

**SCIENCE IN ACTION:  
TALES OF THE CALGARY SCIENCE NETWORK**

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**WHO WE ARE: A SHARED PURPOSE**

The best thing about being part of the Calgary Science Network is the meetings. Considering that we all have too many meetings and resent the time we have to spend in them, that is remarkable. But these meetings are short, focussed and task-oriented. The members of the network share a vision and a goal and meet in order to get things done.

What is the Calgary Science Network? It is a fairly loosely knit group of individuals who, for a number of reasons, are interested in the public awareness of science. We represent a varied group: some of us are scientists, some educators, and some communicators of various sorts. Our president is a research scientist, now retired; our vice-president, a petroleum-geologist; our other board members include a science writer and a public information officer. We have educators, students and journalists among our members. A diverse group, but we share a goal: we feel that science and technology are a vital part of our lives and that it is important for everyone to know more about what drives this area of our society.

The Network brings information to the public at large. But, although some of its activities are for adults, some for high school students and some for the whole family, we have chosen to focus our efforts primarily on a very important group within that the public – elementary and junior high school students. Developing interest in science at an early age is a good strategy and an efficient use of our resources.

We have two primary areas of activity. During Science and Technology Week each October, the Network sponsors a number of events. In addition, as a part of our networking function, we attempt to keep track of all the various activities taking

place during that week. All these events are included in the publicity packages we generate for media release and we try to function as a coordinating body for all the groups involved. These groups range from the Calgary Zoo to the Canadian Society of Petroleum Geologists. Programs and audiences are vastly different, but the underlying purpose is the same – public awareness of science.

The driving force of the network is volunteers, and I will talk more about our volunteers later. But I can't emphasize enough that without volunteers we would not be able to function. And although that brings its own problems, it is also our greatest strength. We don't do this for money. All of us believe that public awareness of the importance of science and technology to our lives is vital.

### **WHY WE STARTED: SCIENTIFIC LITERACY**

What we really want to promote is sometimes called scientific literacy. Scientific literacy includes, not just an appreciation of science because it is fun and interesting, but also an awareness of the nature of S&T and its place in society. In order to understand the nature of S&T, there must be an understanding of how science works. Scientific method, hypothesis and testing of theories must be understood to some extent. In addition, the interdependence of science, mathematics and technology should be understood. And finally, science does not stand outside of society. People do science, and it always remains a human endeavour.

#### **WHAT IS SCIENTIFIC LITERACY?**

- Appreciation of the nature of S & T and its place in society
- Knowledge of how science works
- Awareness of the interdependence of science, mathematics and technology
- Recognition that science is a human endeavour

Scientific literacy is required in order for individuals to function effectively in a science and technology culture. What is more, it is also needed by municipal, provincial and federal leaders in order to compete effectively in the industrialized world. Finally, it is necessary, in a democracy, for individuals to understand what is essentially one of the most important driving forces of industrial society. If we are to make informed decisions, and therefore participate effectively in the democracy, we have to understand what the underlying principles of science are.

So, although many of us in the Network are excited by science, either by the doing of it, or the things it can teach us, that is not the only reason to continue to work for scientific literacy. Decision-makers and the voters who elect them need basic scientific knowledge to help them make decisions on vast numbers of public concerns, including: reproductive technologies, biotechnology, nuclear waste, acid rain, toxic waste, and other environmental issues, such as forestry, agriculture, composting and what is the best light bulb to use. All these issues have a basis in science and technology. How do you make solid decisions about the issues if you do not have any knowledge of, or interest in, the science that underlies them?

As we know from Edna Einseidel's 1990 study, the level of scientific knowledge, in general, is not high. When more than one-third of Canadians surveyed don't know that the Earth goes around the Sun, and more than half think that dinosaurs and humans co-existed, we have a problem. Although scientific literacy is not only a Canadian problem, Canada's record is not great.

#### CANADIAN BACKGROUND

- 30% of Canadian students drop out before obtaining a High School diploma.
- Canada spends less on scientific R & D than most developed countries.
- Canada has the fewest scientists and engineers per capita of all developed countries.
- Enrolment in science and engineering at Canadian universities is at a low level and declining.

The Calgary Science Network is one approach to building a more scientifically literate Canada. It has as its main advantage its community involvement – a volunteer base.

