

SPRING 1990

INNOVATION

BUSINESS OPPORTUNITIES

CLEAN
WATER

ENVIRONMENTAL
NICHE FOR
PETRO-CANADA

NO BORDERS
HERE

ROAD TO
MOSCOW

CANADA
AWARDS

NETWORK

INDUSTRY, SCIENCE
AND TECHNOLOGY CANADA
LIBRARY

MAY - 1 1990

BIBLIOTHÈQUE
INDUSTRIE, SCIENCE
ET TECHNOLOGIE CANADA



Table of Contents

2

No Borders Here

A Saskatchewan company's global outlook plays a big role in its success.

5

Road to Moscow

Dr. Norman Salansky looks to Soviet technologies for business opportunities.

8

Canada Awards for Business Excellence 1989

Highlighting the innovation and invention winners.

10

Raising Consciousness and Revenues

How one industry's growing environmental awareness created a niche for Petro-Canada.

13

Network

Sources of Technology-Based Business Opportunities.

14

Business Opportunities

Formerly known as Technology Transfers.

INNOVATION

This is a reader's magazine, open to ideas and information from its readers. Offers and requests of technology transfers must come from our readers in Canada to match those supplied from abroad.

You can contact us at:

INNOVATION, Technology Transfer Service (J011), Technology Liaison Directorate, Industry, Science and Technology Canada, 235 Queen Street, Ottawa, Ontario K1A 0H5
Tel: (613) 954-3458.



Hon. Benoît Bouchard
Minister of Industry, Science
and Technology

Hon. William C. Winegard
Minister for Science

Hon. Tom Hockin
Minister of State (Small Businesses
and Tourism)

Également publié en français

Editorial



When the Prime Minister created Industry, Science and Technology Canada (ISTC) as the federal government's flagship economic portfolio, the change in government policy was neither subtle tinkering with existing programs, nor a mere shuffling of responsibilities.

It was a wholesale change in the priorities of the industry portfolio. Its name—Industry, Science and Technology—accurately reflects its new emphasis on integrating industrial policy and science and technology policy.

As borders fall and economies become more integrated, we must perform and compete on a world scale. Canadian companies must think global in their sourcing, selling, and manufacturing in order to compete for export markets, as well as to maintain a niche in the domestic market. These are not times for a limited horizon or a parochial attitude. These are times for global vision and attitudes that make product and process innovation, and creative management, a way of life in our companies.

This issue of *Innovation* captures the essence of ISTC's new policy orientation.

Leon-Ram Enterprises, the Saskatchewan company profiled in the article "No Borders Here" has been a pioneer of this approach. The company's ability to tap into the market potential and technology of the U.S., Australia and Europe has played a major role in its success. Leon-Ram has also been exemplary in its adaptation to changing market conditions, expanding beyond its agricultural roots and investing in new product R&D.

"Road to Moscow," the story of Dr. Norman Salansky and his company, International Medical Machines, is another example of the potential in going global. Dr. Salansky was one of some 200 Canadian business people who accompanied the Prime Minister to the Soviet Union last November. As the article explains, he is working to match Soviet strength in basic research with Canadian technological expertise.

The government's confidence in the wisdom of the market is reflected in "Raising Consciousness and Revenues," an article that shows that today's heightened environmental awareness leads not only to business expenses but also to business opportunities. It tells how recognition of a specific pollution problem in the pulp and paper industry created a market niche for Petro-Canada to sell Purity PDO 2201, a high-quality oil product.

A sidebar article on ISTC's Environmental Industries Sector Initiative describes our role in encouraging environmental technology development, both to protect the environment and to promote a new growth industry. This is one of a series of sector competitiveness campaigns uniquely tailored to the circumstances of individual industry sectors and based on extensive consultation with the businesses involved.

ISTC also promotes Canadian industry by recognizing and publicizing outstanding performance. "Canada Awards for Business Excellence 1989" highlights last year's winners in the invention and innovation categories and explains how all winners benefit from the awards.

Innovation's "Special Events" list has long been a valuable source of information on domestic and international conferences, trade shows, meetings, etc. This issue introduces another regular feature that focuses on the domestic and international scene. Publications and data bases from Canada and around the world are included in "Network: Sources of Technology-Based Business Opportunities."

ISTC also plays an important role in helping businesses find potential partners. The list of offers and requests for technology (now "Business Opportunities," formerly "Technology Transfers") that appears in every issue reflects our emphasis on technology adaptation and exploitation.

While the name of the magazine remains *Innovation*, we have added the subtitle *Business Opportunities*. One of our most important jobs at ISTC is to help ensure that innovations are translated into actual business opportunities. The aggressive application and commercialization of technology is of fundamental importance to Canadian industry in competing in world markets.

Consultation with the business community is critical to ISTC. As the department and this magazine adapt to meet the challenges of the 1990s, your feedback is most welcome.

We hope that ISTC and *Innovation* can contribute to the success of your business ventures.

No Borders Here:

Global Outlook Plays Big Role in Saskatchewan Firm's Continuing Success

A Canadian company that makes agricultural equipment in Yorkton, Saskatchewan, has recently auditioned for what promises to be *the* show for the 1990s — the opening of the Eastern bloc for business with the West. The role may be only a bit part, but the actors view it as the chance of the decade.

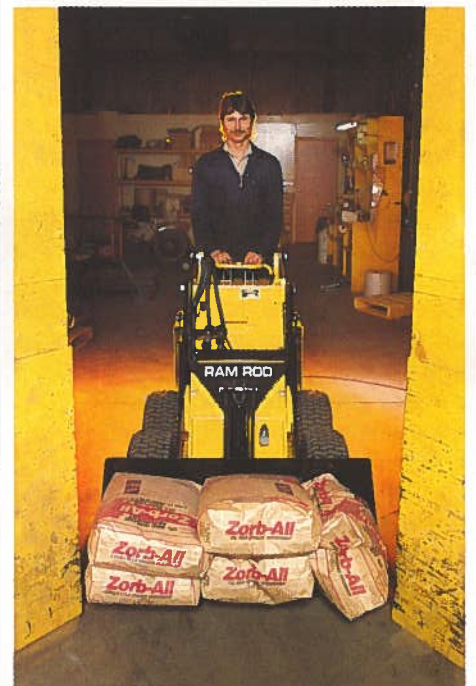
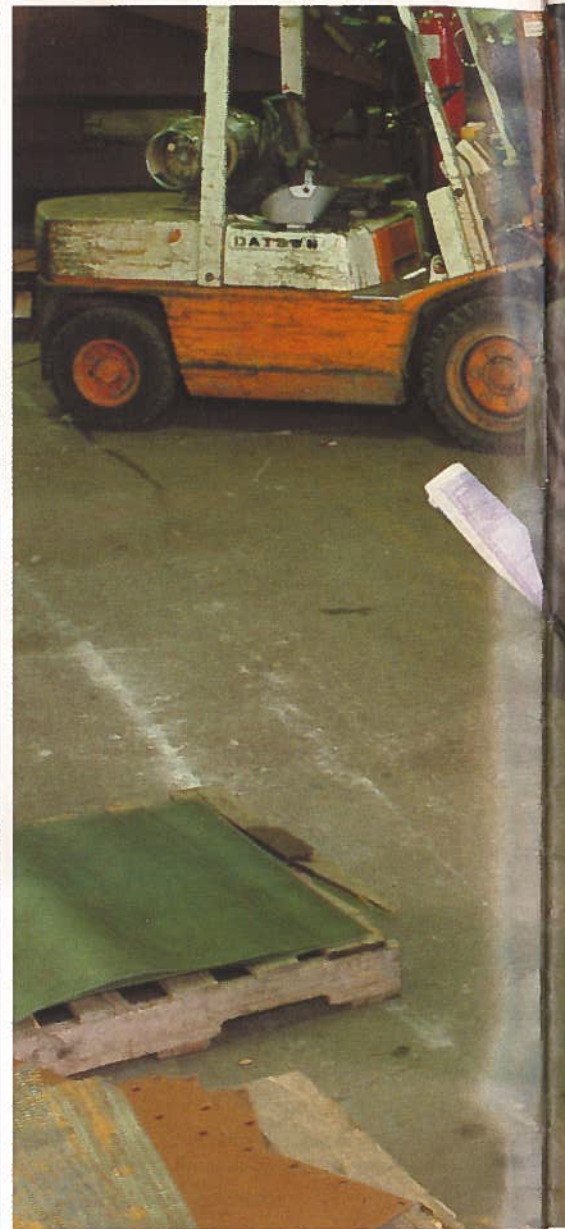
Last year Leon-Ram Enterprises Inc. shipped ploughing, seeding, and material-handling equipment such as loaders and tractors to the Soviet Union for evaluation and is waiting for word on how it performed. The hope is that the Soviets will purchase the technology and build the equipment under licence. Ray Malinowski, the company's executive vice-president and part owner, says: "This stage is testing. . . and seeing whether the equipment suits the market."

If the Soviet lead pans out, it would not be the first time that Leon-Ram has traded in technology with the other side of the world. In 1983 the company opened an office in Toowoomba, Australia, which is the heart of Darling Downs, an area that is undergoing major development for agriculture. However, the distance and heavy tariffs soon dictated that Australia would have to be handled differently from the company's markets in Canada and the U.S. That's when technology transfer began to make a lot of sense.

Leon-Ram purchased the right to build and sell an air-fed seeding and fertilizing machine from an Australian firm called Symonds Products. This machine impressed the Saskatchewan company with its accuracy, gentle handling of seed, and versatility with different sizes and types of material.

The technology transfer, however, was not just one way. Leon-Ram authorized another Australian company, Mason Planters, to build front-end loaders and tillage equipment. The company supplied the Australian firm with the blueprints, technical information, material lists, and process books and drawings that they needed to manufacture these products themselves. As part of the deal, Mason also received sample units.

Ramrod miniskid-steer
loader in action.





Leon (l) and Ray
Malinowski (r).

In return Leon-Ram obtained payment for the initial package and entered into an arrangement to receive royalties on sales. Royalty agreements were to continue until the expiration of patents, and any new patents were to extend the life of the deal. With products like the front-end loaders, where Leon-Ram has no patents, the companies have a more flexible agreement.

Instead of selling heavy equipment like front-end loaders to the Australian company, Leon-Ram sells them the right to manufacture the equipment as well as some high-priced components. "When we shipped front-end loaders to Australia," says Malinowski, "the import duty was 30 percent (still is by the way) and our pricing was out of bounds for the marketplace. When we started providing only the components, we were able to become competitive."

How did the deal materialize? "We never went on a technology drive or anything like that. We had been selling some items in Australia: we were able to sell tillage equipment but not our front-end loaders. . . [I assume] the people there wanted to expand their manufacturing capabilities and noticed we had a product line that wasn't selling.

"They approached us and asked whether we would be interested in letting them build. It was a plus for us because the 30 percent duty blocked us out of the market. We are now talking to them about the possibility of building rock pickers for the Australian market.

