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AND PUBLIC AWARENESS OF
SCIENCE AND TECHNOLOGY }

A Study for
The Science Council of Canada)

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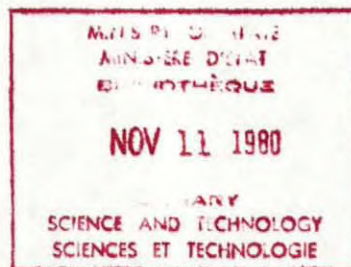


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INTRODUCTION

In fulfillment of part of the commitment which the Ministry of State for Science and Technology made to the Study on Public Awareness of Science and Technology, which is being conducted by the Science Council of Canada, an official of MOSST, in association with an outside consultant, undertook to examine the voluntary sector's practices, policies and attitudes towards public awareness of science and technology. The methodology used in conducting this study is described in Annex A.

This report is presented in two parts. The first describes in general terms the state of public awareness activities in the voluntary sector. The observations and comments made are based on previously accumulated information, materials gathered during the course of the study, personal interviews and discussions, and the professional experience and knowledge of the authors.

Part two presents an in-depth case study describing the activities of the SCITEC-sponsored Task Force on Public Awareness of Science and Technology during the years 1977-1979. The case study, in outlining the background, history and activities of a specific but very important attempt by some elements of the scientific voluntary sector to increase public awareness of science and technology, may provide some worthwhile lessons for current and future endeavours in this area.

PART ONE: THE VOLUNTARY SECTOR

1. Definitions

A prerequisite for this study was an attempt to arrive at certain definitions or clarification of terms; the first being that of the concept of "voluntarism". There are many apparent difficulties in defining this term. People in Action, HN110
29 the report of the National Advisory Council on Voluntary Action (NACOVA), found voluntary activity to be so diverse in form and focus that exceptions could be made to almost every generalization about it. The objectives of voluntary activity were seen to constantly evade categorization and to change continually; even those engaged in it do not always agree on definitions and descriptions. Furthermore, almost any field of endeavour can constitute a focal point for voluntary activity.

NACOVA believed that there did not exist an all-encompassing definition of voluntary action. However, definitions are still very much needed for functional purposes. To communicate a feeling for, or the spirit of, voluntary action, NACOVA termed it "active" citizenship; that is, people accepting a real responsibility for shaping their communities and their country and acting in some way on that responsibility. It is all that people do when they act of their own free will; in other words, the NACOVA report stated, it is people participating. We are not necessarily persuaded by this point. All employees participate, whether or not they are volunteers. If, however,

their participation is for the sake of regular and continuing payments, then they are not volunteers. This distinction is crucial because it emphasizes a special commitment by volunteers to a specific concept or principle.

For the sake of this study, we have chosen to define "voluntarism" as the organized reaction of an individual, or a group of individuals who share the same concerns, to meet a recognized need through the allocation of discretionary time and/or money, in a free and willing manner.

With regard to an attempt to define "voluntary associations", we generally agree (albeit with some modifications) with the NACOVA report's list of certain characteristics which distinguish such associations. These characteristics can thus be described as the following:

- (a) voluntary associations are formed in order to further some common interest or objective or to meet some recognized need;
- (b) members can join or leave a voluntary association without compulsion;
- (c) the members of voluntary associations are not oriented to, or motivated by, personal profit in so far as their voluntary activities are concerned;
- (d) policy-making in voluntary associations is controlled by the volunteer members;

- (e) voluntary associations are independent, though they may collaborate extensively with government, business; other institutions, and with each other;
- (f) generally, voluntary associations have a high degree of involvement by volunteers throughout; and
- (g) for the sake of this study, we are only concerned with voluntary associations involved in scientific, engineering and technological activities. The term "scientific" refers to the human as well as the natural sciences.

The second prerequisite for this study is to outline for the reader our concept of public awareness, as it is the mold which shapes the observations which follow. In general, a definition suggested by Mr. Leslie Millin, Secretary of the Science Council, to certain officials of MOSST as a starting point for discussion purposes, appears to be satisfactory. This definition is as follows:

"Public awareness of science and technology may be defined as a social condition in which the average member of the public can gain access to information that he can understand such as to contribute meaningfully to those public decisions on science and technology that affect his life."

There are, of course, certain difficulties with this definition. It must be pointed out, however, that one of the hoped-for outcomes of the Science Council's study is a clear understanding of

what is meant by public awareness. We, therefore, did not regard the development of a definition of public awareness as one of our objectives.

We believe, however, that the term "public awareness" means more than passive receptivity to information. One can be fully aware of S&T issues, without being in a position "to contribute meaningfully" if that means involvement in public debate and decisions. Even so, the aim of a policy to heighten awareness ought therefore to be more than merely to inform the public about scientific and technological issues. Such a policy should make the public attentive or actively watchful, in order to assist it to better understand and comprehend S&T issues.

If one accepts these distinctions, then the simple dissemination of information, i.e. public information or public relations activities, can be considered as one element of public awareness activities. The aim of these latter activities includes public information, but is broader: it should be to make the public more knowledgeable and have greater understanding of scientific and technological issues. In this way, they may be able to make rational, freely chosen decisions on matters which affect their lives. In assisting the voluntary sector to increase public awareness of science and technology, the government will be responding to its democratic responsibility of helping Canadians to participate in debates and decisions concerning important scientific issues affecting society.

2. Observations and Comments

Discussions with volunteers and officers of various voluntary, science-oriented associations, as well as our examination of certain public awareness activities and efforts in recent years, have enabled us to make a number of observations on the state of public awareness in the voluntary sector in Canada. These are outlined below in no particular order of priority or significance.

