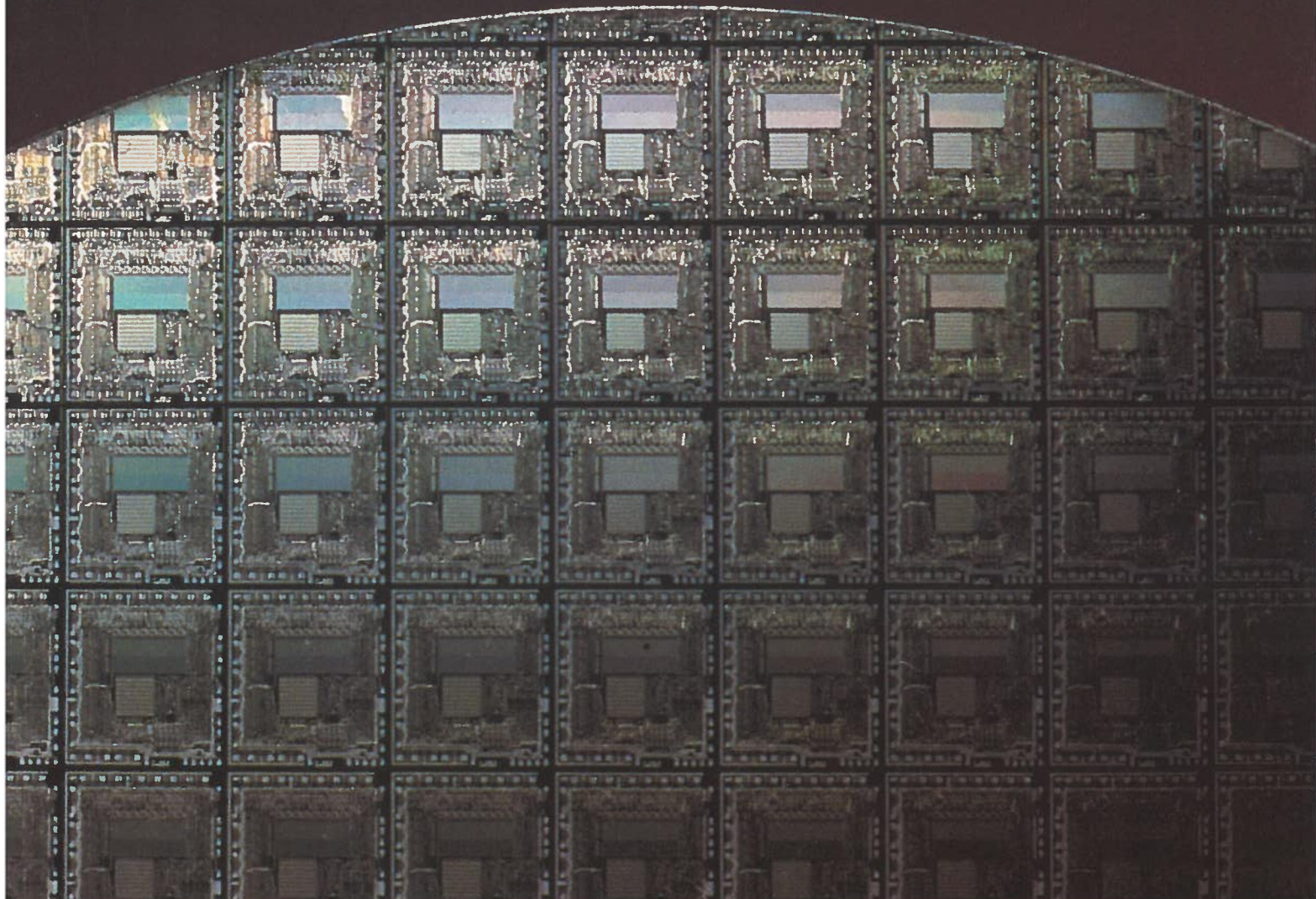


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Supplement to Canada Commerce *Sept/Oct*
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Magnified silicon chip takes on the appearance of a large geodetic dome.

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Welder at Portatest Manufacturing in Edmonton.

EDITORIAL

EXTENDING IDEAS IN YOUR COMMUNITY UNIVERSITY WEEK IN CANADA — OCTOBER 19-27

The theme of this year's University Week "Extending Ideas into Your Community" is a particularly appropriate one for this, the third issue of Innovation Supplement.

It is, after all, one of the basic reasons for our publication and, in fact, one of the major thrusts of the Department of Regional Industrial Expansion. We are fortunate to have the president of one of Canada's most progressive universities outline his philosophy in our lead article (opposite). It

is with a certain amount of satisfaction that we point to the fact that DRIE and one of its predecessors, Industry, Trade and Commerce, played an important supporting role (morally and financially) in Waterloo University's Canadian Industrial Innovation Centre, among others across the country.

We wish the university community well in its efforts since it is such an essential factor in our effort to remain competitive in an increasingly complex world. R.J. McD.

Innovation Supplement

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. Ideas for articles and information, even finished articles, will be welcomed.

We invite you to become a part of the *Innovation Supplement* with your comments and ideas. You can contact us at:

**Innovation Supplement
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The Universities and Canada's Economic Future

By Douglas Wright,
President, University of Waterloo

We have heard plenty of talk of late about the high tech era that is shortly to engulf us . . . if, indeed, it is not already at hand. We have heard of integrated manufacturing, computer communications, software, biotechnology, artificial intelligence, and unprecedented rates of change which affect every facet of our lives and which will continue to do so as far into the future as we can see.

More and more, we are starting to recognize that the key to our economic competitiveness and well-being, and perhaps to Canada's very survival as an independent nation during this coming era of rapid and continuous change, will lie in our ability to find a way to keep up-to-date technologically.

Simple Meaning

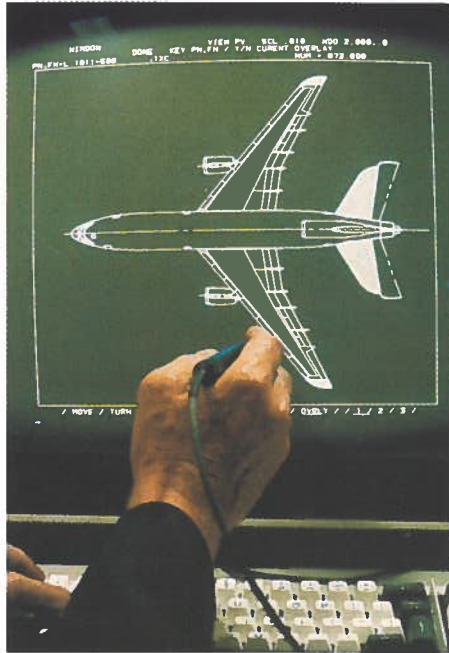
One of the simplest, most useful meanings I can think of for the word "technology" is simply — know-how *and* know-why. No more, no less. Technology has to do with our intellectual capabilities, directed towards the solution of increasingly complex problems.

This is indicated by the fact that some of the countries that are doing best in the world these days are those that might be described as technology-rich (countries like Switzerland, Germany and Japan). It is interesting that each of these might also be termed resource-poor.

On the other hand, some of the worst are in themselves resource-rich . . . with fertile soil, a favorable climate, or a wealth of mineral or petroleum reserves. The reason for their difficulties is that while resource-rich they are technology-poor!

It seems to be evident that the key to any country's success in the future, Canada included, will depend more and more on our human resources and less and less on our acknowledged wealth of natural resources.

The way to develop our human resources is, primarily, through our educational institutions as well as through the efforts we Canadians expend in the research and development areas.



Now I would not for one moment suggest that all we have to do is turn on the research tap and all our problems will be solved, for all time. That would be unbelievably naive. (To illustrate, our most critical need at the moment is probably in the area of innovation management, rather than new ideas and inventions in themselves.)

Research nonetheless remains a very important factor. Countless hundreds of millions of dollars, pounds, marks, yen,

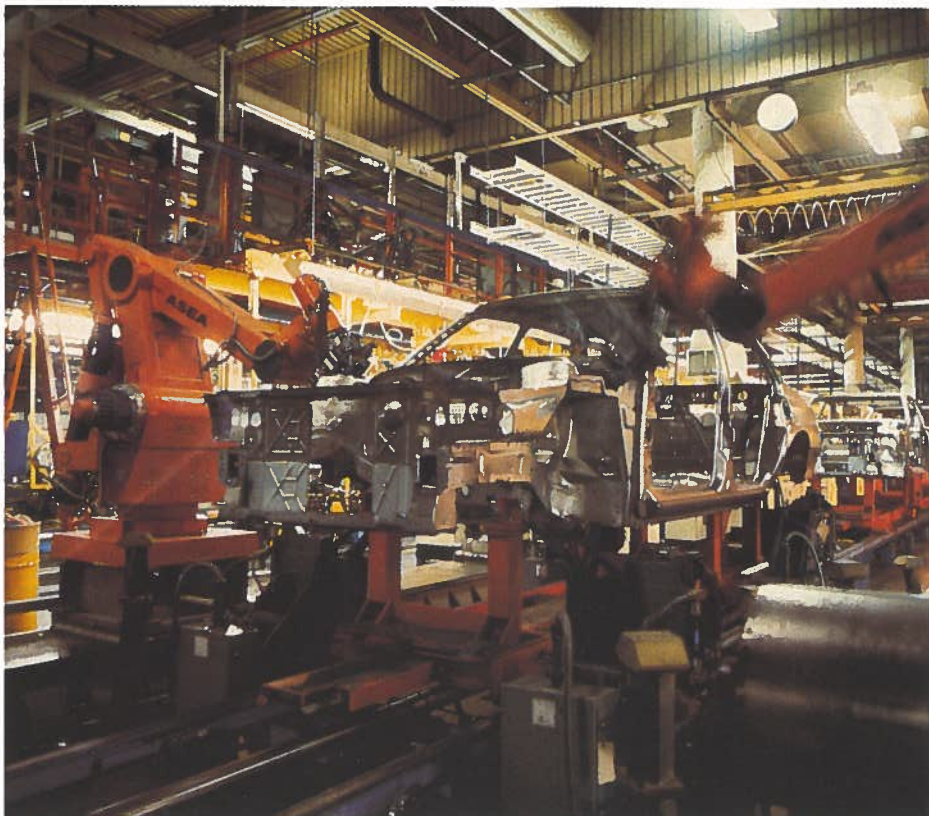
zlotys, rubles and so forth are currently being spent on research elsewhere in the world in this global effort to pave the pathway to the new age, and to establish competitive advantage for individual countries.

The message is clear — we Canadians have no alternative but to do research and development if we wish to avoid being completely overwhelmed by the year 2000, or perhaps sooner. If we fail to do research and development, our prospects are forbidding. In fact, they are gloomy enough even if we do mend our ways and devote much more effort to creating new ideas and developing our human resources.

Assuming that we do not wish to throw up our hands and watch helplessly as our country goes down the drain, the question is: How should we proceed?

This larger question is generally broken down into a series of questions, some of which might include: What percentage of GNP should government devote to supporting research? Assuming we cannot compete in technology development across the board, what should we focus on? What technology development should be done here and what should we be prepared to buy from other countries? What is the role of our universities in all this? What responsibilities do they have in technology transfer?

