BCIT
BRITISH COLUMBIA INSTITUTE OF TECHNOLOGY
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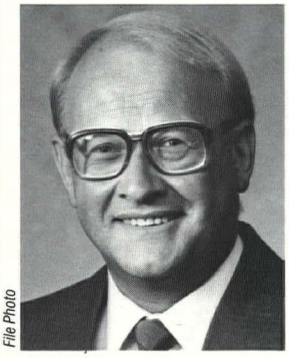
SPECIAL ISSUE
CONNECTION

ADVANCED TECHNOLOGY TO BOOST ECONOMIC GROWTH

The provincial government recently announced a new mandate for the British Columbia Institute of Technology. It emphasizes its redirection as a centre of advanced technology and its continuing role in the economic growth of the province.

"The mandate reflects the new direction the provincial government has set for BCIT," said Advanced Education Minister Stan Hagen at the time of the announcement last July. "Under this new mandate, BCIT will continue to support economic growth, enhance productivity and increase employment opportunities in the province in an important new way."

The new mandate statement for BCIT reads: The British Columbia Institute of Technology will be an innovative and flexible advanced technology enterprise which will focus on those initiatives that increase the level of entrepreneurial activity within the province. Specifically, BCIT will:


File Photo

Advanced Education Minister Stan Hagen: "BCIT will continue to support economic growth, enhance productivity and increase employment opportunities."

- establish expertise in specific technological areas and develop applications for British Columbia business and industry;
- facilitate technology transfer by providing innovation, industrial assistance and contracted applied research;
- provide a highly trained work force vital to the establishment and continuance of advanced technology in British Columbia.

Hagen also said his Ministry has undertaken a review of programs offered at BCIT and identified those more suited to be housed at other institutions and other programs more suited for BCIT.

"The new mandate is recognition and support for what we've been doing at BCIT," says President Roy Murray. "There is a definite attempt at program rationalization in the Lower Mainland and that is reflected in our new mandate."

The following proposed program transfers to and from BCIT are currently under review:

- To BCIT from Vancouver Community College —

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TECHNOLOGY CENTRE: A RESOURCE FOR THE PROVINCE

B.C. business and industry will be getting a big boost in the development of new technology with the assistance of a proposed BCIT Technology Centre.

The Centre will be an extensive resource and development facility working with business and industry to develop ideas and expertise in the field of high technology.

It is the latest move to fulfill BCIT's new mandate as it relates to technology transfer, contract applied research and the cultivation of student business initiatives.

The Technology Centre will focus on three main areas:

1) Contract Applied Research - On a contract basis, the Centre will work on specific product development or applied research projects of direct benefit to B.C.'s businesses and industries;
2) Industry Development - Technical specialists from the workforce will learn new technology through the Centre by way of short specialty courses and by visiting and assessing other business and industrial operations;
3) Enterprise Development - The Technology Centre will act as:

- a resource for applications to agencies that give technical assistance;
- a limited patent search service; and
- a development program for innovative student business initiatives ('student incubation').

"It's a resource for the province," says BCIT President Roy Murray. "Although it will be located on the BCIT campus, it's a separate organization that will serve business and industry and focus

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Security Alarm Installer, Power Engineering, Electricity and Industrial Electronics, and Computer Systems Technology Program.

- From BCIT to VCC — Hospitality Diploma Program, Cooking, Baking, Meat Cutting, Meat Wrapping, Sausage Making, Banquet Cook.
- From BCIT to Douglas College — Health Information Technology, Upholstery, Appliance Repair.
- From BCIT to Capilano College — Horticulture.
- Other proposed program moves —Bricklaying to Kwantlen College; Embalming apprenticeship and Piledriving will be delivered by industry.

"We will continue to work closely with the Ministry of Advanced Education and Job Training to ensure a smooth transition for staff and students," says BCIT Board Chairman Ed Taylor. "We at BCIT are excited about the challenges of our new mandate and we look forward to positive developments for the institution in the future."

The new mandate gives BCIT responsibility for new technology and its impact on economic development, says President Murray, which means the preconceived notion of BCIT's place in the hierarchy of post-secondary institutions will change.

"Our concept of programming courses will change," he says. "We won't only be offering one and two year programs. We'll be designing variable length programs to meet client needs.

"Some of these new programs will be delivered to university grads, engineers for example, who will come to BCIT for specialized training in a new technology."

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exclusively on applied research and technology transfer.

"TRIUMPH and Discovery Park are good examples of the same concept."

The student incubation program will provide an opportunity for students to develop their innovative ideas at the BCIT Technology Centre for a short period after graduation. They will learn about creating a business plan, crucial steps in product development and how to raise venture capital for their ideas.

The Technology Centre will be staffed by a broad cross-section of experts seconded from BCIT, other universities and colleges, and business and industry. But such involvement will not be limited to the BCIT campus or even the Lower Mainland. Experts may be involved in the Centre while remaining in their own community.

The Technology Centre will be an autonomous organization with its own advisory board, director and small staff. It will also be an integral part of academic activities at BCIT, which has the labs and equipment necessary for applied research activities.

Expertise will be developed in technologies that can be applied in various sectors of the B.C. economy. New applications in electronics, for example, will be sought in the health care industry. More applications for telecommunications and computers will be sought in the manufacturing industry and biotechnology expertise in the resource industry.

Initiatives in applied research and technology transfer are not new at BCIT. Two years ago, the Institute started the Development Assistance Centre (DAC) to support such activities. DAC is a non-profit organization, funded by the provincial government, which is responsible for ensuring that applied research at BCIT is not in unfair competition with the private sector and that the Institute receives adequate compensation.

Although the DAC will be phased out, the components of the DAC associated with marketing BCIT expertise to business and industry, patent search and resource assistance will be incorporated into the new technology centre.

The Technology Centre hopes to achieve ambitious results within its first three years of operation — $4 million of contract applied research, technology transfer to at least 75 current companies in B.C., "student incubation" opportunities to at least 30 new graduates, and the initiation of 15 new companies.

CHAIRMAN SAYS BCIT MUST STAY CURRENT

BCIT is facing a challenging and exciting future, according to Board Chairman Ed Taylor. Armed with a new mandate, the Institute looks to the future with a clearer direction than it has had in the last five years, he says.

"For the first time in a long while, we have a direction from the government as to where it wants us to go," says Taylor, a Comptroller and company officer for Crestwood Forest Industries of Cranbrook, B.C. "But more importantly, the government has a clearer direction in its own mind for BCIT.

"We have always known why BCIT programs are different from college programs, for instance, and why students choose BCIT instead of colleges. Now, I think we have succeeded in communicating these important differences to the government."

The new mandate states that BCIT will develop state-of-the-art technology and prepare highly trained individuals to fill positions in industry. As a result, Taylor suggests, more funding for BCIT may be forthcoming.

"Our ability to provide students with that edge in education has been eroded somewhat in the past five years," says Taylor, whose company employs about 15 BCIT grads.

"One of the vice-presidents in my company recently told me that while the quality of BCIT graduates is still very high, he is concerned that the equipment used in some of the programs is rapidly being outdated.

"Our industry and industry in general is moving ahead very rapidly with new technologies. One would expect that students hired out of BCIT would have had at least some exposure to current technology, if not more.

"We're going to have to ensure that BCIT grads stay up-to-date."

File Photo

Ed Taylor, Chairman of the BCIT Board of Governors: "Armed with its new mandate, BCIT faces a challenging and exciting future."

Taylor says the proposed BCIT Technology Centre is one of the opportunities to keep the Institute current. He says it is a two-way benefit: the province and industry get immediate access to the vast pool of expertise at BCIT and BCIT faculty have the opportunity to maintain their currency.

He says he is disappointed with the departure of President Roy Murray, whose leadership and vision will be sorely missed by BCIT.

"He has an enthusiasm about him that inspires loyalty and hard work among the staff," says Taylor. "That is a rare quality to come by, and we're certainly going to miss him."

Taylor, meanwhile, is finding his own job challenging, to say the least. He took over as Chairman July 1, 1988, but has been involved on the Board of Governors since 1983, during which he served on three different committees. The new job is a bigger commitment, he says, having to divide more time between Cranbrook and BCIT's Burnaby campus.

"It's certainly a stimulating job, and I'm enjoying it a great deal," he says. "I want the Board to establish a closer relationship with the government over the next few years, so that BCIT's needs are better understood.

"We've addressed that in recent activities. It can only do us good."

ROY MURRAY LEAVES BCIT POISED FOR THE FUTURE

"Institutions like BCIT must forge stronger links with business and industry," says BCIT President Roy Murray.