(a) Members of voluntary associations normally give more of their time, knowledge and skills than of their money to sustain the activities of their particular organizations. The significance of this fact is the recognition that people are willing to give a measure of what they have to achieve important social goals. Further, there is an implicit warning that to sustain voluntarism and to benefit from the volunteer's freely-given time and efforts, there must be sufficient financial resources to sustain an organizational infrastructure which can coordinate the activities of the human resources which are available. As well, to achieve effective results, there needs to be adequate money to fund the public awareness programs of voluntary associations.

Examples of successful volunteer organizations include the United Way, the Red Cross, the Heart Fund, and the Cancer Society. This sampling reflects the social responsibilities man feels toward his fellow man and the fact that activities associated with humanitarian considerations seem to lead to greater financial contributions and voluntary support than is the case with associations involved

in other pursuits which have less of an emotional appeal. The volunteer, it would thus seem, is primarily motivated by altruism (although some element of self-interest or self-fulfillment may also be a factor).

- (b) Whereas there are a great number of scientific and technological societies and associations in Canada, very few are active in pursuing public awareness programs. The Royal Society, the Youth Science Foundation, SCITEC, Science Focus, the Agriculture Institute of Canada and others all have a strong desire to make the public more aware of scientific and technological issues. Yet most associations assert that more could be done if only sufficient financial resources were available to fund public awareness programs.

This chronic lack of money to support budgets for materials, publicity and advertising diminishes the ability of many voluntary associations to undertake S&T public awareness programs. Also the weaker organizational visibility, in turn, reduces the number of potential new members of such associations who could, through their dues, help to sustain and expand the work of existing members.

As was mentioned previously, the scientific and technological community seems to suffer more from this inability to establish and maintain continuous public awareness programs than those agencies which are of a charitable, health-related or humanistic nature. By contrast, many S&T

associations struggle for finances continually and thus do not have adequate funds available for science public awareness. Where significant and assured funding can be found, however, the success of S&T public awareness is astounding. The Ontario Science Centre is a testament to this fact, although it is not a voluntary association, being funded by the province of Ontario and having a fully employed and paid staff. This in itself is an important point - if voluntary organizations had the type of finances, infrastructure and full-time staff as does the Ontario Science Centre, then S&T public awareness activities could be much more effective than is now the case.

- (c) Public awareness programs, in addition to being costly, require a great deal of time and effort in order to achieve their goals. Scientists, as members of their respective societies and associations, find it necessary to make priority decisions as to the allocation of their discretionary time. Often science policy, international science concerns, inter-disciplinary communications and relations with governments and industry seem to be preferred by scientists and others to the more onerous task of educating the public. Consequently, many scientists do not seem to treat public awareness with the same attitude they normally would apply to scientific endeavour and do not regard public awareness as worthy of serious consideration. Some scientists who have attempted to

communicate with the public have been snubbed by their colleagues. They may also be rebuffed by their superiors and thus their incentive to become involved in public awareness activities may be weakened. Furthermore, very few scientists have sufficient knowledge of, and skills in, public awareness to feel comfortable in that role or to perform it effectively.

- (d) Local events, usually aimed at a select audience or a small segment of the population, such as high school students, science teachers, professionals, business representatives or the like, seem to achieve a fair degree of success. These projects, however, must be maintained by proper financing and organization. When they are not, such events come and go but do not usually leave a continuing program for science and technology public awareness in their wake.
- (e) Many representatives of the voluntary sector with whom we spoke identified the need for clearly defined goals, objectives and policies with regard to public awareness of science and technology - by both the government and the voluntary sector itself.

The establishment of a coherent federal policy on public awareness of science and technology should emphasize the government's concern in this area, ensure the most efficient use of government funds, and provide fair and equitable treatment to those requesting assistance. It should also clarify the roles and responsibilities of

the various federal departments and agencies involved. Such a policy should also reflect the needs and aspirations of the various scientific and technological associations in Canada which are, or could be, involved in public awareness activities. Those needs and aspirations, however, must first be formulated and articulated by the voluntary sector itself.

A clearly defined policy and set of guidelines on federal support for S&T associations - indeed for all organizations which may be termed voluntary - has been considered a desirable objective for some time. Even so, and despite much study and effort in recent years, little progress has been made towards developing such a policy. A number of factors have contributed to this, some of which are also of direct relevance to the possible development of a policy on public awareness.

An important consideration is that S&T associations in the voluntary sector vary greatly in structure, discipline, role and activities. Comments have been made as to whether a distinction can even be made between voluntary and non-voluntary organizations, with many associations possessing elements of both. Such diversity cannot be dealt easily under a single, uniform policy. Therefore, arguments have been made that, as opposed to a uniform policy, a determination of support for S&T associations (vis-a-vis public

awareness) should be based on the particular needs of the association in question, and should reflect the very real differences which exist among the various disciplines.

(f) In discussions with representatives of certain S&T associations, some indication was obtained as to what types of objectives and goals the voluntary sector should have in terms of developing a better, long-term attitude or awareness on the part of the public. These, very briefly, include the following:

(i) creating public opinion in favour of, and public demands for, greater funding for Canadian research. This objective is ostensibly motivated by self-interest on the part of voluntary associations. It derives from an often times urgent need for finances to carry out research programs and from a need or desire to influence government regulations and policies concerning scientific and technological endeavours. Research and development is a primary concern for the scientist and is a valid reason for participation in public awareness activities. Yet the achievement of research funding should not be the only reason for involvement in public awareness. Scientists should not ignore the broader benefits of public awareness in contributing to the quality of life in Canadian society.