Because things are moving so rapidly the world over, it is well to take note of the fact that our country is in a particularly vulnerable position. We are not a member of any trading block. We do not have a domestic economy of the scale of the Americans, the EEC or the Japanese. We are not as protec-

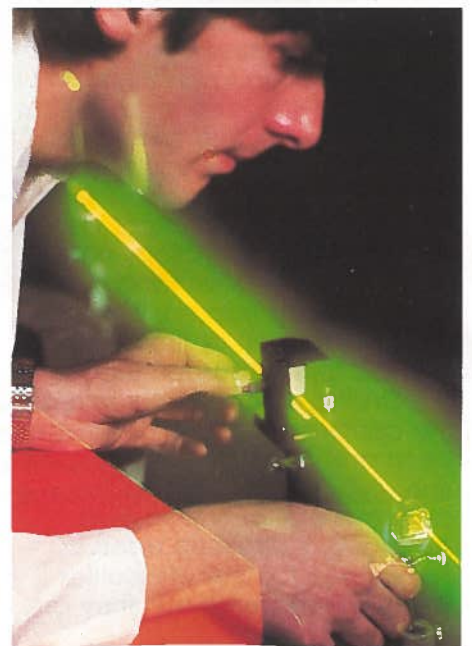


The point is, we want our manufacturing industry to survive no matter how it has to change to keep up with the rest of the world; we cannot afford not to have it as a source of wealth.

Though we Canadians have a great deal to be worried about, I think there are also grounds for some amount of optimism because one of the most attractive features of high tech is that it can often be adapted to small-scale enterprise. I mentioned earlier our competition from industrial giants such as the U.S. and Japan. But the computer makes it possible to manufacture with such a degree of flexibility that short runs (small scale production) can become economic. Indeed, reports indicate some of the most successful, high tech, high value-added manufacturing in Japan is done in remarkably small enterprises.

In summary, then, we must move into high tech manufacturing as quickly and as effectively as possible . . . and there are grounds for hope that we will be able to survive, industrially, if we do so.

One of the things that can work in our favor in all this is our university system. Unlike some countries (Japan is probably the



tive as either the Japanese or the Europeans. We are heavily dependent for our economic well-being on our resource industries. Our manufacturing is frequently not competitive. Furthermore, we have not yet opened our eyes to the seriousness of our situation.

In the past our national focus has been on the resource extraction industries. Indeed, Canada's finance minister's budget as recently as 1981 very clearly tried to write off — or so it seemed to me — our manufacturing industry as of only minor significance to this country.

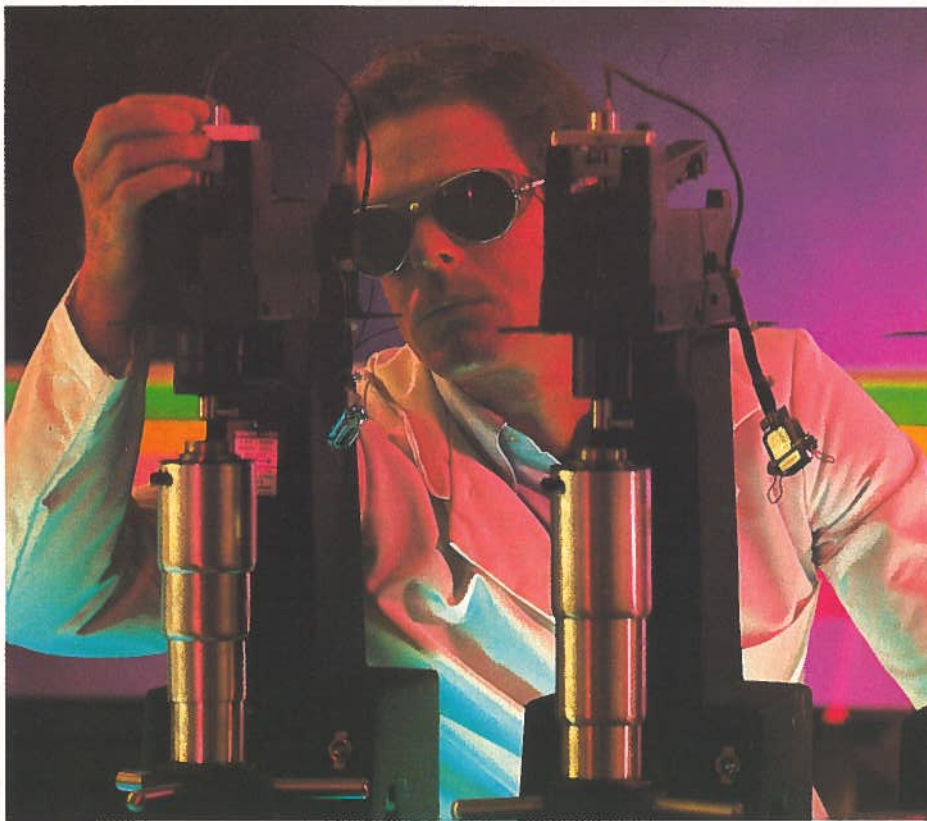
The fact is, however, we cannot afford to let manufacturing collapse. We need it not only for its employment potential but as a source of wealth. To put it another way, if robots are going to produce most goods in the future we will need the know-how to both build and service robots and we will need it here in Canada — so we can have our share of the wealth to be created by those robots.

Admittedly, this is not going to solve our many employment problems over the next decade or so, because we know that whereas manufacturing currently

accounts for 20 to 25 per cent of all employment this is in the process of declining sharply. The forecasts are that even under the best of circumstances, employment in manufacturing may drop from 20-25 per cent of the working population to perhaps five per cent. The picture will be even bleaker of course if we were to permit the manufacturing sector to go completely out of existence in the future.

In a sense, we ought not regret losing much of this employment because the work involved tends to be that which is the most dangerous, or tedious, or unpleasant . . . in short, the part that is most readily replaced by robots and the rest of the new automation technology.

Let us remind ourselves that we have lived through this kind of thing before and with no regrets — at least in retrospect. Since 1900 we have displaced the vast percentage of the agricultural workers of this country. While there were dislocations in the process, most of us today would approve the change because the kind of work that characterized agriculture at the turn of the century was extremely heavy and unpleasant.



most notable example) where universities are seen primarily as farm teams for the major industrial corporations, we in Canada are more apt to follow the Western tradition viewing our universities as, among other things, the driving engines of innovation.

Canadian universities can serve as the creators of the knowledge that could spell the difference between success and failure in the world of tomorrow.

One could cite countless examples of benefits already derived from university research; this is surely well known already for examples abound — in the transportation industry, the energy industry, plastics, communications, forest products, in agriculture, and so on.

If this is to happen — if Canada is to find a way to preserve or even strengthen its manufacturing segment — it will most assuredly have to look to its universities both for the research that will undergird the new technologies and for the human resources (the technologically proficient individuals) who will be required.

What we have to have in these days of belt tightening at all levels of government is a new

awareness that for some segments of society this is emphatically the wrong time for retrenchment. The universities in particular need encouragement and funding from government to permit them to undertake a speedup in research programs and other activities. We need funding that will permit us to educate and train the vast numbers of technologically proficient scientists, engineers, mathematicians and so forth that we will have to have to meet the challenges of a global high tech era.

It has been said that technology is best transferred by means of a pair of shoes . . . that is, by having a person who has gained new knowledge on a university campus (or wherever) stepping out into the business and industrial world and taking that knowledge — that know-how — with him, or her.

There are two ways of doing this, basically: (1) young, technologically-proficient people can take their knowledge with them as they move on to become key employees in existing enterprises, or (2) they can establish their own technology-based enterprises . . . they can become entrepreneurs.

Our observation is that the second choice is one that an increasing number of young Canadian men and women are opting for. Indeed, it certainly seems to be a rapidly emerging phenomenon among University of Waterloo alumni.

We at Waterloo, with our commitment to high standards of achievement and our established strengths relating very closely to the new technologies, look forward to making a significant contribution to Canada's national well-being in the years ahead.

We have seen our research activities grow rapidly in recent years — as much as 35 per cent per annum. As well, our co-operative education programs now seem more relevant than ever.

We have been taking additional significant steps in the direction of technology transfer through the establishment of such organizations as the Canadian Industrial Innovation Centre (a spin-off enterprise offering innovation management assistance and expertise), the Waterloo Centre for Process Development, the Institutes for Computer Research and Experimental Mechanics, the Centre for Risk Studies and several others. We are co-operating with other universities including Guelph and Toronto in a variety of education and research programs and activities.

Interesting work is also getting under way at Waterloo to help Canadians in general to achieve a better understanding as to what might be termed the social and cultural implications of technology. (This is exemplified in the recent establishment on campus of a Centre for Society, Technology and Values.)

The suggestion I would like to put forth here is that it will be increasingly important, in the future, to continue to fund the universities. This funding must, of course, be done with great care, to assure that the needed problems are addressed, and to assure that they are addressed by the best people.

Advanced Materials at the Ontario Research Foundation

Advanced materials are no novelty to the scientists at Ontario Research Foundation. Early development programs included such topics as inorganic polymers, semi-conductive glasses, powder metallurgy, and glass/ceramic-metal seals. In the more recent past, ORF was involved in many leading-edge developments including cobalt-chrome alloys (superalloys), biomedical materials, penetration-resistant armour plate, chemical vapour deposition of tungsten carbide coatings, electrically conductive plastics, and thermal storage materials.

Last year's advanced materials, however, are this year's conventional materials, and Ontario Research has continued to lift its sights in response to the needs of the times. Thus the materials and programs described here not only allow us a glimpse into the broad spectrum of ORF capabilities, but they provide an insight into the current priorities of the industries and governments of Ontario and Canada that sponsor these programs.

Sol Gel Research

Sol gel is a chemical means of producing ceramic materials from liquid solutions or colloidal suspensions of raw materials. In contrast to the traditional method of producing ceramics by high-temperature sintering, sol gel techniques are capable of producing engineering ceramics with properties approaching the theoretical upper limit. This is because of the control permitted over the raw materials, and thus over the powder geometry and chemistry, resulting in a controlled microstructure.

The sol gel technique is particularly appropriate for producing uniform ceramic powders and thin films. Powders of very uniform grain size are used in ceramic engines and for electronic components such as piezoelectric ceramics.

Films, formerly produced by sputtering, vacuum deposition and spray pyrolysis techniques, are now produced by the sol gel technique. ORF was one of the first to prepare tin oxide coatings, used in solar energy devices for the reflection of infra-red waves, by means of this process.

Another interesting application is the production of electrochromic films, that is, films that change colour or opacity on application of an electric current. At ORF, tungsten oxide films have been prepared that change from transparent to dark opaque on application of a small electric current. Reversal of polarity causes the film to become transparent again. An obvious application is the control of windows employed in passive solar heating systems.

Other Cementitious Materials of Current Interest

Among new cementitious composites investigated at Ontario Research is a structural material with sufficiently low density (1 gram per cubic centimeter) that it is able to float on water. The new material possesses high strength in addition to light weight.

High flexural and tensile strength cement-based materials are also of continuing interest to ORF scientists. These materials are expected to compete with such energy-intensive structural materials as metals, plastics and ceramics in certain applications.

Porous Vascular Grafts

The use of porous structures as vascular grafts is based upon the fact that a porous implant in contact with a blood stream becomes covered with a thrombus lining, the flow surface of which converts in time to a fibrin lining of less thrombogenicity. An endothelial lining eventually may develop upon this surface by fallout leaking from the blood stream. Although it is known that human ability to heal a conventional porous prosthesis with relatively smooth walls is much less than that of experimental animals, observations suggest that complete healing is possible with time.

At ORF, porous vascular grafts are prepared by extruding fibres of medical grade thermoplastic polyurethane onto a rotating mandrel 6 to 10 millimetres in diameter. By altering the experimental conditions, the porosity, pore size, bonding of fibres and elasticity are easily varied over a wide range. The technique should also permit the substitution of such polymers as polysulphones and polycarbonates for polyurethanes.



Preliminary in vivo tests run on dogs have been encouraging, while the ability to vary both structure and properties provides potential for the development of superior vascular grafts in humans as well as animals.