"I guess the [equipment] we are making from Australia came about in the same way. We noticed a product and in a forthright fashion asked if there was the possibility of us being able to produce it on this side of the ocean. They were receptive so we sat down and made similar types of arrangements."

The potential entry of Leon-Ram into the Soviet market began much the same way, with discussions and dealing through Balerus, a Soviet-based manufacturer of agricultural equipment. Even if the current efforts in the Soviet Union don't bear fruit, the seeds have been planted for growth of the company in Europe.

Although a 1987 attempt to reach an exclusive agreement for its products in England was unsuccessful, Leon-Ram has established dealer relationships in France and Germany. Malinowski sees the Europe 1992 initiative opening a market of 350 million consumers, and he wants Leon-Ram to capitalize on it. In addition to showcasing one of its skid-steer loaders at a major agricultural fair in Paris this Spring, the company is studying the European market, rules that pertain to safety and protective gear, and specifications.

Leon-Ram has invested heavily in its line of skid-steer loaders and is banking on them to make inroads around the world. They differ from conventional loaders in that separate controls for the right and left sets of wheels provide better handling in tight quarters. Technology for these products was also purchased from an Australian company.

Two models Leon-Ram now makes are much smaller than traditional skid-steer loaders made in Canada. These miniskid-steer loaders do not have a cabin for the driver or a seat: the driver stands on a platform behind the machine.

The advantage of these miniskid-steer loaders is that they can get into very small spaces; you can take them through a doorway. Malinowski says the units are attractive to all sorts of people who need a machine in a confined area—chicken farmers, pig farmers, roofing contractors, renovators, etc. Attachments such as backhoes, trenchers, snowblowers, augurs and brooms add flexibility.

"We have a product that we have spent literally millions of dollars on in development," says Malinowski, "and now in the last three or four years we have sold hundreds of units. . . we've taken the bugs out and it's a mature product.

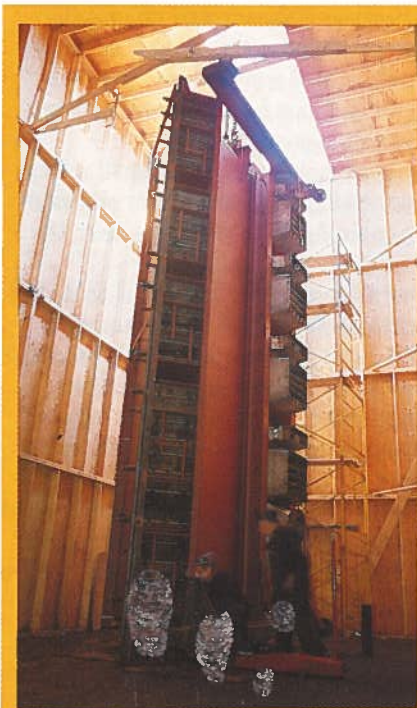
"It's exciting, a product that can sell to urban or rural and any country in the world and to all industries — agriculture, mining, lumber, cities, departments of highways. It knows no boundaries and . . . it sells every month of the year. Now there are peaks and valleys, but if you build seeding and tillage equipment, nothing happens from November 1 to May 1, and that puts a very severe strain on an organization. This product has [year-round] applications."

This line has helped diversify the customer base for Leon-Ram in a big way. In the space of a decade, this \$20-million-a-year company halved its reliance on agricultural sales.

The eight engineers on staff with the company are divided into groups concentrating on the different product lines: skid-steer loaders, dozers and loaders, seeders and cultivators, and hydraulic components. "We expect to keep in tune with the trends and, of course, get ahead of them if it's possible," says Malinowski.

What he refers to as "the agricultural crunch" of the 1980s forced his company to think about its future in terms of diversification. It went from doing all of its business in agriculture as it entered the decade to its current level of doing half of it outside agriculture.

Malinowski believes Leon-Ram was able to remain successful due to this diversification effort and the engineering leadership that met the challenge of developing new products.



Leon-Ram's welding expertise was put to good use in the custom manufacturing of these wind boxes for a power-generating plant.

"Today we have the potential to grow on three or four fronts," he says. "We still have to realize those opportunities, but less than ten years ago we had just one sector to get our bread and butter from, and we feel a little more secure."

The company's drive to serve new markets is continuing. Since 1987 Leon-Ram has become increasingly involved in contract metal-working. This has required upgrading skills and capacity. In order to meet the requirements to provide components for a heavy-oil upgrader in Regina, Leon-Ram employees began a continuing training process. Malinowski hopes the company will also be involved in a heavy-oil upgrader project in Lloydminster.

Leon-Ram has augmented its market about 1 000 percent every decade since the 1950s when Leon Malinowski took over his father's equipment repair business. The 1960s saw a move from Bankend, Saskatchewan, with a population under 40, to Yorkton, the Prairie town of 15 000 where the company now employs 140 people, one-third of the town's manufacturing labour force.

In the early 1970s the company opened an office in Minot, North Dakota, in order to simplify purchases by American clients. Today, the American market accounts for one-quarter of Leon-Ram's revenue.

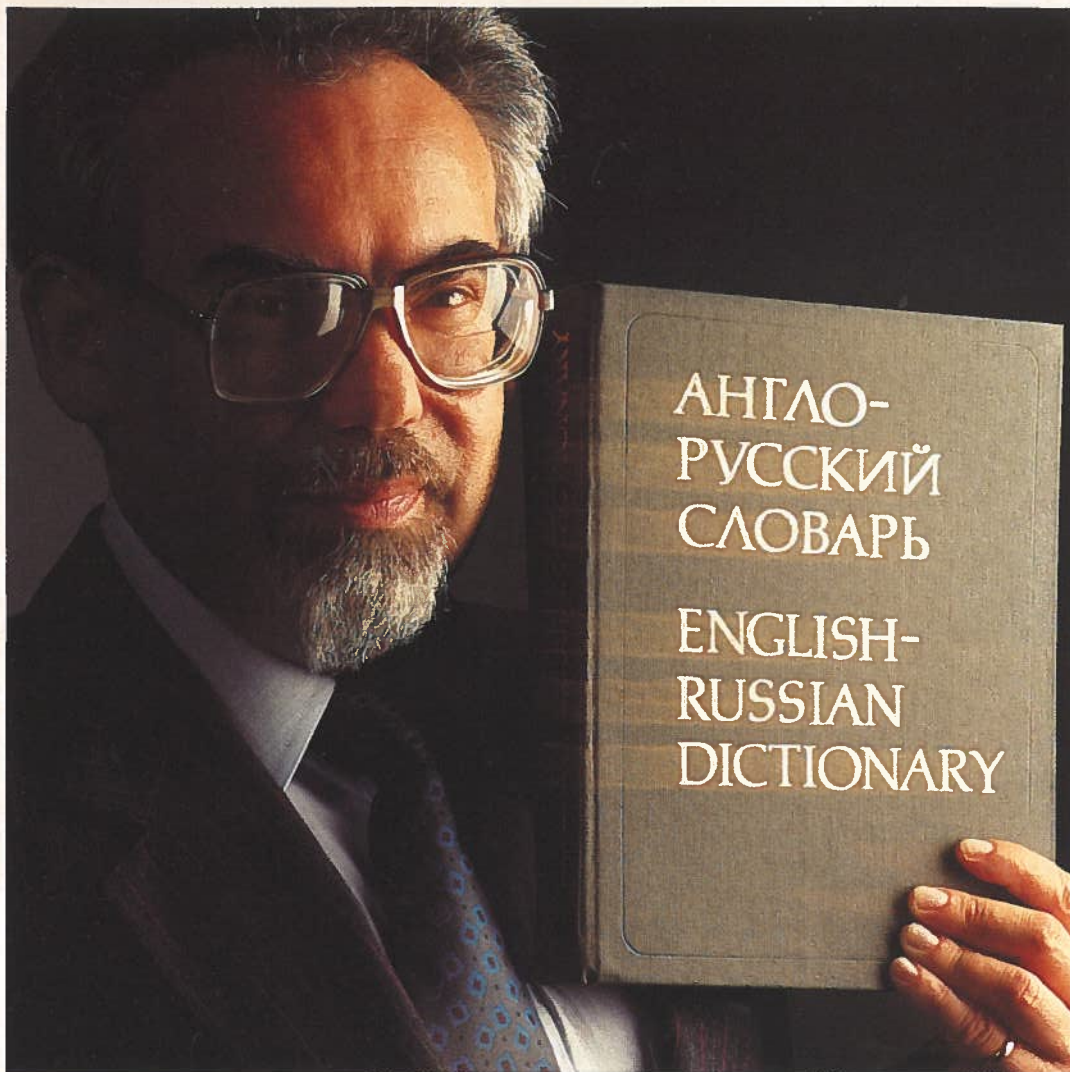
The Canada-U.S. Free Trade Agreement has given the company a real boost. While agricultural equipment has always enjoyed free access to the U.S., other products, such as skid-steer loaders, have not. Duties on some of these products will be eliminated over the next five years.

The freer movement of personnel under the agreement has also benefited Leon-Ram: ". . . our technicians and service people can freely go into the country to train, teach or service equipment," says Malinowski. [Before the agreement] we could only transfer people under more restrictive conditions. . . ."

Today, exports directed primarily towards the U.S., France and Australia represent about one-third of Leon-Ram's business. The company's history of seeking new horizons, whether in terms of markets or technologies, seems to have paid off. "There's a big investment to change," says Malinowski, "costs before benefits. But now we are starting to mature in some of these areas and . . . we can reap some benefits."

Contact:

Ray Malinowski
Executive Vice-President
Leon-Ram Enterprises Inc.
135 York Road East
Yorkton, Saskatchewan
S3N 3N6
Tel.: (306) 783-6592



Dr. Salansky, with one of his most important tools.

Road to Moscow: International Technology Broker Norman Salansky Finds Business Opportunities in the Soviet Union

Technologies available around the world represent a largely untapped source of business opportunities for Canadians.

