerge in due process.

If the adjudicative process provides a framework within which assessment can take place, then the legislative function ensures that this assessment is adequate to the task. The mixture of functions is difficult because it places an inquiry in a vacuum (somewhere between a court and a legislature) unable to meet the demands and expectations of either. Without the adjudicative function, Le Dain suggested, an inquiry would be overly responsive to political pressures. But with it, an inquiry would probably get caught in a court-like determination of issues and sacrifice the imaginative approach necessary to produce adequate and far-reaching policy recommendations. The conflict between these two approaches would certainly cause problems for those conducting inquiries, but the absence of conflict could be equally serious for it would stifle the inquiry's potential for creative response to the public and to the issues.

As inquiries become a regular part of the environmental assessment process, and in some senses routine, they will develop their own practices and procedures, more adequately matched to the task in hand. Certainly, an increasing amount of litigation, launched by dissatisfied participant groups, will have its effect in shaping how inquiries handle the problems of evidence and due process within a broadly based and far-reaching investigation.

XII. Inquiries and Policy

Inquiries and Other Forms of Policy Deliberation

What actually constitutes an inquiry has never been established. Similar functions are carried out by inquiries, agencies, departmental coordinating committees, parliamentary committees and advisory bodies. The guidelines, set out in various Inquiry Acts across Canada, provide little help for the provisions for "an inquiry" are bare-boned and the required procedures are minimal in many jurisdictions. Many inquiries, like those conducted under environmental assessment processes, may not be formally mandated; yet they function, to all intents and purposes, as inquiries.

The advantages of a parliamentary committee over an inquiry has recently been debated extensively.[1] Parliamentary committees are said to be more responsive;[2,3,4] on the other hand inquiries are said to bring a fresh approach.[5] Differences between the two are obvious: parliamentary committees, unlike inquiries, seldom have the staff or resources to carry out a scientific assessment and are tied directly into the political process in which their recommendations must be approved. Inquiries are assumed to be independent while parliamentary committees draw their members, usually on a proportional basis, from parties in the legislature. But even here, the differences between inquiries and committees break down under closer examination.

Parliamentary committees report directly to Parliament and usually produce politically necessary compromises that mitigate the need for extensive legislative debate. Yet, inquiries also produce compromises. Perhaps the more explosive the issue, the more likely it will be dealt with by an inquiry forum where the public is involved in fashioning a compromise.

An inquiry is accountable to its mandate. It reports to government and its recommendations are weighed before being implemented. The unpredictability of inquiries, and the compromises they promote, is offset by the eventual integration of those "compromises" into established policy processes.

Some parliamentary committees are investigative, while some inquiries simply seek to generate public discussion. Inquiries, themselves, differ in approach as much as committees, for example they may or may not hold public hearings, question experts, commission research, or emphasize public process. More important than form, then, is the nature of the task undertaken and the time and powers given to a body to conduct its work.

The differences between regulatory agencies and inquiries are much more significant. Theoretically, the same questions can be addressed by both. Both consider applications for development, and include in their considerations social, economic and technical information. Both may decide to hold hearings as a means of gathering evidence and their procedures vary greatly. Some agencies only make recommendations, as do inquiries, and are given no decision-making powers. Some inquiries may be "captured by industry", as regulatory agencies are reputed to be. Both inquiries and agencies can interpret their mandates either narrowly or widely.

Yet there are significant differences between the two. In the assessment of products, for example, it is common to refer to a difference between prescriptive and performance standards. Prescriptive standards set quality levels or specifications for each of the elements involved in the development of a product or of the final product. Performance standards, on the other hand, set levels of performance for the product as it is being built and being used.

The question of prescriptive and performance standards has direct relevance in the assessment of the development of a major project and in any discussion of the comparative strength of regulations, regulatory bodies and inquiries. Much of the assessment procedure in most inquiries centres on the standards that must be achieved if a development is to be considered safe. These standards are similar to prescriptive standards; they are set in advance and refer to specific elements in the design and construction. An inquiry, as an *ad hoc* consideration of a future development, can *only* set prescriptive standards.

Yet the design of any major project changes as that project is being developed. The equipment used in construction, the design of the project and the way operations are carried out reflect an actual state of affairs that can be known only during construction and operation. An inquiry, therefore, operates on the faith that actual conditions will not force significant changes during design or construction from the original assessment.

A regulatory agency is in a different position when it comes to standards. An agency can, in theory at least, monitor development throughout the construction phase. Factors that alter the balance of an assessment can therefore be taken into account. A project is not often halted, but it can be modified because continuing assessment draws attention to changing factors. Similarly, although each development may be unique, a regulatory agency can apply what it has learned in one development, in assessing the next.

An agency can, in theory, then apply performance standards. Regulatory agencies often have powers to grant licences, impose conditions on how that project will be built, monitor development and enforce their regulations. Although they seldom resort to precedent in their licensing function, agencies can also draw upon the accumulated experience of a continual series of decisions of a similar kind. In addition, agencies may have a limited but real capability to set policy, at least in the administration of their legislative mandate through regulations and decisions. Thus, at a casual glance, the "freshness of approach" of inquiries is offset by the very powerful advantages of agencies.

Few would argue today, however, that regulatory agencies are more appropriate in providing assessment. In part, this is a result of the nature of regulation both worldwide and in Canada. The word "regulation" carries with it a set of assumptions about the way in which the goals of public interest and corporate development will be merged.

Participants in the aluminum wiring inquiry, for example, were not unlike other citizens. They had no particular experience with regulatory agencies (especially agencies such as Ontario Hydro) before the inquiry but they had a series of expectations. When those expectations were not met, they considered that the regulatory bodies represented in the inquiry had been negligent. For example, intervenors believed that regulation operated primarily as a form of government control over business. They felt that agencies should be unbiased in their consideration and that they should take into account the nature of the vested interest of those parties making applications. Intervenors believed that regulation should be "in the public interest", a term they equated with providing the maximum possible protection for the public. Regulatory agencies were considered to be a kind of public proxy or the citizen's representative in the corporate world. Of course, public intervenors in inquiries were not naive, for they knew that agencies often failed to fulfill this role. They argued, however, that regulatory agencies should and would, with an appropriate degree of public and inquiry pressure, come much closer to these goals.

In reality, regulatory agencies in Canada function quite

differently from these expectations. In the first place, although regulatory agencies in Canada exercise some control, regulation is very much a cooperative process. Regulatory agencies consult their constituent publics, which may or may not include general public or consumer advocacy groups, regularly on both a formal and informal basis. Through their operation, those representing "the public interest" and those representing the corporate interest are brought together into a forum where those interests can be debated and a compromise achieved. Although the agency acts as an arbitrator, it does so with the implicit, if not explicit, assumption that those who appear before it seek some form of cooperative resolution and view the agency itself as the means of ensuring that cooperation. An agency, therefore, is a centre for negotiation and not simply a means of control or coercion. That the end result of regulation may be seen, from some perspectives, as being "coercive" does not alter the basically cooperative nature of the process. For to speak of a decision or regulation as "coercive" is simply part of the negotiating strategy of those who seek the most favourable resolution of their interests through regulatory agencies.

In the second place, regulation involves only a particular kind of accountability. Regulatory agencies, contrary to popular myth, are not simply the agents of those they regulate, although, clearly, they are influenced and often persuaded by those who often appear before them and with whom they may share, as one person put it, the same "mind set." Accountability distinguishes regulation from informal meetings behind closed doors in a government department or from the quiet, sometimes collusive, agreement among those with apparently conflicting interests. Accountability *to what* or *to whom*, however, is seldom made any more explicit in regulation than "to the public interest."[6]

Accountability in regulation is not measured in fact by reference to a set of goals. It is measured instead by the procedure used to make the decisions. Regulatory agencies, for example, will often hold public hearings or consider only evidence that has been submitted and tested through the public hearing process. They may also choose to seek input for a variety of sources, including government departments or members of the public.