"I have been committed to that process," he adds, "through applied research, co-operative education, sharing faculty expertise with industry, and through industry advisory committees on campus."

President Murray, who recently resigned his post to become President of Confederation College in Thunder Bay, Ontario, reflects on his tenure at BCIT with a feeling of accomplishment. In his three-and-a-half year term, he has seen the institution through a merger and some of the most turbulent financial times it has ever faced.

Now, with a new mandate firmly established, Murray feels the Institute is finally heading in the direction he envisioned when he took the helm in mid-1985.

"BCIT is a great institution and I will be sorry to leave it," Murray says. "The Institute has been suffering under severe financial problems and these must be resolved so it can get on with fulfilling its mandate."

Roy Murray took on the top position at BCIT just six months before the scheduled merger between BCIT and Pacific Vocational Institute.

"The merger," he says, "had the potential to be a disaster — merging two unions and financial and administrative systems, facing the necessary layoffs and getting employees to recognize a single institution."

While fine points are still being settled in some areas, Murray says the most difficult challenges are over, thanks to the consultative process that created an open, participatory staff/management relationship during the transition.

"We used single team, non-conflict bargaining," says Murray. "We told people that regardless of all the tough decisions that have to be made they will be given a chance to express their views and that those views will be taken into consideration.

"As a result of that, I think we made the tough decisions, we progressed rapidly and we did it without alienating the employees."

In the midst of the merger, Murray and his staff were also trying to forge a new direction for BCIT, one that went beyond the concept of BCIT as simply a training institution. The idea was to make

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File Photo

Former Chairman of the BCIT Board of Governors, the late Malcolm Wickson with Prime Minister Brian Mulroney.

MALCOLM WICKSON REMEMBERED

"He was a great contributor to this institution," recalls President Roy Murray about the late Malcolm C.J. Wickson, Chairman of the BCIT Board of Governors from 1983 - 1988.

Wickson's death on April 9, 1988 was felt at all levels of the Institute. During his period on the Board, he recognized the accomplishments of the faculty, staff, students and graduates and worked tirelessly to establish BCIT as a premier educational institution in Canada.

Wickson played a major role in the amalgamation of the British Columbia Institute of Technology and Pacific Vocational Institute and faced the challenges of building a new institute. In eulogizing Malcolm Wickson, President Murray stated, "We all owe him a debt of gratitude for his tireless efforts on behalf of BCIT. His contacts with federal and provincial governments, captains of industry and the community, helped me tremendously as we merged the two institutes, bonding and shaping them in his vision, which we both shared, making BCIT the finest institution in Canada."

For many years, Wickson served the Progressive Conservative Party of Canada, in Ontario and British Columbia, beginning as a party worker, then as an organizer, planner and strategist. He gave to the BCIT Board of Governors the same unselfish commitment that he gave to his political work.

Malcolm Wickson's years of dedication to BCIT have been honoured by the establishment of the Malcolm C.J. Wickson Memorial Endowment Fund. The fund will provide financial aid to BCIT students who have demonstrated a combination of high academic achievement and leadership.

The Honourable John Fraser, Speaker for the House of Commons and a boyhood friend of Wickson's, serves as Chairperson of the Honorary Committee. Senator Norman Atkins, Leader of the Senate, is also actively involved in raising funds.

A goal of $100,000 has been set for the endowment of the fund and this amount will be matched by the Provincial Advanced Education Endowment Fund. Donations received for the Malcolm C.J. Wickson Memorial Endowment Fund will be administered in trust by BCIT. The capital will be invested and the income it generates used to provide the awards in perpetuity.

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optimum use of BCIT's highly specialized expertise in technology and contribute more directly to the provincial economy. The Institute would take more of a role in applied research, product development and technology transfer than it had in the past.

Murray discussed his vision of BCIT's expanded role with then Education Minister Jack Heinrich and received his support. The immediate result was the creation of the government-funded Development Assistance Centre (DAC), a non-profit organization closely allied with BCIT that oversees applied research at the Institute.

"This single concept of taking our technological expertise and contributing it directly to business and industry has given new life to BCIT," says Murray. "It has ignited BCIT people to develop their ideas, working more closely with business and industry.

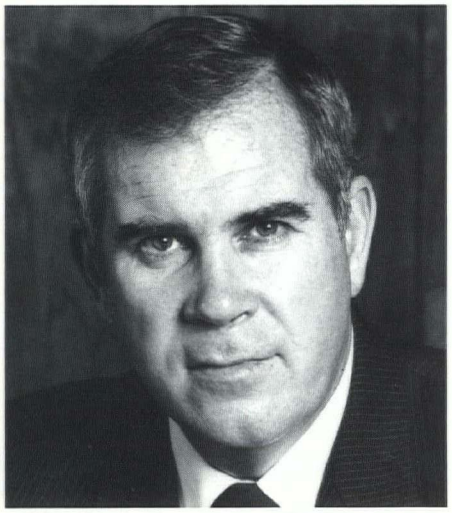
"The Applied Research in Computer Systems (ARCS) Laboratory is a perfect example: the concept of applied research and working with business and industry in problem-solving. ARCS is a very vital program and we are trying to encourage other projects in this vein." (See article in this issue).

BCIT's role in applied research was recently formalized in its new mission statement, which also resulted in the formation of the Technology Centre. The Centre will act as an extensive resource and development facility in the field of high technology.

The expanded purpose of BCIT has also led to a number of important co-operative projects between the Institute and business and industry.

"Industry is now seeing the Institute as their own resource," says Murray. "Educators must be partners with industry in the educational process because they are the consumers of the end-product — highly qualified grads. They have the ultimate decision over who they will hire."

Murray's personal involvement with provincial and national government bodies has given him the opportunity to develop ideas and contacts that have benefitted BCIT. His appointments to the National Research Council of Canada (NRC) and the B.C. Premier's Advisory Council on Science and Technology has projected a new image for the Institute on the role that it intends to play in science and technology.



File Photo

BCIT President Roy Murray: "BCIT is a great institution and I will be sorry to leave it."

Among his many other accomplishments as BCIT's President, Murray is particularly pleased with the establishment of the Sea Island campus for aviation programs. He remembers the day it happened.

"One of my staff, Jerry Lloyd, walked into my office one morning and told me Pacific Western Airlines was selling its hangar on Sea Island. They were already considering an offer of $2.8 million, but I phoned Rhys Eyton (Chairman and CEO of Canadian Airlines International Limited) anyway.

"Jerry and I were on a flight to Calgary at 12 p.m. We met him in the afternoon and within hours had a tentative purchase agreement for $1.3 million, which would require provincial approval. We flew back home at 5 p.m.

"All in a day's work!" he adds with a grin. "Little did we know that government approval would take almost a year."

Murray says the additional hangar space allowed the aviation program to expand to meet the national curriculum and increased the potential for further industry co-operation.

"The Sea Island hangar was partly a gift," he adds. "It was our initiative plus Pacific Western's desire to do something with the institution.

"The facility is just booming."

Murray says one of the most exciting prospects for the future is the growing involvement of business and industry in post-secondary education. Both now regard education as increasingly important and have taken a more active role in it.

"Competition has gotten tougher not only locally, but globally," he says. "Employees have become a more important resource than they have ever been before. Business and industry have realized that if you want good employees you'd better make an investment in them because they now have the ability to move like baseball players, especially engineers or good technicians."

With joint training programs, Murray believes BCIT will be turning out graduates who are more responsive to the needs of industry than ever before.

"It's a two-way benefit," says Murray. "A co-operative training program gives industry the chance to assess students before they graduate and our students have the benefit of exposure to state-of-the-art equipment and labs."

President Murray sees exciting possibilities for even greater co-operation in the years ahead.

"Institutions like BCIT are a wonderful resource for business and industry," he says. "They're now making better use of this resource and are recognizing the great potential for mutual benefit in the future."

GRAD LEARNED SMALL BUSINESS SKILLS

It isn't every day that Kim Miller gets a request for an RCMP officer on horseback to ride through the Bayshore ballroom, but when she does, the BCIT grad considers it all in a day's work.

"I have this theory that nothing is impossible," says the 25-year-old President of Simply Everything Services Inc., a company that offers a range of domestic and business services as broad and varied as the name implies.

Miller graduated in 1984 from the two-year Small Business Development Program. Her initial intention was to go into retail management and after graduation she joined Canadian Tire in their management program. After two years with the company, Miller found that her love of small business urged her to explore opportunities on her own.

She and her partner, Marion Bell, explored a number of possible business opportunities before they finally settled on the concept of Simply Everything. Another six months of thorough demographic and financial research, which included marketing surveys and focus groups, convinced them that they had a winning idea.