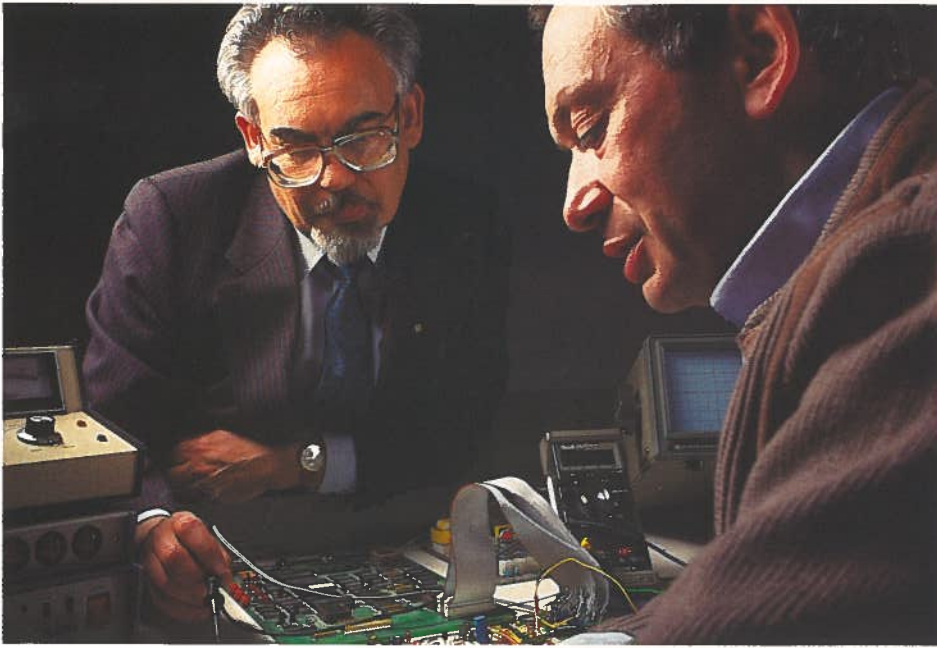
In setting up the experimental International Technology Brokers Program in 1988, the National Research Council (NRC) has helped Canada take advantage of this vast potential. The objective of the program was to increase the flow of new ideas, processes and equipment into the country, strengthening the research and development base of Canadian manufacturers.

When the NRC set out to recruit brokers from across Canada, business people with extremely varied skills and educational backgrounds expressed interest. Among the final group of 12 brokers, areas of expertise include food, medical technologies, engineering and chemistry.

Under the program, each broker received up to \$80 000 in their first year of operation and up to \$70 000 in their second to defray expenses associated with establishing such a business — rent, salaries, promotional material, mailings, travel, etc. Brokers were required to devote an additional 25 percent of their own funds to projects for which they received assistance. Any profits they made through international technology transfers went to their respective companies.

“The technology is the company’s,” said program manager David Fletcher. “The broker brings it in, licenses it, or sub-licenses it to others.” Although the NRC phased out this program as of March 31, 1990, Fletcher confirmed that there “have been quite a number of successes,” and he hopes the brokers will continue the efforts the NRC helped them to initiate.

One who will most definitely do so is Dr. Norman Salansky of International Medical Machines (IMM) Inc., based in Downsview, Ontario.



Dr. Salansky and Boris Strelchik discussing new project specifications.

Dr. Salansky is ideally suited to the role of an international technology broker dealing with Eastern Bloc countries, where he has primarily focused on searching for health care technologies. He has a PhD in Material Sciences (Micro-electronic Applications) from the Institute of Physics, Siberian Branch, Academy of Sciences, U.S.S.R.

Involved in research and development in both academic and industrial environments in the Soviet Union, the United States and Canada, Dr. Salansky has published more than 150 papers and books on his research efforts and currently holds 20 patents. He is an Adjunct Full Professor at the University of Toronto (Institute of Aerospace Studies) and a member of numerous corporate medical advisory boards.

Dr. Salansky established IMM in 1981 because of his long-standing interest in applying micro-electronics to the bio-medical field and his many years working with neuroscientists and neurophysiologists, designing different kinds of medical equipment. Today, the company employs full-time engineers and technologists, and hires other researchers and scientists as consultants for specific projects.

In 1989 Dr. Salansky made five trips to the Soviet Union, three to Hungary and two to Finland. Last November he was one of 200 Canadian business people who accompanied Prime Minister Brian Mulroney to Moscow in an effort to make business connections in the Soviet Union. In all of the countries he has visited, Dr. Salansky has discovered a whole new world of technology.

During his visits to the Soviet Union, Dr. Salansky has met with that country's leading scientists and with politicians. As a result of these visits, IMM is negotiating more than 100 technology transfers and has established a joint venture with the Soviet Academy of Sciences. In addition Dr. Salansky has been active in setting up joint research between leading scientists from the University of Toronto and the two largest institutions of the Soviet Academy of Sciences: the Institute of Physical Problems (Kapitsa-Landay Institute) and the Institute of Radio-electronics, which has 6 000 scientists.

One of the more exciting Soviet technologies that IMM has obtained exclusive rights to involves early diagnosis of cancer, cardiovascular disease and AIDS. The company is now working to confirm the effectiveness of this technology. Once it has done so, the technology will be offered to various medical centres.



In some cases IMM's technology transfer activities involve collaboration, with the company contributing sufficient R&D to establish a joint patent with the foreign originator. When a technology is outside his particular field, Dr. Salansky tries to find a Canadian company with a matching interest and inform its representatives of what is available.

Dr. Salansky describes technology transfer as "a tremendously important area of activity, especially for Canadians." The Eastern Bloc countries have spent billions on research, he says, and are in fact very advanced. But a definite gap exists between research and implementation of the results, because these countries lack the skills and business infrastructure to develop technology.

By collaborating with Eastern Bloc countries, Dr. Salansky believes IMM can help bring some outstanding new medical technologies to North America: "It happens that I understand the language very well and I understand the subject. I have been working with leading scientists and they believe we can deliver what they're missing — whether human engineering or micro-electronics. We can add our technology to their studies and build new health care products. What we would like to do is activate the interest of North American companies in the technologies the Eastern Bloc countries have available."



Fabulon, an IMM laser therapy product.

Even without the benefit of technology transfer, Dr. Salansky's company has done some interesting work in health care technology. One of the first products he developed at IMM was a pain-blocking electronic device called Codetron. Now used in hospitals around the world, Codetron has had impressive results in reducing the pain of cancer patients.

Together with several professors, Dr. Salansky is continuing work on Codetron, looking into new applications. A professor at McMaster Medical School, for example, has discovered that Codetron can be used to help control patients' nausea after surgery and to treat lower back pain and osteoarthritis.

IMM is also very involved in developing the use of "soft," low-power lasers, as opposed to the "hot" powerful lasers employed in surgery, especially ophthalmology. Dr. Salansky explains that the mild interaction of these soft lasers with the human body makes possible "a number of very interesting phenomena," including the alleviation of migraine headache pain. He adds that he has also had extremely good results using soft lasers for smoking cessation and controlling obesity. IMM is also developing soft lasers for collagen regeneration — very useful in the healing of wounds — plastic surgery and cosmetology.

The company's continuing R&D efforts, combined with the potential of technology transfer from the Eastern Bloc, should ensure its place as a leading innovator in medical equipment in the years to come.

Contact:

International Medical Machines Inc.
955 Alness Street
Downsview, Ontario
M3J 2J1
Tel: (416) 661-3035

(bottom left)

Codetron. Strong, deep stimulation from six electrodes delivers electrical signals to afferent nerves in random sequence.

Some Eastern Bloc Technologies Available from IMM

- instruments for cell investigation
- an ultrasonic technology for treatment of gynaecological and tonsil diseases, which can also be used to clean infected wounds
- corrective vision devices
- stimulation therapy with four wave forms for use in orthopaedics and sports medicine
- a device for curing chronic dermatological conditions like seborrhoea and acne
- a herb tea for the prevention and healing of kidney disease
- an ophthalmic preparation containing medicinal plant compounds to treat conjunctivitis
- a portable uterine monitor useful in fighting infant mortality due to unexpected premature births
- a software collection for chemical research containing all the programs necessary for use by a chemist developing new molecules

Canada Awards for Business Excellence 1989

As the world economy becomes more knowledge-intensive, invention and innovation have increasingly become associated with business success. That's why they are included among the categories eligible for the Canada Awards for Business Excellence.

Since 1984, Industry, Science and Technology Canada has honoured outstanding business achievements with this awards program. All Canadian companies are eligible to enter, and winners are selected by panels of experts from the private sector.

Media attention is one of the most important benefits for winners. Coverage of the 1989 awards included trade and business publications, small-town weekly newspapers, and major urban dailies from coast to coast.

Award winners also receive the exclusive right to incorporate the program logo on their advertising, letterhead and packaging, highlighting their success for customers and suppliers.

Within the winning companies, the awards are valuable motivational tools.

Eugene Joseph, the president of Virtual Prototypes, the gold award winner for innovation in 1988, reflected on the benefits to his company: "Internally, it boosted morale, and everyone is very proud of it. Our business is international, dealing with very large aerospace companies. . . these organizations attached great importance to this official recognition of excellence.

"It gives us—a small organization—proof of substance to work with these large international organizations. For those people or companies who don't know your business, the award helps overcome a barrier of uncertainty and adds tremendous credibility."

Medical developments swept the gold awards in both the innovation and invention categories in 1989. IAF BioChem International Inc. of Montreal took top honours for invention with a highly efficient AIDS diagnostic test. The gold award for innovation went to Willowdale's Connaught Laboratories for a highly effective bacterial meningitis vaccine.

IAF BioChem International Inc. – Gold Medal Winner, Invention

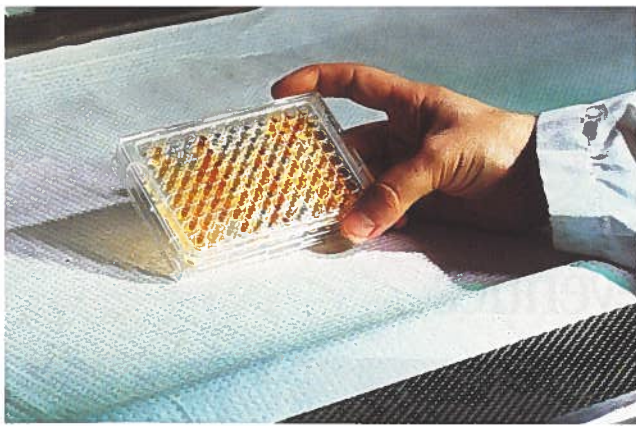
Instead of using the actual AIDS virus to test blood samples for the presence of antibodies to the Human Immunodeficiency Virus (HIV), IAF BioChem's test uses synthetic peptides that duplicate the characteristics found in the virus. This kind of test has several advantages:

- It eliminates the need to deal with hazardous biological material during the production of test kits.
- It eliminates the risk of foreign protein contaminants, which has been a major factor in false positive results.
- It can detect recently infected individuals two to six weeks earlier.

What sets the IAF BioChem test apart from others, however, is that it recognizes both strains of the AIDS virus, HIV-1 and HIV-2. This second virus has so far been very rare in North America.



A fermenter used in vaccine production.



Microtiter plate with serum from subjects in each well. Yellow wells indicate samples containing antibody to HIV-1 or HIV-2 (indicating the presence of the virus).

However, Dr. Allan Ronald, an AIDS expert who heads the Department of Internal Medicine at the University of Manitoba, says that looking for HIV-2 will become more important. He described the IAF BioChem test as "... a major step forward with potential to save money by having one test instead of two."

Connaught Laboratories - Gold Medal Winner, Innovation

The most common form of bacterial meningitis is haemophilus influenza type b or Hib disease. Between 1979 and 1984, 1806 cases of Hib disease were recorded in Canada. Approximately three to five percent of victims die, and neurological damage is found in between 20 and 45 percent of survivors.