However closely tied they may be to a political process, agencies stress their independence. One author, commenting on a similar phenomenon in media, calls this dependence on process, the "strategic ritual".[7] Those who go through the process, she suggests, are absolved from responsibility for the content or impact of their decisions. Agencies that assume the existence of a hearing or consultative process, together with their "independence" and "watchdog-like attitude," is sufficient to ensure accountability are good examples. Agencies that assume, as many do, that the

existence of appropriately named government departments or regulatory bodies is sufficient to guarantee supervision and a monitoring process fall prey to the dangers of believing in strategic rituals.

Most inquiries and environmental government assessments have assumed that the existence of agencies and departments in a variety of related fields will ensure that those recommendations accepted by the government are enacted and the regulations are enforced. But officials in New Brunswick and Saskatchewan from government departments involved in implementing recommendations of inquiries in those provinces are quite candid about the limitations and claim that they lack resources for the level of research and monitoring that would be involved. The agencies and departments are, themselves, political creations, subject to the dictates of Cabinet and they sometimes, especially in the case of departments of the environment, lack a strong, industry-based constituency outside government. Their ministers may often be quite junior in the cabinet hierarchy. In short, they are likely to offer moral rather than technical monitoring despite the aggressive commitment some officials have to their mandate.

From the study of the six inquiries, the following points become clear:

1. With a few notable exceptions, regulatory agencies in Canada do not function as watchdogs. They usually lack sufficient independent research capacity to conduct a far-reaching investigation. They view themselves as working in cooperation with, not in opposition to, the regulated industry. They tend to recognize what is often called "management prerogative" or the right of companies to keep most decisions internal and private. They do not always regard their own hearings as an arbitration of interests, indeed they may not even hold hearings. Many regulatory agencies do not solicit public input, and those that do often find the public advocate outnumbered and outweighed by corporate participants. Except in matters of law and jursidiction, they are not backed by a judicial review and thus, their decisions or actions are not subject to a second level of assessment. This last situation may be changing.

2. Operating cooperatively, regulators often suggest that the enforcement of regulation demands initiative and responsibility from industry and this would be undermined by an adversarial approach.

3. Regulation is often included as part of the design phase during the development and application of new technologies. The regulatory agency often operates an "auditing" approach by using its research capacity to evaluate the level of engineering for the developing project.

4. Regulatory agencies often operate through a set of committees in which problems can be identified and solutions pinpointed before the issue comes to a hearing. The public may occasionally be invited to send representatives to these committees or to participate in parallel discussions as a means of ensuring public responsiveness to regulation.

5. Regulatory agencies are usually bound by fairly restrictive mandates that traditionally confine their examination of new technologies. Examples include satellites, questions of rates, tariffs, and provision of nondiscriminatory service to all sectors of the community. Even when agencies attempt to consider social, cultural and other general questions, they may be constrained by legislation dating from a period when agencies and inquiries had clearly different concepts of their tasks.

It is not surprising, therefore, that inquiries appear "fresh" and responsive when compared to regulatory agencies. Inquiries can build up a research capability without increasing government bureaucracy and exhibit greater latitude in most areas. Yet, inquiries are not "fresh" and responsive under all conditions. When, for example, a multiplicity of inquiries on similar subjects creates "professional participants," many of the advantages are lost. This latter problem is common, and extends from the advocate groups to the participation of established institutions, departments and corporations. Experts travel between inquiries, giving essentially the same testimony to each. Testimony goes stale when corporations set up internal departments to prepare inquiry defenses or assign public relations staff to the task of appearing.

It must be wearying for officials, such as those from the AECB, to appear for the tenth time to explain their mandate and what they do. Little is learned that could not be gleaned by reading the transcripts of other inquiries. For participants, the problem of inquiry fatigue is common. As one Bayda inquiry staff member put it:

> "I get rather concerned, or at least I have of late, when I think of all the inquiries coming up. . . . We are making demands of our public participation groups that are perhaps unreasonable. . . . If we keep holding these we may soon get into a situation where nobody is happy. They can't possibly participate in all of them but if they don't participate it isn't a good inquiry. The demands on the public are going to be enormous."

Problems of Enforcement

Inquiries depend upon the good will of government and departments to ensure that the conditions they propose "on approval" are met. If governments have an adequate independent research

capability then they can conduct analyses of the data. If they possess the mandate to enforce their actions and are prepared to monitor development then the associated goodwill can be practically and usefully applied. Where government lacks these facilities, goodwill may become an act of blind faith.

In Canada at present, a great deal of the power of both inquiries and regulatory agencies is dependent upon persuasion. The techniques of this persuasion could well be strengthened. In the approval of an application, or the recommendation that a development should be allowed to proceed, certain conditions, often instigated in response to concerns raised by advocate groups, are imposed. This response may be phrased in one of two ways:

- An inquiry or agency can indicate that a development should be allowed to proceed under certain conditions. Their answer is: "Yes, but. . . ."
- An inquiry or an agency can indicate that a development should not be allowed to proceed unless certain conditions are met. Their answer is: "No, not unless. . . ."

While these two approaches may reflect the same conclusion they have a different impact. For a regulatory agency, the second alternative allows for a staged series of approvals, conditioned by successful completion of earlier work. Inquiries, on the other hand, can make recommendations, but cannot hold back approvals. A "yes, but. . ." approach taken by inquiries gives the mandating government a green light.

Use of a "No, not unless. . ." reply places the burden of responsibility clearly on the proponent and the government to fulfill a series of conditions before proceeding. An agency or inquiry that uses this answer views its task more strategically and is aware that the government that provided its mandate and the proponent corporation are in need of forceful persuasion.

Inquiries, Regulation and the Problem of Jurisdiction

Every nuclear-related inquiry spent a major portion of its effort in identifying the nature of nuclear regulation, only to propose recommendations on how regulation might be matched to the demands of the assessment. Many inquiries lead to the creation of regulatory agencies, or at least new regulation. Regulation seems to be a logical consequence of an inquiry. Yet, regulatory agencies are unlikely to perform the roles assigned to them by inquiries. The AECB is a clear example. The Board's view of its mandate together with its approach ensures that it is ill-matched to meet the demands made by advocate groups and often by inquiries themselves.

Underlying the relationship between inquiries and regulation, and an important cause of the problems, are disputes over

jurisdiction. It is worth reviewing the problem of areas of jurisdiction, as it affects both assessment and regulation emerging from an inquiry:

- The federal government is responsible for the physical environment while the province assumes responsibility for the social and human environment.
- The federal government is responsible for health and safety regulation in nuclear developments, while the provincial government is responsible for occupational health legislation and for its monitoring and implementation.
- Both federal and provincial governments have departments of consumer affairs, these departments have joint mandate over consumer and corporate relations.
- There are both federal and provincial departments of health, operating drug control programs. In addition there are research organizations funded at each level.

The Point Lepreau case in New Brunswick provides a wonderful example of the "alphabet soup" involved in any assessment or regulation. The AECB deals only with health and safety, related to radiological factors. Environment Canada deals with the natural environment, the DOENB with the social and human environment and with pollution and water resources control, the federal department of Fisheries and Oceans with ocean waters, the provincial DMA with zoning, EARP with environmental assessment, the provincial environmental protection service (EPS) with environmental monitoring of matters under provincial control, AECL with the development of the technology, and, many would claim, the provincial cabinet with all aspects of decision making. The departments of Labour and Health (federal and provincial) should also be mentioned.