"BCIT gave me the tools to analyze an opportunity," says Miller of the Small Business Development Program. "We learned to look at marketing from a small business perspective — advertising, accounting, evaluating business opportunities, market research — all from a very realistic point of view.

"BCIT taught me that if I didn't know something, I could find out. I had no hesitation about using all the information resources available — the Federal Business Development Bank, the provincial government and the major banks."

In one-and-a-half years, Simply Everything's customer base has grown to 350. Eighty per cent are regular customers requiring the basic domestic services, such as cleaning, errands, shopping, child care, catering and anything else this busy clientele doesn't have time to do. The other 20 per cent represents one-time-only requests for specific services, such as the RCMP officer on horseback.

"That was one of our most wonderful jobs," recalls Miller. "It was for a convention of banking delegates from North and South Carolina. The theme was Canadiana and the horse and rider were the opening event.

"The doors swung open and the horse and rider bowed. They weren't supposed to bow but they were too tall to get through the door. All 450 delegates rose to their feet and applauded. I thought the horse was going to bolt and the head of hotel security looked at me and asked 'how much insurance do you have?'"

The horse remained calm and was followed by a bag and drum corp, the happy culmination of three months of organizing on Miller's part.

Miller works with 185 companies in Vancouver to provide Simply Everything's services, ensuring that references are checked and guarantee policies fit with her own. Many new contacts result from the myriad of requests she receives.

Photo: Brian Gauvin

Kim Miller, President of Simply Everything Services Inc: "BCIT gave me the tools to analyze an opportunity."

Miller credits her farming background in rural Saskatchewan as part of the reason for her entrepreneurial savvy. "Every day you get up in the morning and work for yourself."

But, she says, many people with good ideas fail at small business because they are not realistic about business opportunities and their likelihood of providing financial return.

Since her student days, Miller has continued to be involved with BCIT. She sits on the advisory committee to the Small Business Development Program, guest lectures once a year, and is helping to develop a guest lecture program.

"I love the fact that I can go back to BCIT anytime, buy someone a coffee, discuss my business ideas and get advice."

WESTINGHOUSE DONATES TEN PROGRAMMABLE LOGIC CONTROLLERS

Keeping in touch with graduates of his Process Automation and Instrumentation program paid off last Spring for BCIT Program Head Ted Upward.

A former student of Upward's, now working at Westinghouse Corporation in Vancouver, phoned "out of the blue" and told him the company was looking for colleges or institutions to which to donate equipment.

The piece of equipment, a Programmable Logic Controller (PLC), was crucial to Upward's program. He was currently operating with only one, which had to be shared among 18 students.

"I was on the phone to Westinghouse immediately and subsequently had Ross Bailey of our faculty make a submission to the company within the hour," says Upward. "We sent it on the Fax machine."

This September, Westinghouse presented BCIT with 10 PLCs worth an estimated $1,000 each. They also sold the Institute 10 programmers for the units at 50 per cent off the retail value.

"This was such an enormous opportunity for us that it couldn't be missed," says Upward. "If you're going to have relatively large classes and have to get something done, then everybody in the class must have one. It is very much like computer programming. You can't have one terminal for 18 students."

PLCs are computer-based devices used to control various automated processes in industry. Invented by the automotive industry in the late 1960s, they have revolutionized industry in the way computers have revolutionized business. They replaced the costly and cumbersome electro-mechanical relay systems that controlled the on/off functions in automated processes.

PLCs are used extensively in the automotive, pulp and paper and petrochemical industries. They are also used to control heating, ventilation and air conditioning in large buildings.

"Today, they are being refined to the point where they meet all kinds of special requirements in industrial work," says Upward. "They are the single most pervasive element today in terms of automation."

The equipment went right to use in the Fall 1988 program, and it has enabled Upward to start a new course on PLCs in distributed computer systems in January 1989.

"The timing of the Westinghouse donation was very fortunate," says Upward. "There is a great need for training and upgrading on PLCs and these new units will be of great benefit to us in meeting that need."

Photo: Ken Gill

Westinghouse Sales Representative John Lomas (right), presents Electronics Technology Instructor Ted Upward with a Westinghouse donation of 10 Programmable Logic Controllers for the BCIT Process Automation Program.

BROADCAST COMMUNICATIONS GRADS SET THE STANDARD

BCIT has graduated more than 1,200 professionals from its Broadcast Communications program, one of the original technologies taught at the Institute when it opened its doors almost 25 years ago.

Broadcast Communications Associate Dean, Brian Antonson, recently looked into the number of graduates who are working in television or radio in the Lower Mainland. He counted 86 who appear "on-air" on a regular basis. That number doesn't include the grads in "behind-the-scenes" work, such as production or management. Nor does it include further legions of grads who have dispersed throughout the province and across the country, and to the U.S. and abroad.

"Broadcast Communications alumni are everywhere in the industry," says Antonson, himself an early graduate of the program. "Our graduates have become an industry standard, trained to enter the market place. When industry people say 'I want a BCIT grad,' everyone knows what they're talking about."

Why is the program such a success?

"Number one, because we are very close with people in the industry," explains Antonson. "We have their support in the form of an extensive Advisory Committee and we listen to them."

Photo: Brian Gauvin

Broadcast Communications Associate Dean Brian Antonson (standing) looks on as Television Instructor Rob Nason (front) takes students through a live production.

Antonson explains that the program turns out three "streams" of students over a two-year period, specializing in radio, television, and broadcast journalism. An Advisory Committee of more than 40 industry representatives, divided into sub-committees for each stream, provide regular feedback and direction to the program.

"A number of people on the Advisory Committees have said the reason they stay involved is that we listen to what they say," says Antonson. "It's not just a rubber stamp situation. We take criticism, we take advice and when they meet later, they see that we've acted on their advice."

Originally, Broadcast Communications students were trained in all three areas and were graduated as "general broadcasters," Antonson says. But as the industry became more specialized, the BCIT program evolved into the current structure.

Radio and television students are given a range of basic skills, from operation and commercial copywriting to production and feature work. While the radio program includes more "on-air" work, television students are taught entrepreneurial skills to reflect the increasingly freelance nature of the medium. Broadcast journalism students are trained for news work in either radio or television.

But there is another reason why Antonson believes Broadcast Communications is so highly regarded.

"We do an excellent job here at BCIT," he says. "The industry time and again hires our students. BCIT has built a reputation for turning out superior people and they just keep getting better."

Photo: Ray Young

Members of the Canadian Association of Equipment Distributors (CAED) present BCIT Heavy Duty Mechanics student Dan Noske with a $250 award of excellence in an October ceremony: (l to r) Stanley Rust, National Vice President, CAED, Bill Cosulich, B.C. President, CAED, Ed Wilk, Instructor, Heavy Duty Mechanics Program (in background), award recipient Dan Noske, Len McNeely, Dean of Trades, and John Hopper, Executive Vice President, CAED.

Photo: Brian Gauvin

Chief Instructor for BCIT's Aviation Program Peter Mills (left) discusses maintenance procedures for the Alouette III helicopter with student Peter Devito.

FEDERAL GOVERNMENT DONATES ALOUETTE III HELICOPTER

When Bill Foyle heard there were two government-owned Alouette III helicopters up for sale, he knew he had to have one for his Aircraft Maintenance Program at Sea Island campus.

Foyle, Associate Dean of Aircraft Programs, advised BCIT President Roy Murray of the availability of the helicopter. Murray, on behalf of the BCIT Board of Governors, contacted then Federal Minister of Supply and Services Michel Cote, Minister of Transport John Crosbie and Tom Siddon, MLA. The late Malcolm Wickson, then Chairman of the BCIT Board, was instrumental in demonstrating the need to donate one of the Alouette IIIs to BCIT. Also because of Wickson's efforts, the government donated the second helicopter to the Southern Alberta Institute of Technology.

"We're very fortunate to have acquired the aircraft for the program and thankful to the federal government," says Murray. "We have no capital for expenditures of this magnitude, so it's a real coup for the aircraft maintenance program."

Foyle estimates the market value of the helicopter at about $50,000, tools and parts another $75,000. The Alouette III, built in 1966 by Aerospatiale in France, was formerly used by the Canadian Coast Guard in Victoria. Foyle says it will be used for all maintenance, operational checks and ground runs.

"Now that we have a hangar large enough to house all the airplanes, we're getting them in better condition and we're getting much better utilization out of them as well," says Foyle.