- (ii) developing an appreciation on the part of the public of science as being an important and essential element of human life, society and culture which should not be neglected;
- (iii) determining what and how the public is thinking with regard to scientific and technological issues and identifying the public's needs and desires. This would involve a means of getting feedback from the public, as well as enhancing the scientists' understanding of issues of pressing social concern;
- (iv) identifying the various publics one wants to reach - the public in general, scientifically informed citizens, bureaucrats, politicians, youth, etc. (In this regard it should be pointed out that one scientist, such as a physicist, is a member of the public when it comes to the work of another scientist, such as a psychologist.)
- (v) determining what type of structure or organization (if any) should be developed for public awareness (for instance, a central, co-ordinating organization or a series of activities that can be undertaken by different associations); and
- (vi) increasing public understanding and knowledge of the social implications, costs and benefits of scientific and technological developments.

(g) In discussions with representatives of certain S&T associations, some indication was also given of the types of activities which could be undertaken by the voluntary sector so as to increase public awareness of science and technology. These, very briefly, include the following:

- (i) science fairs;
- (ii) open houses;
- (iii) scientific and technological publications;
- (iv) public seminars, symposia and lectures;
- (v) inter-disciplinary seminars on specific topics;
- (vi) media relations (press releases and conferences, radio and television commentaries, interviews with the press, etc.);
- (vii) scientific awards (to achieve public recognition);
- (viii) science weeks;
- (ix) scientific exchanges with other countries;
- (x) science olympics;
- (xi) displays, demonstrations and exhibits;
- (xii) museums, as well as travelling exhibits;
- (xiii) establishment of a data base, clearing-house, or communications network (so that information can be readily accessed by the public, organizations and the media concerning S&T matters, including listing of experts in various scientific fields).

(h) Although other reports commissioned by the Science Council are to deal with the media's coverage of science and technology and its relations with the scientific community, it is important to note here that the voluntary sector has expressed concern over what it perceives to be the low level of media responsibility in communicating science

to the public. It was conceded, however, that in recent years, the interest of the media in S&T issues has generally increased; even so, representatives of voluntary associations thought that much more could, and should, be done, especially in regard to "serious" science programming on television.

The criticism levelled at the media by the scientific community includes: an inadequate number of experienced journalists and science writers; non-publication of, or inaccuracy in, material following interviews; sensationalism; and the inadequacy of coverage, in terms of both quantity and quality. However, the media cannot be expected to take all the blame. The following comment by the 1977 MOSST report, Media Impact Volume III: The Scientific Community and the Mass Media, is still relevant:

"Certainly the same criticism levelled at the media can be levelled at the scientific community: their hit-and-miss approach to the coverage of science in its broadest sense. In this case, the lack of coherent policies by the organizations representing the individual scientists and engineers may be one of the key reasons for media inaction. Why should the media have to bend over backwards to dig out scientific news and developments, when even

the majority of science organizations are doing little to promote themselves. As a result, to date, there has been NO planned and coordinated cooperative effort between the researchers and the media writers."

Few S&T associations seem to have any publicity procedures or media relations policies at all. Furthermore, few scientists have had previous exposure to the news media. In general, they neglect public relations and do not cultivate media contacts. As a result, few organizations put out news releases on their research activities, nor are they ready to argue their case in the public forum and, even if they do, they often find that they are misunderstood.

Many organizations believe that the factors contributing to their weak performances in media relations included: lack of adequate financial resources for publicity and public relations budgets; lack of personnel knowledgeable in the field; and low priorities accorded science by government and media management.

A great deal can be done to overcome the practical and attitudinal problems associated with media coverage of scientific and technological issues. This, however, requires sustained effort by, and co-operation between, the scientific community and the media, since disseminating

information and increasing public awareness by means of the mass media is an enormously complex phenomenon. The following excerpt from The Use of Mass Communication Strategies to Promote Life-Style Change: The Case of Energy Conservation In Canada by Patricia Vertinsky illustrates this point.

"A popular conception of mass communication depicts the media as a giant hypodermic needle jabbing indiscriminately to stimulate or depress the passive masses, yet this idea presupposes a direct and immediate response from the receiver. The process, of course, is far more complex, for mass media information is received, passed on, distorted, assimilated, rejected, or acted upon in ways which are, in part, determined by the operation of various social and social-psychological systems at various points of transmission and reception as the flow of information takes place. The communicator is thus challenged to develop complex skills where he must understand the various sub-cultures, language habits, and other aspects of his audience in appraising the content of the message he is sending."

3. Concluding Remarks

Our examinations reveal that there is very little ongoing activity in the area of public awareness of science and technology within the voluntary sector in Canada. Various factors contribute to this situation. Predominant among these is the lack of adequate and continuing financial resources which are needed to plan, develop and maintain the types of activities necessary for success in this area. Public awareness programs often have low priority in the budgets of voluntary associations as they prove to be extremely costly, especially in light of the generally poor financial state of most associations.

In order for society to reap greater benefit from the valuable time, knowledge, skills and efforts of volunteer labour, there must exist sufficient financial resources to sustain an organizational infrastructure that can co-ordinate and support the activities of these human resources which are available through voluntary organizations. Many of the representatives of voluntary associations with whom we spoke believe this to be an area in which a role for government involvement and funding could be beneficial. Some expressed a desire to see some form of structure or mechanism set up to administer and co-ordinate the dispersal of government funds to various voluntary associations for public awareness activities. Such a structure need not involve the establishment of a new

organization but could use existing bodies such as the Science Council of Canada or the three granting councils (the Social Sciences and Humanities Research Council, the Natural Sciences and Engineering Research Council and the Medical Research Council).

Another difficulty associated with the weak state of public awareness activity is the lack of clearly defined goals and policies in this area, on the part of both the government and the voluntary sector itself. It is appropriate to point out here that the objectives of the Science Council's Study on Public Awareness of Science Technology are:

- (a) to derive a policy on federal role, duties and responsibilities concerning public awareness of scientific and technological problems and opportunities in Canada; and
- (b) to recommend appropriate administrative and other arrangements for the implementation of such a policy.