This web of relationships was complicated in the Point Lepreau case because, in the case of maritime fisheries only, the federal Fisheries Act gives the federal government control over some aspects of the ocean as an environment, although water pollution is normally a responsibility of the provincial government. In the EARP hearing and afterward, Environment Canada was given major responsibility. Perhaps because the New Brunswick Department of Environment determined that the matter was extremely complex, the problems and controversies were considered too great for a newly established and somewhat junior department.

The matter would be laughable if it were not that the effects of any major development are felt in the ecosystem, and can only be calculated through the dynamics of the *relationships* among elements in the environment. The environment, as an ecosystem,

involves both human and natural elements, and is influenced by economic and social factors.

The problem of multiple jurisdictions, when added to the variety of regulatory authorities makes variable-by-variable study of the situation necessary. But the relationship among these variables is obscured because no one will take responsibility for an overview. An independent analysis is improbable, for reports of any monitoring studies carried out by individual agencies or departments become part of departmental prerogative and are seldom published in journals or made accessible to the public, let alone seen by other agencies or departments.

Disputes of jurisdiction prevent a full assessment unless informal arrangements are made between willing parties. Because this is an uncommon arrangement, it is probable that the issue of the desirability of a nuclear power plant will not be assessed until that plant is in place. Jurisdictional disputes have hampered the reform of legislation; the aborted reform of nuclear regulation is a prime example.

Nothing proposed by an inquiry, which operates only at a federal or provincial level, will alter the situation. Disputes of jurisdiction lie outside the province of an inquiry, and are unlikely to be responsive to its pressures. These disputes often seem to make mockery of the recommendations of an inquiry and more than any other factor, they make the inquiry seem irrelevant.

The problem has not been taken as seriously as it should. Setting up yet another joint coordinating committee to oversee separate federal and provincial research programs, as has been done on the subject of nuclear waste, is a feeble step towards a solution. Far-reaching coordination could only be achieved by a body that has continuing and full-time participation from both levels of government, and an appropriate level of power to carry out tasks of assessment and monitoring. Such a body would require either formal, and perhaps visible, links with decision makers or the power to make its own decisions and supervise their implementation.

Ethics and Policy

It is usually granted today that assessment includes an ethical or value-based consideration. What constitutes ethical assessment and how it should be done is, by no means, a matter of consensus. The Bayda inquiry, for example, stressed that any discussion of uranium mining in Saskatchewan must include a consideration of ethical issues. The intervenors agreed with the premise. They disagreed, however, on what ought to be done. The Bayda inquiry *did* address what it considered to be ethical questions to its own

satisfaction, if not to that of some participants and commentators. It did so in a manner similar to the Porter inquiry. The difference in approach between these inquiries and that of their critics stems from the way in which ethical questions were perceived. From the perspective of both inquiries, ethical questions could be distinctly separated and dealt with individually. From the critics' point of view, they could not.

The Bayda inquiry attempted several levels of separation. First, it separated ethics from scientific matters and assumed that information about uranium mining could be assessed without reference to ethics. The critics disagreed. The questions asked, the standards used, the nature of the comparisons they argued all constituted implicit ethical decisions of the inquiry.

Secondly, the inquiry distinguished between that which was under the control of the people of Saskatchewan and that which was the general responsibility of any world citizen. The inquiry took the position that uranium mining in Saskatchewan was unlikely to have direct impact on nuclear proliferation, and that its cessation would have little effect on that issue. The critics again disagreed, arguing in favour of "collective responsibility" by everyone for actions that could result in serious harm or danger to the world. *If the choice of avoiding risk is available*, they argued, then a cost/benefit analysis is particularly inadequate, especially in a situation that poses as many dangers as nuclear proliferation.

Finally, the inquiry made a distinction between general moral questions about which individuals might have little say and individual moral actions. Individuals in positions of responsibility, the inquiry claimed, should assume responsibility for their actions. Critics of the inquiry disagreed, suggesting that individuals often work in an institutional framework that makes a moot question of individual responsibility.

Once the issues were distinguished in this manner, the Bayda inquiry could conclude by stating its recommendations on ethics as follows:

> "Since those two conclusions (about the safety of the proposed mine) are based upon the maintenance of proposed levels of risks in the development of the uranium industry in Saskatchewan and at Cluff Lake in particular, there follows from those judgements (of safety) a moral obligation upon the *respective individuals* and groups to maintain the conditions on which they were made. Our conclusions respecting the moral obligations are:
>
> 1. the monitoring of uranium mine/mill operations is a moral obligation upon the regulatory agencies;
> 2. the enforcement of agreements and regulations is a moral obligation upon governing agencies;

3. the adherence to specified regulations and agreements is a moral obligation upon the industry and its agents;
4. diligence in determining and setting safety standards for the nuclear industry is a moral obligation upon persons and bodies who have assumed or are charged with those responsibilities;
5. seeking solutions in their area of expertise to ameliorate the undesirable and unintended results from the harnessing of nuclear power is a moral obligation on the scientific and technological community;
6. those moral obligations are humanly possible to fulfill; and
7. failure to comply with such regulations or to carry out regulatory responsibilities is a breach of moral trust."[8]

In the Bayda inquiry, responsibility in issues like nuclear proliferation was assumed to be collective and, thus, distinct from the individual decision making involved in the mining of uranium in Saskatchewan. On the other hand, corporate responsibility was seen to rest on the goodwill of individuals, and corporations were addressed as "persons" and exhorted to behave like good citizens. Corporate constraints were not believed to involve major problems.

In fact, the discussion of ethics often masks the discussion of the allocation of resources and of decision-making power. Thus, it is not surprising that advocate groups would suggest that inquiries should address the ethical issues first. In practice, however, inquiries consistently treat ethical issues as the last item on the agenda, as part of a discussion on acceptable levels of risk or when political disagreements cannot be resolved. In light of these criticisms, it makes sense to list what the advocates interviewed for this study thought ethics ought to mean to an inquiry.

- Social assessment is not simply a question of social factors influenced by development, it should focus on those who set priorities and those who benefit from a specific development. Assessment should contribute to recommendations about developments that are responsive to different kinds of pressures or to pressures generated outside established institutions and corporations.
- Citizens should not be considered as "blocking new developments" but as "sharing power" to make decisions about the kind and direction of development. New institutional arrangements for power sharing should be proposed.
- Community impact should be generated in response to the imposition of specific technologies and should include the social condition of the population at large, their lifestyle, values, welfare, and aspirations.
- The assessment should not centre on technology, but on the public. It is more valuable to indicate an appropriate develop-

ment and application of the technology rather than to mitigate the effect of the application of technology.

- Attitude surveys are only one means of gauging public sentiment and a means of indicating which mitigating measures are necessary.
- Relevant questions for discussion should be raised before information is collected and analyzed.
- The institutional constraints under which governments and corporations operate should be made visible and taken into account in the fashioning of recommendations.
- The question of problems of design or in taking mitigation measures are important, but they should be made secondary to an assessment of necessity and desirability.

Those interviewed argued, that if policy-making bodies have abandoned the process of investigation and decision making to those who are involved in technological development then the role of an inquiry should be to bring technically-oriented people back into a policy debate. It should force those who design and finance developments to respect the wishes of the electorate as expressed politically through an inquiry, a referendum, or Parliament. The discussion of ethics is easily mystified, however, it is not much different from what goes on daily, for better or worse, in political parties, advocate groups and legislatures.