Fuel Cell Research

Fuel cells are of particular interest to utility companies because of their ability to produce electricity more cleanly and efficiently than conventional combustion reactors, using hydrogen-rich gases from almost any source including wastes.

Current fuel cell research at ORF involves the precise characterization of traditional and advanced materials used as fuel cell electrodes. Techniques are available for measuring the electrical characteristics of fuel cell electrodes, but little work has been done to date on examining the electrode's physical structure. The program at ORF thus comprises the development of methods for determining pore structure, pore distribution, thickness, surface area, surface roughness, and mass density of the electrodes.

Once all the methods have been developed and refined, they will be used to study the operational parameters of a complete fuel cell, and thereby provide an effective means of optimizing fuel cell operating efficiency.

Advanced Transducer Materials

Transducers are electronic components capable of transforming one form of energy into another. Piezoelectric materials, frequently employed as transducers, may transform mechanical energy into electrical energy or electrical energy into mechanical energy, depending on the application involved. Common applications in which piezoelectrics act as generators of electrical energy are: phonograph cartridges, sonar hydrophones, microphones, gas barbecue lighters and vibration sensors. Applications in which they are used to produce mechanical energy include: sonar projectors, fish finders, video head positioners and medical diagnosis.

Piezoelectric ceramics (piezoceramics for short) are designed and fabricated for use at ultrasonic frequencies, each of which is appropriate for certain applications. The program at ORF involves the development and characterization of piezoceramics for use in a variety of applications, and the use of advanced processing methods to improve the quality of the products. Currently under development are piezocomposites with enhanced properties for particular applications. Processes employed with success are the hot pressing technique, which results in a uniform dense product with superior characteristics, and the tape casting method, which produces ceramic components in thin layers without lapping or polishing. This latter method, when applied to plant production, will have the effect of reducing costs by eliminating several manufacturing steps.



Hydrogen Storage in Glass Microcapsules

Storage of compressed hydrogen gas in cylindrical glass microcapsules is a new concept offering the potential merits of light weight, low cost, and simplicity in systems design. Because the permeability of hydrogen through certain glasses is highly temperature dependent, rates of delivery may be varied simply by adjusting the temperature.

The advantages of cylindrical microcapsules over other shapes are:

- An existing drawing technology developed for the optical fibre industry
- Shape that permits treatment of both inner and outer surfaces prior to sealing
- Aligned cylinders have good packing efficiency
- Rigid fibre bundles may be assembled

Fused silica is employed at Ontario Research for this work because it has good tensile strength and a high hydrogen permeability that is strongly temperature dependent. The main thrust of the program has been toward the fabrication of suitable hollow fibre microcapsules, and the characterization and improvement of those properties critical to hydrogen storage applications. Process steps have been improved during the program, and the measured hydrogen storage density has been found to be satisfactory.

Electroluminescent Displays

Electroluminescence involves the emission of energy, usually in the form of light, from a surface that has been excited by an electrical charge.

ORF physicists are currently working on two projects related to electroluminescent displays. One consists of research on large area displays for military applications; the other combines an electroluminescent display in contact with a photoconductive (x-ray) sensor for filmless x-ray radiography.

Both projects require research on electroluminescent materials such as ZnS:Mn and photoconductor layers such as PbO and CdS, and involve the fabrication of thin films by reactive electron-beam vaporization.

Ceramics for Diesel Engines

One could hardly be blamed for questioning the wisdom of employing "brittle" materials in such a demanding application as a diesel engine. The general public are familiar with ceramics in domestic products, but most are unaware of the very tough engineering ceramics now available.

Typical examples are hot-pressed silicon nitride (HPSN) and hot-pressed silicon carbide (HPSC) ceramics, which have about three times the impact resistance of a china cup. By coating HPSN with a special chemically bonded layer containing silicon, it is possible to increase its resistance to high-velocity projectile fracture by a factor of seven.

The advantages of ceramics over metals in diesel engines are:

- Higher permissible operating temperature with the elimination of water cooling, and the possibility of using alternative fuels.
- Large reductions in friction, wear and corrosion.

The program at ORF does not involve all-ceramic engines, but rather the application of zirconium oxide ceramics to the steel surfaces of existing diesel engines using a plasma arc process. A successful outcome to the program should result not only in longer-lived diesel engines and higher efficiency, but would eliminate the problems associated with water cooling. Thus the radiator would be relegated to history, alongside the starting crank.

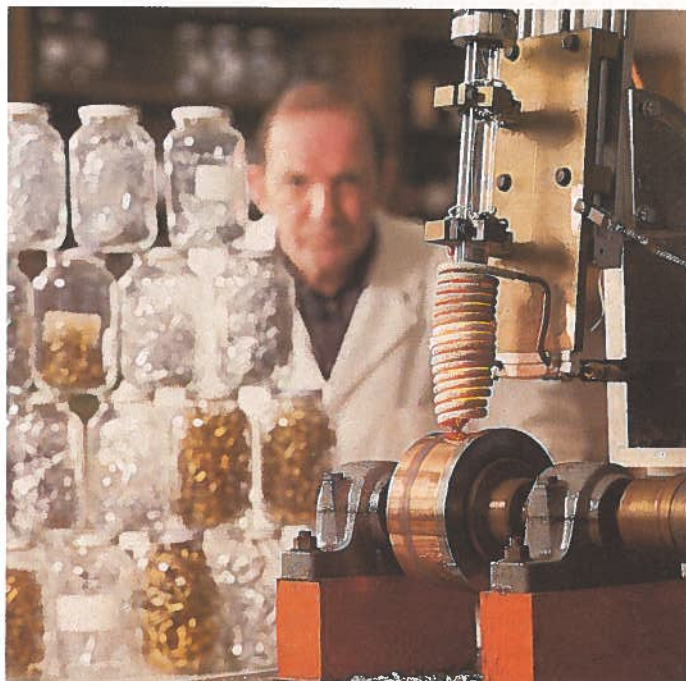
The Multidisciplinary Approach

The broad range of materials-related programs carried out over the years testifies to the multidisciplinary character of the Ontario Research Foundation. But diverse capabilities do more than permit the handling of a diversity of problems: they also bring a many-faceted approach to each individual problem. Such an approach is frequently an advantage in materials research, where efforts to put new materials to new uses may require expertise from several disciplines. A confluence of ideas from diverse sources also frequently results in a creative synergism — a situation that would be impossible within a narrow scientific environment.

Rapid Solidification Technology (RST)

The technique of rapid solidification involves the sudden cooling of metals and alloys from the melt to produce materials with unusual or improved properties. Such cooling rates, in excess of 10^3 or 10^4 K/S, can only be obtained with materials having at least one dimension under 100 μ m. This necessarily limits the practice to atomized powders and thin ribbons.

The atomization techniques used at ORF for the production of metal and alloy powders are adaptations of standard powder metallurgy procedures. The methods used for ribbon production involve spreading the molten metal on a cold substrate. The intimate contact provides good heat transfer and more rapid cooling of the ribbon than is possible with powders.



Potential applications of RST include:

- New aluminum alloys that are impossible using conventional means.
- Stainless steels with improved pitting and oxidation resistance.
- Superior tool steels having more homogeneous distribution of fine particles.
- Special alloys called "metallic glasses" that combine high strength, hardness, some ductility, good corrosion resistance, and enhanced magnetic and electric properties.

At ORF, a zinc-aluminum alloy has been strip cast from the melt to demonstrate the potential of melt-spinning in producing a strip of 0.0008-inch thickness, a process with savings in both energy and labour costs. Metal wood products of dimensions ranging from 0.005 to 0.040 inches in width and 0.003 to 0.010 inches in thickness were also produced in trial runs. These materials were compacted into simple shapes by the conventional techniques of hot and cold pressing.

East European Delegations Visit Canada

Here to study opportunities for Technical Cooperation with Canadian Firms
Hungarian Economic Days in Canada,
October 8-11, 1985

The Hungarian Chamber of Commerce, together with the Canadian Chamber of Commerce and the Canadian-East European Trade Council, will organize a series of business seminars in Montreal, Toronto and Calgary from October 8 to 11. On the agenda are technical presentations and workshops by Canadian and Hungarian specialists and key decision makers in Hungary's pharmaceutical, energy, infrastructural engineering, data processing, metallurgical, food, petroleum and gas industries. The sessions will be held at conference centres in Montreal, Toronto and Calgary, and are designed to promote direct contact between Canadian and Hungarian business people and to offer practical advice on doing business in Hungary. The workshops will provide an opportunity to examine Hungary's needs and capabilities in the sectors under study and should thus interest Canadian importers and exporters and businesses interested in potential technical cooperation.

The following topics will be discussed:

Energy production and conservation equipment:

Low-water cooling and waste heating utilization; hydraulic engineering.

Pharmaceutical products: The pharmaceutical industry and medicinal research in Hungary; opportunities for cooperation in pharmaceutical research and production.

Computerization: Computerization and electronics in Hungary; software engineering; logical programming; Hungarian software exports.

Infrastructural engineering: Opportunities for participation by developing countries in major capital projects.

Metallurgy: Innovations in iron metallurgy in Hungary; powder blasting systems for treating pig iron and steel; electric arc furnaces.

Food industry: Livestock management in Hungary; meat and milk products for export.

Petroleum and gas industry: Acquisition of Canadian know-how and technology; joint development and marketing of a petrochemical software package; derricks and related equipment; pipeline design and construction.

Technical Days of the GDR in Canada,
October 21-30, 1985

For the second time in Canada, the Chamber of Foreign Trade of the German Democratic Republic, together with the Canadian Chamber of Commerce and the Canadian-East European Trade Council, will organize a series of seminars on advanced technology and equipment recently developed in the German Democratic Republic. This event will take place in Montreal on October 21 and 22, Ottawa on October 22 and 23, Toronto on October 24, 25 and 29, and Calgary on October 30.

The delegation of technical specialists and foreign trade representatives will discuss the following industrial sectors:

Machine tools: Production of gears by CNC-controlled MODUL hobbing machines and Niles gear-generating grinders equipped with a micro-electronic control system; large element and roller-treating machinery.

Scientific instruments: JENA 250-CF microscopes used in medicine and biology.

Printing machines: Planeta sheet-fed offset machines; modern folding and sealing techniques for bookbinding machines; the "Original Perfecta" for rational cutting.

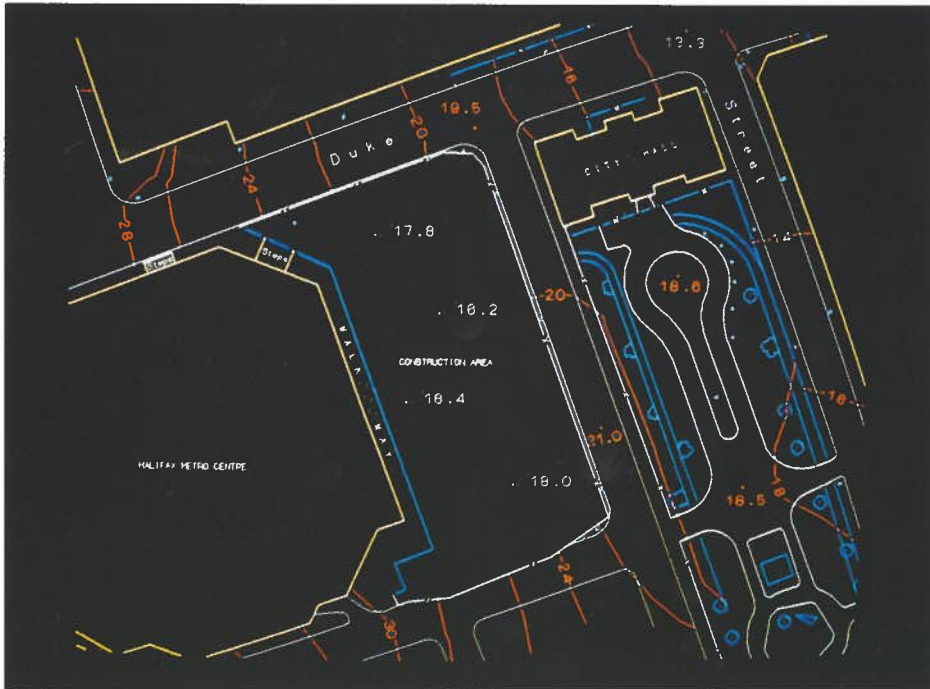
Open-cast mining: Mining methods; reutilization of dump trucks for open-cast mining; application of geodesic and photogrammetric instruments to open-cast mining; complex processing of lignite by drying, briquetting, coking and gasification — the secret to continuously working winning devices and plants.