Aircraft Maintenance students learn from being able to do general maintenance on the aircraft. They also carry out inspections, make minor repairs, and do run-ups (starting up the engines) as they prepare for careers in the aircraft industry.

"All eight classes of 18 students each get to work on the aircraft," says Foyle. "Students in the Structures course also benefit."

Aircraft Structures students learn the basics of repairs to aircraft structures.

GENERAL MOTORS CONTRACTS BCIT FOR TRAINING MECHANICS

Auto manufacturers are finding that technological change is outpacing training, says Terry Fletcher, Chief Instructor of the Automotive Program. If an increase in the number of training hours doesn't take place soon, there will be a shortage of technicians to repair the vehicles.

"In 1965 a mechanic would have had to read 5,000 pages of information to qualify or be competent to work on any vehicle," says Fletcher. "In 1989 he would have to read over 460,000 pages."

Alarmed about this trend, General Motors of Canada approached the Institute to provide ongoing training to its British Columbia dealership mechanics. A contract was soon drawn up that now involves BCIT instructors Rob MacGregor and David Ney delivering courses to GM technicians at the company's Vancouver headquarters. Eventually, the training courses will be delivered to GM people on the BCIT campus.

"General Motors came to us because their facilities will not allow them to train their people at the rate required," says Fletcher. "They don't have the instructional staff or the space to meet the training requirements for their product and industry. They've approached training institutions across the country and in the United States as well."

The Institute is currently negotiating the next phase of the training contract, which would involve BCIT, General Motors and the provincial government in a new apprenticeship training program for GM apprentices throughout the province.

Photo: Brian Gauvin

As part of a joint BCIT/GM Automotive Technology Program, BCIT Automotive Instructors David Ney, (third from left) and Rob MacGregor (extreme right) go over new GM Tracker manual with a class of GM technicians and dealers.

CEOs LEARN COMPUTER BASICS

Last September, members of BCIT senior management found themselves trying to explain DOS, word processing, computer spreadsheets and other concepts to a class full of executives.

It was a unique introductory computer course put on by BCIT for some of Western Canada's top CEOs. The idea was the brainchild of President Roy Murray, who had been approached by many CEOs to offer a hands-on computer program.

"The President found that many of these people knew little about computers, and that they wanted to learn a few basics," says BCIT Student Services Vice-President Paula Pick.

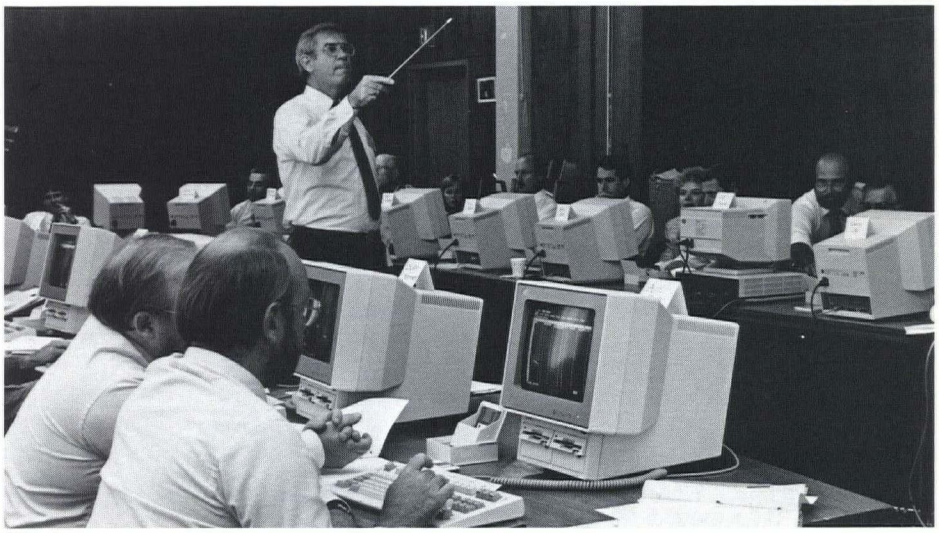
The group of VPs, deans, directors and associate deans enlisted the help of the Computer Services department to coach the tutors on points to be covered and to provide software and learning materials. IBM, a long-time supporter of the Institute, provided 25 PS/2 micro-computers and much appreciated expertise.

The executives were given an overview of standard hardware components and an introduction to disk operating systems. There were two sessions on application programs, including word processing and spreadsheets, the latter of which was taught by President Murray. Sessions on artificial intelligence and the "electronic office" rounded off the program, and there were optional tours of four high-tech computing activities at BCIT.

"One thing we had to do was pull together as a team," says President Murray of the BCIT teaching group. "It took a great deal of planning and co-ordination and everyone worked hard to make it a success."

Judging by the course evaluation forms, the BCIT instructors delivered a winner. The executives invariably said they felt more comfortable with computers and would like to take additional courses.

Vice President of Education Brian Gillespie offers a few computer tips to President's Club Chairperson Marie Taylor during BCIT-sponsored Computer Course for Executives last September.



Photos: Ken Gill

BCIT President Roy Murray teaches the Lotus 1-2-3 spreadsheet section of last September's CEO Computer Course.

NATIONAL RESEARCH COUNCIL ASSISTANCE PROGRAM OFFERED THROUGH BCIT

The National Research Council's Industrial Research Assistance Program (IRAP) offers Canadian industry a wide range of services and expertise to help stimulate a firm's productivity, profitability and international competitiveness.

Through the IRAP program, the National Research Council has worked side-by-side for over 65 years with small and medium-sized companies to improve the economic development of Canada.

The services offered by IRAP can be accessed through an Industrial Technology Advisor (ITA). Through the ITA network, the firm can draw upon the substantial technical, scientific and engineering expertise available not only at BCIT, but through various public and private organizations.

BCIT currently has two ITAs working on campus, both positions jointly funded by the NRC and BCIT. Owen Edwards is on leave from his position as an Instructor in Mechanical Systems Technology at BCIT and Dennis McKintuck took on the ITA position last summer. Both Edwards and McIntuck report to the BCIT Development Assistance Centre and work for BCIT. Their role is to serve a multitude of businesses that require technological assistance. After examining the company's problem, the ITAs offer their help and, if necessary, they return to BCIT and arrange to use the skills and expertise of the faculty and staff of the Institute, setting up a course of action that will assist the company.

There are several types of IRAP programs designed to meet the varying needs of B.C. companies. If you feel the National Research Council's IRAP program may benefit your company, please call BCIT.

ARCS LAB LEADS IN SOFTWARE DEVELOPMENT

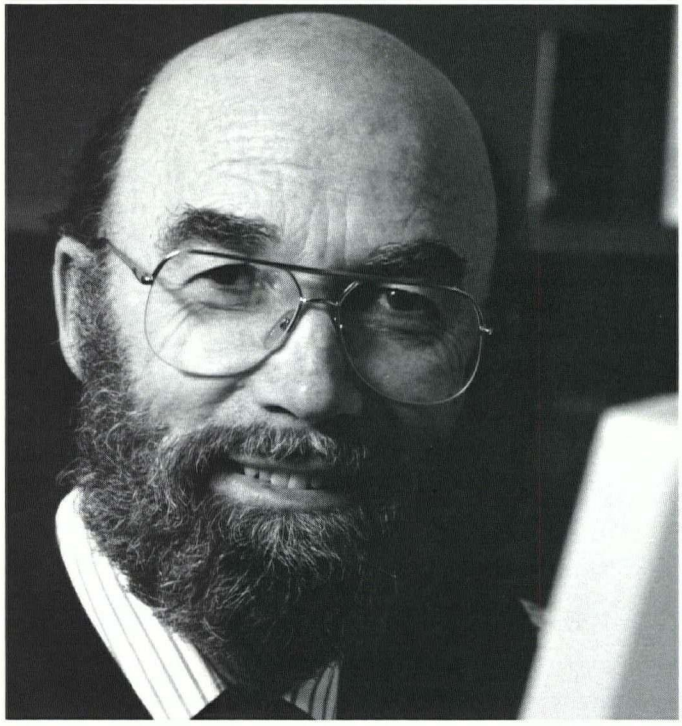


Photo: Brian Gauvin

Dr. Michael Scriabin: "Canada can be number one in software development in the world. We have the means and we have the talent right here."

Since its inception four years ago, BCIT's Applied Research in Computer Systems (ARCS) Laboratory has worked on applied research contracts for some of North America's foremost high tech firms, including IBM, Microtel Pacific Research, Control Science Corporation, B.C. Tel and UNISYS.