Inquiries in the Policy Process

Inquiries, as they are currently being used by governments and advocate groups, constitute a relatively new kind of political forum. The old-style inquiry, commissioned before 1970 for example, heard representatives from lobby groups and established voluntary organizations. Each represented both an interest and a constituency. Inquiries were, therefore, a pre-negotiation stage in the development of policy through Parliament. They provided an opportunity for a recognition of the constituent interests that would have to be appeased in any final legislation or decision.

Current inquiries approach issues and public discussion in a different way. They stress formal assessment, assuming it to be scientific. They are primarily designed to attract the participation of new groups and individuals into policy-making procedures. They are often called, by their critics, "unrepresentative"; indeed they are, for they are designed to work as exercises in direct and not representative democracy.[9] They have probably come about as a result of pressures created by social movements calling for "participatory democracy" for they certainly respond to the demands made by consumer, urban, environmental and other advocate movements of the last decade. Theoretically, at least, those touched directly by an issue and who seek confrontation with decision

makers and those who have little regard for the temper of representative institutions all find an inquiry a unique opportunity for public discussion.

As such, current inquiries extend and supplement other forms of political debate. Whether or not this means they are actually commissioned, as many advocates and some commissioners have suggested, to "cool out dissent" or co-opt their participants remains a moot point. If that is their assigned task, judging from the inquiries in this study, they fail dramatically.

Certainly, in the case of the Bayda inquiry, the inquiry did little, if anything, to deter those who thought that uranium mining should not proceed in the province. The government's decision to accept the inquiry recommendations was not seen as a point of closure in the debate. Several people suggested that advocate groups became much stronger after the government's decision and that people who became interested in the issue during the inquiry later joined these groups.

In all the inquries chosen for the study, those taking an advocate position were more committed to that advocacy after the inquiry than before. The inquiry sharpened the issue, it made political activity more acceptable and provided the basis for contacts among others and for the development of new skills. Even when the decision of the inquiry matched the demands of the participants, they were likely to remain active. Where the process was nonadversarial and the inquiry produced some resolution and compromise, pressure for advocacy still remained. It may be that the most successful public participation efforts are those that result not only in better design for technology, or even in more participation in decision making, but also in better advocacy as well.

It may be useful to view an inquiry as an enclosure. Within an inquiry process, groups and individuals have the opportunity to express their views. They do so within the framework of a debate in which they can confront those with whom they do not agree. Advocacy groups seek, but seldom find, opportunities to do both. Thus, several people have called inquiries "seductive."

It is important to remember, however, that the individuals and groups who take part in an inquiry have usually been active in connection with the issues under discussion. They often leave the inquiry more firmly resolved in their opinions, and certainly better prepared to defend their position in other public forums. Their participation in the inquiry is simply one stage in their involvement with an issue, in some cases not even the most important stage.

The inquiry brings many people into debate. It promises a clarification and resolution of issues and a delineation and negotiation of conflict and positions. To some extent, it promises much

more than it can deliver. The conflicts between the Saskatoon Environmental Coalition and the Saskatchewan Mining Association were not resolvable by means of an inquiry, no matter how successfully it was carried out. Differences between those who favour "soft energy paths" and those who argue for the necessity of nuclear power are well known, and cannot be negotiated in an inquiry no matter how skilled the commissioners. These problems are generated outside the inquiry. The inquiry itself bears little resemblance to a labour negotiation, although various groups may emerge with a compromise tailored to their interest. In a labour negotiation by contrast, those who enter the debate must find means of working closely together after the negotiations have been concluded.

As a consequence, those who participate in inquiries do so with two conflicting motives. As participants, they look for compromise and resolution of the issues being addressed. As representatives of an interest or advocate position, they attempt to express that interest in a public forum. Inevitably, they address *both* the inquiry and the public throughout the proceedings. Actions taken with respect to one audience may have little to do with the other. And the skills required for participating in the inquiry may be different from those required for addressing a constituent public. The two motives can generate conflicting obligations and responsibilities; yet both are inevitable and necessary.

The extent to which an inquiry is viewed "as mere formality," with a decision already having been made, will determine the degree to which that inquiry is taken seriously. Inquiries that are perceived by advocates or proponents as "mere formalities" are invariably used as staging grounds for the public presentation of issues.

There may be two different kinds of inquiries, one where those who participate have already formed judgements before the inquiry begins and the other where issues are newly recognized within the inquiry itself. The Berger inquiry represented the latter and felt that a new resolution of issues was within the bounds of possibility. Other inquiries, Bayda being a good example, operate in situations where judgements have already been formed. The quality of testimony can differ significantly between the two kinds of inquiries.

It is inevitable that an inquiry which acts as a staging ground attracts a more "professional" type of participation from all concerned. Inasmuch as an inquiry is yet another public forum, groups attempt to prepare the best presentation possible. An official from Ontario Hydro called this approach "not being surprised by anything that is raised in the hearings." To this end, advocate groups seek training and depend increasingly upon

experts to ensure that their views are presented in a "professional" manner.

Inquiries and Planning

Some inquiries consider themselves to be planning bodies, but unfortunately the exercise of planning contains many myths. Planning is assumed to be a form of assessment or policy making and as a necessary addition to the decision-making process which is synonymous with the public interest. As planners will attest, the picture is far more complex.

Planning and assessment are different functions. Assessment is an attempt to establish what is; planning to establish what might be. Too great an emphasis on "what is" often leads to the perception that the future will look very much like the present. Those who are involved in taking action view the future as a continuation and sometimes a justification for what has already happened. "Future studies" are an indeterminant and often unsuccessful field of endeavour. Therefore, if assessment is allowed to set the agenda for planning, then it may also set constraints on what alternatives are seen to be possible.

The Porter inquiry provides a good example. Those who conducted the assessment or contributed to it were very much tied by their acquaintance and involvement in past policies. As a result, the range of alternatives considered was limited.

Planners are seldom key decision makers. Although their function is political, they are seldom integrated into the world in which policy is shaped and implemented. Planning is almost always an adjunct to policy making. It is sometimes important but it can be isolated by bureaucratic and other measures from making direct intervention. Planning remains supplementary. It is a tool which may or may not be used as the occasion demands. Inquiries often have trouble making governments cognizant of their recommendations[10] and when they function as planning bodies, they add to the difficulty of their task.

It is often suggested that we live in an unplanned society. Nothing could be further from the truth, for not all planning involves those who call themselves planners or policy analysts, and certainly not all planning involves inquiries. Corporate planning, government programs, patterns of decisions made by agencies or tribunals all constitute planning, however implicit the planning process might be. Such planning efforts are coordinated in many ways, such as informal discussions among interested parties before legislation is introduced, through continuing regulation, through a committee structure or organizations like the Standards Council and the AECB. A shared approach is often taken for granted and the planning philosophy is often implicit.

When an inquiry attempts to act as a planning body or recommends further planning activities, it argues, essentially, for a *redirection* of current orientations and methods of planning. In addition, it imposes new demands upon a system that is accustomed to meeting the needs of its constituents in particular ways. It suggests that the needs of different constituent groups should be taken into account and proposes different goals and methods of development.

Those who participate in inquiries often make seemingly reasonable suggestions for additions to the planning process. The Porter inquiry made a number of quite specific proposals for example. Such proposals may involve a few significant costs yet can result in considerable social benefits. Nevertheless, they are often ignored or met with a wall of hostility.

Those who participate in good faith during the planning sessions of an inquiry are baffled. To have asked for so little and to have received such a response simply does not make sense to them. It does make sense, however, when the current government and corporate planning priorities or development strategies are taken fully into account. The introduction of a new planning capacity is not a technical problem and, as the Porter inquiry participants later understood, often cannot be met with technically-oriented, albeit innovative, proposals.