In the development of such a policy, the views and comments of the voluntary sector should be determined (by greater discussion than was possible for this report) and incorporated. This, of course, will necessitate co-operation, communication and consensus, between the voluntary sector and government, as well as industry and philanthropic institutions, but especially within the voluntary sector itself.

The third major factor contributing to the low state of public awareness activity within the voluntary sector concerns media relations. Mass media coverage of S&T issues, although having increased significantly in recent years, remains poor in both quantity and quality. As has been pointed out in this report, criticism can be levelled at both the media and the voluntary associations for this state of affairs. In order to achieve significant and continuing changes in this area, in terms of both attitudes and practical developments, there is a need for co-operation, communication and mutual understanding between media representatives and the scientific community. Members of each group need, first of all, to realize and appreciate the benefits of public awareness of science and technology to themselves and society, and also to understand the advantages of working together in this important concern.



PART TWO

CASE STUDY:

TASK FORCE ON PUBLIC AWARENESS OF SCIENCE AND TECHNOLOGY

1. Task Force Proposal

The Association of the Scientific, Engineering and Technological Community of Canada (SCITEC) was founded on January 17, 1970 as an umbrella organization of scientific societies. Its broad objective is "to marshal the scientific, engineering and technological community; to provide leadership, to communicate, cooperate and work within itself, with government and the public in the national interest in those areas in which it can make a competent contribution".

In May, 1977, reacting to what was perceived as the need for more dialogue between the scientific community and the general public, SCITEC Council established a Task Force on Public Awareness of Science and Technology in Canada. It was composed of executive officers from SCITEC, l'Association canadienne française pour l'avancement des sciences (ACFAS), the Royal Society of Canada, Science Forum and Québec Science. The Task Force, on August 22, 1977, submitted a proposal to the Minister of State for Science and Technology for a project to: increase public understanding of issues bearing on science and technology; contribute to the development of a more cohesive scientific community; create more understanding of scientific activities in Quebec among English-speaking Canadians, and vice versa; and improve relations among francophone and anglophone scientists.

The introduction to the Task Force's proposal outlined the rationale and justification for its objectives:

"Science and technology are indispensable parts

of almost every major decision affecting the future. Canadians need greater access to and more interest in scientific information. Without much more informed discussion and greater public awareness of the potential and limitations of science and technology, Canadian decision-makers will find it difficult to forge realistic policies in such areas as energy, industrial development and transportation."

The proposal also noted several recent developments which indicated the need for greater public awareness of science and technology. These included the following: (a) The Science Council of Canada's Background Study 25, National Engineering, Scientific and Technological Societies of Canada, published in 1972, urged Canada's scientific societies "to create an interested and informed public through

- (i) making increased efforts to communicate to the public using the public media - newspapers, radio and television...;
- (ii) cooperating more closely with the science writers;
- (iii) addressing communications to youth, both directly and via the teaching of science and career counselling;
- (iv) providing a forum for discussion, by scientists and non-scientists, of public issues involving Society and science and technology;

- (v) supporting a news vehicle specializing in science policy and social concern...;
- (vi) initiating programs which emphasize considerations of the future, thereby stimulating public interest by informed extrapolations of the future impact of science and technology;
- (vii) taking a public position on the scientific aspects of major issues..."

(b) Volume III (1977) of the Media Impact study on science communication, undertaken by MOSST, reported that the majority of Canadian scientists, engineers and their associations which were surveyed endorsed the concept of a national science-based organization with a mandate and necessary support to promote the popularization of science in Canada. Furthermore, the study noted that the reaction of scientists polled on the need for a national science magazine in Canada was overwhelmingly positive.

(c) The Government Organization (Scientific Activities) Act, 1976 charged the Science Council of Canada with the responsibility for increasing public awareness of

- "(i) scientific and technological problems and opportunities, and
- (ii) the interdependence of the public, governments, industries and universities in the development and use of science and technology."

Even in its new role, however, the Science Council might have found it difficult to achieve the level of public participation and discussion that was required across the country. The Task Force thus argued that a grass roots organization, based in the scientific and technological community, could effectively complement the government's activities in this area and could provide for channels of communication and avenues of participation at the local, regional and national levels.

The Task Force's proposal requested federal funding to undertake a project that would culminate in the establishment of a continuing national activity to increase public awareness of science and to stimulate dialogue within the scientific community. The proposal was in two parts. First, the Task Force requested funds to allow the careful development of an activity that would be firmly situated in a national framework and which may or may not have necessitated the establishment of a new association.

The second part of the Task Force's proposal focussed on the development of a popular English-language science magazine, namely, a revised Science Forum. The Editorial Board of Science Forum had agreed to join forces with SCITEC and the Task Force with the expectation that the magazine would become the communication organ of the new national association or activity. The revised magazine would then serve as a selling point to attract members to the new association and, at the same time, the membership would act as a continuing and extensive base for subscriptions to the magazine.

In a letter dated September 16, 1977 to the Executive Director of the Science Council, the Minister of State for Science and Technology said that he was in full support of the objectives of the proposal and that he was prepared to approach the government for funds for the project. He thought, however, it should be the Science Council, with its new mandate for public awareness, and not MOSST which should take on active management of the project.

The Minister endorsed the concept of a feasibility project of one year which he felt would be a good way to: (a) determine if a new association was needed; (b) define the association more fully; and (c) determine if there was enough support by scientists and the public to sustain the venture.

The Minister emphasized this last point by stating:

"The success of this venture will ultimately depend on the support it generates from within the scientific community. I think special attention should be given, therefore, by the Council to the first part of the proposal, that is, to establishing quite firmly the degree of agreement and commitment the proposed changes have from existing science associations (SCITEC, ACFAS, RSC), what their relationship would be with the new association, if it is formed, and how the proposal would improve the interaction between the anglophone and francophone scientific groups."