Its work in the field of Artificial Intelligence (AI) and expert systems has attracted attention from around the world, and ARCS Lab director Dr. Michael Scriabin and "knowledge engineers" Stephen Bisanz, Geoffrey Lakeman and Sandy Place were recently invited to address an international conference on AI at the University of Tennessee Space Institute.

Scriabin was also asked to give a series of seminars and lectures at the Hong Kong Polytechnic Institute.

"All it takes is the right people and a commitment from government and industry to subsidize research in this area, and we in B.C. and Canada could be number one in software development," says Scriabin.

The ARCS Lab was established in 1984 by Scriabin, who was then head of BCIT's Computer Systems Technology (CST) program. At first, the Lab received funds indirectly from a $102,000 grant from ABC Technology Inc. to fund continuing research and development work at BCIT. Graduates of the CST program were hired to work on projects and Scriabin maintained a full teaching load.

Scriabin attributes BCIT President Roy Murray with recognizing the Lab's potential and, in 1987, seed money was given to establish a full time staff of six knowledge engineers with Scriabin as full time director.

The term knowledge engineer has been carefully chosen to reflect that the professionals are not limited to one of the many fields related to computers systems.

Scriabin, who has worked with computers for 36 years, is careful to cultivate a team approach in the lab. Members share new developments with each other, even if working on different projects.

As new programming tools are developed, the knowledge engineers co-operate to make them generic to many applications, and they are added to the Lab's "toolkit." These techniques can then be incorporated into new projects, speeding up development time. Sometimes a task which took a month the first time it was undertaken, takes only a day or two the next time.

In a very real way, Scriabin says BCIT's ARCS Lab is providing a model for the type of mutual commitment from government and industry that will make B.C. and Canada leaders in the field. There are currently five Vancouver companies that have applied to the B.C. government's Science and Technology Fund for jointly-funded applied research projects with the ARCS Lab.

"What we are doing in these joint efforts with B.C. companies is technology transfer in a big way," says Scriabin.

"It's not something we should be regarding as a side line at BCIT. It's an important way of quickly updating companies and their personnel now, not years from now when a BCIT graduate walks in and changes things."

After a recent project was completed for B.C. Tel, the company broadened the scope of its own proposed Expert Systems Group and renamed it the Emerging Technologies Group.

"Our work is very much applied and oriented towards solving company's problems," explains Scriabin. "At BCIT and in the ARCS Lab, we are not measured by the number of publications we have in academic journals; we are measured by the clients' satisfaction. That hinges on how well we solve their problems, and if it requires a mixture of four or five techniques, then we'll use them."

The ARCS Lab has received recognition for its work in Symbiotic Systems which incorporate "intelligent" computer systems with the creative, human ability to recognize patterns and images. Computer and human user interact in a "synergistic" fashion, each helping the other to achieve better and better solutions to the problem.

A Symbiotic System was recently implemented to solve nurse scheduling problems at Kelowna General Hospital, where three sets of union regulations entered into the process, on top of the usual complexities of creating timetables. The system, designed by knowledge engineers Brandon Bell, Bruce Kenny and Sandy Place, involves a large spreadsheet on which different shifts are booked. A pattern-matching algorithm, operating in the background, notifies the user of conflicting shifts and patterns that violate union rules.

Scriabin credits BCIT's Fred Martin with providing the basis for a creative team in the ARCS Lab. The knowledge engineers are graduates of Martin's Expert Systems Option of the Computer Systems Technology program.

"Things change so quickly in computers that it is difficult to stay on top of all the innovations," says Scriabin. "Our way of doing things here enables us to spend time on only new work with computers, not wasting time rewriting old solutions."

Photo: Ken Gill

Not much larger than a Honda Civic, the BCIT-designed Beaver can haul four to 10 ton logs out of a stand of second-growth timber. Stephen Hutchinson, graduate of the Heavy Duty Mechanics Program, handles the remote control on this early Beaver prototype.

NEW MACHINE ANSWERS PROBLEMS IN SECOND GROWTH FOREST MANAGEMENT

It's six feet wide, five feet tall, 11 feet long, and can haul three-ton logs out of a thickly treed stand of timber. It's radio-controlled, its four large wheels are separately hydraulically-powered and it can compete with any traditional wheeled skidder.

It's called the 'Beaver' and the BCIT-associated Gen Two Ecological Equipment Ltd. thinks it is the answer to cost-effective silvicultural work in B.C.'s second growth timber stands.

The forest industry is beginning to address the need for stand enhancement in addition to re-forestation after harvesting the original trees. In most second growth sites, trees are growing too close together. In some cases, less desirable species were planted. Now, as they approach maturity, these stands contain many trees that are retarded and small in growth. Traditional forestry methods and equipment do not work in these stands as costs are too high and damage to the site is too great.

"What is needed is a whole new generation of equipment that can go into these stands, take out logs and do silvicultural work to put the stands in shape," says Graham Cocksedge, a BCIT instructor and principal in Gen Two. "Then there will be something for the future, and in many situations an alternative to large clear cuts."

Cocksedge and Jim Simpson, a BCIT silviculturalist, discussed these problems as far back as 1985, and conducted an international search for equipment that matched their design specifications. Nothing appeared to be suitable.

The missing link was a basic machine that was small and light, that could take four to ten tons of payload into or out of those stands and act as a hydraulic power source for other functions within those stands.

The Beaver was born.

The two BCIT instructors were about to "go into the garage" to start work on their machine when the BCIT Development Assistance Centre (DAC) was created in 1987. The Centre helped create a design team of BCIT expertise, made of faculty and students, from 12 different areas, including Small Engines, Heavy Duty Mechanics, Mechanical Engineering, Electricity and Electronics Technology, Forestry, Mathematics, CAD/CAM, Operational Management and Steel Trades.

Working for over a year on the Beaver's design, the team finally created its first field testing vehicle this past spring. Testing is currently being conducted in the Greater Vancouver Regional Watershed demonstration forest in North Vancouver, and there are plans for second and third test machines this spring. Testing will be done in the Mission Municipal Tree Farm, where special silvicultural trials with the Ministry of Forests and Lands have begun. A production prototype is scheduled for completion by the Fall of 1989.

"We're more than happy with the results so far," says Cocksedge. "We're very happy with the design team approach. We feel it has been very productive and rewarding.

"We can see that this kind of industrial co-operation represents a great opportunity for faculty and students at BCIT for professional renewal and development and personal interest."

DAC also helped establish and incorporate Gen Two Ecological Equipment, in which BCIT has an equity position. The design group has long-term plans to continue refining the Beaver, perhaps in conjunction with BCIT's new Technology Centre.

The machine has the potential to act as a remote power source for forest, mining and other resource operations. Running on a diesel engine, the Beaver can also power hydraulic lines for saws, roto-tillers, pruning shears and a variety of other tools. These attachments will be developed over the next few years, partly in association with companies that have suitable implements for the Beaver.

The Beaver's marketability has always been clear to members of the design team, and this has been confirmed during the testing of the first prototype. Two major forest licensees have indicated interest in the Beaver for thinning second growth stands in the 50 to 60-year-old age groups.

Silvicultural operators and small wood lot owners are the target market group, but governments and traditional forest companies might also be interested.

Gen Two is currently looking for resources to take the machine through the production stage. The BCIT design team thinks it has a winning product and expects financing soon.

"The beauty is that it's a simple yet versatile piece of machinery and it seems to provide answers to many problems of second growth forests management," says Simpson.

"The silviculture operator can both harvest and cultivate a second growth stand at the same time. He can take out enough wood to recover costs and it is financially feasible to do thinning and other work to the stand concurrently.

"That work is going to add great value to the stand over the next few years at low initial costs, and that's really the selling point."

'EXPERT' COMPUTER SYSTEM HOLDS PROMISE FOR INDUSTRY

BCIT's Dr. Jeff Skosnik says it is too early to say, but his research group may have stumbled onto an important discovery — a major improvement in the problem-solving ability of industrial expert systems. An expert system is a computer program that acts like an expert. With human knowledge programmed into it, the system can ask questions, produce solutions to a problem and explain its reasoning.

Still in the theoretical stages, the Skosnik group's discovery is an outline for a program called an "automated reasoning system" that he hopes will dramatically improve the efficiency of expert systems in solving industrial problems. And while Skosnik is keeping his excitement in check until the system is fully functional, the "theorem prover" has recently been given enthusiastic reviews by experts from Stanford University.

"We can't quite call it a major breakthrough yet," says Skosnik, who holds a PhD in mathematical logic. "I'm hedging my bets until the actual instrumentation is finished, after the actual systems are in place.

"Of course, I think it's going to work, but only when it's up and running in an industrial plant will we be able to make a fair assessment of how it works."