These events will be held with the assistance of the Canadian-East European Trade Council and the Canadian Chamber of Commerce to promote business and technical cooperation between Canadian firms and their GDR counterparts.

For further information on these opportunities, contact Peter Egyed, Executive Director, Canadian-East European Trade Council, Ottawa. Telephone: (613) 238-4000. Telex: 053-3051.

UNB Prof's Mapping System Fills Many Bills

By Joyce Cameron



Dr. Masry's current mapping system, based on sound mapping ideas and requirements, uses more than his research and teaching experience. It draws from extensive Canadian research and development experience in mapping, accumulated from the pioneering days in the '60s to the present. Known by its acronym CARIS, his computer assisted resource information system coordinates the entire mapping process from the compiling and storage of data to retrieval in the form of customized maps and data that meet individual requirements. The maps may be conventional topography, thematic or special purpose.

Polygon maps displaying topological relationships with such data as population, soil and forestry can be produced. The system handles the polygon-type information in the same file as cartographic information, a feature which was particularly appealing to LRIS for the continued development of land information systems in the Maritimes. The benefits of the applications of data such as electricity, water, sewer and telephone services can be enjoyed by companies, builders, renovators and the like who will be able to take advantage of the system's potential in the future.

Dr. Masry explained why he set up Universal Systems Ltd., the firm that delivered the CARIS system to LRIS. "Many engineering ideas are lost for long periods of time — and sometimes never used. Sometimes we have an idea and we look for someone outside to develop or market it. It's hard to get someone to listen and adapt these ideas. Often they have a slim chance of being used." In fact, an earlier invention of his was purchased

Every landowner in the Maritimes will be depending on an automated mapping system designed by University of New Brunswick professor Salem Masry within a decade. In a \$1.3 million project, the Surveys and Mapping Division of the Land Registration and Information Services (LRIS) began compiling data in April 1984 to be included in a computer aided resource information system supplied by Dr. Masry's firm, Universal Systems Ltd. When the project is completed, the LRIS System will produce — at the touch of a button — a detailed map of any piece of land in any one of the Maritime provinces.

How and why did a surveying engineering professor get involved with one of Canada's most advanced digital mapping systems?

Dr. Masry answers, "because I like not only to teach about something I've done myself, but

also to see that what I'm doing is used." In his teaching and research at UNB, he uses computers in mapping and mapping data as an information system.

Shortly after he started at UNB in 1966, the University acquired one of the first analytical stereoplotters. The instrument, which had been developed at the National Research Council, needed a good deal of expertise to make it function as an effective research tool. Dr. Masry devoted himself to that task, and in so doing won international recognition. From this first analytical stereoplotter that pioneered the automation of mapping, he moved to digital mapping systems — a long way from the conventional method of mapping with a mechanically controlled pencil. Likewise, his early teaching and research interests in aerial surveying and land surveying (especially mining surveying using laser technology) shifted to digital mapping.

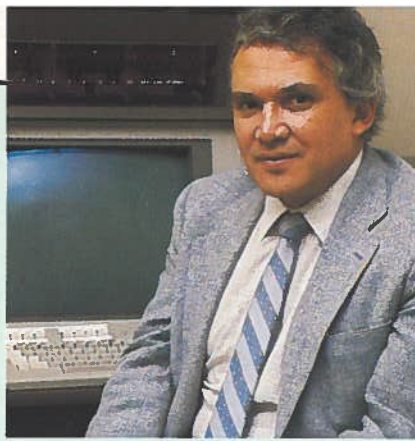
SALEM E. MASRY

Salem E. Masry received a PhD in photogrammetry from the University of London and started at the University of New Brunswick in Fredericton, N.B., in 1966. He became an assistant professor in 1970, an associate in 1974 and a full professor in 1979. He holds one patent and has published 19 papers in refereed journals. In 1982 he received the prestigious Talbert Abrams Award from the American Society of Photogrammetry.

In order to compete for an application-oriented research contract in 1979, Dr. Masry founded Universal Systems Ltd. The company now employs five full-time employees as well as part-time staff.

His digital mapping system, CARIS, was selected over several other systems marketed by multi-national companies as the best system for the Land Registration and Information Service to adopt for the digital mapping of the Maritime provinces; a seven-station system has been in production at the Surveys and Mapping Branch in Summerside, P.E.I., for the past year. Universal Systems is currently working on a contract to provide the next generation of automated charting equipment for the Canadian Hydrographic Service.

In February of 1985, the Association of Professional Engineers of New Brunswick and the New Brunswick Department of Commerce and Development awarded him an Engineering Award of Merit for developing and marketing his computer assisted resource information system (CARIS).



Canadian Hydrographic Service, software developed with LRIS assistance, and software developed with Natural Science and Engineering Research Council (NSERC) support at UNB — representing in total well over 100 person-years of work.

The first work station was put together and tested on Universal Systems' premises and the rest on site at LRIS' Surveys and Mapping Division in Summerside, Prince Edward Island. Although the output of each work station is passed to a central computer, there is a small minicomputer at each work station. This unit does most of the processing of the data collected at that station and enables each station to continue collecting data even if the control computer is not functioning.

Universal Systems is currently working on contracts for the Canadian Hydrographic Service to develop an electronic chart system to be installed in the bridge of a ship for navigation purposes, as well as the next generation of their automated system for chart production. Any businesses or governments with activities in urban mapping, property mapping, geosciences, hydrographic charting, topographic mapping and resource management can use CARIS.

UNB's pioneering professor still has to admit he does a little conventional mapping — at least in the area of Universal Systems' future. These mapping plans include increasing the amount of contract work and expanding the company to manufacture more of the component parts it uses here in Canada. If Dr. Masry succeeds, he'll be achieving more than just success in his own business. More jobs will be created and Universal Systems will be even more appreciated than it is now as a clean industry and a "high tech" project in a region that can use both. And the University of New Brunswick professor will continue to pass on abundant engineering experience to his students in his digital mapping courses.

by a major manufacturer but never developed. Rather than let CARIS collect dust, the engineering professor set up his own company.

Universal Systems, located at 259 Brunswick Street in Fredericton, has enabled Dr. Masry to undertake research contract work which, because of penalty and liability clauses, the University cannot accept.

The company now employs five full-time employees — one secretary and four engineers, all of whom are UNB graduates Dr. Masry has admired and enjoyed working with. In addition, one full-time systems analyst on exchange from the federal government joined Universal Systems at the beginning of January. One other person completes the list of jobs created by the company to date. She's a technician who comes in to work as needed, sometimes only part-time, but sometimes full-time. In the next couple of months,

Dr. Masry expects to hire a business manager so that he can concentrate on the creative aspects of his work.

The number of companies in the field is small, but the competition is intense. According to Dr. Masry, one Canadian company, two multi-million dollar U.S. based companies and one European company constitute the major competition. In fact Universal Systems won the Council of Maritime Premiers \$1.3 million LRIS contract, which was evaluated by a team of top Canadian experts, over two of these other major competing companies.

Three Universal Systems people worked on the LRIS contract which ran from April 1983 to March 1984. "A lot of capital cost in the form of off-the-shelf computer hardware was involved," Dr. Masry noted. CARIS combines software developed by the

Canada's One-Stop Resource For Welding Technology

Unique Welding Technology Centre Offers a Full Range of Services — From Design and Development to Troubleshooting and Training.

Today, Canada is playing a tough game of catch-up with the rest of the industrialized world. It is a good time to remember that we have an ace in the hole when it comes to improving our welding applications and technology.

The Welding Institute of Canada can provide many of the fabricating answers our industries need in order to compete more successfully at home and abroad. For over a decade, this highly specialized national organization has helped hundreds of plants, contracting companies, and engineering offices to produce faster, stronger, more economical welds in structural steels, high-alloy steels, stainless steels, aluminum, and other metals.

A Complete Overview of Current Technology

At present, the W.I.C. is unique in North America, being able to provide full information, research and assistance concerning any aspect of modern welding technology. This includes robotic welding, remote weld sensing and feedback control, and

Even large companies with sophisticated welding know-how make use of W.I.C. services to develop new techniques or products.

computer modeling of welds, together with process development, material technology, engineering, testing and inspection.

Even very large companies with sophisticated welding know-how have made use of W.I.C. services to develop new techniques or products. Stelco, Alcan, Algoma, Nova and Ontario Hydro are a few well-known names from the Institute's list of clients.

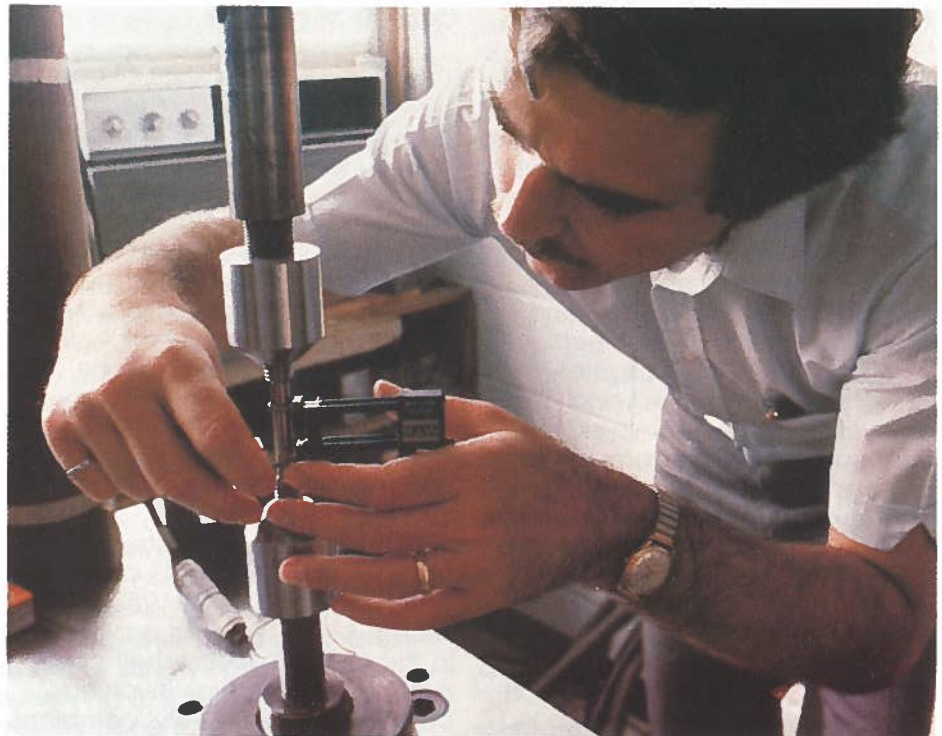
The kind of help available — as long as it pertains to welding — is almost unlimited. For example, a design engineer might want to evaluate the weldability of a particular material. The W.I.C. has a department that will work with the engineer to closely determine the mechanical and physical changes of the material as it undergoes various types of welding. Whether the engineer needs precise answers about the

microstructural relationship between metal and weld, or broader answers concerning optimum welding procedure, the W.I.C. can supply them.