On October 19, 1977, senior representatives of science-oriented departments and agencies met, at the request of MOSST, to consider support for the proposal of the Task Force on Public Awareness of Science and Technology. Sufficient financial assistance was obtained for the project to proceed. A total of \$85,000 was collected, of which \$21,033 went to support the work of the Task Force and \$63,967 was given to Science Forum. Those providing financial assistance were: the Science Council, MOSST, the International Development Research Centre, the National Research Council, the Department of Communications, Agriculture Canada, the Department of National Defence, the Department of Health and Welfare, and Environment Canada.

On March 3, 1978, a consultative meeting was organized by the Task Force to discuss the proposal that a national activity be undertaken to increase public awareness of science and technology and to generate advice on the institutional framework that would be needed to coordinate this activity. The participants included government representatives, the presidents of 15 science associations, and many of Canada's better known scientists and science communicators.

After lengthy discussions, it was apparent that no consensus existed on the need for a new association for the advancement of science. All agreed that much more could be done to increase public awareness of science and to improve the interactions between scientists and the public, but existing organizations should be used for this purpose. Therefore, a two-pronged activity was accepted

which was to constitute Phase II of the public awareness project. This consisted of: (a) a series of pilot projects under the leadership of Dr. David Suzuki, to be organized by SCITEC in several cities, with the creation of local science associations as a goal; and (b) the dissemination of information about science and technology in the French language media. (This latter aspect was organized by l'ACFAS and evolved into le Service d'information Hebdo-science.) Developments leading to a popular version of a widely-distributed Science Forum, including the transfer of publishing responsibility from the University of Toronto Press to Québec Science, were welcomed by most participants.

2. Evolution and Demise of Science Forum

As has been indicated previously in this report, the financial assistance required for Science Forum to make certain publishing and editorial changes which its editorial board felt were essential to its success, even its very survival, was gathered as a result of the efforts of the Task Force. In fact, the two parts of the Task Force proposal - the establishment of a new national activity or association and a revised Science Forum - were seen to be interdependent.

The Task Force's proposal outlined two major disadvantages that had prevented Science Forum from reaching its potential in circulation and influence. These were, first, the absence of permanent full-time staff and, second, a lack of funds. The lack of funds, together with the fact that the journal had been produced by a scholarly publisher (the University of Toronto Press)

as a semi-scholarly publication, meant that it was never adequately promoted and remained unknown to many potential readers. Inadequate funding also restricted the possibility of innovative editorial policy and imaginative design and layout; and the absence of full-time staff made proper editorial planning impossible. The result was that the magazine struggled along from year to year, largely on the voluntary efforts of over-committed people, and that its circulation never rose beyond a few thousand.

About the time that SCITEC was discussing the need for a national public awareness activity, the government had suggested that Science Forum undertake a feasibility study to test the practicality of a proposal for funding which it had made in early 1977. After discussions with SCITEC and others, the directors of Science Forum decided that their best interest would be served by the type of activities suggested in the proposal by the Task Force on Public Awareness of Science and Technology and thus joined in this venture.

In May-June 1978, responsibility for publishing Science Forum was transferred from the University of Toronto Press to Québec Science. The format of the magazine was modified along a pattern resembling that of Québec Science which had become something of a publishing success-story. As well, it was to be published every other month rather than monthly.

Although these changes were made, the increase in circulation and readership of Science Forum never materialized. On March 5, 1979, therefore, the Chairman of the Board of Directors of Science Forum wrote to the Secretary of MOSST to state that the advertising and other business-oriented activities of Science Forum had not been as effective as could have been wished. He went on, however, to outline and support a proposal made by CB Media Limited and Key Publishers of Toronto for them to assume publishing responsibility for Science Forum. This action, however, would require bridge financing from the federal government of \$200,000 a year for two years.

MOSST subsequently convened a meeting of science-oriented departments and agencies on April 3, 1979 to determine if financial support could be made available. The meeting was informed that, if the required assistance was not forthcoming, the June issue of Science Forum would be the last and the magazine would cease publication. The consensus of those attending the meeting was that, although the continued publication of Science Forum was deemed important, a revised proposal with more detailed financial data and a clearly-defined statement of editorial policy was needed before any decisions on funding could be made.

On August 29, the Chairman of the Board of Science Forum sent a revised proposal to the Secretary of MOSST. Shortly thereafter, MOSST officials wrote to departments and agencies which had attended the April 3 meeting to ask them to examine this proposal

with a view to determining if they could help fund it. Replies indicated that no money would be forthcoming. Some departmental representatives judged the proposal to be too vague, not adequately substantiated, unrealistic and too risky.

Science Forum ceased publication with its June 1979 issue.

3. Phase II Activities

On March 31, 1978, the Chairman of the Task Force wrote to its members noting the outcome of the consultative meeting of March 3, namely, that "the idea of a new association did not have wide support" and that it had been decided instead to initiate a few strategic pilot projects. In the light of this, it was decided that these projects would not require the continued existence of the large Task Force as a steering mechanism with representation of all the organizations initially involved. The Chairman of the Task Force therefore asked the Science Council to establish a smaller task force under its direction to follow through on the proposed Phase II activities.

Phase II of the public awareness project was then undertaken. Departments and agencies contributed \$80,000, of which \$32,000 went to SCITEC for pilot projects in various cities, and \$48,000 was entrusted to ACFAS for the dissemination of information in the French-language media. Both of these activities are described below.

A. Regional Pilot Projects

As a result of decisions made at the March 3, 1978, consultative meeting, SCITEC supported a number of regional, pilot projects under

the leadership of Dr. David Suzuki which aimed at arousing local interest in matters of a scientific nature. It was hoped that Dr. Suzuki would encourage local residents to form science associations which would then undertake to initiate a calendar of local science and technology public awareness activities.