The expert system will be built into three different applications over the next year and a half. Two will take the form of industrial trouble-shooting expert systems at the Kelowna-based Sun-Rype fruit processing plant and at Prince George Pulp and Paper. The third will become an educational tutor for industrial simulation.

When it is fully implemented at Sun-Rype, for instance, the expert system will help maintenance workers correct breakdowns in the fruit processing operation. The system is simple enough, Skosnik claims, to run on a normal stand-alone micro-computer.

"It's an intelligent trouble shooting program driven by a more powerful logic than what is currently available," he says.

Skosnik, a program head for BCIT's part-time studies in Electrical/Electronic Trades, was approached in 1987 by Dennis Duffey of the International Brotherhood of Electrical Workers (IBEW) and the Electrical Contractors Association (ECA) to develop industrial applications for artificial intelligence (AI). Mr. Duffey had successfully negotiated a three-year CEIC Innovations grant for IBEW/ECA to explore logic-based AI systems for the electrical contracting industry. The project was something of a first for BCIT and required, at key points along the way, some innovative assistance from President Roy Murray, Drug Svetic, Dave Hume and Dave Bernard.

Initially, Skosnik and his research team looked at commercially-available artificial intelligence software, but found nothing that satisfied his requirements. The team set about writing its own system.

One of the problems expert systems face is dealing with the vast quantities of information stored in the computer. If a problem arises in an industrial plant, how does the expert system sift its way through the myriad of details to reach a solution? If it were to consider every possiblity, the system could take years of processing time to reach a suitable answer. Computer people call this a "combinatorial explosion."

Most expert systems use rules of thumb to deduce answers to a problem, but this method won't necessarily consider every correct solution. It will only consider solutions that fall under the guidelines set out by the system.

Skosnik thinks he may have found an approach for the computer to consider every correct solution without getting bogged down in a combinatorial explosion. If Skosnik is right, the more information stored in the system, the simpler the problem can become and the faster a solution can be generated.

Ironically, it was the ancient Chinese philosopher, Lao Tzu, that sparked Skosnik's imagination to find his approach. He said, "In the mind of the novice, there are many possibilities, whereas in the mind of the expert, few."

"If my car breaks down and I do not know how to begin to repair it, my search space is, for all practical purposes, infinite," Skosnik elaborates. "Whereas the skilled mechanic, with more knowledge than I, proceeds much more quickly to what is germane.

"Under this system, adding knowledge to an expert system can sometimes simplify the reasoning process rather than complicate it."

If the automated reasoning process translates successfully into industrial applications, there will be considerable commercial potential for the system, Skosnik says. Its greatest asset, he adds, is that it uses full logic, whereby the computer produces not only correct solutions, but all possible correct solutions. Since the system is considerably more efficient than others on the market, it can be implemented on smaller computers and would be less expensive.

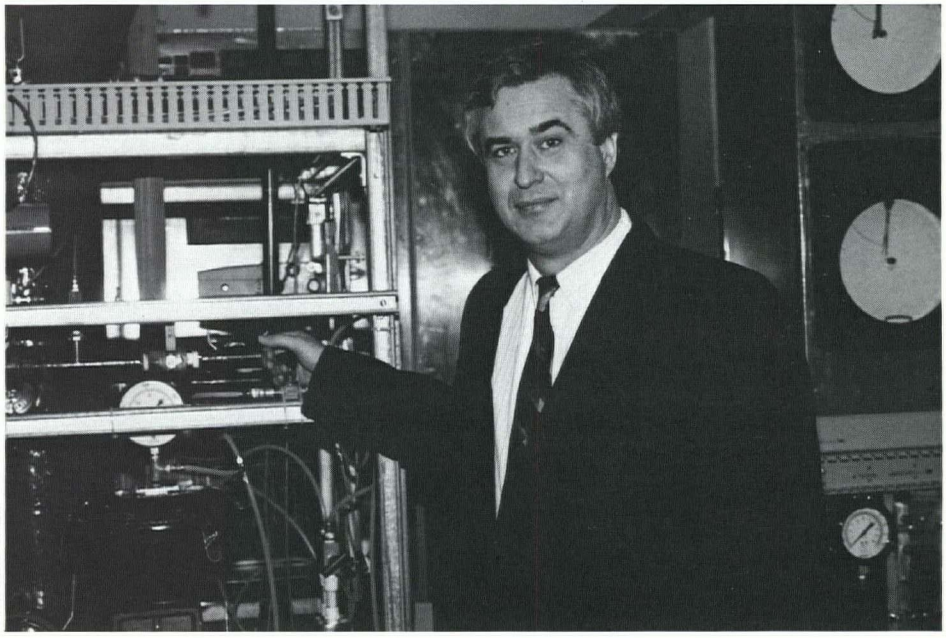


Photo: David Morton

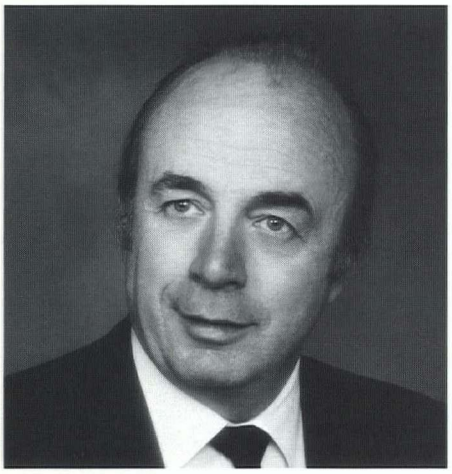
BCIT Automated Reasoning expert Jeff Skosnik drew inspiration from the ancient Chinese philosopher, Lao Tzu, to develop a new innovation in artificial intelligence.

INCREASED SUPPORT OF ADVANCED TECHNOLOGY URGED

"BCIT is a unique institution," said Dr. John MacDonald, founder of MacDonald Dettwiler and Associates, in a keynote address to BCIT's Engineering Technologies and Trades graduating class last June. "It provides the type of training in which the Canadian educational system has traditionally been the weakest."

In a technically advanced society, said MacDonald, much of the demand for skilled workers is at the technician level. Canada has traditionally filled this need by bringing skilled workers from other countries, but MacDonald said the country could gain a competitive advantage by training its own. That means greater support to institutions such as BCIT.

MacDonald, whose company is one of Canada's leading high technology firms, also spoke at a recent BCIT Development Council Breakfast Series meeting. On both occasions, he addressed the changing role of science and technology in the Canadian economy and the importance of educating scientists, engineers and technicians for the 21st century.



File Photo

Dr. John MacDonald, President of MacDonald Dettwiler: "BCIT provides the type of training in which the Canadian educational system has traditionally been the weakest."

Developed countries are experiencing a transition, he said, from a mass production-based economy to a knowledge-based economy. Competitive advantage is gained through applying scientific and technical knowledge to the production of useful goods and services.

Such an economy depends on the knowledge of highly-skilled technical people in the workforce. If the economy is to remain competitive, these workers should be treated like a renewable resource which must be continually replenished through research, development and education.

MacDonald said the Canadian education system is not doing enough to interest young people in science and technology and career possibilities in those areas. He cited a study in which Canada, with 30 engineers and scientists per 1,000 workers, ranked last among the six major industrial countries. This figure compares to 65 in the U.S., 62 in Japan, 49 in West Germany, 41 in France, and 34 in Britain.

Advanced technology, he says, provides a means by which our traditional resource industries can be made more efficient. By building a strong advanced technology sector within our industrial infrastructure, we can increase our world-wide competitiveness.

Even though Canada's achievements in creating advanced technology over the past century have been of the highest quality, said MacDonald, Canadians still have a national attitude that seems to say if something is sophisticated and technically advanced, it must come from somewhere else.

To build a knowledge-based economic structure, Canadians must change their attitude about the role they play in the world economy and about their ability to compete.

"It is the inability to have the confidence and the creativity to exploit the technology, rather than the inability to create it, that lies at the root of our problem," MacDonald said. •

Photo: Brian Gauvin

Associate Dean of Medical Laboratory Science Jannie Scriabin: "The concept of establishing BCIT as the Western Canadian training centre for cytogenetics technologists is a very realistic long term goal."

To Fred Bauder, the problem was obvious — cytogenetics labs were experiencing a chronic, province-wide shortage of trained staff. With demand for cytogenetics, such as pre-natal testing, fast on the rise, lab resources were being stretched to the limit.