None of these difficulties make it impossible for an inquiry to act as a planning body. For instance, the Porter inquiry did not begin with an application to be considered. Ontario Hydro's document[11] could have served that purpose (and perhaps was intended to by the government), but the document had a narrow perspective and was clearly out of date by the time the inquiry was well underway. The Porter inquiry was faced with two choices. It could use its research and hearings to develop a plan, or it could evolve its own planning framework. In the absence of an application or proposal, the inquiry chose the latter approach. Several possible options and plans were considered, but only in the light of their contribution to a framework for planning. The emphasis, therefore, was on proceedings and approach. There are merits in this choice; certainly it is a necessary prerequisite for a comprehensive plan but there are associated difficulties.

For example, the approach could only be successful to the extent that the public became involved. Despite the high degree of participation from advocate groups, an effective organizing campaign conducted in the early stages of the inquiry, and innovative practices, participants came only from groups with a direct interest. They comprised those who considered participation as their civic duty and those who considered the inquiry to be one stage in a continued debate. Much to the frustration of the inquiry, participa-

tion from other sectors of the community was limited. Contrary to popular myth, other inquiries have been remarkably more successful in attracting participation from "missing" sectors of the public (other advocate and interest groups, volunteers, and individuals). The Ham commission provides a good example of such a success.

In addition, there was a real and omnipresent danger that the proceeding would become an end in itself. Once that had happened, it would not be surprising if only those with a direct interest and commitment, or those who were funded would continue to participate. People who became involved on these bases tended to be those who were supported as a result of the inquiries, or the conservative middle class who were committed to the protection of the status quo.[12]

The Porter inquiry could have taken a different approach by viewing its efforts to construct a specific plan as a necessary ingredient in creating political effectiveness. It could have worked with a small group of selected participants in drafting an initial proposal. It could have brought this draft proposal to the public for evaluation and response, and incorporated their questions and reaction into a final report. It could have selected target interest groups and ensured they knew their interests were being discussed. Had the Porter inquiry taken this direction, it would have given a general public something specific to consider and to measure their own experience, information, and priorities. It could have subsumed the technical information under the general proposal by assuming that those who felt the need would master the information necessary to develop a position in reference to the plan. It would then have freed its Public Interest Coalition from the pressures of the inquiry and the advocate groups, and drawn instead on advisers taken from various sectors of the community.

Had the Porter inquiry done these things, it would have attracted a different kind of participation. In the end, its effect would have been different, being tied to the implementation of its recommendations rather than to procedure.

Conclusion

Inquiries need an independent basis for the evaluation of information and an open-ended approach to fulfill their responsibilities as scientific bodies. They also require a problem-solving approach that is directed at closure and decision making in order to create effective policy. If they must set their own agenda for a scientific investigation then they require the cooperation of their mandating government and of corporations and others who carry responsibility for implementing their recommendations. It is little wonder, therefore, that the match between science and policy in an inquiry is difficult, for the tensions between the two are severe.

In effect, inquiries may be no better or worse than other bodies that also make policy recommendations. Differences emerge only in terms of the time, resources, and scope of the investigation involved. Inquiries are simply one more item in the political lexicon. Yet, as they are now being used, they represent a shift in emphasis from representative to direct forms of political participation. The assumption that individuals and advocate groups have a role to play in the formation of policy, without regard to their political importance, is radical indeed, and certainly a cause of some of the backlash currently being felt against inquiries.

The likelihood that inquiries will disappear from the scene, or revert to a previous form, is small. Pressure from the new advocate sector is as real to governments as were the lobbies of large voluntary organizations in the past. But the likelihood that inquiries will co-opt these groups, and therefore diffuse advocacy, is also small. Inquiries bring issues and advocacy into focus for a limited time. They do little, however, to resolve often fundamental conflicts about the allocation of resources and decision-making power.

Many people consider that regulatory agencies react to conditions that are not of their making, such as applications for projects, initiation of new products, or conditions in the industry being regulated. Inquiries provide a fresh approach because they are "anticipatory". But in fact, this may be an illusion, for inquiries also react to situations. They are commissioned because problems have been identified and defined in particular ways. They respond to public controversy. They are seen as useful because political compromises have become unstuck or past decisions are being questioned. They operate within a context over which they have little control.

Inquiries, like agencies, assess applications for projects that were conceived and dictated by corporations and their policies. They often assess a new technology only after it has made its impact and some products are examined for hazards after they have been made widely available to the public. Inquiries operate within a network of political institutions, standard-setting bodies, agencies, government departments and cabinets, many of which have far more decision-making power than the inquiry itself.

Assessments and recommendations are influenced by jurisdictional disputes, disputes which inquiries have no power to affect. They draw from a public whose judgements have largely been formed before the assessment is complete and whose membership in advocate groups or corporate institutions predates the inquiry and diminishes its importance.

The role, scope and method of inquiries, therefore, cannot be assessed without reference to the world in which they operate. In

most cases neither scientific assessment nor dispassionate policy investigation is a high priority in that world. The growing mythology that surrounds inquiries, particularly after the Berger inquiry, often masks the true nature of the situation in which they operate and the critical relationship between inquiries and other bodies. Inquiries are seen as forward looking, or anticipatory, but in fact frequently mirror other events. Issues move in and out of an inquiry like threads through a tapestry. The constraints placed by events and political pressures cut short the assessment that occurs within them, and limits the role both scientists and others play in the determination of policy.

Notes

I. The Study

1. T.R. Berger, "The Mackenzie Valley Pipeline Inquiry,"*Queen's Quarterly*, Vol. 83, No. 1, 1976.
2. T.R. Berger, "The Mackenzie Valley Pipeline Inquiry," *Osgoode Hall Law Journal*, Vol. 16, No. 3, 1978.
3. I.G. Waddell, "The Mackenzie Valley Pipeline Inquiry," *Advocate*, Vol. 34, 1976.
4. L. Auerbach, "The Berger Report Sets an Important Precedent," *Science Forum*, Vol. 58, 1977.
5. A. Thompson, "In Defence of Accountability," working paper prepared for the Science Council Committee on Northern Development, 1977.

Part One - Inquiries and Technological Assessment: Nuclear-related Development in Three Provinces

1. G.B. Doern, *The Atomic Energy Control Board*, Law Reform Commission, Ottawa, 1976.
2. D. Torgeson, "From Dream to Nightmare," *Alternatives*, Vol. 7, No. 1, 1979.
3. W.E. Eggleston, *Canada's Nuclear Story*, Clarke, Irwin and Co., Toronto, 1965.
4. Ontario, *Hydro in Ontario: A Future Role and Place*, Task Force Hydro Report No. 1, August 1972.
5. Saskatchewan, *The Cluff Lake Board of Inquiry: Final Report*, Chairman Mr. Justice E.D. Bayda, 1978, pp. 148-273.
6. G.B. Doern, *op. cit.*
7. G.B. Doern, Editor, *The Regulatory Process in Canada*, Macmillan, Toronto, 1978.
8. G.B. Doern, *Regulatory Processes and Jurisdictional Issues in the Regulation of Hazardous Products in Canada*, Science Council of Canada, Background Study No. 41, Ottawa, 1977.
9. G.B. Doern, "Science and Technology in the Nuclear Regulatory Process: The Case of the Canadian Uranium Miners," *Canadian Public Administration*, Vol. 21, No. 1, 1978, pp. 51-82.
10. G.B. Doern, *Government Intervention in the Nuclear Industry*, Institute for Research on Public Policy, Montreal, 1980.
11. G.B. Doern, *The Atomic Energy Control Board*, Law Reform Commission, Ottawa, 1976; and interviews.