Complete assessments of the engineering performance of various welds, investigations of failed welds, and non-destructive evaluation of completed welds are other services offered by the Welding Institute of Canada. From improved production and quality control methods to welding safety techniques and welder training, the W.I.C. can provide professional assistance from coast to coast. It is Canada's one-stop resource for welding technology.

New Welding Developments

Although the Institute was founded with a federal government grant in 1973, it was created and is controlled by



Technician tests metal tensile in certification process.



Welder squares of metal in full-sized testing rig.

industry, and is not supported by tax dollars. Most of its revenues come from consultive and R&D services supplied to industry on a contract basis. Other income is generated through the sale and administration of a broad range of welding training programs, and through industry membership. The unique infrastructure of industrial participation is demonstrated by the fact that over 100 major industrial companies across Canada support the Institute through corporate membership; 160 further companies are registered as chapter sustaining members at the local level in support of over 3 000 individual members who participate through 15 chapters across the country.

In R&D, the Institute mainly provides an inter-active problem-solving function for its clients. It also acts as a channel for new technologies such as pulse arc and laser welding, finding useful applications for them in the workplace.

However, there are several instances where the W.I.C. has undertaken research that would benefit a large cross-section of industry. An excellent example of this type of work is their successful development of FM pulse welding technology.

In gas metal arc welding, the amount of current flowing between the wire electrode (which is also the weld material) and the piece to be welded must be kept in constant relationship with the feed rate of the wire. Instead of trying to do this by utilizing a constant DC current or a fixed frequency pulse current, W.I.C. researchers developed a system where current regulation is achieved by pulse frequency modulation. This resulted in more consistent transfer of weld material and significantly improved welding conditions. The FM technique made it possible to produce very smooth pulse-controlled welds in overhead welding applications without spatter or short-circuiting.

The Institute then developed a small FM pulse regulator which can be used with conventional welding power sources. Because the regulator can be retrofitted to existing welding units, pulsed welding technology is accessible at a lower-than-normal capital investment for equipment. This technology has been licensed to a major Canadian manufacturer.

Another important development by the Institute is a weld-sensing device which greatly improves on-line control of machine welding. This solid state,

high tech unit acts as a real-time monitor of infra-red emissions from the weld as it is being formed. The instant feedback it provides allows much closer control of the welding path (the position of the arc in the groove) and the amount of current applied to the welding.

Because the infra-red sensor was developed as an industry-wide benefit, a large part of the financing was supplied by the National Research Council. Any company with a welding problem whose solution would be a widespread advantage should not overlook the possibility of this kind of assistance. The W.I.C. could make proper application — and the company could receive excellent R&D, financed by government or industry.

The Institute has garnered a world-wide reputation through its research on pipeline fracture problems, using its full-scale test facilities located at Oakville. This is one of many examples where the Institute was able to play a unique role in a collaborative venture involving industry, universities and government.

A Full-Scale Training Centre

In this country and many other parts of the world, the Welding Institute of Canada is best known through its highly competent training courses. Although some teaching is done at the Oakville (Ontario) and Boucherville (Québec) W.I.C. centres, over 50% of all courses administered by the Institute are home-study programs. Several colleges from Nova Scotia to B.C. have installed a variety of W.I.C. welding courses. And five Canadian universities now offer a Master's degree in welding engineering — with much of the basic course material supplied by the Institute. Other W.I.C. welding instruction is provided in the form of plant seminars and conferences.

"You can't improve welding practice," says Bill Winship, Director of Communications for the Institute, "until you increase the knowledge level of the people involved. Our courses are devel-

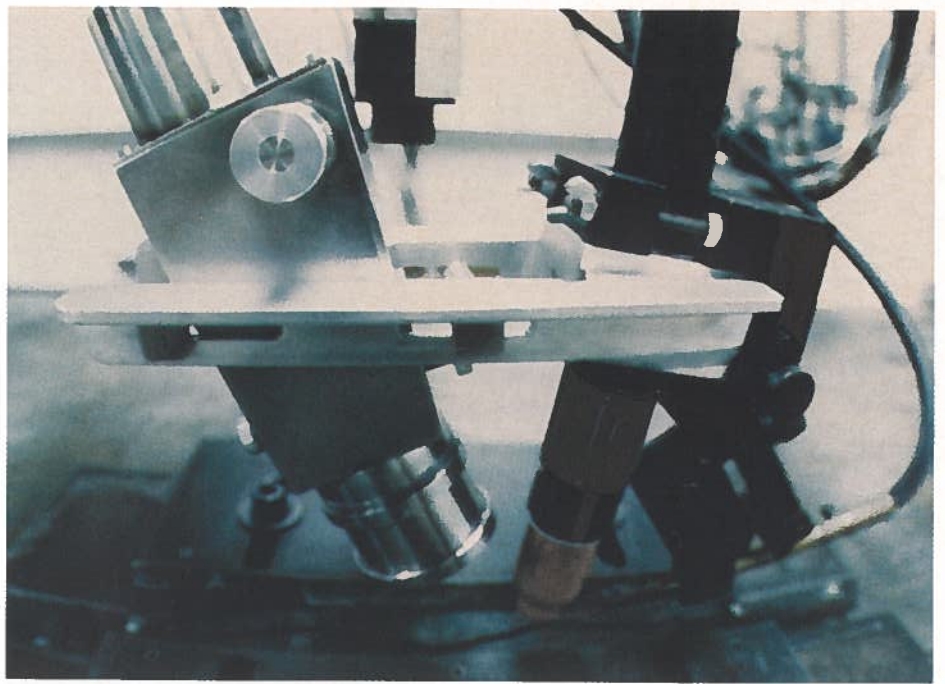
The Welding Institute of Canada is a unique transmitter of the latest welding technology being developed all over the world.

oped in co-operation with industry and the Canadian Welding Bureau. They have been accepted as a national training standard for quite a few years.

"By the end of this year, each of the different welding topics we teach will be available as a self-contained training module. This will allow an individual or company to obtain the exact instruction required by making customized selections from a range of almost 40 modules. Besides 30 to 50 pages of tests and illustrations per module, we are currently working with Leighton and Kidd to develop video presentations for each subject area."

The W.I.C. sets exams for each course section, marks the papers, and issues a diploma to successful students. Students may take an exam covering the same area of welding as often as necessary to achieve a passing mark. No additional fee is involved. Twelve of the topics now offered in modular form represent the body of knowledge a person must acquire in order to be certified as a welding supervisor by the Canadian Welding Bureau. The charge for this group of courses is \$175, which is quite reasonable for such a valuable training package.

"With one notable exception," Bill Winship continues, "our instruction concentrates on the theoretical aspects of welding. By doing this, we are able to upgrade the calibre of welding supervisors and engineers as well



Infra-red sensing system for real-time monitoring.

as of the welders themselves. We assume that any would-be steel welder taking our courses has access to equipment for hands-on experience.

"We do make an exception to this rule when we teach aluminum welding. Aluminum is just as easy to weld as steel. But it takes a different set of skills as well as different theoretical knowledge. Since this type of welding is not widely practised, we cannot assume equipment will be available for the trainee. In many ways, this is a pity — because aluminum can be welded more



Pulsed MIG welding of aluminum.

quickly with less risk of distortion than steel. However, I think that the steady gain of wire-fed and gas-shielded arc welding techniques over the older stick electrode methods will prompt a new degree of interest in aluminum welding. We have courses that enable an accredited steel welder to become a skilled aluminum welder in about two weeks."

A World Class Opportunity

The Welding Institute of Canada is a unique transmitter of the latest welding technology being developed all over the world. And the 45 people employed by the W.I.C. can apply highly specialized backgrounds and skills to any welding problem. All companies that use welds can improve their competitive position by utilizing the many services offered by this Institute. Here is a world class opportunity for Canadian industry. And here is a standing invitation to all Canadian companies: Join the Institute and participate in the local chapter of the W.I.C. to gain many valuable insights concerning welding production methods.

**For full details, contact
The Welding Institute of Canada,
391 Burnhamthorpe Road East,
Oakville, Ontario
L6J 6C9.**

TECHNOLOGY TRANSFERS

OFFERED

CANADA

- Touch-Sensitive Position Encoder
- H.F. Electronic Mail System Software
- Implantable Micro-Pump
- Compositions for, and Treatment of, Herpes Viral Infections
- Demulsification of Water-In-Crude Oil Emulsions
- Polyarylene Polyethersulfone Ionomers
- Dilatometric Device for the Detection of Delaminations
- Identification of Brucella abortus and Brucellosis Infection
- Suicide Plasmid Vehicles for Insertion Mutagenesis in Bacteria
- Direct Recovery of Precious Metals by Solvent Extraction and Selective Removal
- H.F. Digital Facsimile Terminal Software
- Constant-Volume Discharging Device
- Water Purification System
- Pipe Stand
- Exercise Control for Video Games
- Apparatus for Making and Maintaining an Ice Surface
- Rowing Ergometer
- Safety Control and Lock for Anesthetic Vaporizers
- Wound Coverings and Processes for Their Preparation
- Pan-Brick Panels
- Removable Sewer Fluid Trap
- Patent and Product Line Sale

BELGIUM

- Specialty Truck Body Construction
- Mineral Fibre Mixture
- Noise Absorbing Concrete Panels
- A New System to Make Beds

BRITAIN

- PVA Emulsions
- Internal Urinary Incontinence Control Devices

GERMANY

- Safe Anti-Spray Ring
- Turbo-Burner for Furnaces
- Laser Beam Analyser
- Measurement System for Process Control Parameters
- Cell Cracking Technology

POLAND

- Skateboardcycle

SWITZERLAND

- Bath Salts in the Shape of a Fish

U.S.A.

- Valve Structure
- Radio Frequency Communication System Utilizing Radiating Transmission Lines
- Adjustable Telescopic Tree Props
- Hydrophobic Composite Including Core, Polyurethane/Asphalt First Coat and Hydrophobic Colloidal Oxide Second Coat, and Method of Production

REQUESTED

BRITAIN

- Industries of Interest

OFFERED CANADA

Touch-Sensitive Position Encoder — Case 3993

A position encoder which uses surface acoustic waves and echo-ranging techniques to determine the position coordinates at which a human finger or passive stylus touches the surface of the encoder. The minimum resolvable area is about 6 mm square.

H.F. Electronic Mail System Software — Case 8222

A software package designed to operate on specially configured microcomputer hardware. When coupled with an H.F. transceiver and a suitable H.F. terminal, it will provide a low-cost text mail facility to remote locations, ships, marine platforms, etc.

Implantable Micro-Pump — Case 6432

This implantable variable-rate pharmaceutical dispensing device can be either preprogrammed to deliver a desired variable dosage or slaved to a suitable sensor which controls the delivery rate. One obvious application is as an artificial pancreas which would closely monitor and supply the body's demand for insulin.

Compositions for, and Treatment Of, Herpes Viral Infections — Case 6598

This invention is directed to compositions for treating localized herpes infections adapted to build up and maintain a film on application to the site of the infection. These therapeutic compositions are derived from fruits containing anthocyanins, preferably highly coloured anthocyanins.

Demulsification of Water-In-Crude Oil Emulsions — Case 7332

This invention deals with the breaking of water-in-oil emulsions, particularly those resulting from steam injection or water flooding of secondary oil wells. The addition of small amounts of water-insoluble polar compounds like aliphatic carboxylic acids, alcohols and ketones effectively break the emulsion. The additive mixtures can be recovered from the organic phase and recycled to minimize costs.