During the period October 1 - December 31, 1978, program visits were made to five cities in Ontario: Ottawa (October 28), London (November 4), Kingston (December 1-2), St. Catharines (December 8) and Guelph (December 15 - 16). The strategy used by the project team was similar in each case. Initially, telephone contacts were established with members of the local university known to be active in science public awareness programs in the community, with members of the local or regional Board of Education and, whenever possible, with the local press and media and community interest groups involved in issues of public education and science and technology.

Shortly thereafter the Project Director, Dr. John Kucharczyk, travelled to the community to meet with local organizers and members of the press and media, and dates were set for the program visit by David Suzuki. Posters advertising the Suzuki talks were printed for distribution in such locations as universities, area high schools, libraries, etc. As well, the representative from the local or regional Board of Education was asked to inform area high school science teachers (and through them their students) of the Suzuki visit.

Visits consisted of 1 - 1½ hour public lectures by David Suzuki on the broad topic of "science and technology in our society" and concluded with his making a proposal that the community undertake to form an association or organization to encourage public discussion and debate on science and science-related issues by means of projects and open forums. Before and often after the lectures, Dr. Suzuki met with members of the local press and media; in some cases, the lecture was taped for subsequent broadcast on television or radio. A total of 19 interviews were given, of which 9 were for radio (broadcast time 3 hours, 22 minutes); and 3 for television (1 hour). At least 10 articles appeared in daily newspapers following Dr. Suzuki's interviews with print journalists. Approximately 800 subscription forms for Science Forum and 370 copies of the magazine were given out.

According to the director of the pilot projects, the proposal that a concerted program to increase public awareness of science and technology in Canada be started at the community level clearly met with a strong and very positive response. He based this assessment on the generally large audiences at the lectures, but especially on the numbers of individuals who subsequently enlisted as founding "members" of the local science associations.

Whereas it was relatively easy to attract large and enthusiastic audiences for David Suzuki's lectures, it soon became apparent that establishing independent local science associations was an altogether more difficult matter. Five associations were established as a result of the Suzuki visits. These were: the Ottawa Association for Science in Society (OASIS); Science, Technology and You (STAY) in London; the Kingston and District Science Association (KDSA); Science Interest Group Niagara (SIGN) located in St. Catharines; and the Guelph/Fergus-Elora Science Forum.

A series of meetings between the Project Director and the interim coordinators for the five Ontario groups revealed several problem areas that needed immediate attention. As might be expected, the coordinators were anxious to determine what sort of organizational structure would best serve the needs of the local community and the objectives of their association.

It was agreed at the outset that decisions about organizational structure were solely the responsibility of each association. However, since these questions would likely remain undecided for several months, it was judged important that the groups initiate a project as soon as possible to ensure that a majority of members could participate in a visible public awareness activity early in their association's development. This, it was thought, was a prerequisite for attracting funding from local business and industry and general support from the community, national research organizations and governments.

To introduce a possible, immediate project, the Executive Director of Science Focus, the group which, as a committee of SCITEC, had organized the first Science and Engineering Week in Ottawa, was sent to explain the science engineering week concept to the members of the five local associations. Only STAY in London, however, seized on this idea and organized a science focus week in October 1979.

In order to implement the projects and sustain interest, officials involved believed it was essential to establish and staff an office so that association members would be informed about meetings, and so that events and projects would be publicized through interviews with the local press and media. Although several competent and conscientious individuals had volunteered to serve as interim coordinators in each of the five Ontario associations, the groups uniformly lacked a chief organizer who would provide this vital continuous access and resource function during the first critical months. SCITEC, therefore, authorized that a total of \$3000 be allocated for operational expenses incurred by the associations prior to March 31, 1979. After that date, however, all funding for Phase II activities terminated. The five local science associations are now effectively moribund.

B. Science Focus

At this point in the case study, certain information should be presented concerning Science Focus. Although not directly connected to the Task Force on Public Awareness of Science and Technology, this organization was nonetheless very closely involved in SCITEC's efforts in this area.

In October 1978, the first Science and Engineering Week was organized as a pilot project in Ottawa by SCITEC's, appropriately named, Science and Engineering Week Committee. This endeavour was most successful in that it attracted approximately 40,000 people to its various seminars, exhibits, lectures and open houses. Arrangements were also made for scientists and engineers to visit local high schools with a view to discussing their work with students and teachers. This met with enthusiastic response.

Encouraged by the success of the pilot project in Ottawa, Science Focus was created in order to promote science and engineering weeks in other cities as a vehicle to achieve the goal of furthering a better understanding by the general public of science, engineering and technology issues. The second "Week" was held in London, Ontario from October 27 to November 4, 1979.

Science Focus has attracted major financial support from industry and the province of Ontario, plus pledges of assistance from local governments, associations and societies. The Science Council awarded Science Focus a contract which is now completed, and MOSST provides office space and furniture.

The past experiences that Science Focus has had in Ottawa and London indicate to them that it is simply not enough to put science on display and expect people automatically to become more knowledgeable about the issues related to scientific discovery and technological innovation. People must be motivated to enquire, to attend public meetings, exhibits and seminars, and to make their views known.

Science Focus has found that extensive (and thus expensive) advertising and publicity materials, widely circulated through all media venues, as well as in public places, are essential to successful high attendance figures.

This, of course, means that public awareness of science and technology will require substantial funding. Also, events must address topical issues and provide informed explanations and answers to the public's queries.

C. Le Service d'information Hebdo-science

In addition to the regional pilot projects held in five Ontario cities, and again as an outcome of decisions made at the March 3, 1978, consultative meeting, Phase II of the public awareness project consisted of the dissemination of scientific and technological information in the French-language media. In order to achieve this goal, l'Association des communicateurs scientifiques, l'Association canadienne-française pour l'avancement des sciences, and la Fédération québécoise du loisir scientifique established

le Service d'information Hebdo-science, using \$48,000 in funds originally collected by the Task Force on Public Awareness of Science and Technology.