III. Environmental Assessment at Point Lepreau

1. P. Emund, *Environmental Assessment Law in Canada*, Emund-Montgomery Ltd., Toronto, 1978.
2. G.B. Doern, *The Atomic Energy Control Board*, Law Reform Commission, Ottawa, 1976.
3. Emund, *op. cit.*
4. Private communication.
5. G.B. Doern, *The Atomic Energy Control Board*, Law Reform Commission, Ottawa, 1976.
6. Emund, *op. cit.*
7. G.B. Doern, "Science and Technology in the Nuclear Regulatory Process: The Case of Canadian Uranium Miners," *Canadian Public Administration*, Vol. 21, No. 1, 1978, pp. 51-82.

IV. Balancing Development and Risk in Uranium Mining

1. Stearns-Roger Inc., *Environmental Assessment and Safety Report*, Ex. AMK34, Department of the Environment of Saskatchewan, November 1976.
2. G.B. Doern, Editor, *The Regulatory Process in Canada*, Macmillan, Toronto, 1978.
3. G.B. Doern, *Regulatory Processes and Jurisdictional Issues in the Regulation of Hazardous Products in Canada*, Science Council of Canada, Background Study No. 41, Ottawa, 1977.
4. G.B. Doern, "Science and Technology in the Nuclear Regulatory Process: The Case of the Canadian Uranium Miners," *Canadian Public Administration*, Vol. 21, No. 1, 1978, pp. 51-82.
5. G.B. Doern, *Government Intervention in the Canadian Nuclear Industry*, Institute for Research on Public Policy, Montreal, 1980.
6. G.B. Doern and R.W. Morrison, Editors, *Canadian Nuclear Policies*, Institute for Research on Public Policy, Montreal, 1980.
7. G.B. Doern, *Government Intervention and Nuclear Policy in Canada*, Institute for Research on Public Policy, Montreal, 1980.
8. *Saskatchewan Hansard*, 29 March 1977.
9. Stearns-Roger Inc., *op. cit.*
10. Saskatchewan, *The Cluff Lake Board of Inquiry: Final Report*, Chairman Mr. Justice E.D. Bayda, 1978, p. 171.
11. L. Auerbach, "The Berger Report Sets an Important Precedent," *Science Forum*, Vol. 58, 1977, pp. 22-25.
12. I.G. Waddell, "The Mackenzie Valley Pipeline Inquiry," *Advocate*, Vol. 34, 1976.
13. T.R. Berger, "The Mackenzie Valley Pipeline Inquiry," *Queen's Quarterly*, Vol. 83, No. 1, 1976.
14. T.R. Berger, "The Mackenzie Valley Pipeline Inquiry," *Osgoode Hall Law Journal*, Vol. 16, No. 3, 1978.
15. Canada, "Mackenzie Valley Pipeline Inquiry," *Northern Frontier Northern Homeland*, Vol. 1, Ottawa, 1977, pp. 163-197.
16. *Saskatchewan Hansard*, 21 March 1977.

V. An Inquiry and Electric Power Planning

1. K.J. Slater, *Ontario Hydro's Planning Concepts*, working paper prepared for the Royal Commission on Electric Power Planning, Toronto, 1976.
2. Ontario, *Report of the Solandt Commission*, Public Inquiry into the Transmission of Power between Lennox and Oshawa, April 1975.
3. Canada, Energy, Mines and Resources, *The Management of Canada's Nuclear Waste*, Chairman K. Hare, Report No. EP 77-6, 1977.
4. Ontario Hydro, *Long Range Planning of the Electric Power System*, Report No. 556 SP, 1 February 1974.
5. Ontario, *The Report of the Royal Commission on Electric Power Planning*, Chairman Arthur Porter, Final Report, February 1980, Appendix A, p. 187.
6. Transcript of workshop.
7. John O'Dean, "The Role of Ontario Hydro as an Economic Development Tool of the Province," paper prepared for the Royal Commission on Electric Power Planning, Toronto, 1976.
8. Slater, *op. cit.*, p. 3-4.

VI. Aluminum Wiring and the Determination of Risk

1. F. Fine, *The Aluminum Wiring Inquiry*, 1979.
2. Personal communication.
3. Ontario, *Report of the Commission of Inquiry on Aluminum Wiring*, Part 1, Commissioner J.T. Wilson, Queen's Printer for Ontario, Toronto, December 1978, pp. 15-18.
4. Ontario Hydro, *Wiring Systems Use in Single Family Homes*, Progress Report, Report No. 75-537K, 1975.

5. Ontario, *Report of the Commission of Inquiry on Aluminum Wiring*, Part 1, *op. cit.*, p. vi.
6. *Ibid*, p. 5.
7. *Ibid*, p. 25.

VII. An Inquiry in the Light of Public Controversy

1. United Nations Social Defence Research Institute, *Research and Drug Policy*, Milan, 1979.
2. E. Murphy, *The Black Candle*, Thomas Allen, Toronto, 1922.
3. Canada, *Final Report of the Commission of Inquiry into the Non-medical Use of Drugs*, Chairman G. Le Dain, Ottawa, 1973, pp. 941-947.
4. *Hansard*, 25 April 1967.
5. Canada, Health and Welfare Canada, *Annual Report, 1968-69*, Ottawa.
6. Canada, Health and Welfare Canada, *Annual Report, 1968-69* and *Annual Report, 1969-70*, Ottawa.
7. See also, *Final Report of the Commission of Inquiry into the Non-medical Use of Drugs*, *op. cit.*, p. 42.
8. *Ibid.*, p. 94.
9. Canada, Commission of Inquiry into the Non-medical Use of Drugs, *Interim Report*, 1970, p. 2.
10. United Nations Social Defence Research Institute, *op. cit.*, p. 71.
11. *Ibid.*, p. 72.
12. Canada, Commission of Inquiry into the Non-medical Use of Drugs, *Research Report*.

Part Three - Scientific Assessment and a New Technology

1. L. Salter, "Telecommunications in Canada: The Limits of Conventional Analysis," mimeo, 1981.

VIII. Regulation as Assessment: The Communications Satellite Case

1. D. Slaco, "The Telesat-TCTS Decision," unpublished paper, 1979.
2. C. Dalfen, "The Telesat Canada Domestic Communication Satellite System," *Stanford Journal of International Studies*, Vol. 5, 1975.
3. Department of Communications, *Instant World*, Ottawa, 1971.
4. C.M. Drury, *White Paper on a Domestic Satellite Communication System for Canada*, Industry, Trade and Commerce, Queen's Printer, Ottawa, 28 March 1968.
5. Private communication.
6. Broadcast Act, Revised Statutes of Canada, Vol. 1, Chapter B-II, 1979.
7. National Transportation Act, 1966-67, c. 69, s. 2, Revised Statutes of Canada, Vol. V, Chapter N-17, 1970.
8. The Railway Act, R.S. c.234, s. 1, Revised Statutes of Canada, Vol. VI, Chapter R-2, 1970.
9. Slaco, *op. cit.*
10. Dalfen, *op. cit.*
11. Department of Communications, *op. cit.*
12. G.D. Hutchison, "The Definitive Story of the Telesat-TCTS Affair," *In Search: Canadian Communications Quarterly*, Department of Communications, Ottawa, 1978.
13. T.G. Kane, *Consumers and the Regulators*, Institute for Research on Public Policy, Montreal, 1980.
14. G.B. Doern, *The Atomic Energy Control Board*, Law Reform Commission, Ottawa, 1976.
15. R. Schultz, *Federalism and the Regulatory Process*, Institute for Research on Public Policy, Montreal, 1979.