Polyarylene Polyethersulfone Ionomers — Case 7796

A new copolymer has been developed for use as an ion exchange material or permselective membrane. The aromatic ionomeric copolymer having arylether and arylsulfone linkages has been prepared by condensation of both an alkali metal bisphenate salt and a dihalodiphenylsulfone. This improved engineering thermoplastic exhibits excellent resistance to hydrolysis and oxidation and at the same time excellent mechanical and thermal stability, toughness and ease of synthesis.

Dilatometric Device for the Detection of Delaminations — Case 7881

A device for detecting delaminations in coated materials or layered composites, without most of the drawbacks or limitations of devices using techniques such as holography, ultrasonic transmission testing or thermal wave microscopy. This device, which can be used to scan portions of bulky materials on the spot, would be ideal, e.g., for inspecting the aluminium skin adhesion of aircraft wing structures.

Identification of *Brucella abortus* and Brucellosis Infection — Case 7957

This invention is concerned with an antigenic polysaccharide specific for *Brucella abortus* and *Yersinia enterocolitica*. The antigen, which is more readily isolated from the *Yersinia*, can be coupled to carriers suitable for immunoassay use such as ELISA and RIA. A monoclonal antibody has been produced and assay procedures and kits are detailed.

Suicide Plasmid Vehicles for Insertion Mutagenesis in Bacteria — Case 7990

This invention is concerned with suicide plasmid vehicles that can be maintained in donor species of bacteria but are suicidal in recipient species of bacteria and can be used to introduce genetic material into the indigenous genetic material of the recipient.

Direct Recovery of Precious Metals by Solvent Extraction and Selective Removal — Case 8062

A process is described for the direct recovery of gold and platinum group metals from aqueous chloride solutions. Substituted hydroxyquinolines are used for the solvent extraction and selective stripping/precipitation steps separate the desired precious metals. The organic phase can be recycled to minimize costs.

H.F. Digital Facsimile Terminal Software — Case 8221

A software package designed to operate on specially configured hardware consisting of an IBM-PC, an H.F. transceiver and associated radio modems. Using H.F. packet radio techniques, the system provides large file transfer facilities for digital facsimile message transmission between two remote locations.

Constant-Volume Discharging Device — Case 5715

An inexpensive liquid-metering valve built around a resilient ball in a vertical cone. It dispenses a fixed volume whenever the ball is dislodged. One obvious application is a tankless flush toilet.

For any of the offers listed above, write to: Canada Patents and Development Limited

275 Slater Street
Ottawa, Ontario
K1A 0R3

Please quote the appropriate case number

Water Purification System

A Canadian inventor offers a Canadian company, under licence, the manufacturing and marketing rights for Canada and the United States, for his multiple layer purifier filter device for removing organic contaminants from home and domestic water supplies. It is claimed to remove organic contaminants permanently without affecting other ions.

Write to: Mr. S. Houser, 288 Mill Road, Apt. E-45, Etobicoke, Ontario M9C 4X7.

Pipe Stand

A vertically adjustable stand for supporting a length of pipe includes a tubular column with legs for supporting the column in a vertical position, and a post telescopically mounted in the column for adjusting the height of a concave supporting plate on the top. The post is locked in position by a brake and brake shoe held in an opening in the column and a lever mounted on the opposite side of the column for pulling the brake shoe against the post after the post has been raised to the required height.

Write to: E.A. Frisk, 11726 - 123 Street, Edmonton, Alberta T5M 0G9.

Exercise Control for Video Games

This invention relates to a link-up between an exercise bike and a video game that translates exercise movements into game play thus making the exercise more enjoyable. The only modification necessary to the exercise bike is to the handlebars. They have inner and outer sleeves that are rotatable and simulate the joystick movements of a video game.

Write to: W.J. Pannekoek, 676 Wain Road, Sidney, B.C. V8L 3R9.

Ice Making System

An extruded plastic module made up of tubular sections interconnected with webbing is individually connected to a supply header and return header to allow brine to be circulated through it. Each strip is laid out on the proposed ice surface and allows brine to be circulated through alternating tubes.

Write to: J.M. Remillard, 9390 Eastman, La Salle Québec H8R 2K8.

Rowing Ergometer

The crouch, pull and finish positions of rowing in the ergometer of this invention are provided by a sliding seat that can be rocked sideways to develop balancing skills in the user and by stationary foot rests that can be raised or lowered in relation to a support frame. They can be tilted forward or backward or relocated. The ergometer has a handlebar in the shape of a yoke so that the user may pull it in more closely to his chest. Rotating resistance to the handlebar pull is a pressure roller contact on a bicycle wheel tire.

Write to: M. Terpenning, 625 Brookleigh Road, Victoria, B.C. V8Z 3K1.

Safety Control and Lock for Anesthetic Vaporizers

A control device for anesthetic vaporizers that ensures the operator is able to select a desired anesthetic with certainty, and to assure that other anesthetic vaporizers are in an "off" condition when one anesthetic has been selected. The apparatus includes a setting at which all associated anesthetic vaporizers are safely "off". The invention is a rotatable rod adapted for mounting on an assembly of anesthetic vaporizer tanks. The rod has a number of C-collars, the opening in each adapted to receive a flat spiral wing projecting from the on/off control on an anesthetic vaporizer. The C-collars permit a setting at which it is impossible to open any of the associated anesthetic vaporizers. The control mechanism includes visual and audible indicators when a correct setting has been selected by the operator.

Write to: Southmedic Incorporated, 84 Jerseyville Road West, Ancaster, Ontario L9G 1A2.

Wound Coverings and Processes

Skin covering materials, especially for wounds, comprise dextran C made insoluble by reaction with epichlorohydrin in combination with a suitable humectant. The compositions may be in the form of self-supporting sheets of the dextran C impregnated with humectant material, or in the form of pastes applied to the wound. The humectant material is preferably glycerin or isopropanol-propylene glycol and an oil. The wound covering material allows removal of exuded body fluid and seals the wound site against bacterial infection. At the same time, it keeps the wound moist to prevent scale formation. Medications may be incorporated into the wound covering material to assist in healing and further to safeguard against bacterial infection.

Write to: P.Y. Want, 47 Marblemount Crescent, Agincourt, Ontario M1T 2H5.

Pan Brick Panels

A Regina company offers a Canadian firm in the building industry, under a manufacturing licence, its new product, a panelized brick-wall system, made of plywood, insulation and brick. It is suited for renovation and retrofit work, whether used for interior or exterior application. The unique, self-sealing interlock joint allows the panels to slide together quickly and easily. The tongue and groove joint holds each succeeding row of panels firmly in place.

Write to: Mr. J. Lemckert, General Manager, Pan-Brick Inc., 610 Henderson Drive, Regina, Saskatchewan S4N 5X3. Telephone: (306) 545-3922.

Removable Sewer Fluid Trap

A Quebec firm is offering a Canadian company the rights to manufacture and market its new removable sewer fluid trap under licence in Canada. The trap is installed in sewer manholes and serves to prevent the circulation of pollutant and/or explosive gases in all types of sewage systems (commercial, residential, municipal or industrial).

Write to: Mr. Marcel Guibord, President, Stelem Inc., 2230 Perrot Boulevard, Notre-Dame Ile Perrot, Quebec J7V 5V6.

BELGIUM

Specialty Truck Body Construction

Belgian firm offers a Canadian company in the industrial truck body works, under licence, the production of an hydraulic compression system allowing truck or trailer transport volumes of low density reversible foams to be doubled. Roof of the truck body can be pumped up twice the normal body height. An intermediate floor is provided which also is hydraulically powered. High quality standards are maintained and they can be built in accordance with specific needs of each customer. Ref. No.: 08.

Write to: Mr. B. Jans, Executive Director, Jans Carrosserie P.V.B.A., Industrieterrein 1-2, B-3730 Hoeselt, Belgium. Telephone: (32)-11-41.10.41. Telex: 39528.

Mineral Fibre Mixture

Belgian firm offers a Canadian company in the construction products division a licence for products used for the coating of interior walls where improved thermal, acoustical or fireproof building requirements are specified. The layer is humidity regulating. This innovative finish is used mainly for public and industrial buildings. Ref. No.: 037.

Write to: Mr. R. Jansen, Executive Director, Jansen Afwerkingsbedrijf NV, Peerderbaan 63, B-3578 Meeuwen, Belgium. Telephone: (32)-11-47.15.81. Telex: 39849.

Noise Absorbing Concrete Panels

Belgian firm offers a Canadian company in the construction products division a manufacturing licence for its noise absorbing concrete panels to be mounted along highways. In contrast with many other noise reduction panels, these panels are absorbent rather than reflective. The construction consists solely of a specially prepared cast concrete. Ref. No.: 041.

Write to: Mr. Huygen, Betonac Beton NV, Hasseltse Steenweg 119, B-3800 St. Truiden, Belgium. Telephone: (32)-11-68.00.92. Telex: 39874.

A New System to Make Beds

A Belgian firm offers a Canadian company the rights, under a manufacturing licence or joint venture agreement, a new system that makes it possible for beds to be made automatically. This system can act on itself or it may be connected to a personal or professional computer.

Write to: Mr. Patrick Lantin, Marketing Manager, Mecar Robotics, 267, rue Royale, 1030 Brussels, Belgium.

A Patent and Product Line Sale

Rand Industries Ltd. of British Columbia offers to Canadian companies in the fibre optic, telecommunications, wire and cable industries, the outright sale of their patents issued in Canada, U.S.A. and other countries.

For more details write to: Mr. J.A. Smith, Marketing/Sales, Rand Industries Ltd., P.O. Box 1058, Aldergrove, British Columbia V0X 1A0. Telephone: (604) 854-6722.

BRITAIN

PVA Emulsions

A British firm offers a Canadian company in the chemicals industry, under licence, the manufacturing and marketing rights for Canada and the United States for its wide range of polyvinyl acetate, acrylic and other polymer emulsions for use in the adhesives, paints and paper chemicals industries. It is claimed to achieve considerable cost savings by manufacturing its own emulsions in-house process.

Write to: Worldwide Business Portfolios Limited, Norham House, 12 New Bridge Street, Newcastle upon Tyne, NE1 8AD, England.

Internal Urinary Incontinence Control Devices

A British inventor offers a Canadian company in the medical urinary field for bioengineering products, under licence, the manufacturing and marketing rights for Canada and the United States, for a disposable, internal urethra situ-automatic involuntary urinary incontinence control devices. It is claimed to give the patient, male or female, greater mobility with less embarrassment. This could be used to defer a prostrate operation until it was convenient or necessary.

Write to: Mr. G.H.I. Cornwell, 21 Talbot Road, Harrow Weald, Middlesex, HA3 7QQ, England.

GERMANY

Cell Cracking Technology

A well-known German firm offers a Canadian company complete technical know-how based on many years of experience, an exclusive licence for manufacturing and marketing in Canada and perhaps the United States, for its pressure expansion technology cell cracking, a method of mashing of organic material without mechanical power.

Write to: Emma Helwig, Ulrichstrasse 17, D-5014 Kerpen 3, West Germany.

Measurement System for Process Control Parameters

Non-intrusive measurement process and analysis system for determination of process parameters (density, thickness, homogeneity, etc.) by X-ray, IR, UV, scintillation, etc.

**Contact: R. Loeffel or J. Bors
Loeffel Verfahrenstechnik GMBH
Haydnstr. RA
D-7514 Eggenstein-Leopoldshafen 1**

Safe Anti-Spray Ring

A ring placed around flanged pipe joints which ensures that any pressurized fluids which may leak through a defective seal do not spray out. The device re-routes leaking fluids around several diversionary paths, reducing pressure and kinetic energy. Conforming to international safety standards, it is rapidly fitted without tools.