In a report to the Science Council in March, 1979, the Director of Hebdo-science concluded that the organization's success was due to the fact that it fulfilled a specific need. Local weekly papers do not have the means to pay science writers and journalists but, when offered well written texts on science issues, they will do their best to incorporate them in their columns.

Several scientific writers and editors work for Hebdo-science for a fee. The topics of articles written are quite varied, but principally touch on the problems of energy, health, nutrition, technology and scientific discoveries. Texts are prepared in such a manner as to be able to be printed immediately in the weeklies. These texts are accompanied by photographs, with appropriate captions and titles.

Hebdo-science distributed three to five scientific articles free-of-charge each week to 230 French-language weeklies in Canada. More than 100 of these published at least one article on science per week. After the first year of operation, Hebdo-science began selling their texts on a subscription basis. To date, 60 weeklies have purchased this service. Readers have shown strong interest in the context of these articles. As well, Hebdo-science now offers a radio news service.

In June, 1979, Hebdo-science requested a renewal of federal funding from the three granting councils so that its work could continue. In October, it approached MOSST in this regard. Similar requests were sent to the Science Council and the Secretary of State. The Inter-Council Coordinating Committee (ICCC) discussed the Hebdo-science request for funding on December 10, 1979. The Committee did not view support for activities such as Hebdo-science as falling within the Councils' mandates. (The Social Sciences and Humanities Research Council, however, subsequently contributed \$20,000 to permit Hebdo-science to continue its activities.) The ICCC agreed, however, that MOSST should clarify the responsibility for developing a policy on the diffusion of popular science and the creation of public awareness for science. The development of such a policy is at present a major objective of the Science Council's study on public awareness.

4. Concluding Remarks

This case study has briefly described a specific, but very important, attempt by certain elements of the voluntary sector to increase public awareness of science and technology in Canada. The prime mover or coordinator of the activities involved in this endeavour was the Task Force on Public Awareness of Science and Technology, initially a committee of SCITEC but subsequently constituted as an autonomous body. In August, 1977, the Task Force submitted a proposal in two parts to the Minister of State for Science and Technology. Part one consisted of a project "that would culminate in the establishment of a continuing activity

to increase public awareness of issues bearing on science and technology and of a new network of relations among existing scientific organizations to provide a truly national framework for this activity and to fully engage the 'producers' of science in it". Part two of the proposal involved the development of a popular science magazine, namely, a revised Science Forum, which would become the communications organ of the new national activity or association.

The efforts and activities of the voluntary sector with regard to the Task Force on Public Awareness of Science and Technology provide some valuable lessons for, and point out the difficulties associated with, any future endeavours in this area.

For instance, there appeared to be general agreement that local organizations were a good idea, that one needed to begin at the grass-roots level; that one could deal with serious aspects of science and still interest the public; that a variety of forums (lectures, seminars, films, etc.) could be complementary means of getting a message across; and that goodwill and voluntary efforts were available but they are insufficient unless backed by adequate financial support.

Furthermore, it may be said that, owing to the efforts of the Task Force and the organizations and individuals associated with it, the public became more aware of certain S&T issues, as well as of the general need for greater interaction between it and the scientific community. In fact, the members of the Task

Force, in their submission to the Minister of State for Science and Technology had expressed their belief that the process of undertaking the proposed activities could well be as important as the final product, in that it would involve disparate scientific groups working together for a common goal.

The scientific community, as represented at the March 3, 1978, consultative meeting, did not support the establishment of a new national association to promote public awareness of important S&T issues and to increase communication between the public and scientists. Rather, it was decided that these objectives could be achieved by means of existing organizations. Strong support was expressed for undertaking a public awareness activity along the general lines of the Task Force proposal, particularly in terms of the need to involve the lay public at the community level.

The Task Force did not achieve its primary objective of establishing a continuing national 'activity' to increase public awareness of scientific and technological issues and to fully engage scientists in it. As the Task Force proposal outlined, this activity did not necessarily entail the creation of a new association and, in any case, as has been indicated previously, this approach was not acceptable to the scientific community. Yet the alternate methods which were decided upon also did not meet with great success. No "new network of relations among existing scientific organizations" resulted.

The five local groups founded as a result of Dr. Suzuki's visits to Ontario communities had short and ineffective existences. It appeared that these associations found it difficult to make the public more aware of their activities. Various explanations have been offered for this, including: (a) a lack of genuine commitment and support from scientists in the communities themselves; (b) a lack of continued funding (government support ended on March 31, 1979); and (c) poor organization (although the volunteer organizers brought a wide variety of professional skills to the project, these were not always the ones necessary for successful implementation of the associations' activities).

The dissemination of scientific and technological information in the French-language media, which constituted part of the Phase II activities of the public awareness project, seems to have met with a fair measure of success. The continued existence of Hebdo-science, however, depends on the availability of funding which, to date, has come predominantly from the federal and Quebec governments.

Another aspect of the public awareness project involved attempts to revise and invigorate Science Forum. Format, publishing and editorial changes were implemented, but these did not substantially increase the magazine's circulation and readership. The directors of Science Forum therefore felt compelled to request additional government funding in the form of bridge financing to permit private sector interests to assume publishing responsibility. This request was not granted. Consequently, Science Forum ceased publication with its June 1979 issue.

Several reasons may have contributed to the demise of Science Forum. Some that have been suggested include:

- (a) the failure to establish a national public awareness association or continuing activity. Science Forum was to serve as a selling point to attract membership to the new association or activity, and the membership was to serve as a continuing and extensive base for subscriptions to the magazine;
- (b) the lack of experienced business management;
- (c) poor marketing techniques;
- (d) the magazine's reliance on, and failure to obtain, external funding;
- (e) lack of dedication and contribution on the part of the scientific community;
- (f) choice and treatment of subjects not suited to the interests of the target public;
- (g) too high ambitions for the quality of the publication;
and
- (h) an unrealistic estimation of the size of the potential market.