16. H.N. Janisch, "Policy Making in Regulation: Towards a New Definition of the Status of Independent Regulatory Agencies in Canada," *Osgoode Hall Law Journal*, Vol. 17, No. 1, 1979, pp. 46-101.
17. D. Hartle, *Public Policy Decision Making and Regulation*, Institute for Research on Public Policy, Montreal, 1979.
18. Private communication.
19. W.T. Stanbury, Editor, *Studies on Regulation in Canada*, Institute for Research on Public Policy, Montreal, 1978.
20. G.B. Doern, Editor, *Regulatory Process in Canada*, Macmillan, Toronto, 1978.

IX. Science and Inquiries

1. Saskatchewan, *Cluff Lake Board of Inquiry: Final Report*, Chairman Mr. Justice E.D. Bayda, 1978, p. 142-159.
2. *Ibid.*, p. 62.
3. G.B. Doern, "Science and Technology in the Nuclear Regulatory Process: The Case of the Canadian Uranium Miners," *Canadian Public Administration*, Vol. 21, No. 1, 1978, pp. 51-82.
4. H. Inhaber, *Risk of Energy Production*, Atomic Energy Control Board, Ottawa, 1978, p. 224.
5. A. Thompson, "In Defence of Accountability," working paper prepared for the Science Council Committee on Northern Development, 1977.
6. J.E. Hodgetts, "Public Power and Ivory Power," in T. Lloyd and J. McLeod, *Agenda 1970*, University of Toronto Press, Toronto, 1968.
7. A.M. Willms, "The Administration of Research on Administration in the Government of Canada," *Canadian Public Administration*, Vol. 10, No. 4, 1967.

X. Inquiries and Their Participants

1. Saskatchewan, *The Cluff Lake Board of Inquiry: Final Report*, Chairman Mr. Justice E.D. Bayda, 1978.
2. G.B. Doern, *The Atomic Energy Control Board*, Law Reform Commission, Ottawa, 1976.
3. A. Roman, *A Citizen's Guide to Participation Before Tribunals*, Public Interest Advocacy Centre, Ottawa.
4. M. Treblicock, "Winners and Losers in the Modern Regulatory State," *Osgoode Hall Law Journal*, Vol. 13, 1975, pp. 619-647.
5. T.G. Kane, *Consumers and the Regulators*, Institute for Research on Public Policy, Montreal, 1980.

XI. Inquiries and the Legal Process

1. Saskatchewan, *The Cluff Lake Board of Inquiry: Final Report*, Chairman Mr. Justice E.D. Bayda, 1978, p. 202.
2. *Ibid*, p. 274.
3. *Ibid*, p. 2.
4. *Ibid*, pp. 274-275.

XII. Inquiries and Policy

1. R. Schultz, *Federalism and the Regulatory Process*, Institute for Research on Public Policy, Montreal, 1979.
2. H.N. Janisch, "Policy Making in Regulation: Towards a New Definition of the Status of Independent Regulatory Agencies in Canada," *Osgoode Hall Law Journal*, Vol. 17, No. 1, 1979, pp. 46-101.
3. R.G. Dixon, "The Independent Royal Commission and Political Responsibility," *Administrative Law Review*, Vol. 27, No. 1, 1978.

4. D. Hartle, *Public Policy Decision Making and Regulation*, Institute for Research on Public Policy, Montreal, 1979.

5. A. Thompson, "In Defence of Accountability," working paper prepared for the Science Council Committee on Northern Development, 1977.

6. E. Belobaba, *On the Question of Consumer Advocacy*, Canadian Consumer Council, Ottawa, 1972.

7. G. Tuchman, "Objectivity as a Strategic Ritual," *American Journal of Sociology*, 1972.

8. Saskatchewan, *The Cluff Lake Board of Inquiry: Final Report*, Chairman Mr. Justice E.D. Bayda, 1978, p. 288.

9. C. Pateman, *Participation and Democratic Theory*, Cambridge University Press, Cambridge, 1970.

10. J.D. Maxwell, "Royal Commissions and Social Change in Canada, 1867-1966," PhD Thesis, University Microfilms, Ann Arbor, Michigan, 1966.

11. Ontario Hydro, *Long Range Planning of the Electric Power System*, Report No. 556 SP, 1974.

12. P. Emund, *Environmental Assessment Law in Canada*, Emund-Montgomery Ltd., Toronto, 1979.

Publications of the Science Council of Canada

Annual Reports

First Annual Report, *1966-67* (SS1-1967)
Second Annual Report, *1967-68* (SS1-1968)
Third Annual Report, *1968-69* (SS1-1969)
Fourth Annual Report, *1969-70* (SS1-1970)
Fifth Annual Report, *1970-71* (SS1-1971)
Sixth Annual Report, *1971-72* (SS1-1972)
Seventh Annual Report, *1972-73* (SS1-1973)
Eighth Annual Report, *1973-74* (SS1-1974)
Ninth Annual Report, *1974-75* (SS1-1975)
Tenth Annual Report, *1975-76* (SS1-1976)
Eleventh Annual Report, *1976-77* (SS1-1977)
Twelfth Annual Report, *1977-78* (SS1-1978)
Thirteenth Annual Report, *1978-79* (SS1-1979)
Fourteenth Annual Report, *1979-80* (SS1-1980)
Fifteenth Annual Report, *1980-81* (SS1-1981)

Annual Review

First Annual Review, *1980* (SS1-1/1980)

Reports

Report No. 1, **A Space Program for Canada,** July 1967 (SS22-1967/1, $0.75)
Report No. 2, **The Proposal for an Intense Neutron Generator: Initial Assessment and Recommendation,** December 1967 (SS22-1967/2, $0.75)
Report No. 3, **A Major Program of Water Resources Research in Canada,** September 1968 (SS22-1968/3, $0.75)
Report No. 4, **Towards a National Science Policy in Canada,** October 1968 (SS22-1968/4, $0.75)
Report No. 5, **University Research and the Federal Government,** September 1969 (SS22-1969/5, $0.75)
Report No. 6, **A Policy for Scientific and Technical Information Dissemination,** September 1969 (SS22-1969/6, $0.75)
Report No. 7, **Earth Sciences Serving the Nation - Recommendations,** April 1970 (SS22-1970/7, $0.75)
Report No. 8, **Seeing the Forest and the Trees,** 1970 (SS22-1970/8, $0.75)
Report No. 9, **This Land is Their Land. . .,** 1970 (SS22-1970/9, $0.75)
Report No. 10, **Canada, Science and the Oceans,** 1970 (SS22-1970/10, $0.75)
Report No. 11, **A Canadian STOL Air Transport System - A Major Program,** December 1970 (SS22-1970/11, $0.75)
Report No. 12, **Two Blades of Grass: The Challenge Facing Agriculture,** March 1971 (SS22-1971/12, $0.75)
Report No. 13, **A Trans-Canada Computer Communications Network: Phase 1 of a Major Program on Computers,** August 1971 (SS22-1971/13, $0.75)
Report No. 14, **Cities for Tomorrow: Some Applications of Science and Technology to Urban Development,** September 1971 (SS22-1971/14, $0.75)

Report No. 15, **Innovation in a Cold Climate: The Dilemma of Canadian Manufacturing,** October 1971 (SS22-1971/15, $0.75)

Report No. 16, **It is Not Too Late – Yet: A look at some pollution problems in Canada. . .,** June 1972 (SS22-1972/16, $1.00)

Report No. 17, **Lifelines: Some Policies for a Basic Biology in Canada,** August 1972 (SS22-1972/17, $1.00)

Report No. 18, **Policy Objectives for Basic Research in Canada,** September 1972 (SS22-1972/18, $1.00)

Report No. 19, **Natural Resource Policy Issues in Canada,** January 1973 (SS22-1973/19, $1.25)

Report No. 20, **Canada, Science and International Affairs,** April 1973 (SS22-1973/20, $1.25)