Although it can occur in all age groups, Hib meningitis is primarily a disease of children under five years of age. Over the same six-year period mentioned previously, 90 percent of all cases in Canada occurred in this age group. The frequency of Hib meningitis among infants (under one year old) during this period was approximately four times higher than that for one to four-year-olds.

Polysaccharide vaccines have been used for some time to protect children from the disease. Unfortunately, these vaccines have not been effective in children under two years of age.

The Bureau of Biologics at National Health and Welfare Canada is the federal body that licenses biological drugs in Canada. Its director, Dr. John Furesz, explains how a new type of vaccine is more effective: "... many manufacturers have tried in the last few years to combine the polysaccharide with a protein carrier. They combine the two together and, somehow, the infants are able to produce antibodies against Hib bacterium.

"It certainly is a very important new concept in immunization procedures to have a carrier. You can use various proteins . . . Connaught opted for the diphtheria toxoid approach, and the vaccine seems to be working very well in the different age groups.

"In Finland, a huge clinical trial was quite successful. Those children were six months of age and older. The vaccine not only built up a good antibody response but the actual protection against the disease was quite good."

The Connaught vaccine is called ProHIBiT™. With this vaccine, a portion of the Hib bacterium's surface, which cannot produce the disease but is recognizable to a child's immune system, is joined or conjugated to diphtheria toxoid, a substance that creates a strong immune response in infants. Injecting Hib bacterium alone would not create antibodies to the Hib disease that causes bacterial meningitis, but the combination successfully fools the immune system into doing so.

ProHIBiT™ is believed to be the world's first licensed conjugate vaccine. It is licensed for use in both Canada and the United States for the immunization of children over 18 months. The first year it was available in these markets, it generated \$50 million in sales and significantly reduced the incidence of Hib disease in this age group. The vaccine cannot be considered for licence in Canada for children under 18 months until additional clinical studies now being conducted here and in the U.S. have been completed.

This Year's Awards

Applications for the 1990 awards, which will introduce a new environment category, were accepted until April 6. The awards ceremony will be held on October 31, 1990 at the Westin Hotel in Ottawa.

Contact:

Canada Awards for Business Excellence
Services to Business Branch
Industry, Science and Technology Canada
235 Queen Street
Ottawa, Ontario
K1A 0H5
Tel.: 954-4079
Fax: 954-1894
or any of the ISTC regional offices listed inside the back cover of this magazine.

1989 Gold Award Winners

Quality

Xerox Canada Inc.

Productivity

Henderson, Barwick Inc.

Marketing

Oak Bay Marine Group

Entrepreneurship

George S. Petty, Chairman and CEO
Repap Enterprises Inc.

Labour-Management Co-operation

Stelwire, a division of Stelco Inc. and
United Steelworkers of America,
Local 3258

Innovation

Connaught Laboratories Ltd.

Invention

IAF BioChem International Inc.

Industrial Design

Altero Technologies Inc. and Karo Design
Resources

Small Business

Zepf Technologies Inc.

The Canada Awards
for Business Excellence Trophies.



Raising Consciousness and Revenues



Tom Moore, a Petro-Canada tank wagon loader, taking a sample of Purity PDO 2201.

Pressure to clean up the environment has undoubtedly left many companies struggling to balance the long-term investment required with short-term financial statements. Fortunately, increased awareness of environmental issues can lead to increased revenues too.

A better understanding of sources of water pollution in the pulp and paper industry, for example, has provided Petro-Canada with a new niche for a high-quality oil product. While the company is best known for its fuels and lubricants, this product is used in the processing of pulp. In order to understand where Petro-Canada fits in, some background on the pulp and paper industry is required.

Many pulp and paper mills employ a chlorine bleaching process, and evidence is mounting that this process is a source of dioxins. Some of the dioxins discharged into our water by these mills are highly toxic, threatening fish, wildlife and, ultimately, human health.

In addition to its effect on colour, the bleaching process plays a part in certain attributes that consumers take for granted in paper products. They expect books to stand up to many years of use, paper towels to be absorbent and personal care products to be hygienic.

While consumers are beginning to adjust their demands and balance them with sensitivity towards environmental impact, it is a gradual process. Efforts to reduce the toxic by-products of industrial processes are still critically important. In Canada, the pulp and paper industry is among those where such efforts can be most productive, if only because it is so huge.

One third of the pulp and paper sold in the world comes from Canada. In 1989, Canadian mills produced 24.9 million tonnes of pulp and paper, with shipments valued at more than \$20 billion. The industry accounts for one in ten Canadian jobs.

Recycled oil in chain saws may even leave unchlorinated dioxin precursors on trees.



Research indicates that base oils in defoamers, which are used to reduce foaming in the pulp washing process, play a role in the creation of polychlorinated dibenzofurans (PCDFs) and dibenzodioxins (PCDDs), often referred to simply as dioxins. They do so because they are a source of unchlorinated precursor compounds, namely dibenzofuran (DBF) and dibenzodioxin (DBD). This was established in a study by the Pulp and Paper Research Institute of Canada (PAPRICAN), which first reported its findings at the 1988 International Dioxins Symposium in Sweden.

Defoamer oil is not the only source of unchlorinated dioxin precursor compounds in the pulp and paper industry, according to the PAPRICAN study: "DBF is ubiquitous. It occurs in air, water, process additives and perhaps even in the wood furnish itself." A spokesperson for one chemical company that manufactures defoamers stressed that levels of dioxin precursors are measured in parts per billion (ppb). He went on to speculate that detectable levels of dioxin precursors in recycled defoamer oil, which has much higher levels than virgin oil, might be transferred from chain-saws to trees when they are felled.

Since PAPRICAN identified the oil in defoamers as a source of dioxin precursors, the demand for extremely pure base oils has increased dramatically. Furthermore, environmental issues are now making headlines daily, and many industries are at least beginning to clean up their products and processes. With public pressure increasing and federal standards for all toxic emissions from pulp and paper mills looming, that industry is no exception.

The clear solution is Purity PDO 2201; the brown solution is a solvent refined base oil.

Pressure for change is coming from all of the players involved, including the end users of the paper. This is evident in a letter from *Equinox* magazine editor Bart Robinson to *The Globe and Mail*, which was published on December 13, 1989: "... we are adding our voice to the rapidly growing number of publishing houses requesting—indeed demanding—zero-effluent processes and products from the pulp and paper industry."

Although many companies make food-grade oil products that contain few if any dioxin precursors, they are regarded as too expensive to present an attractive solution. Water-based defoamers do not contain dioxin precursors, but they are not suitable for all applications. Nevertheless, at least one supplier has produced water-extended defoamers with significantly reduced levels of dioxin precursors that have been successfully used in some mills.

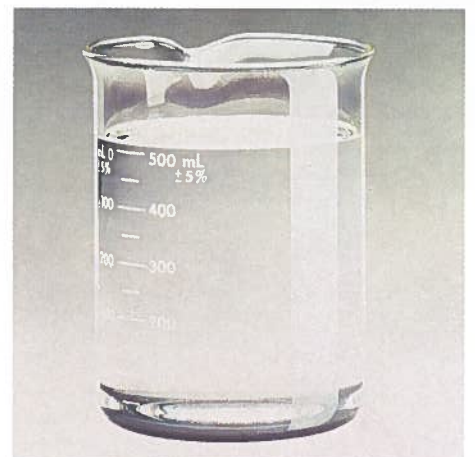
The PAPRICAN study also found wide variations in the amount of dioxin precursors found in various defoamers, particularly between those containing virgin oil and those containing recycled oil, which is far less expensive. However, the study did not identify the manufacturers of the various oils tested, and PAPRICAN is not willing to release that information.

Since there is no standard analytical methodology for obtaining such measurements and there are plenty of ways in which samples can be contaminated, it is difficult to obtain an objective evaluation of the levels of dioxin precursors in various oils.

However, a Petro-Canada magazine advertisement claims that their product, Purity PDO 2201, "is the only defoamer oil that delivers dioxin precursor levels under 1 ppb (DBD) and 1 ppb (DBF). . . ." Dr. Stephen Cohen, Petro-Canada's senior co-ordinator of fluids research, says "... the levels are well below one ppb."

Petro-Canada uses a unique two-stage severe hydrotreating process to produce Purity PDO 2201. The company believes the process has several advantages over the conventional solvent-extraction process used to purify lubricants.

In the conventional process, solvent is added to the feedstock and then extracted, carrying with it about 80 percent of the impurities. Hydrotreating, however, produces a base stock that is nearly 100 percent free of impurities. Dr. Cohen explains the effect of hydrotreating on the dioxin precursors in the oil: "Basically, it destroys the dibenzodioxin and dibenzofuran in the feedstock stage."



Promoting Environmental Industries: ISTC's Role

In June 1989, the Prime Minister announced the federal government's Environmental Industries Sector Initiative, which is being led by Industry, Science and Technology Canada (ISTC). This initiative is intended to enhance the international competitiveness of Canadian companies that produce environmental goods (e.g., oil skimmers, smokestack scrubbers) and provide environmental services (e.g., risk assessment, planning). Although this undertaking is still at an early stage, objectives have been set and certain products and activities are planned.

Environmental Industries Sector Initiative

Objectives

- to formulate a medium-term industrial development strategy
- to improve the information base, including statistics, on market size, import penetration, economic structure and performance
- to create a supply capability profile that would compare Canadian industries with the competition vis-a-vis promising market segments
- to identify and analyze domestic markets and principal international markets
- to identify technologies critical to Canada's international competitiveness and to attach priorities to them

Work is already underway on many of these objectives. Teams of officials from various federal departments in Ottawa and across Canada have, for example, begun to classify environmental products and services and to study economic characteristics, markets, and critical science and technologies.

Key Products and Activities Planned

- a directory of suppliers, research agencies and labs
- publications based on studies of Canadian supply capability, market opportunities, and critical science and technologies
- workshops in support of publications
- ongoing consultation among federal and provincial governments, associations, industry spokespersons, etc.

For more information, contact:

Richard Slowikowski
Project Manager
Environmental Industries Sector Initiative
Industry, Science and Technology Canada
235 Queen Street
Ottawa, Ontario
K1A 0H5
Tel: 613-954-2989

The essence of the hydrotreating process involves subjecting the feedstock to hydrogen pressure of 20 megapascals (3 000 pounds per square inch) in the presence of a catalyst at a temperature of 390°C. This permits the removal of impurities such as sulphur, nitrogen and oxygen. Further processing separates the products into petroleum fuels and wax-free oil. The product is then subjected to the hydrotreating process once more.

The concept of hydrotreating as a means of purifying base oils was developed around the turn of the century.

However, it was not economically feasible for lubricants until the late 1960s when affordable means of producing hydrogen became available. Petro-Canada became interested in the process around 1973, when supplies of oil from the Middle East became uncertain. Hydro-treating enabled Petro-Canada to produce high-quality lube oils and greases from widely available Canadian crude oil.