#### REASONS FOR A SCIENCE NETWORK

- The level of scientific literacy in the general public is inadequate
- Basic knowledge of S & T, essential for the citizens of a democracy
- Science and technology are needed for a competitive edge
- There is a shortage of scientists and engineers in Canada

## **IN THE BEGINNING: A LITTLE BIT OF HISTORY**

The Calgary Science Network is an affiliate of the Royal Society of Canada's Public Awareness of Science Committee and has as its objective to serve as a nucleus for a province-wide network in Alberta. It was initiated by a group of scientists who recognized that national learned societies, like the Royal Society, had not really achieved a great deal in the area of public awareness. In 1988, this group began to meet with educators and media representatives for informal discussions about the issue of public awareness of science.

As they met, they learned more about each other. They shared information about science curriculum, science fairs, science olympics, programs to encourage women in science and then began to understand what the problems were.

The group discovered that educators in the Calgary area were very willing to cooperate, and they are an integral part of the Network. In response to specific requests from the educators in the network, they began to develop programs like the Science Hotline, hands-on kits and other resources.

Getting information to the public via the media was a problem. Network members learned that reporting science takes some special skills and not every newspaper has a reporter assigned specifically to do science stories. The electronic media is even more difficult to access. Local radio stations have limited resources and television stations have too much competition for air time. Besides, it's often difficult to capture the importance of a science story in just a short sound or visual "bite". The network established links with the Canadian Science Writers' Association early on and worked with them to increase the possibility of getting science stories to the public.

The scientists who had started the Network became increasingly aware of the need to reach out to the public. Generally not a group that looks for contact with the media, it is recognizing the need for contact with the media and the educational community.

And so the Network developed with these general goals:

**Purpose:** The Calgary Science Network is an alliance of volunteers devoted to the promotion of public awareness of science, particularly among elementary, junior and senior high school students.

**Objectives:**

- A) To foster and promote the communication of science and scientific attitudes through all possible channels including the educational systems, the news, and broadcast media, and public displays and exhibitions.
- B) To stimulate local scientific and associated societies, agencies and business to become more involved in, and to promote, public awareness of science activities and attitudes.
- C) To serve as a coordinating body for the organization, and dissemination of information pertaining to activities directed toward the promotion of science to the public.
- D) To serve as a body with which other organizations may liaise and cooperate in order to meet objectives of mutual benefit.

**OUR AUDIENCE**

We target a broad audience – we are, after all, a network – but we tend to focus on students, in particular, on elementary and junior high students. Not a surprising choice: lifetime interests are developed at an early age and it makes sense to raise awareness in children if you want to create a long-term interest in any subject. Moreover, this group often has not had a very positive exposure to science from within the school system.

In Alberta, science is compulsory only until the first year of high school; after that it, becomes an optional subject. Students who are turned on by science before high school will continue in science, those who have been turned off, will drop it. That is another good reason to target students who have not yet reached high school. The final reason is logistics: this group is available to us in what is already a well-organized and accessible organization. The school systems in the Calgary area have been a crucial part of the Network.

There are a number of major influences on children's developing interests and we keep them in mind when we put our programs together. There are many, but, for our purposes, the main ones are:

- family and friends
- school
- the media

What this means for the development of scientific literacy is that we need to examine each of these areas and target activities. In all honesty, we do some better than others.

Children's friends are hard to influence. Science buffs do not usually have a good image. Changing the image of the "science nerd" is not an easy prospect, and is probably not the best place to start. But we can promote activities for the whole family and we do. There are events scheduled during Science and Technology Week that are particularly appealing to the family. These would include a Pet Rock Clinic at the Institute for Sedimentary and Petroleum Geology, and a star-gazing evening put on by the Royal Astronomical Society, as well as events at the Zoo and the Science Centre. Our most recent endeavour is the publication of a guide to all the science activities in Calgary – a resource for parents and teachers.

Influencing students during school time is probably what we do best. For the reasons I have already outlined, this is partly a matter of logistics. It is also due to the composition of the Network, which includes a number of educators. But it is also just good sense. Helping teachers and schools to make science fun and relevant is probably the most effective way to foster a scientifically literate society. For many teachers science, is hard. They didn't like it when they had to learn it and they don't find it easy to teach. The Network provides these teachers with a number of resources that can help them become excited about science and show them ways to make their students excited, too.