That was three years ago. Bauder, as head lab technologist of the cytogenetics lab at Vancouver's Children's Hospital, was experiencing the squeeze first hand. Both he and VGH colleague, Kamil Josifec, agreed something had to be done. They put in a call to BCIT's Jannie Scriabin, Associate Dean of Medical Laboratory Science, to investigate the possibilities of starting a cytogenetics program.

"I've never had that kind of phone call before, that is, someone just phoning up wondering if BCIT could establish a new program," says Scriabin. "But he was right and I could see the need for something in cytogenetics at BCIT."

Together, Bauder, Scriabin, Josifec and BCIT Vice-President of Education Brian Gillespie wrote a proposal and began planning the program. In 1987, a 13-month cytogenetics program opened its doors to students for the first time, with Bauder and

Cytogenetics Program Head Fred Bauder (left) with student Angela Lechner. Bauder: "Our program is trying to answer a chronic, province-wide shortage of trained cytogeneticists."

CYTOGENETICS PROGRAM RESPONDS TO NEED

Josifec as part-time faculty members. Now in its second year of operation, Bauder has become the full-time head of the program, which was extended to 14 months this year. Five fully-trained cytogenetic lab technologists have been graduated, all of whom are now working in B.C. hospitals. The program hopes to graduate five more in 1989.

Cytogenetics is the study of the chromosomal make-up in the cell's nucleus. By studying the chromosomes from the fluid or tissue of an individual, cytogeneticists can diagnose certain disorders and conditions before they may be readily apparent.

The most common form of cytogenetic tests are pre-natal diagnoses, such as amniocentesis or chorionic villi sampling (CVS), where Down Syndrome and a variety of other conditions are anticipated. The number of older women having children has increased dramatically in the past ten years, and the demand for cytogenetic testing has risen proportionately. Bauder estimates the number of amniocentesis tests has risen to about 2,500 per year in B.C.

"More and more people are availing themselves of cytogenetic testing," says Bauder. "There is a great need for this kind of service across the country, but there are just too few trained people to fill the need."

The BCIT program is clinically-oriented so that graduates can move into professional capacity with a minimum of orientation. The program involves about eight months in the classroom and six months in hospital labs in the Lower Mainland. After graduation, students are eligible to write their national certification exams for the Canadian Society of Laboratory Technologists.

At the moment, the number of classroom positions is geared to the number of training positions available in the labs. Associate Dean Scriabin says it is unfortunate there are so few positions when the need is so great, but the one-on-one instruction that Bauder provides ensures that grads get top-notch training.

The BCIT program is the only one of its kind in Western Canada, according to Bauder. The only other Canadian institution offering a cytogenetics program is the Toronto Institute of Medical Technology, which graduates 12 people per year. Most of those graduates are absorbed by the hospital system in Ontario.

One of Bauder's long-range goals is to establish BCIT as the Western Canadian school for cytogenetic lab technologists. He says Vancouver is an ideal location because of the number of highly qualified people here. Scriabin adds that such an arrangement may involve a joint venture with other Western provinces.

"One is always learning in cytogenetics," says Bauder. "I certainly know that what we're doing right now is not what we'll be doing 10 years from now. Automation is right around the corner.

"The program must be ready for automation, and that's one reason we've made it so clinically-oriented. The students are right in the labs much of the time, so they'll be able to see automation first hand when it comes."

Photo: Brian Gauvin

Biotechnology Program Head Paul Barran: "Biotechnology is moving at such a fast pace. It is important the systems and examples we teach are right up-to-date."

PROGRAM KEEPS PACE WITH BIOTECHNOLOGY FIELD

Dr. Paul Barran has a challenge on his hands. As program head for the BCIT biotechnology program, he has only two short years to train qualified technologists in a field that he describes as "wide open."

Biotechnology is the harnessing of various biological systems for very specific purposes. It includes any number of applications, such as genetic engineering techniques, harnessing bacteria for the production of human insulin, and developing more efficient fermentation systems in the production of anything from beer to vitamins.

Citing applications for this still-emerging technology, Barran makes his way through a dizzying range of modern industries: agriculture, forestry, medicine, manufacturing, petroleum, food processing. The actual number of applications currently in use is relatively small, but Barran says the technology is readily available and the implications of biotechnology are potentially revolutionary.

"Things are moving at such a fast pace in the biotechnology field," says Barran, who has a PhD in medical genetics.

"I may have been an expert in a certain technique three years ago, but now it is virtually obsolete. It is very important that the systems and examples we use to teach are right up-to-date. Our graduates should be as close to the leading edge as possible so that they can be flexible and adaptable when they go into a lab situation."

The three-year-old program has so far produced 16 graduates, most of whom have found jobs in a variety of research labs on the Lower Mainland. They are working specifically in biotechnology, such as UBC biomedical labs, or in more general lab situations. Another 18 are expected to graduate this year.

"The types of jobs our graduates are getting have been traditionally filled by university-trained BSc's," Barran says. "But the kind of feedback we're getting is that our grads are better trained for their work than a BSc. They may not have the same level of theoretical knowledge, but they have the all-important skills."

He adds that the BCIT graduates are also competing against applicants with Masters degrees.

"We're competing against a higher level of applicant, and we're competing favourably," Barran says.

Barran and three other instructors give students a grounding in what he calls the five "component technologies" of biotechnology, including industrial microbiology, recombinant DNA technology (genetic engineering), monoclonal antibody technology, cell culture and biochemistry. But Barran adds that the program is still at the stage where some fine tuning is taking place.

"We're trying to shift our focus to reflect where our students are finding jobs," Barran explains. "It is perhaps a little unrealistic to spend a great deal of time on large scale fermentation techniques because that isn't taking place here in B.C., and it likely won't for the next five to ten years."

On the other hand, some companies are developing monoclonal antibodies for use in medical diagnosis and therapies. Monoclonal antibodies are biological compounds that can be manufactured in the lab to bind to specific cells in the human body, such as cancer cells. Scientists can attach other chemicals to the antibodies, such as low-level radioactive chemicals, that can help identify traces of cancer. Toxic chemicals could also be attached to help destroy the cancer cells on contact.

"As we find our job market, we'll learn how our employers are relating to our students," says Barran. "In other words, do they wish they had more training in certain areas and less in others. Then we'll incorporate that feedback into the program."

Because biotechnology encompasses techniques such as genetic manipulation, Barran encourages class discussions on the ethical and sociological considerations of the field. "Supercows," for instance, have raised questions about their impact on the tightly regulated dairy industry. These cows are treated with growth hormone (produced synthetically using recombinant DNA techniques) and develop into larger animals. Other questions centre on the ethics of introducing "growth genes" into embryos, producing genetically altered animals.

"Science is largely self-regulating, so we feel students have to be aware of the rationale behind certain experiments," Barran says.

"We try to touch on what has been done with certain experiments, what is hoped to be done and any moral and ethical considerations that arise."

While the BCIT program produces qualified biotechnologists at the laboratory technologist level, Barran says at least five of his students became so "fired up" about the field that they are now aiming for graduate degrees at universities.

"These people have come out of the program wanting to direct research rather than simply carry out the experiments," he says. "With the foundation in lab techniques they learn in our program, they will be in a position to make better contributions to the field, once they have acquired the theoretical knowledge."

PLASTICS PROGRAM TRAINS FOR BOOMING INDUSTRY

BCIT's Plastics Technology Program Head Dr. Don Wilson says most people may not realize it, but we are in the midst of a quiet plastics revolution. Once thought of as a cheap replacement for wood, glass or steel, plastic is fast becoming the material of choice among manufacturers of a wide variety of goods.

The evidence, Wilson says, is all around us. Look at any modern office, for instance. Almost everything that was once wood or steel — furniture, flooring, desk utensils (such as binders, pens, rulers), telephones or casing for computers — has now been replaced or augmented by plastic.

Plastics, by some measures, is the fastest growing major industrial sector in Canada. Since 1975, consumption of resins has grown by an average of eight per cent a year, to almost 1.7 million metric tons in 1986.

The revolution is apparently being felt in British Columbia's business community as well, according to Wilson. There are some 170 plastics-related companies now operating in the province. They are growing at a rate of 15 per cent annually, racking up sales of over $400 million. Employment is growing at a rate of 10 per cent a year, creating an increasing demand for people with special technical skills.

No small wonder, then, that the industry and provincial government established the first program in plastics technology in B.C. two years ago. This Spring, the two-year BCIT diploma program will graduate its first group of plastics technologists tailor-made for an industry that, until now, has had to largely train its own personnel who have come from other fields. The BCIT grads will be qualified in almost all areas of the manufacturing side of the industry as well as research and development, technical service, machine setting, product design, inspection and quality control.