As a final note, two central themes emerge from the events and developments associated with the public awareness project described in the case study. These elements, which are inter-related, are the need for (a) adequate and continuing funding, and (b) the commitment and support of the scientific community.

When one or both of these are lacking, as they were in varying degrees in the ventures initiated by the Task Force's project on public awareness, the successful implementation of activities to increase public awareness of science and technology would be very difficult, if not impossible, to achieve.

ANNEX A

METHODOLOGY FOR STUDY:
THE VOLUNTARY SECTOR AND
PUBLIC AWARENESS OF
SCIENCE AND TECHNOLOGY

METHODOLOGY FOR STUDY

As a first step in producing this particular study, the authors developed an outline of certain tasks they believed to be essential. These involved the identification of:

- (1) organizations, groups, societies and individuals active in public awareness of science, engineering and technology in the voluntary sector in Canada;
- (2) current and proposed public awareness programs and activities of the voluntary sector;
- (3) sources of support both in dollars and in "kind" for science public awareness, paying particular attention to private sector involvement;
- (4) the role, effectiveness and impact of national, voluntary public awareness efforts in relationship to local/regional voluntary efforts;
- (5) the role of the private sector in influencing the efforts of the voluntary sector in science public awareness and vice versa.

As we became immersed in the various aspects of the study, we found it necessary to make some adjustments to the original terms of reference. For instance, we thought that to properly deal with number (3) above, a questionnaire would be required. As this was not possible due to time and financial constraints, and as indications were that voluntary activity in S&T public awareness is at a fairly low level, point (3) became inconsequential

to this report. We also found it necessary to make certain refinements, rather than wholesale changes, which should not alter the basic concepts of the study and, indeed, may be quite beneficial.

In conjunction with Science Council officials, it was determined that information relevant to the study would be gathered by means of personal interviews (when possible), phone conversations and letters, as well as through previously written reports, brochures, newsletters, etc. Furthermore, a one-day workshop was held with representatives of certain voluntary associations, as well as MOSST and Science Council officials, to discuss various aspects of the voluntary sector's attitudes toward, and activities in, public awareness.

Again due to time and financial constraints, the workshop had to consist only of representatives of associations from Ottawa and Montreal who were available and willing to attend. These were:

- (1) Social Science Federation of Canada;
- (2) Youth Science Foundation;
- (3) Agricultural Institute of Canada;
- (4) Royal Society of Canada;
- (5) SCITEC;
- (6) Hebdo-science (ACFAS);
- (7) Science Focus;
- (8) Innovation Management Institute of Canada.

An obvious prerequisite for the study, as we saw it, was the compilation of a list or inventory of voluntary scientific, engineering and technological associations in Canada. It was decided that, for the purpose of this study, national associations

would be emphasized. A perusal of foundations and granting agencies was also done. Numerous sources of information were used to produce a list. The most useful were the following:

- (1) Scientific and Technical Societies of Canada. Canada Institute for Scientific and Technical Information, National Research Council, 1978.
- (2) The 1980 Corpus Almanac of Canada. Margot J. Fawcett, Editor/Publisher, Corpus, 1980.
- (3) The Canadian Directory to Foundations and Granting Agencies. Ed. Allen Arlett, Association of Universities and Colleges of Canada, 4th edition, 1978.
- (4) Scientific, Technological and S&T-Oriented Organizations. List compiled by Media Impact study, MOSST, 1975.
- (5) National Engineering, Scientific and Technological Societies of Canada. Allen S. West, Special Study No.25, Science Council of Canada, December, 1972.

As we decided that there was no reason to duplicate lists compiled by others such as the above, and due to time and other constraints, no specific inventory of S&T voluntary associations was produced for this particular study. An optimum situation would have been the compilation of an inventory of voluntary associations involved in public awareness of science and technology. This, however, would have entailed contact with each of the several hundred S&T associations to determine their public awareness activities, if any. This endeavour is judged to be well beyond the scope of this study.

After a determination of the names, types and quantity of the various voluntary associations in Canada which were oriented towards science and technology, decisions as to which organizations were to be used as sources of information were based on the following criteria: (a) availability of information as to names, addresses and telephone numbers of the officers of the associations; (b) limitations of time and finances for acquiring information; (c) previously-made contacts; and (d) previously-accumulated information.

Insofar as this study is concerned, information has been derived from the following voluntary associations:

- (1) Committee for the Understanding of Technology in Human Affairs;
- (2) Canadian Movement for Scientific Responsibility;
- (3) Canadian Society for Clinical Investigation;
- (4) Royal Society of Canada;
- (5) Youth Science Foundation;
- (6) Science Focus;
- (7) Agricultural Institute of Canada;
- (8) Ontario Secondary Schools Science Teachers Federation;
- (9) The Association of the Scientific, Engineering and Technological Community of Canada (SCITEC);
- (10) Energy Probe;
- (11) Canadian Committee for Nuclear Responsibility;
- (12) Science Institute (St. Andrew's College, Aurora, Ont.);
- (13) Canadians for Health Research;
- (14) Innovation Management Institute of Canada;
- (15) le service d'information Hebdo-science;
- (16) l'Association canadienne-française pour l'avancement des sciences (ACFAS);
- (17) Social Science Federation of Canada;

- (18) Ottawa Association for Science in Society (OASIS);
- (19) Science, Technology and You (STAY) in London;
- (20) The Kingston and District Science Association (KDSA);
- (21) Science Interest Group Niagara (SIGN);
- (22) Guelph/Fergus-Elora Science Forum.

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