Television is probably our biggest competition. It is difficult to make anything as exciting as Ninja Turtles and it is equally difficult to design activities that move as quickly as the average advertisement, and require as short an attention span. And

yet that is the challenge that we face. The Network has done a number of media-related activities, but this is probably not an area that is easy to pierce. To date, our greatest success has been with print. The Calgary Herald has been one of our staunchest supporters, providing advertising space and two full pages for the winners of the science essay competition. Our one area of “media awareness” is a “Science Journalist for the Day” workshop that lets a relatively small number of students experience the process of developing science stories for print and radio.

## **WHAT WE DO**

The Calgary Science Network focusses on three areas during the year. A blitz of activities takes place during Science and Technology week in October involving all the network members and a number of other organizations. Some of the events are simply awareness builders, but others focus specifically on a teaching experience. For the Network volunteers, this week means a real buzz of activity. But our involvement does not stop there. Throughout the year, the Science Hotline continues its work forming a link between teachers and scientists. And we are broadening our scope. The Network’s newest project is the *Calgary Science Fun Guide*: a new resource for teachers and parents.

### **WHAT DOES THE NETWORK DO?**

- NATIONAL SCIENCE AND TECHNOLOGY WEEK ACTIVITIES
  - Opening Event
  - Science Essay Contest for grades 5 - 8
  - Science Drama for grades 4 - 9
  - Science Supplement in the Calgary Herald
  - Science in the Mall
  - Science Demonstrations
  - Pet Rock Fossil Clinic
  - Science Good Question
- CALGARY SCIENCE FUN GUIDE
- THE SCIENCE HOTLINE

## Science and Technology week

Science and Technology week was established by the federal government in 1990 and provided a useful focus during the first year of the Network. Volunteers from the network worked overtime, staffing a number of exhibitions throughout the week, including demonstrations of police science, fire-fighting technology and a number of exhibits of high technology industry.

Presently, organizations throughout the city organize events and set up science and technology displays, and the Network is more and more involved in publicizing and coordinating them. In addition, the Network sponsors a number of events. There have been some changes in focus and activities over the last few years, but a number of activities have found great success and become staples over the last few years.

**Kickoff event:** The kickoff event takes a slightly different approach each year, but always has as its goal promoting interest in S&T week. In 1991, the University of Calgary celebrated its twenty-fifth anniversary, and the university hosted the opening event for S&T week. One year later, hardy members of the Network turned out on a bitterly cold day to watch the Young Scientists of Canada pit scientific principles – in the form of a pulley system – against the combined muscle power of the University of Calgary football team – and win. Calgary’s October weather is just too unpredictable and so we changed venues in 1993 and held a science challenge – indoors. Young Scientists Club members and local media representatives battled to solve a number of scientific “puzzles.”

**The science essay competition:** For the last three years, the science essay competition has presented students with an unusual challenge: combining an interest in science with good writing skills to come up with a winning science essay. Winners get cash prizes and the opportunity to be a “Science Journalist for a Day”. Interest in the competition is strong each year and the students’ work is outstanding. As an added bonus, the Calgary Herald publishes the top essays on its science page.

**Science drama:** That’s not the only time art meets science. In a combination of song and story players, several drama troupes teach elementary school students about

ecology, photosynthesis, and so on. Several drama troupes visit schools in the Calgary area during S&T week. Thousands of students have the opportunity to learn some science in a most appealing way. Evergreen Coop, one of the drama groups, has taken its shows on the road in the last year, crossing Canada to demonstrate its unusual approach to science in centres from coast to coast.

**The Calgary Herald science supplement:** When does science hit the newspapers? According to a survey by the Canadian Science Writers' Association, not too often. But the Calgary Herald is the exception. During S&T week they publish an eight-page supplement dedicated to science and technology.

**Science in the mall:** Shopping becomes a whole new experience when science hits the malls. Each year during S&T week, a number of exhibits are set up in various shopping malls. Glass-blowing, slime monsters and science challenges add a new element to the standard Saturday fare.

**Science demonstrations:** Junior high school students are exposed to various kind of science demonstrations. Motion and Magic in Maths, and Chemistry Magic demonstrations add a new dimension to the study of science, and makes it not-quite-classroom-stuff.