Report No. 21, **Strategies of Development for the Canadian Computer Industry,** September 1973 (SS22-1973/21, $1.50)

Report No. 22, **Science for Health Services,** October 1974 (SS22-1974/22, $2.00)

Report No. 23, **Canada's Energy Opportunities,** March 1975 (SS22-1975/23, $2.75, other countries: $3.30)

Report No. 24, **Technology Transfer: Government Laboratories to Manufacturing Industry,** December 1975 (SS22-1975/24, Canada: $1.00, other countries: $1.20)

Report No. 25, **Population, Technology and Resources,** July 1976 (SS22-1976/25, Canada: $2.00, other countries: $2.40)

Report No. 26, **Northward Looking: A Strategy and a Science Policy for Northern Development,** August 1977 (SS22-1976/26, Canada: $2.50, other countries: $3.00)

Report No. 27, **Canada as a Conserver Society: Resource Uncertainties and the Need for New Technologies,** September 1977 (SS22-1977/27, Canada: $2.25, other countries: $2.70)

Report No. 28, **Policies and Poisons: The Containment of Long-term Hazards to Human Health in the Environment and in the Workplace,** October 1977 (SS22-1977/28, Canada: $2.00, other countries: $2.40)

Report No. 29, **Forging the Links: A Technology Policy for Canada,** February 1979 (SS22-1979/29, Canada: $2.25, other countries: $2.70)

Report No. 30, **Roads to Energy Self-Reliance: The Necessary National Demonstrations,** June 1979 (SS22-1979/30, Canada: $4.50, other countries: $5.40)

Report No. 31, **University Research in Jeopardy: The Threat of Declining Enrolment,** December 1979 (SS22-1979/31, Canada: $2.95, other countries: $3.55)

Report No. 32, **Collaboration for Self-Reliance: Canada's Scientific and Technological Contribution to the Food Supply of Developing Countries,** March 1981 (SS22-1981/32, Canada: $3.95, other countries: $4.75)

Background Studies

Background Study No. 1, **Upper Atmosphere and Space Programs in Canada,** by J.H. Chapman, P.A. Forsyth, P.A. Lapp, G.N. Patterson, February 1967 (SS21-1/1, $2.50)

Background Study No. 2, **Physics in Canada: Survey and Outlook,** by a Study Group of the Canadian Association of Physicists, headed by D.C. Rose, May 1967 (SS21-1/2, $2.50)

Background Study No. 3, **Psychology in Canada,** by M.H. Appley and Jean Rickwood, September 1967 (SS21-1/3, $2.50)

Background Study No. 4, **The Proposal for an Intense Neutron Generator: Scientific and Economic Evaluation,** by a Committee of the Science Council of Canada, December 1967 (SS21-1/4, $2.00)

Background Study No. 5, **Water Resources Research in Canada,** by J.P. Bruce and D.E.L. Maasland, July 1968 (SS21-1/5, $2.50)

Background Study No. 6, **Background Studies in Science Policy: Projections of R & D Manpower and Expenditure,** by R.W. Jackson, D.W. Henderson and B. Leung, 1969 (SS21-1/6, $1.25)

Background Study No. 7, **The Role of the Federal Government in Support of Research in Canadian Universities,** by John B. Macdonald, L.P. Dugal, J.S. Dupré, J.B. Marshall, J.G. Parr, E. Sirluck, and E. Vogt, 1969 (SS21-1/7, $3.00)

Background Study No. 8, **Scientific and Technical Information in Canada, Part I,** by J.P.I. Tyas, 1969 (SS21-1/8, $1.00)
Part II, Chapter 1, Government Departments and Agencies (SS21-1/8-2-1, $1.75)
Part II, Chapter 2, Industry (SS21-1/8-2-2, $1.25)
Part II, Chapter 3, Universities (SS21-1/8-2-3, $1.75)
Part II, Chapter 4, International Organizations and Foreign Countries (SS21-1/8-2-4, $1.00)
Part II, Chapter 5, Techniques and Sources (SS21-1/8-2-5, $1.25)
Part II, Chapter 6, Libraries (SS21-1/8-2-6, $1.00)
Part II, Chapter 7, Economics (SS21-1/8-2-7, $1.00)

Background Study No. 9, **Chemistry and Chemical Engineering: A Survey of Research and Development in Canada,** by a Study Group of the Chemical Institute of Canada, 1969 (SS21-1/9, $2.50)

Background Study No. 10, **Agricultural Science in Canada,** by B.N. Smallman, D.A. Chant, D.M. Connor, J.C. Gilson, A.E. Hannah, D.N. Huntley, E. Mercer, M. Shaw, 1970 (SS21-1/10, $2.00)

Background Study No. 11, **Background to Invention,** by Andrew H. Wilson, 1970 (SS21-1/11, $1.50)

Background Study No. 12, **Aeronautics - Highway to the Future,** by J.J. Green, 1970 (SS21-1/12, $2.50)

Background Study No. 13, **Earth Sciences Serving the Nation,** by Roger A. Blais, Charles H. Smith, J.E. Blanchard, J.T. Cawley, D.R. Derry, Y.O. Fortier, G.G.L. Henderson, J.R. Mackay, J.S. Scott, H.O. Seigel, R.B. Toombs, H.D.B. Wilson, 1971 (SS21-1/13, $4.50)

Background Study No. 14, **Forest Resources in Canada,** by J. Harry G. Smith and Gilles Lessard, May 1971 (SS21-1/14, $3.50)

Background Study No. 15, **Scientific Activities in Fisheries and Wildlife Resources,** by D.H. Pimlott, C.J. Kerswill and J.R. Bider, June 1971 (SS21-1/15, $3.50)

Background Study No. 16, **Ad Mare: Canada Looks to the Sea**, by R.W. Stewart and L.M. Dickie, September 1971 (SS21-1/16, $2.50)

Background Study No. 17, **A Survey of Canadian Activity in Transportation R & D,** by C.B. Lewis, May 1971 (SS21-1/17, $0.75)

Background Study No. 18, **From Formalin to Fortran: Basic Biology in Canada,** by P.A. Larkin and W.J.D. Stephen, August 1971 (SS21-1/18, $2.50)

Background Study No. 19, **Research Councils in the Provinces: A Canadian Resource,** by Andrew H. Wilson, June 1971 (SS21-1/19, $1.50)

Background Study No. 20, **Prospects for Scientists and Engineers in Canada,** by Frank Kelly, March 1971 (SS21-1/20, $1.00)

Background Study No. 21, **Basic Research,** by P. Kruus, December 1971 (SS21-1/21, $1.50)

Background Study No. 22, **The Multinational Firm, Foreign Direct Investment, and Canadian Science Policy,** by Arthur J. Cordell, December 1971 (SS21-1/22, $1.50)

Background Study No. 23, **Innovation and the Structure of Canadian Industry,** by Pierre L. Bourgault, October 1972 (SS21-1/23, $2.50)

Background Study No. 24, **Air Quality - Local, Regional and Global Aspects,** by R.E. Munn, October 1972 (SS21-1/24, $0.75)

Background Study No. 25, **National Engineering, Scientific and Technological Societies of Canada,** by the Management Committee of SCITEC and Prof. Allen S. West, December 1972 (SS21-1/25, $2.50)

Background Study No. 26, **Governments and Innovation,** by Andrew H. Wilson, April 1973 (SS21-1/26, $3.75)

Background Study No. 27, **Essays on Aspects of Resource Policy,** by W.D. Bennett, A.D. Chambers, A.R. Thompson, H.R. Eddy, and A.J. Cordell, May 1973 (SS21-1/27, $2.50)

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