The local industry was involved in early discussions for the program and supported it with a wealth of donations and expertise. Wilson estimates that over $82,000 worth of equipment has been given to the program, cultivating a feeling of ownership by the industry. Total Plastics of Delta donated equipment and hosted one of the temporary labs while the BCIT premises were being built. ASI Plastics of Coquitlam and Western Concorde of Annacis Island also made their plants available for training purposes and the B.C. Regional Society in the Plastics Industry in Canada lent valuable support.

"With employment growing at least 10 per cent annually, we are going to absorb 400 people a year," says Greg Howard of Columbia Plastics. "The people coming into the industry will need the technical skills that BCIT can offer."

Taking part of the lab portion off campus while the BCIT facilities were being readied proved to be an asset for the students, according to student Chuck Stewart. He says the experience gave them a unique insight into how the companies operate.

"They seem excited by us and by the attention focussed on them by our program," Stewart says. "The more you learn, the more you realize how many possibilities there are in this field."

The BCIT curriculum emphasizes the manufacturing side of the industry rather than the chemical processes used to create the plastics.

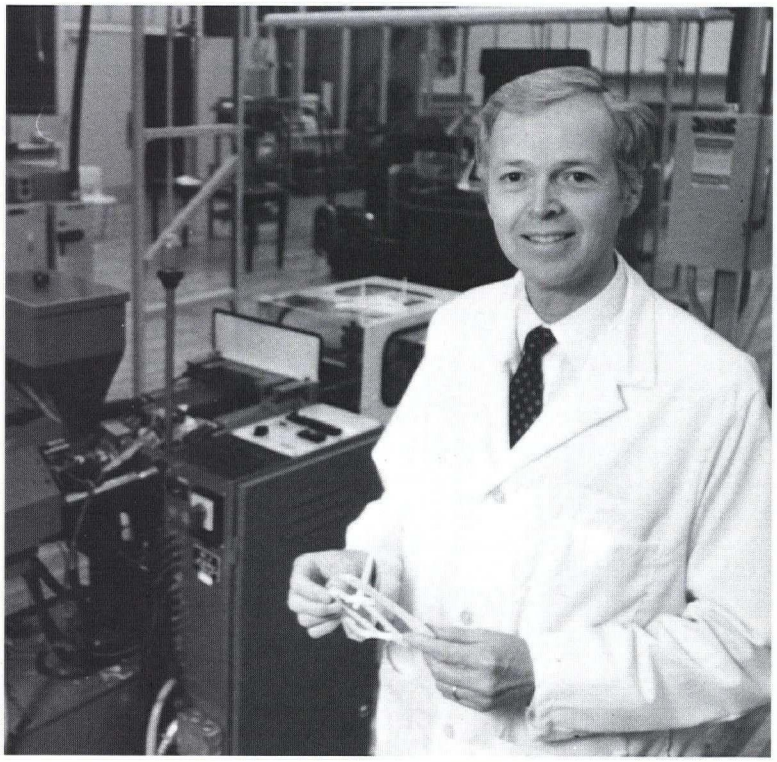


Photo: Brian Gauvin

Plastics Program Head Don Wilson with a test sample taken from injection moulding machine: "We are in an age of plastics right now that is definitely changing our lives."

Plastics are comprised of extremely long molecules called polymers. They can be altered in a seemingly endless number of ways to create equally diverse properties, and it is this diversity that has enabled plastics to be used in so many ways. New polymers are being developed almost daily, according to Wilson.

The BCIT plastics students learn the major manufacturing techniques, such as blow moulding, where softened plastic is formed into a tube to make common household products like plastic bottles. The "blown film" process forces melted raw plastic through a circular die tool and blows it into a hollow bubble to produce film for products such as plastic bags. The blown film process is popular in B.C. with 15 large plastic film companies doing a brisk business here and in the U.S.

In thermo-setting plastics, which use a different variety of polymer, raw material is poured into a pre-set mould and left to harden. This process is used in the boat-building industry for making re-inforced plastics with fibreglass. Many experts predict in the near future that cars will be manufactured using re-inforced plastics.

Design engineers are beginning to discover unusual new properties of plastics. The use of odour-impregnated plastics is a new area of research that could have numerous applications in the future, according to Wilson. At the moment, the technique is being applied to artificial Christmas trees with a built-in pine odour.

"We have the best possible support from industry, in terms of assistance and representation on our Advisory Committee, and I believe we will be turning out top-notch people," says Wilson.

"It will take awhile for our reputation to solidify, but in a few years, our graduates will be setting the standard for qualified personnel in plastics."

BCIT CAMPUS CENTRE CLOSER TO SOD-TURNING

File Photo

The Tower Group Chairman Peter Crowder, Broadcast Communications, 1968: "We're confident the sod-turning for the Campus Centre will happen this Spring."

The BCIT Campus Centre has raised over one third of the original goal of $750,000 needed from the private sector," says Student Association President Guy Steeves. "Two corporate donations of $50,000 each from Pepsi and Molsons have stengthened our commitment to a Spring sod-turning."

BCIT's two donor clubs, The President's Club and the Tower Group, are well on their way to reaching their targets for the Campus Centre project.

"The Tower Group is a motivated group of individuals committed to the future of the Institute," says Peter Crowder, founding Chairman. The donor club is aimed at alumni who contribute a minimum of $1,500 to BCIT over three years. Raising funds for the BCIT Campus Centre is the group's first project and a particularly apt one because of the nature of the Centre.

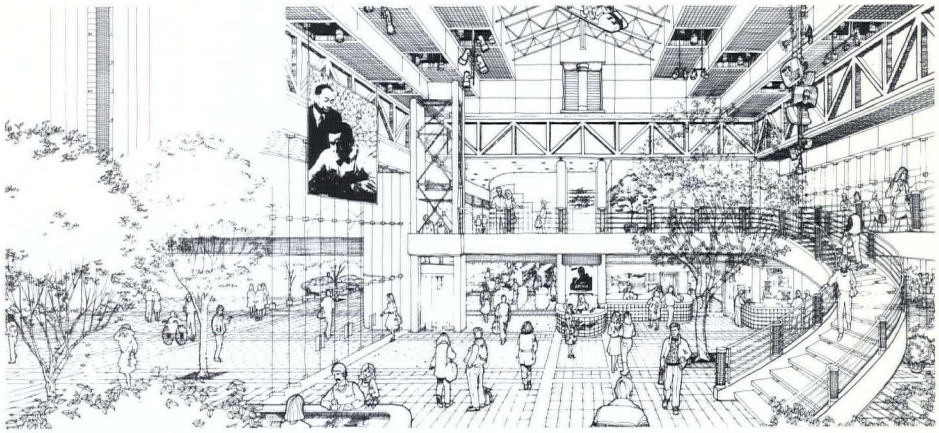
"The Campus Centre will act as a meeting place for BCIT students and potential employers," says Crowder, a 1968 Broadcast Communications graduate. "It's the type of facility that BCIT has needed since my own student days."

The Campus Centre will include study and social areas for students and seminar rooms for professional development and educational exchange between employers, students, staff and alumni. It will provide a permanent home for the Alumni Association and space for a number of service-oriented tenants. The building will bridge Goard Way, joining the North and South campuses, and provide a striking physical presence from Willingdon Avenue.

An 80-foot-tall clock tower will recognize the contributions of alumni. President's Club and Tower Group members will also receive priority use of Campus Centre facilities.

The BCIT Student Association initiated and has been the driving force behind the project, with the Institute and Alumni Association joining in the fund raising efforts. The Centre will be largely funded through student fees.

The Student Association has been innovative in starting up a Campus Centre Club for student participation, as well as providing a matching grant program for employees wishing to donate. The Institute is putting together a payroll deduction plan for staff so they can participate as well.



Architect's rendering of the BCIT Campus Centre, a meeting place for students and employers and a home for the Alumni Association.

Peter Crowder, Vice President of the Data Division of UNIDEN CANADA INC., has been involved with Advisory Committees for the Broadcast Communications Program in the past. He sees his voluntary work in The Tower Group as a way of giving something back to the Institute and contributing to its growth.

"In becoming involved with The Tower Group, the challenge was to find alumni to form an executive group to help steer fundraising activities, develop a strategy and see it through," says Crowder.

"More importantly, we're not only here for a specific fundraising project, but we're here to provide a focus for concerned alumni who see helping the Institute as a way of providing some payback on where we got in our careers as a result of going through BCIT in the first place."

BCIT

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British Columbia Institute of Technology
Burnaby Campus
3700 Willingdon Avenue
Burnaby, B.C. V5G 3H2
(604) 432-8865