Turbo-Burner for Furnaces

A turbo-burner for use with oil, gas or liquid gas fired furnaces which uses an axial turbine to optimise air flow and swirl, thus improving the degree of efficiency in burning the fuel mixture. The device is adaptable to any boiler size, the turbine blades and control surfaces being adjustable. Successfully tested for over one year.

Laser Beam Analyser

A new type of device for the almost loss-free measurement of the energy, beam diameter and beam distribution of a CO₂ or yag laser, without hindering operation. There is a compact laboratory version or a low-cost dem version adaptable to all makes of laser systems.

For information on above, contact: Commercial Division, Canadian Embassy, Friedr.-Wilhelm-Str. 18, 5300 Bonn 1

POLAND

Skateboardcycle

A Polish inventor seeks joint venture or licensing arrangements in Canada, for his new type of skateboardcycle with a special drive mechanism. The skateboardcycle can be driven with legs resting on the balanced board of the carriage and can be directed (steered) right or left, or can be stopped by applying the brake. It is claimed that the skateboardcycle may be used as a little vehicle for short distances, as well as sport.

Write to: Mr. Z.J. Trachimowicz-Taylor, Ul. Zubardzka 13/44, 91-022 Lodz, Poland. Telephone: 51-84-84 Lodz.

SWITZERLAND

Bath Salts in the Shape of a Fish

Swiss inventor offers to a Canadian company specializing in personal hygiene products to manufacture and market his new gadget, under licence, throughout Canada and worldwide. It is claimed that FISKY, a block of bath salts in the shape of a fish, wriggles and changes colour when placed in water and imparts a very pleasant fragrance to the bath.

Write to: Mr. D. Chablaix, Avenue du Grey 76, CH-1018 Lausanne, Switzerland.

U.S.A.

Valve Structure

This pressure balancing valve is particularly suitable for use in a conventional air brake system for vehicles where separate sources of air under pressure are employed to conduct air to a service brake air chamber for applying the brakes during normal running conditions and to a spring brake air chamber for holding the spring actuated braking device out of braking condition except when used for parking or in an emergency.

In this application the valve permits the application of both the service brake force and spring brake force to enhance the holding effect. The valve includes a limiting check valve action wherein the pressure developed in the service brake line is relieved when it exceeds a predetermined amount.

Write to: J.M. Graham, 820 North Delaware, Apt. 308, San Mates, California 94401, U.S.A.

Radio Frequency Communication System Utilizes Radiating Transmission Lines

A radio communication system for use in tunnels, mines, buildings or other shielded locations in which a pair of radiating transmission lines extend through such location in spaced relation to each other. Each transmission line has at least one unidirectional amplifier with the sense of the unidirectional amplifier of one transmission line being opposite to the sense of the unidirectional amplifier of the other. Each of the amplifiers has a gain which is less than the coupling loss between the transmission lines. Two or more mobile transceivers in the location served by the system are coupled to the transmission lines by electromagnetic wave propagation to communicate directly with each other at a given radio frequency within the frequency range of the system.

Write to: United States Department of Energy, Washington, D.C. 20585, U.S.A.

Adjustable Telescopic Tree Props

American inventor offers a Canadian company, under a manufacturing licence, his new invention — a lightweight, inexpensive, simple and easy to use telescoping prop particularly adapted for support or spreading of tree branches to save the limbs from being broken because of the weight of the fruit or nuts.

Write to: Mr. D.W. Roark, P.O. Box 8076, Springfield, Missouri 65801.

Hydrophobic Composite

An improved hydrophobic composite is prepared by depositing on a core material an adherent first coat comprising a film-forming polyurethane and, optionally, asphalt, and applying to the thus-coated core material a hydrophobic colloidal oxide, such as hydrophobic fumed silica. The composites are useful in various waterproofing applications, as well as in cleaning up oil spills.

Write to: T.B. Crane, Apt. 11008S 5501 Seminary Road, Falls Church, Virginia 22041, U.S.A.; C. Craig, C/O Craig Research Ltd., 2524 Queenswood Drive, Victoria, British Columbia V8N 2X5, Canada.

Removable Sewer Fluid Trap

A Quebec firm is offering a Canadian company the rights to manufacture and market its new removable sewer fluid trap under licence in Canada. The trap is installed in sewer manholes and serves to prevent the circulation of pollutant and/or explosive gases in all types of sewage systems (commercial, residential, municipal or industrial).

Write to: Mr. Marcel Guibord, President, Stelem Inc., 2230 Perrot Boulevard, Notre-Dame Ile Perrot, Quebec J7V 5V6.

BELGIUM

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Write to: Mr. Huygen, Betonac Beton NV, Hasseltse Steenweg 119, B-3800 St. Truiden, Belgium. Telephone: (32)-11-68.00.92. Telex: 39874.

A New System to Make Beds

A Belgian firm offers a Canadian company the rights, under a manufacturing licence or joint venture agreement, a new system that makes it possible for beds to be made automatically. This system can act on itself or it may be connected to a personal or professional computer.

Write to: Mr. Patrick Lantin, Marketing Manager, Mecar Robotics, 267, rue Royale, 1030 Brussels, Belgium.

A Patent and Product Line Sale

Rand Industries Ltd. of British Columbia offers to Canadian companies in the fibre optic, telecommunications, wire and cable industries, the outright sale of their patents issued in Canada, U.S.A. and other countries.

For more details write to: Mr. J.A. Smith, Marketing/Sales, Rand Industries Ltd., P.O. Box 1058, Aldergrove, British Columbia V0X 1A0. Telephone: (604) 854-6722.

BRITAIN

PVA Emulsions

A British firm offers a Canadian company in the chemicals industry, under licence, the manufacturing and marketing rights for Canada and the United States for its wide range of polyvinyl acetate, acrylic and other polymer emulsions for use in the adhesives, paints and paper chemicals industries. It is claimed to achieve considerable cost savings by manufacturing its own emulsions in-house process.

Write to: Worldwide Business Portfolios Limited, Norham House, 12 New Bridge Street, Newcastle upon Tyne, NE1 8AD, England.

Internal Urinary Incontinence Control Devices

A British inventor offers a Canadian company in the medical urinary field for bioengineering products, under licence, the manufacturing and marketing rights for Canada and the United States, for a disposable, internal urethra situ-automatic involuntary urinary incontinence control devices. It is claimed to give the patient, male or female, greater mobility with less embarrassment. This could be used to defer a prostrate operation until it was convenient or necessary.

Write to: Mr. G.H.I. Cornwell, 21 Talbot Road, Harrow Weald, Middlesex, HA3 7QQ, England.

GERMANY

Cell Cracking Technology

A well-known German firm offers a Canadian company complete technical know-how based on many years of experience, an exclusive licence for manufacturing and marketing in Canada and perhaps the United States, for its pressure expansion technology cell cracking, a method of mashing of organic material without mechanical power.

Write to: Emma Helwig, Ulrichstrasse 17, D-5014 Kerpen 3, West Germany.

Measurement System for Process Control Parameters

Non-intrusive measurement process and analysis system for determination of process parameters (density, thickness, homogeneity, etc.) by X-ray, IR, UV, scintillation, etc.

**Contact: R. Loeffel or J. Bors
Loeffel Verfahrenstechnik GMBH
Haydnstr. RA
D-7514 Eggenstein-Leopoldshafen 1**

Safe Anti-Spray Ring

A ring placed around flanged pipe joints which ensures that any pressurized fluids which may leak through a defective seal do not spray out. The device re-routes leaking fluids around several diversionary paths, reducing pressure and kinetic energy. Conforming to international safety standards, it is rapidly fitted without tools.

Turbo-Burner for Furnaces

A turbo-burner for use with oil, gas or liquid gas fired furnaces which uses an axial turbine to optimise air flow and swirl, thus improving the degree of efficiency in burning the fuel mixture. The device is adaptable to any boiler size, the turbine blades and control surfaces being adjustable. Successfully tested for over one year.

Laser Beam Analyser

A new type of device for the almost loss-free measurement of the energy, beam diameter and beam distribution of a CO₂ or yag laser, without hindering operation. There is a compact laboratory version or a low-cost dem version adaptable to all makes of laser systems.

For information on above, contact: Commercial Division, Canadian Embassy, Friedr.-Wilhelm-Str. 18, 5300 Bonn 1

POLAND

Skateboardcycle

A Polish inventor seeks joint venture or licensing arrangements in Canada, for his new type of skateboardcycle with a special drive mechanism. The skateboardcycle can be driven with legs resting on the balanced board of the carriage and can be directed (steered) right or left, or can be stopped by applying the brake. It is claimed that the skateboardcycle may be used as a little vehicle for short distances, as well as sport.

Write to: Mr. Z.J. Trachimowicz-Taylor, Ul. Zubardzka 13/44, 91-022 Lodz, Poland. Telephone: 51-84-84 Lodz.

SWITZERLAND

Bath Salts in the Shape of a Fish

Swiss inventor offers to a Canadian company specializing in personal hygiene products to manufacture and market his new gadget, under licence, throughout Canada and worldwide. It is claimed that FISKY, a block of bath salts in the shape of a fish, wriggles and changes colour when placed in water and imparts a very pleasant fragrance to the bath.

Write to: Mr. D. Chablaix, Avenue du Grey 76, CH-1018 Lausanne, Switzerland.

U.S.A.

Valve Structure

This pressure balancing valve is particularly suitable for use in a conventional air brake system for vehicles where separate sources of air under pressure are employed to conduct air to a service brake air chamber for applying the brakes during normal running conditions and to a spring brake air chamber for holding the spring actuated braking device out of braking condition except when used for parking or in an emergency.

In this application the valve permits the application of both the service brake force and spring brake force to enhance the holding effect. The valve includes a limiting check valve action wherein the pressure developed in the service brake line is relieved when it exceeds a predetermined amount.

Write to: J.M. Graham, 820 North Delaware, Apt. 308, San Mates, California 94401, U.S.A.

Radio Frequency Communication System Utilizes Radiating Transmission Lines

A radio communication system for use in tunnels, mines, buildings or other shielded locations in which a pair of radiating transmission lines extend through such location in spaced relation to each other. Each transmission line has at least one unidirectional amplifier with the sense of the unidirectional amplifier of one transmission line being opposite to the sense of the unidirectional amplifier of the other. Each of the amplifiers has a gain which is less than the coupling loss between the transmission lines. Two or more mobile transceivers in the location served by the system are coupled to the transmission lines by electromagnetic wave propagation to communicate directly with each other at a given radio frequency within the frequency range of the system.

Write to: United States Department of Energy, Washington, D.C. 20585, U.S.A.

Adjustable Telescopic Tree Props

American inventor offers a Canadian company, under a manufacturing licence, his new invention — a lightweight, inexpensive, simple and easy to use telescoping prop particularly adapted for support or spreading of tree branches to save the limbs from being broken because of the weight of the fruit or nuts.

Write to: Mr. D.W. Roark, P.O. Box 8076, Springfield, Missouri 65801.

Hydrophobic Composite

An improved hydrophobic composite is prepared by depositing on a core material an adherent first coat comprising a film-forming polyurethane and, optionally, asphalt, and applying to the thus-coated core material a hydrophobic colloidal oxide, such as hydrophobic fumed silica. The composites are useful in various waterproofing applications, as well as in cleaning up oil spills.

Write to: T.B. Crane, Apt. 11008S 5501 Seminary Road, Falls Church, Virginia 22041, U.S.A.; C. Craig, C/O Craig Research Ltd., 2524 Queenswood Drive, Victoria, British Columbia V8N 2X5, Canada.