In 1979, Petro-Canada opened the world's largest hydrotreating plant, and the company began using the process to produce all of its lubricating oils for various markets. Dr. Cohen tells why the company did not produce oil for the defoamer market until last year: "The pulp mill defoamer market was one that we did not enter because the prices were dictated by re-refined oils. It wasn't until the PAPRICAN paper emerged that we began to realize that there was an opportunity there for us to see if we could offer an appropriate product at a price that was attractive."

The trend towards very pure defoamer oils has increased costs for chemical companies that manufacture defoamers. Presumably, it has done the same for the pulp and paper industry and consumers of paper products. However, Petro-Canada isn't complaining. Since it was introduced in July of 1989, Purity PDO 2201 has had what the company calls "phenomenal success in the North American market. . ."

Tom Cully, a Petro-Canada Products manager, says: "We basically have the majority of the defoamer oil market in Canada as they (defoamer manufacturers) convert over. We've been well received in the States too. . . and early this year we expect to start getting some of them flipped over. We're very excited about it."

Contact:

Tom Cully
Manager
Strategy, Resources and
General Manufacturing
M&D Lubricants
Petro-Canada Products
P.O. Box 2844
Calgary, Alberta
T2P 3E3
Tel.: 403-296-7509
Fax: 403-296-3030

Sources of Technology-Based Business Opportunities

PUBLICATIONS

Innovations

This loose-leaf publication, not to be confused with the one you are reading, lists hundreds of inventions and technologies developed in Canadian government laboratories or from government assisted research. It is published annually, with periodic updates mailed to subscribers throughout the year. Many listings will be of interest to small and start-up firms. The cost is \$12.00 a year.

Contact: Canadian Patents and Development Limited, 275 Slater Street, Ottawa, Ontario, K1A 0R3, Tel.: 613-990-6100, Fax: 613-990-8528

Offers: Licensing Opportunities and Product Requests: Licensing Opportunities

These catalogues are published several times per year by a technology transfer consulting firm, established in 1975. They cover both Canadian and foreign opportunities suitable for a wide range of firms as well as new business start-ups. These publications are available free of charge to seriously interested parties.

Contact: Lomar Associates, 1384 Tyandaga Park Drive, Burlington, Ontario, L7P 1N3, Tel.: (416) 336-0002

Holland Info

This monthly newsletter available free of charge from the Dutch government contains photos and descriptions of approximately six new products/technologies per issue. It can provide leads for licensing or joint venture initiatives.

Contact: Netherlands Foreign Trade Agency EVD, P.O. Box 20101, 2500 EC The Hague, The Netherlands

New Swedish Technology (ISSN 0280-378X)

This magazine, published at irregular intervals, features a wide variety of new products/technologies, well illustrated with colour photos. No charge.

Contact: Swedish National Board for Technical Development, Box 432000, s-100 72 Stockholm, Sweden

Licenstorg

This magazine describes various technological developments and technologies that are available under licences in the USSR. Brochures describing individual technologies are also available. No charge.

Contact: Licenstorg, 11 UL. Minskaya, Moscow, 121108, USSR, Tel.: 145-27-00, Telex: 411415

Technology Venturing in Canada

This directory lists federal research establishments by province and department. It also includes a section on the diffusion of technologies from federally funded research.

Contact: Audio-Visual and Print Distribution Centre; Industry, Science and Technology Canada; 235 Queen Street; Ottawa, Ontario; K1A 0H5

Action Canada-France (ISSN 0318-7306)

This magazine is published in English and French ten times per year by a unit of the French Chamber of Commerce located in Canada. Every third issue contains a supplement on new products/technologies and joint venture opportunities from France. Subscriptions are available at \$20.00 per year.

Contact: La Chambre de Commerce Française au Canada, 360 St. François-Xavier, 1st Floor, Montreal, Quebec, H2Y 2S8, Tel.: 514-281-1246, Fax: 514-289-9594

CPI Newsbrief

This monthly newsletter features advances in plastics technology and lists new business opportunities involving product lines, processes, materials and equipment. No charge. Available in French and English.

Contact: Canadian Plastics Institute, 1262 Don Mills Road, Don Mills, Ontario, M3B 2W7, Tel.: 416-746-3443, Fax: 416-441-1208

COMPUTER DATA BASES

DISTCoverly

This data base developed by Industry, Science and Technology Canada contains approximately 20 000 listings of business opportunities from around the world. There is no charge for usage. Currently, it can only be accessed through the department's New Brunswick office.

Contact: Industry, Science and Technology Canada; 770 Main Street, 12th Floor; Moncton, New Brunswick; E1C 8P9; Tel.: 506-857-6412, Fax: 506-857-6429

Defence Technology Enterprises Ltd.

This company's off-line data base lists over 500 technologies it would like to commercialize. Although the technologies were developed in British defence laboratories, they have non-defence applications. Companies wishing to access this data base must purchase an associate membership, which entitles them to attend seminars and conferences as well as to a subscription to a quarterly newsletter.

Contact: Defence Technology Enterprises Ltd., Norfolk House, 433a Silbury Boulevard, Central Milton Keynes, MK9 2HA, England, Tel.: 0908 660245, Fax: 0908 668122

Japan Science and Technology Information Services: English Databases (JICST)

This English language data base of Japanese technologies and scientific developments can be accessed for a relatively low fee. Clients may search the data base themselves from a personal computer or have a specialist do it for them.

Contact: Japan Science and Technology Information Services, 251 Laurier Avenue West, Suite 403, Ottawa, Ontario, K1P 5J6, Tel.: 613-230-4443, Fax: 613-230-4443

Business Opportunities

The following offers of and requests for technology are based on information supplied by the contacts listed for each one.

Summary

Canada

- Backyard Cooler
- Bike Stand
- Confined Space Entry System
- Geriatric Bed

Miscellaneous New Products

- Cross-Current Airfoil Electrostatic Nozzle Case
- New Forms of Myocrisin
- Thermoelectric Gas Chromatography
- Fibre-Reinforced Plastic Sheets
- Variable Intensity Remote-Controlled Needleless Injectors
- Improved Three-Dimensional Imaging Device
- Conversational Hypertext Access Through Telecommunications

Miscellaneous New Inventions

- Artificial Edible Potato Skin
- Device to Remove Low Molecular Weight Hydrocarbon Impurities (Methane, Ethane, Ethylene) from Air or Another Specific Atmosphere
- Process for Synthesis of Cholesterol-Lowering Agents
- Technology Using a Recyclable, Polymer-Supported Alkyl Azodicarboxylate (Resin) in Performing Mitsunobu Reactions on an Industrial Scale
- Unique Artificial Teeth that Simulate the Dentin/Enamel Wear Relationship in Natural Teeth

Pharmaceutical Products for Skin Disorders

- Acsorex
- Lipsorex
- Herp-ex II
- Ex-riasis

- Power Pin for Hook-Up of Farm Equipment
- Treatment Process for Polycyclic Aromatic Hydrocarbons

France

- Bituminous Concrete and Related Equipment
- Prefabricated, Reinforced Concrete Pipe System

Federal Republic of Germany

- Process for Extracting Oil from Herbs
- Production of Insecticides

Switzerland

- Photovoltaic Receptors

USA

- Feminine Hygiene Pad

Offers

Canada

Backyard Cooler

The Backyard Cooler is a leisure product that can be described as a one-person plastic pool, moulded to the shape of the human body for comfort, with a water inlet and outlet. The inventor is seeking a licensing arrangement, joint venture arrangement or outright sale of his intellectual property rights.

Contact: Michael M. Hadac, 32975 Aspen Avenue, Abbotsford, B.C., V2S 6W8, Tel.: 604-859-8168

Bike Stand

A Canadian company is offering, through a licensing arrangement, the manufacturing and distributing rights to interlocking, portable bike stands, each of which can accommodate three bicycles, regardless of tire size. At only 3.6 kg (eight pounds) each, these plastic units are easy to transport but can be filled with water or sand to increase their weight to 45.4 kg (100 pounds) once users have them where they want them.

Contact: Albert Kral, Marnic Industries Ltd., 4694 Second Avenue, Niagara Falls, Ontario, L2E 4H6, Tel.: 416-356-7937, Fax: 416-354-4113

Confined Space Entry System

A businessman wishes to sell the rights to his patent for Uni-Hoist, a life-line system used in underground utility vaults, sewers, pipelines, vats, storage tanks or other such confined spaces. Uses include construction, maintenance and emergency rescue. Uni-Hoist is protected by patents in Canada, the USA, Europe and Australia.

Contact: Mr. Morris Baziuk, Box 53, Group 6, RR #1, Winnipeg, Manitoba, R3C 4A3, Tel.: (204) 338-9874, Fax: (204) 338-0625

Geriatric Bed

University of Alberta Hospitals staff has had a geriatric bed designed to meet needs identified by nurses and nursing researchers. Features include a lift that does not require hand crank operation and a three-quarter length guard rail that is totally out of the way when not needed. They have filed for a patent and are looking for a manufacturer to enter into a joint venture agreement to produce and market it.

Contact: Barbara Nyland, Manager, Technology Commercialization, Research and Technology, University of Alberta Hospitals, 8440-112 Street, Edmonton, Alberta, T6G 2B7, Tel.: 403-492-6711, Fax: 403-492-7082

Miscellaneous New Products

The following seven items are offered for licensing by Canadian Patents and Development Limited:

Cross-Current Airfoil Electrostatic

Nozzle Case Case 7584

This simple electrostatic nozzle may be used to spray one or more charged clouds into different volumes of an enclosed area to allow different materials to be deposited on different sections of the inner surfaces. The use of charged clouds allows a small amount of insecticide to be safely distributed evenly on desired surfaces, which results in substantial savings in materials and labour.

New Forms of Myocrisin Case 8881

This invention describes a novel process for the preparation of (+), (-) or (\pm) forms of sodium gold derivatives of thiomalic acid. The process eliminates the impurities produced during sterilization that are associated with an excess of thiomalic acid and are probably responsible for the toxic side effects. The "all R, all S, RS" and the available commercial myocrisins show different biological activity as demonstrated in-vitro. These improved gold-organic substances may be exploited for their anti-inflammatory or anti-arthritis properties.

Thermoelectric Gas Chromatography

Case 8905

This invention relates to a system capable of performing sub-ambient to super-ambient temperature programmable gas chromatography. A pair of thermoelectric modules in contact with a pair of heat sinks precisely control the temperature of the column between -60°C and $+100^{\circ}\text{C}$ to produce the desired results.

Fibre-Reinforced Plastic Sheets

Case 9128

The Industrial Material Research Institute of the National Research Council of Canada has developed a technique for producing, by extrusion, fibre-reinforced plastic sheets consisting of two plastic layers and, in between, a fibre-filled layer with randomly oriented fibres. The structure has the surface finish of plastic and the mechanical properties of fibre-reinforced plastic products.