**The Pet Rock and Fossil Clinic:** From the very beginning, the Pet Rock and Fossil Clinic put on by the Calgary office of the Geological Survey of Canada has been a smashing success. Everyone has, at some time or other, picked up an interesting-looking rock or fossil and taken it home. During S&T week, scientists from the Geological Survey are available to examine these rocks and fossils at the clinic and take the time to talk about their features.

**"The Good Question":** CBC radio's "The Good Question" answers only science and technology questions during S&T week. Science Hotline volunteers are the primary resource when the questions become difficult.

### **The Calgary Science Fun Guide**

Our newest initiative is the publication of a guide to the science activities available in Calgary. The Calgary Science Fun Guide includes listings of a large number of organizations that have a science component. As well, it includes simple hands-on

activities for children of all ages. Members of the network contributed to the guide. Parents and teachers have been enthusiastic about this useful resource. In less than six months, we sold our initial print run and are making a profit.

### **The Science Hotline**

The Science Hotline developed as an off-shoot of the activities around the first S&T week in 1990. Many of the volunteers of the Network came from institutions, societies or associations that had some kind of outreach program. Generally, they took the form of school visiting or career advisement. But most of these programs were informal and each one advertised to the teaching community independently.

A happy coincidence of volunteer initiative and the establishment of grants to support such initiatives resulted in the founding of the Science Hotline. With provincial and federal grants, the Science Hotline was established in July 1991. A steering committee of the Network hired one full-time staff member and by September of that year the Hotline was in full operation. Teachers can call the Hotline with science questions, to arrange for a classroom speaker or demonstrator, a field trip leader, career counselling, science club advisors, science fair judges and many more resources. The Hotline's slogan: "bringing teachers and scientists together" says it all.

The coordinator of the Hotline swings into action whenever a teacher calls. At that point she tries to match the appropriate scientist with the request. Probably the most important aspect of this particular service is the human touch. The hotline coordinator is a vital part of the process, often guiding the teachers in the choice of topic or the kind of help they need. She also does an extensive follow-up with both the teachers and the volunteer scientist. And the service has grown.

#### GROWTH

August 28, 1991 to June 27, 1992

July 1, 1992 to June 30, 1993

(1992)	254	Registered Hotline volunteers: scientists, engineers, technologists
(1993)	274	

(1992) 9,672	Students visited in their classes
(1993) 13,740	
(1992) 408	Classrooms visited by scientist volunteers
(1993) 581	

The use of the hotline increased about 40% in its second year of operation. Although the third year is still in progress, we expect a further 20% increase in the number of classrooms visited and students reached. As a result of the increased number of requests, the Network now uses part-time help in addition to the full-time coordinator during the busiest times of the year. With this help, it should be able to continue to maintain the present level of service, even if we continue to grow.

#### **HOW MUCH DOES IT COST TO RUN AND WHO SUPPORTS IT?**

We have grown and, as we grow, we need more money. Since 1991, our budget has increased by fifty percent. A substantial portion of our funding comes from provincial and federal grants. In particular, this funding allows us to continue to keep the Science Hotline going. For the remainder of our activities we rely on mainly on corporate donations. Fund-raising remains an ongoing concern, and in the present economy it takes time and commitment from the Network members.

Budget for 1991-1992	\$49,750
Budget for 1992-1993	\$64,050
Projected Budget for 1993-1994	\$75,000

The following support was received in 1992-1993

\$54,000	Grants: from provincial and federal governments, and the Royal Society
\$9,950.50	Donations: from private corporations
\$1,000	Other

### **WHERE DO WE GO FROM HERE?**

All of the activities of the Network rely on the strong commitment of its volunteer base. In this period of reassessment, it is clear that science and technology remain vital to our culture and our economy. Money is an issue for the network, as it is for almost every organization at this time. But, because so much is given to the Network in kind and, in particular, in time and energy by the volunteers, we do an enormous amount with a very small budget.

Educational institutions, corporations and government institutions that employ the volunteers also provide active or tacit support for the Network. As long as the scientists, educators and media representatives continue to believe that fostering scientific literacy is important, the Calgary Science Network will remain a successful example of a volunteer organization.