Variable Intensity Remote-Controlled Needleless Injectors Case 9273

These injectors are designed to allow a high initial velocity of ejection for penetration followed by a lower velocity for a controlled diffusion of injectable fluids. Both intensities of ejection and depth of penetration are adjustable for different purposes and skin conditions. The injectors have applications in dentistry, medicine and veterinary medicine (on animals of all sizes).

Improved Three-Dimensional Imaging Device Case 9415

This lens improves vision systems in which the three-dimensional data is acquired by means of a camera with two apertures. In such systems, either a biprism lens or colour filters have been used to improve resolution at or near zero z co-ordinate and to distinguish positive from negative z co-ordinates. This lens can replace the biprism lens or colour filters without any of their associated complexities or limitations.

Conversational Hypertext Access Through Telecommunications (CHAT)

Case 9507

A computer has the potential to answer specific questions and perform specific tasks without any personal involvement. Until now, the main problem has been the special skills and training needed to use computers. CHAT is a technology system developed to permit laymen to question a computer system simply by typing questions/commands in their native language on a computer keyboard. The system is very user-friendly and is particularly effective when used with a data base.

Contact: F. Crowe, Canadian Patents and Development Limited, 275 Slater Street, Ottawa, Ontario, K1A 0R3, Tel.: 613-990-6100, Fax: 613-990-8528 (Please quote case numbers when requesting information.)

Miscellaneous New Inventions

The following five inventions are available either through licensing, joint venture or outright sale arrangements:

Artificial Edible Potato Skin—shell is composed of natural food ingredients; filling may be natural potatoes alone or combined with other ingredients. Frozen and packaged for transportation and storage.

Device to Remove Low Molecular Weight Hydrocarbon Impurities (Methane, Ethane, Ethylene) from Air or Another Specific Atmosphere—hydrocarbon impurities are oxidized to carbon dioxide and water using a heated metal catalyst. Metal turnings in the catalyst ensure its uniform heating and allow operation at a lower temperature. Useful for the preservation and better storage of fruits, vegetables and flowers as well as other industrial and research applications.

Process for Synthesis of Cholesterol-Lowering Agents—a strategy for making molecules of the compactin and mevinolin type and the hitherto unknown substance 3-ethylcompactin. These powerful hypocholesterolemic agents, which lower blood cholesterol levels, also have potential for semi-synthetic drugs.

Technology Using a Recyclable, Polymer-Supported Alkyl Azodicarboxylate (Resin) in Performing Mitsunobu Reactions on an Industrial Scale—Mitsunobu-type reactions are capable of selectively replacing hydroxyl groups with a wide variety of other functional groups under very mild conditions. The process has applications in pharmaceutical and specialty chemical production.

Unique Artificial Teeth that Simulate the Dentin/Enamel Wear Relationship in Natural Teeth—uses an original design plus a unique combination of plastics. The teeth are self-sharpening and have increased cutting efficiency as a result of a unique horizontal scissors action.

Contact: Office of Research Services, Technology Transfer Program, University of Alberta, 1-3 University Hall, Edmonton, Alberta, T6G 2J9, Tel.: 403-492-5360

Pharmaceutical Products for Skin Disorders

A pharmaceutical R&D company wishes to enter into licensing arrangements to manufacture and market the following four products used to treat skin disorders:

Acsoresx—a non-prescription topical liquid gel for the treatment of acne vulgaris in the early and medium-advanced stages.

Lipsorex—a non-prescription topical gel for the treatment of Herpes Simplex I (Herpes Labialis) infections.

Herp-ex II—a topical preparation for the treatment of Herpes Simplex II (Herpes Genitalis) infections.

Ex-riasis—a topical preparation for the treatment of psoriasis.

Contact: Mr. Pat Beauchamp, President and CEO, Vexco Laboratories Inc., 600-11012 Macleod Trail South, Calgary, Alberta, T2J 6A5, Tel.: 403-271-3883, Fax: 403-278-4665

Power Pin for Hook-Up of Farm Equipment

A company would like to enter into a joint venture agreement for the commercialization of its Power Pin, which allows simpler and safer hook-up of farm equipment. It can be operated from inside the cab or manually from the drawbar area.

Contact: Brian Olson, Olson-Ag Innovations, 1166 Winnipeg Street, Regina, Saskatchewan, S4R 1J6, Tel.: 306-525-8833, Fax: 306-569-8649

Treatment Process for Polycyclic Aromatic Hydrocarbons

A university has developed a treatment process for polycyclic aromatic hydrocarbons. Aluminum hydroxide calcined between 200°C and 500°C offers superior absorption capacity for toxic polycyclic aromatic hydrocarbons (PAH). These hydrocarbons are broken down into innocuous chemicals and absorbed by the calcined aluminum hydroxide, which can be recycled.

The process has environmental applications, e.g., treating industrial exhaust fumes produced by incomplete combustion or organic materials, treating fumes from processes involving high-temperature uses of graphite.

A licensing or joint venture arrangement or the outright sale of the patent rights would be considered.

Contact: Mr. Sylvain Desjardins, Technology Transfer Officer, Université de Sherbrooke, Central Building, Room 043, Sherbrooke, Quebec, J1K 2R1, Tel.: 819-821-7840, Telex: 05-836149

France

Bituminous Concrete and Related Equipment

A company would like to enter into a joint venture or licensing arrangement for its bituminous concrete manufacturing processes and spreading machines. Bituminous concrete is ideal for resurfacing hydraulic works such as dams, canal banks, and large pools or basins. It provides waterproofing, surface protection and a variety of mechanical advantages. The material is also used widely for road surfaces, where its advantages include durability, few seams and joints, and low maintenance costs.

Contact: Mr. Gilbert Raynaud, Commercial Director, Entreprise Malet, 30, Avenue de Larrieu, 31081 Toulouse Cédex, France, Tel.: 011.33 (61) 41.11.31, Fax: 011.33 (61) 41.57.60

Prefabricated, Reinforced Concrete Pipe System

A company is seeking a joint venture arrangement for the manufacturing of its system of prefabricated, reinforced concrete pipe sections with applications in rail and road tunnels, viaducts and overflow pipes, and underground structures such as reservoirs. The system saves 25 to 30 per cent in concrete volume, and structures can be erected five to seven times faster than those made with on-site cast concrete. Only a crane and a team of four men is needed to erect each module.

Contact: Mr. P.H.B. Benard, President, L'Équipe, 1200 McGill College, Suite 1100, Montreal, Quebec, H3B 4G7, Tel.: 514-393-8253, Fax: 514-393-9060

Federal Republic of Germany

Process for Extracting Oil from Herbs

A company specializing in the installation of chemical plants offers technical assistance, simple technology know-how and low-cost equipment to extract essential oils from herbs by steam distillation.

Contact: R. Mangel, Dr. Nolte GmbH, Berliner Strasse 6, D-8264 Waldkraiburg, Federal Republic of Germany, Telex: 56-429 nolte d.

Production of Insecticides

A company is offering—in the form of transfer of know-how, licences or a joint venture arrangement—its technology related to the production of insecticides. Their products are highly innovative, safe for the environment and non-toxic for humans and other mammals. They also meet international safety standards. Contact: Mr. Meyer and Th. Jacobson, Managing Directors, Systemhandel GmbH, Welsersstr. 25, D-85, Nürnberg, Federal Republic of Germany, Telex: 626189 systd., Fax: 09 11-532761

Switzerland

Photovoltaic Receptors

A company is offering the manufacturing and distribution rights for its photovoltaic receptors. They are enclosed in Plexiglas cases that are similar to a one-way mirror in that the light that goes in is not reflected back out. These cases are aerodynamically designed and are primarily intended for use in solar vehicles. Contact: Daniel Chablaix, Entreprise D. Chablaix, avenue du Grey 76, CH-1018, Lausanne, Switzerland

USA

Feminine Hygiene Pad

A company is offering the manufacturing and distributing rights to a new feminine hygiene pad through licensing or some other strategic alliance arrangement. Contact: John Morehead, Technology Search International Inc., 500 East Higgins Road, Elk Grove Village, Illinois, 60007, Tel.: 312-593-2111, Fax: 312-593-2182

Requests

Summary

Argentina

- Citrus Fruit Concentrates

Bulgaria

- Vermiculite

India

- Corrosion Inhibitors for Treatment Plants

Portugal

- Technical Assistance with Propane Mixers, Vaporizers, etc.

Tunisia

- Radio Communications

United Kingdom

- Proprietary Chemical and Polymer Products and Technology
- Consumer Goods
- Metal and Non-Metal Surface Treatments, Chemicals and Technology
- Systems for Large Institutional or Industrial Buildings
- Medical Equipment and Products

USA

- New Products

New Products and Technologies

- Liquid Pumping and Gas Compressing
- Power Transmission, Including Traction and Electric Motor Drives
- Seals, Bearings and Bonding
- Economic Composite Structures and Related Materials
- Coatings and Powdered Metals
- Smart Machines and Diagnostic Capability to Predict Failure
- Machinery Noise Reduction Technologies
- Thermal Energy Management

Argentina

Citrus Fruit Concentrates

A company is seeking know-how, licences and technical assistance to manufacture orange, grapefruit and lemon concentrates.

Contact: Pablo Ferrarotti, PAK Ltda, Santa Fe 1219-6°, 2000 Rosario, Argentina, Telex: 41889 PBTH Ar "Att.PAK"

Bulgaria

Vermiculite

A company wishes to enter into a joint venture agreement to obtain the technical co-operation needed to exploit an open-air deposit of vermiculite estimated at 600-3 000 tonnes with vermiculite and hydrobiotite contents of 15-30 percent and to set up a production line of light building materials, thermo-insulating materials and high-temperature insulating materials for foundries.

Contact: D. Toncheva, FTE "Metallurgimpex," 22 G. Dimitrov Blvd., 1000 Sofia, Bulgaria, Telex: 22 502

India

Corrosion Inhibitors for Treatment Plants

A company would like to enter into a joint venture arrangement to obtain the technical co-operation, know-how and technology to manufacture corrosion inhibitors for oil fields; refineries; and oil, grease and water treatment plants. Contact: Managing Partner, Deltamike Entreprises, 17, Raghunath Dadaji Street, 4th Floor, Fort, Bombay 400 001, India.

Portugal

Technical Assistance with Propane Mixers, Vaporizers, etc.

A company specializing in the installation of gas network projects would like to obtain technical assistance and know-how to set up manufacturing units of propane air mixers, vaporizers, control panels, etc., with a gas output of 13 500 kilocalories/cubic metre.

Contact: Jorge F. G. de Figueredo, GASWATT Lds, Rua de Santana à Lapa, 78-1 dt, 1200 Portugal, Lisbon

Tunisia

Radio Communications

Ref. BRE/TN/42/03.10.89

A company would like to obtain technical assistance with manufacturing and research in radio communications for use in fishing and navigation.

Contact: Commission of the European Communities, DG XXXIII, Business Co-operation Centre, rue D'Arlon 80, B-1040 Bruxelles, Belgium, Tel.: + 322/230 39 49, Fax: + 322/236 29 04

United Kingdom

A representative of various companies in the U.K. would like to acquire the following new products and processes through licensing, joint venture or some other type of alliance.

Proprietary Chemical and Polymer Products and Technology

Client 396/CH/89
A company is interested in chemical formulations for rust prevention, lubricants, adhesives, emulsifiers, fire retardants, etc. Its markets include automotive, building, transportation, steel production, metal working, etc.

Consumer Goods

Client 411/CL/89
An engineering company is interested in a variety of leisure and industrial products. These include domestic appliances, heating/cooling devices, home building accessories, welding equipment and energy conservation products.

Metal and Non-Metal Surface Treatments, Chemicals and Technology

Client 314/C/89
A world leader in electrochemistry and surface treatment technology is looking for products and services related to surface cleaning, electroplating, anodizing, metal or organic coatings, complementary chemicals for industrial use, and factoring of specialist complementary chemicals.

Systems for Large Institutional or Industrial Buildings

Client 420/HD/89
A leading engineering contractor is searching for products and services related to advanced systems for the construction and servicing of "intelligent" buildings. Areas of interest include communication, security, and fire detection and protection.

Medical Equipment and Products

Client 403/FS/89

A medical products company is interested in medical instruments, machines, plastic disposables, sterile fluids, special foods and diagnostic products for use in a wide variety of treatments and services.

Contact: John D. Emanuel, Pax Technology Transfer Limited, 112 Boundary Road, London, England, NW8 0RH, Tel.: 01-328-8823, Fax: 01-624-1242. (Please quote client number.)

USA

New Products

Ref. TSI/RHS/762
A company with experience in machining, precision grinding, welding, electro-mechanical assembly and heat treating is seeking the manufacturing rights for new and unique products related to the following industries: gear; packaging; military, marine, farm, off-road and automotive equipment; construction tools; spray painting; and others. The company is interested in licensing, joint ventures and other arrangements.

New Products and Technologies

Ref. TSI/ASG/903
An industrial firm is seeking — through licensing, joint venture or another type of arrangement — new products and technologies in the following eight areas:

Liquid Pumping and Gas Compressing — especially centrifugal and positive displacement fluid and gas equipment technologies that offer improvements in hydraulic and aerodynamic efficiencies, including enhanced off-design characteristics.

Power Transmission, Including Traction and Electric Motor Drives — new constant torque and variable torque high speed and variable speed drives, as well as new inverter and motor technology developments.

Seals, Bearings and Bonding — radial and axial process seals, including high-speed shaft seals.

Economic Composite Structures and Related Materials

— technology to produce composite structures in low quantity production lots that would be priced competitively with current metal-working techniques. Technologies could include high strength engineering resins, molded plastics, fibre reinforced matrices and metal composites.

Coatings and Powdered Metals — coatings or surface treatments that can be applied to offer corrosion, wear, cavitation and/or erosion resistance on sealing, bearing and other surfaces.

Smart Machines and Diagnostic Capability to Predict Failure — machines and associated devices for existing machinery with applications in adaptive control, programmed control, servo control, non-abusive operation, safe operation and communication.

Machinery Noise Reduction

Technologies — active or passive new techniques or equipment for reducing airborne or structure-borne noise (20 to 20 000 Hz).

Thermal Energy Management

— enhanced heat transfer surfaces for use in typical tube and fin heat exchangers.

Contact: J. Morehead, Technology Search International, 500 East Higgins Road, Elk Grove Village, Illinois, 60007, Tel.: 312-593-2111, Fax: 312-593-2182

Special Events

Summary

Canada

- **RCPS MEDICAL AND SURGICAL EXPOSITION**
Toronto — September 1990
- **HOME INNOVATIONS SHOW**
Winnipeg — September 1990
- **THE EDMONTON BUSINESS COMPUTER SHOW**
Edmonton — October 1990
- **EXPOPLAST '90**
Montreal — October 1990
- **TRUCKCAN '90**
Toronto — October 1990

England

- **WOODMEX 90**
Birmingham — November 1990

Federal Republic of Germany

- **INTERFORST 90 (FORESTRY AND LOG TIMBER TECHNOLOGY)**
Munich — July 1990
- **CLOTHING EXHIBITION**
Munich — August and October 1990
- **IMEGA 90 (FOOD AND CATERING)**
Munich — September 1990

Finland

- **FINNCONSUM 90 (CONSUMER GOODS)**
Helsinki — November and December 1990

France

- **EUROPLAST 90 AND IRC EXHIBITION (PLASTICS AND RUBBER)**
Paris — June 1990
- **SIAL 90 (FOOD PRODUCTS)**
Paris — October 1990
- **INTERNATIONAL EXHIBITION OF SPECTACLES, OPTICIANS' INSTRUMENTS AND EQUIPMENT FOR OPTICIANS**
Paris — October 1990
- **IPHARMEX (PHARMACEUTICALS)**
Lyon — November 1990
- **PRONIC (ELECTRONICS)**
Paris — November 1990
- **GIA 90 AND MATIC 90 (AGRICULTURAL AND FOOD EQUIPMENT)**
Paris — November 1990
- **POLLUTEC (POLLUTION CONTROL)**
Lyon — November 1990

Indonesia

- **HOTEL, CATERING AND TOURISM INDONESIA 90**
Jakarta — October 1990

Singapore

- **LASER ASIA '90**
Singapore — October 1990

Taipei

- **INTERNATIONAL HI-TECHNOLOGY SHOW 1990**
Taipei — June 1990

United States

- **NATIONAL DESIGN ENGINEERS SHOW**
Anaheim — September 1990
- **AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS, NATIONAL TECHNICAL CONFERENCE**
Boston — October 1990
- **LICENSING EXECUTIVES SOCIETY USA/CANADA ANNUAL MEETING**
New Orleans — October 1990
- **NATIONAL CAPITAL AREA INTERNATIONAL AUTO SHOW**
Washington — December 1990

Canada

RCPS MEDICAL AND SURGICAL EXPOSITION

Metro Convention Centre
Toronto, Ontario
September 14-17, 1990
Contact: Anna Lee Chabot, The Royal College of Physicians and Surgeons, 74 Stanley, Ottawa, Ontario, K1M 1P4, Tel.: 613-746-8177

HOME INNOVATIONS SHOW

Winnipeg Convention Centre
Winnipeg, Manitoba
September 26-29, 1990
Contact: H.I. Marketing Services Ltd., 253-375 York Avenue, Winnipeg, Manitoba, R3C 3J3, Tel.: 204-944-1464, Fax: 204-957-1067

THE EDMONTON BUSINESS COMPUTER SHOW

Edmonton Convention Centre
Edmonton, Alberta
October 17-18, 1990
Contact: Gary Gow, Show Manager, Industrial Trade and Consumer Shows Inc., 1015 Centre Street North, Suite 200, Calgary, Alberta, T2E 2P8, Tel.: 403-276-7881, Fax: 403-276-5026

EXPOPLAST '90

Place Bonaventure
Montreal, Quebec
October 26-27, 1990

TRUCKCAN '90

Toronto International Centre of Commerce (Mississauga)
October 26-28, 1990
Contact: Jack McLean, Show Manager, Southex Exhibitions, 1450 Don Mills Road, Don Mills, Ontario, M3B 2X7, Tel.: 416-445-6641, Fax: 416-442-2207

England

WOODMEX 90

National Exhibition Centre
Birmingham, England
November 3-7, 1990
Contact: British Consulate General, Toronto, Ontario, Tel.: 416-593-1290

Federal Republic of Germany

INTERFORST 90 (Forestry and Log Timber Technology)

Munich, Federal Republic of Germany
July 3-8, 1990

CLOTHING EXHIBITION

Fair Grounds

Munich, Federal Republic of Germany
August 19-21 and October 7-9, 1990

Contact: Unilink, 50 Weybright Court,
Unit 41, Agincourt, Ontario, M1S 5A8,
Tel.: 416-291-6359,
Fax: 416-291-0025

IMEGA 90 (Food and Catering)

Munich Trade Fair Centre

Munich, Federal Republic of Germany
September 15-20, 1990

Contact: MünchenerMesse- und
Ausstellungsgesellschaft mbH,
Messegelände, Postfach 12 10 09,
D-8000 München 12, Tel.: (089) 51 07-0,
Fax: (089) 51 07-506

Finland

FINNCONSUM 90 (Consumer Goods)

Fair Centre

Helsinki, Finland

November 27 – December 2, 1990

Contact: The Finnish Fair Corporation,
Box 21, 00521, Helsinki, Finland,
Tel.: 358 015091, Fax: 011-358-0-142-358

France

EUROPLAST 90 and IRC EXHIBITION (Plastics and Rubber)

Parc d'Expositions de Paris-Nord,
Villepinte

Paris, France

June 11-16, 1990

Contact: AB3C—Annie Blin; 29, rue du
Fg Poissonnière; 75009 Paris—France;
Tel.: 33 (1) 42 47 01 42

SIAL 90 (Food Products)

Parc d'Expositions de Paris-Nord,
Villepinte

Paris, France

October 22-26, 1990

Contact: Pierre de Lamotte; Commissaire
Général; Salon International de
L'Alimentation; 39, rue de la Bien-
faisance; 75008 Paris—France;
Tel.: 33 (1) 42 89 46 87; Fax: 42 89 46 94

INTERNATIONAL EXHIBITION OF SPECTACLES, OPTICIANS' INSTRUMENTS AND EQUIPMENT FOR OPTICIANS

Porte de Versailles Exhibition Centre
Paris, France

October 26-29, 1990

IPHARMEX (Pharmaceuticals)

Eurexpo Centre

Lyon, France

November 3-5, 1990

PRONIC (Electronics Industry)

Parc d'Expositions de Paris-Nord,
Villepinte

Paris, France

November 12-16, 1990

GIA 90 and MATIC 90 (Agricultural and Food Equipment)

Porte de Versailles Exhibition Centre
Paris, France

November 12-16, 1990

POLLUTEC (Pollution Control)

Eurexpo Centre

Lyon, France

November 20-23, 1990

Contact: Colette Boright, Promosalons,
Suite 800, 210 Dundas Street West,
Toronto, Ontario, M5G 2E8,
Tel.: 416-977-7320, Fax: 416-977-9671

Indonesia

HOTEL, CATERING AND TOURISM INDONESIA 90

Jakarta Fair Grounds

Jakarta, Indonesia

October 2-6, 1990

Contact: Bill Oakdon, Overseas Exhibition
Services Ltd., 11 Manchester Square,
London, England, W1M 5AB,
Tel.: (01) 486 1951 or (01) 487 5831,
Fax: (01) 935 7214 or (01) 486 8773

Singapore

LASER ASIA '90

Singapore World Trade Center

Singapore

October 24-27, 1990

Contact: Conference & Exhibition
Management Services Pte. Ltd.,
1 Maritime Square, No. 09-43, World Trade
Centre, Singapore 0409,
Tel.: 0065-2788666 & 2783369,
Fax: 0065-2784077

Taipei

INTERNATIONAL HI-TECHNOLOGY SHOW

Taipei World Trade Center

Taipei

June 21-25, 1990

Contact: Far East Trade Service, Inc.,
2 Bloor Street East, Suite 3315, Toronto,
Ontario, M4W 1A8, Tel.: 416-922-2412,
Fax: 416-922-2426

United States

NATIONAL DESIGN ENGINEERS SHOW

Convention Center

Anaheim, California

September 17-19, 1990

Contact: Cahners Expo Group,
999 Summer Street, Stamford,
Connecticut, 06905, Tel.: 203-352-8443
(exhibits) or (203) 964-0000
(attendance)

AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS, NATIONAL TECHNICAL CONFERENCE

Sheraton Hotel

Boston, Massachusetts

October 3-5, 1990

Contact: Katherine W. Jones, Membership
Director, Box 12215, Research Park,
North Carolina, 27709, Tel.: 919-549-8141

LICENSING EXECUTIVES SOCIETY USA/ CANADA ANNUAL MEETING

Marriott Hotel

New Orleans, Louisiana

October 22-24, 1990

Contact: Jack Stuart Ott, 1444 W. 10th St.,
Cleveland, Ohio, 44113, Tel.: 216-241-3940

NATIONAL CAPITAL AREA INTERNATIONAL AUTO SHOW

Convention Center

Washington, D.C.

December 26-30, 1990

Contact: Bob Yoffe, Show Manager,
221 Columbus Ave., Boston,
Massachusetts, 02116, Tel.: 617-536-8152,
Fax: 617-536-8719

Regional Offices

NEWFOUNDLAND

ISTC
Parsons Building
90 O'Leary Avenue
P.O. Box 8950
ST. JOHN'S, Nfld.
A1B 3R9
Tel.: (709) 772-4866
Fax: (709) 772-5093

PRINCE EDWARD ISLAND

ISTC
Confederation Court Mall
134 Kent Street, Suite 400
P.O. Box 1115
CHARLOTTETOWN, P.E.I.
CIA 7M8
Tel.: (902) 566-7400
Fax: (902) 566-7450

NOVA SCOTIA

ISTC
Central Trust Building
1801 Hollis Street
P.O. Box 940, Station M
HALIFAX, N.S.
B3J 2V9
Tel.: (902) 426-4782
Fax: (902) 426-2624

NEW BRUNSWICK

ISTC
Assumption Place
770 Main Street
P.O. Box 1210
MONCTON, N.B.
E1C 8P9
Tel.: (506) 857-4782
Fax: (506) 857-6429

QUEBEC

ISTC
Tour de la Bourse
800 Victoria Place
Suite 3800
P.O. Box 247
MONTREAL, Que.
H4Z 1E8
Tel.: (514) 283-8185
Fax: (514) 283-3315

Local Offices

Alma
Tel.: (418) 668-3084
**Plan de l'Est (Robin d'Anjou)/
Rimouski**
Tel.: (418) 722-3282
Drummondville
Tel.: (819) 478-4664
Québec
Tel.: (418) 648-4826
Sept-Îles
Tel.: (418) 968-3426
Sherbrooke
Tel.: (819) 564-5904
Trois-Rivières
Tel.: (819) 374-5544
Val-d'Or
Tel.: (819) 825-5260

ONTARIO

ISTC
Dominion Public Building
4th Floor
1 Front Street West
TORONTO, Ont.
M5J 1A4
Tel.: (416) 973-5000
Fax: (416) 973-8714

MANITOBA

ISTC
330 Portage Avenue, Room 608
P.O. Box 981
WINNIPEG, Man.
R3C 2V2
Tel.: (204) 983-4090
Fax: (204) 983-2187

SASKATCHEWAN

ISTC
105 - 21st Street East,
6th Floor
SASKATOON, Sask.
S7K 0B3
Tel.: (306) 975-4400
Fax: (306) 975-5334

Local Office

Regina
Tel.: (306) 780-6108

ALBERTA

ISTC
Canada Place, Room 540
9700 Jasper Avenue
EDMONTON, Alta.
T5J 4C3
Tel.: (403) 495-4782
Fax: (403) 495-4507

Local Office

Calgary
Tel.: (403) 292-4575

BRITISH COLUMBIA

ISTC
900 - 650 West Georgia Street
P.O. Box 11610
VANCOUVER, B.C.
V6B 5H8
Tel.: (604) 666-0434
Fax: (604) 666-8330

YUKON

ISTC
108 Lambert Street, Suite 301
WHITEHORSE, Yuk.
Y1A 1Z2
Tel.: (403) 668-4655
Fax: (403) 668-5003

NORTHWEST TERRITORIES

ISTC
Precambrian Building
P.O. Bag 6100
YELLOWKNIFE, N.W.T.
X1A 2R3
Tel.: (403) 920-8568
Fax: (403) 873-6228

Atlantic Canada Opportunities Agency

Tel.: (toll-free) 1-800-561-7862

FedNor

Tel.: (toll-free) 1-800-461-6021

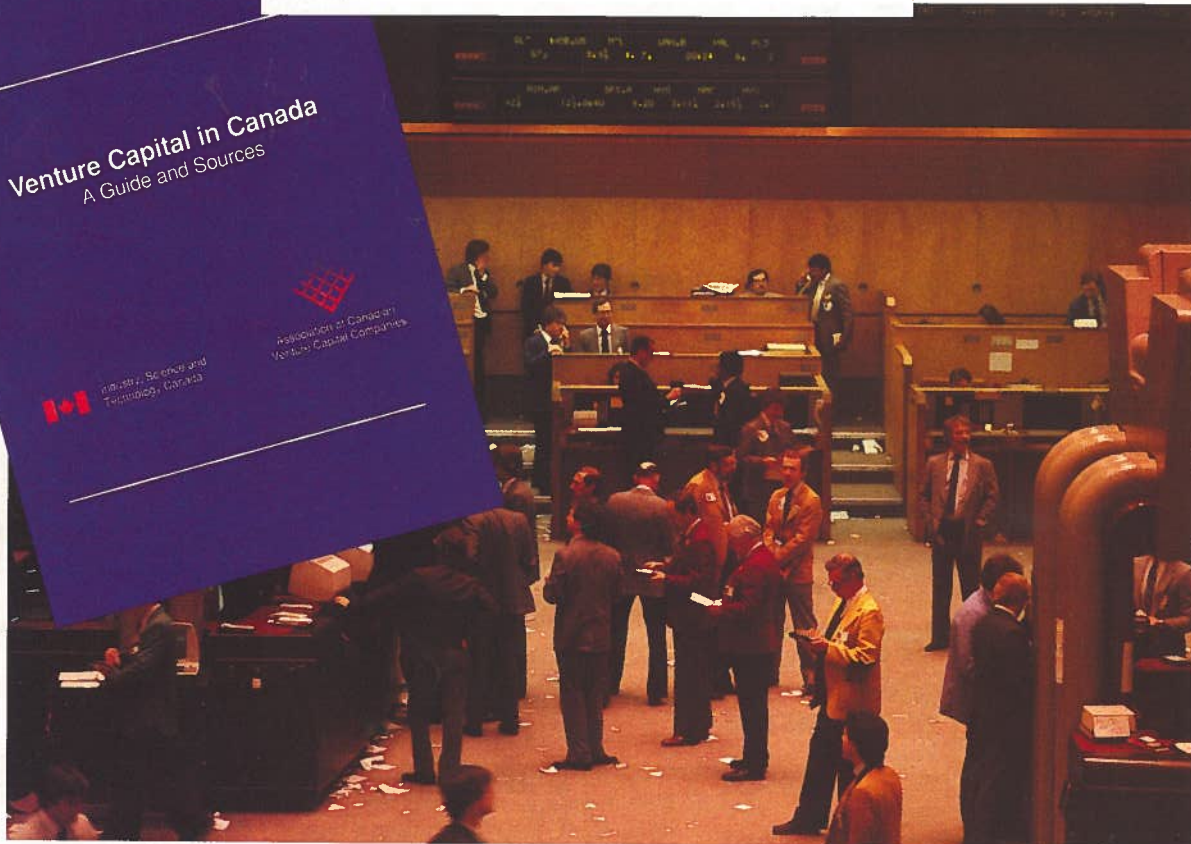
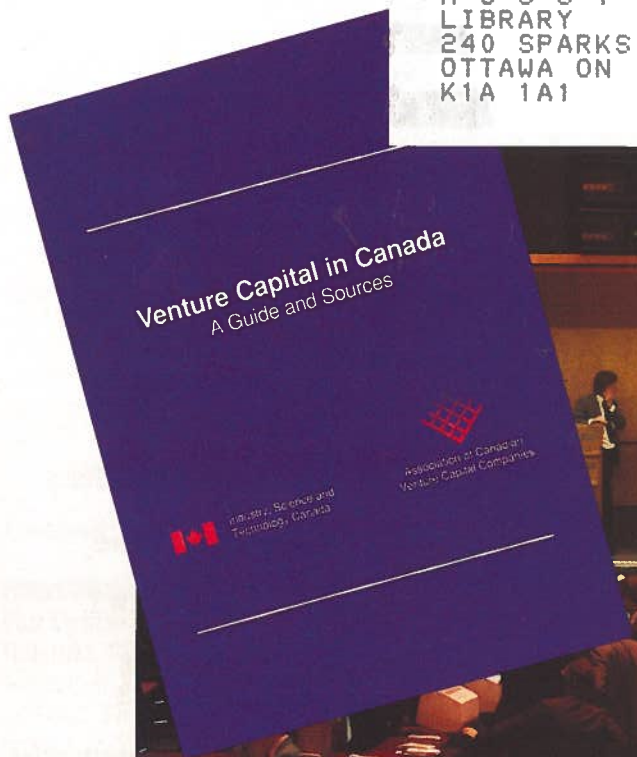
Western Economic Diversification

Tel.: (403) 495-4164
Fax: (403) 495-4557

If undelivered return to:
Innovation
Industry, Science and Technology Canada
Ottawa, Canada K1A 0H5

 Canada Post / Postes Canada
Postage paid / Port payé
Bulk / En nombre
third / troisième
class / classe
K1A 0H5
OTTAWA

WOC0002512C4890NT-AM
M O S S T
LIBRARY
240 SPARKS ST
OTTAWA ON
K1A 1A1



To obtain copies of this publication, write:
Audio-Visual and Print Distribution Centre
Communications Branch
Industry, Science and Technology Canada
235 Queen Street, 2nd Floor West
Ottawa, Ontario
K1A 0H5

or

Contact any of the ISTC regional offices listed on the other side of
this page.



Industry, Science and
Technology Canada

Industrie, Sciences et
Technologie Canada



Canada