REQUESTS

BRITAIN

Industries of Interest

Fairey Engineering Limited, Cheshire, England, seeks Canadian technology under licensing or joint venture arrangements in the following areas: —

Military/Aerospace

Military or paramilitary vehicles and peripherals for low volume, specialist applications e.g. mine clearance, armour, combat digging, nuclear container handling.

Fabricated products for military use constructed from standard or specialised materials e.g. containers, pallets.

Robotics in the battlefield.

Test rigs, remote handling and simulation, nuclear submarine program.

Remote handling of satellite payloads.

Process Industries

Inspection/repair of process plant vessels.

Design/manufacture of food irradiation plant.

Manufacture of licenced sub-processes (e.g. separation plant, pollution control).

Fabrication of process plant equipment in specialised materials.

Biofuels combustion/digestion plant.

Design/manufacture of special mechanical handling plant for glass manufacture.

Process design offices.

Biotechnology based companies.

Offshore Industries

Winches and mooring systems and wellhead equipment.

Offshore pipeline welding.

Equipment for marginal field development.

Remote Operated Vehicles, inspection and manipulators.

Pipes/Sewers

Inspection/repair of underground pipes and sewers.

Trenchless pipe laying.

On-line inspection of gas, oil and process lines.

Offshore pipeline welding.

Industrial/Electrical

Special manipulators for foundries and forges.

Chemical treatment, membrane separation or incineration of hazardous industrial waste.

Remote inspection/testing of power transmission systems.

HVAC

Axial flow fans, including variable duty and bifurcated axial fans.

Heating and cooling coils and heat recovery equipment.

Air Filters and sound or pressure attenuators.

Roof units and agricultural drying systems.

Service and maintenance companies.

Write to: R.S. Marshall, Business Development Executive, Fairey Engineering Limited, P.O. Box 41, Crossley Road, Heaton Chapel, Stockport, Cheshire, SK4 5BD, England. Telephone: 061-432-0281. Telex: 667866.

SPECIAL EVENTS

OCTOBER 1985

- **DES — DESIGN ENGINEERING SHOW AND CONFERENCE**, BRITAIN
- **S.I.T.E.F. (SALON INTERNATIONAL DES TECHNOLOGIES ET ENERGIES DU FUTUR)**, FRANCE
- **BARCLAYS TECHMART — 1985**
THE SECOND MAJOR TECHNOLOGY TRANSFER EXHIBITION, BRITAIN
- **IENA '85**, GERMANY

NOVEMBER 1985

- **TECHNO '85**
7TH INTERNATIONAL LICENSING AND JOINT VENTURE EXPO, JAPAN
- **85 PATENT INFO FAIR**, JAPAN
- **NOVOTECH 85**
3rd EUROPEAN FORUM OF OPERATORS, FRANCE
- **TECHNOLOGIEFORUM BERLIN**, GERMANY
- **EUREKA 34TH WORLD INVENTIONS EXHIBITIONS**, BELGIUM

APRIL 1986

- **HANNOVER FAIR**, GERMANY

MAY/OCTOBER 1986

- **EXPO '86**, CANADA

DES — DESIGN ENGINEERING SHOW AND CONFERENCE

National Exhibition Centre
Birmingham, England
October 8-11, 1985
Cahners Exhibition Limited
Chatsworth House
59-61 London Road
Twickenham, TW1 3SZ England
Telephone: 01-891 5051
Telex: 936028

S.I.T.E.F. (Salon International des Technologies et Energies du Futur) (Incorporating F.I.T.T. '85 — Forum International du Transfert de Technologies)

Palais des Congrès
Parc des Expositions de Toulouse
Toulouse, France
October 22, 1985
Commissariat général du SITEF
Chambre de Commerce et d'Industrie de Toulouse
2, rue Alsace-Lorraine, B.P. 1506
31002 Toulouse, Cédex (France)
Téléphone: (61) 25.21.00
Télex: Chamcom 5318 77 F

BARCLAYS TECHMART — 1985 THE SECOND MAJOR TECHNOLOGY TRANSFER EXHIBITION

The New Technology Exhibition
National Exhibition Centre
Hall 3A
Birmingham, England
October 22-25, 1985
National Exhibition Centre Exhibitions Limited
National Exhibition Centre
Birmingham, B40 1NT England
Telephone: 021-780 4141
Telex: 336635

IENA '85

Nuernberg Fairground
Messezentrum Nuernberg
Federal Republic of Germany
October 30 - November 3, 1985
Mrs. Zetel
AFAG-Ausstellungsleitung
Messezentrum Nuernberg
D-8500 Nuernberg, Germany
Telephone: 0911/86691
Telex: 622080

TECHNO '85 7TH INTERNATIONAL LICENSING AND JOINT VENTURE EXPO

Science and Technology Museum
Chiyoda-ku, Tokyo, Japan
November 12-15, 1985
Techno Tokyo EXECUTIVE OFFICE
The Nihon Kogyo Shimbun
(The Japan Industrial Daily News)
Sankei Bldg., 7-2, Ohtemachi
1-chome
Chiyoda-ku, Tokyo 100, Japan
Telephone: (03) 231-7111
Telex: J22235

85 PATENT INFO FAIR

Science and Technology Museum
Chiyoda-ku, Tokyo, Japan
November 12-15, 1985
Techno Tokyo EXECUTIVE OFFICE
The Nihon Kogyo Shimbun
(The Japan Industrial Daily News)
Sankei Bldg., 7-2, Ohtemachi
1-chome
Chiyoda-ku, Tokyo 100, Japan
Telephone: (03) 231-7111
Telex: J22235

NOVOTECH 85

3rd European forum of operators
of the transfer of technology
November 19-22, 1985 — Lyon,
France

BRUSSELS INTERNATIONAL TRADE FAIR

Parc des Expositions, Place de
Belgique
B-1020 Brussels, Belgium
Telephone: 02/478.48.60

Technologieforum Berlin International Innovation Market

Exhibition and Congress
Berlin, Federal Republic of Germany
November 26-29, 1985

AMK Berlin Ausstellungs-Messe-Kongress GmbH

Messedamm 22
D-1000 Berlin 19

EUREKA 34TH WORLD INVENTIONS EXHIBITIONS

Expo Rogier Center
Brussels, Belgium
November 30 - December 8, 1985
Secretariat
Sogestor S.A.
Rue Duquesnoy 14
1000 Brussels, Belgium
Telephone: 02/512.21.87
Telex: 62052 sofair

HANNOVER FAIR

Hall 7, Hanover Fairgrounds
Hanover, Federal Republic of
Germany
April 9-16, 1986
Mr. Wiegmann
Deutsche Messe und Ausstellungs AG
Messegelaende
D-3000 Hanover 82, Federal
Republic of Germany
Telephone: 0511-89-2735
Telex: 992728

EXPO '86

1986 WORLD EXPOSITION
VANCOUVER, BRITISH COLUMBIA,
CANADA
MAY 2 - OCTOBER 13, 1986
For more information write to or
call:
EXPO Information
P.O. Box 1800, Station "A"
Vancouver, B.C.
Canada
V6L 3A2
Telephone: (604) 660-3976

THE MANUFACTURING OPPORTUNITIES SHOW

Queen Elizabeth Building
Exhibition Place
Toronto, Ontario
October 17 and 18, 1985

North America's largest Manufacturing opportunities show

Exhibitors and suppliers can participate at no cost to themselves

To obtain your "Exhibitor's Kit" and for more information contact the nearest office of the Ontario Ministry of Industry, Trade and Technology or call the Domestic Marketing Branch in Toronto at (416) 965-1809

SECOND FESTIVAL OF INDUSTRIAL VIDEO RECORDING FROM FRANCE

Place Bonaventure
Montreal, Quebec
October 7 to 11, 1985

This festival with focus on communications and technological innovation will allow participants to view selected video recordings on the following technologies:

- Robotics CAD/CAM
- Environment (water treatment and wastes)
- Informatics and Office automation
- Telecommunications
- Energy, new and traditional energy conservation.

Reservations will be accepted until September 27, 1985. Please contact: CFCI Centre ACTIM, 20 Elgin, P.O. Box 218, Place Bonaventure, Montreal, Quebec H5A 1A9, telephone (514) 861-8471, telex: 055-61761.

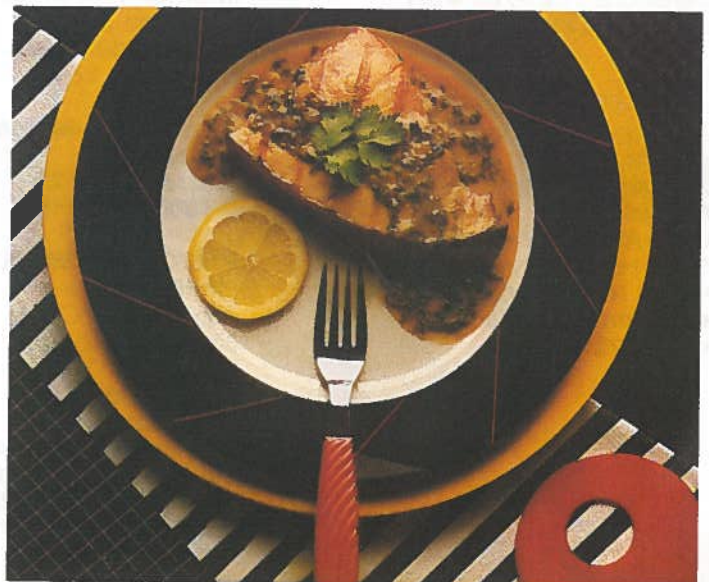
MARKET OPPORTUNITIES CONFERENCE NATIONAL HARDWARE/HOUSEWARES REVERSE TRADE FAIR SKYLINE BALLROOM/TORONTO, ONTARIO NOVEMBER 20-21, 1985

The Canadian Hardware and Housewares Manufacturing Association (CHHMA) in co-operation with the governments of Ontario and Quebec and the federal Department of Regional Industrial Expansion has assembled a wide assortment of imported products purchased by major retailers and distributors as well as federal and provincial purchasing departments which they would consider sourcing in Canada.

WHY NOT FROM YOU.

Canadian manufacturers wishing advanced information on these products should contact:

Jeannine Dimock
Project Co-ordinator (DRIE)
Tel: (613) 995-8216



Regional Offices

The Department of Regional Industrial Expansion maintains regional and local offices in each province for your convenience:

Newfoundland

P.O. Box 8950
Parsons Building
90 O'Leary Avenue
St. John's, Newfoundland
A1B 3R9
Tel: (709) 772-4884

Local Offices:

Corner Brook
Tel: (709) 634-4477
Goose Bay, Labrador
Tel: (709) 896-2741

Prince Edward Island

P.O. Box 1115
Confederation Court Mall
134 Kent Street, Suite 400
Charlottetown, Prince Edward Island
C1A 7M8
Tel: (902) 566-7400

Local Office:

Summerside
Tel: (902) 436-4846

Nova Scotia

P.O. Box 940, Station M
1496 Lower Water Street
Halifax, Nova Scotia
B3J 2V9
Tel: (902) 426-2018

Local Office:

Sydney
Tel: (902) 564-7007

New Brunswick

P.O. Box 1210
Assumption Place
770 Main Street
Moncton, New Brunswick
E1C 8P9
Tel: (506) 857-6400

Local Offices:

Bathurst
Tel: (506) 548-8907
Cocagne
Tel: (506) 576-6672
Fredericton
Tel: (506) 452-3124
Saint John
Tel: (506) 648-4791

Québec

C.P. 247
Tour de la Bourse
800, Place Victoria, Bureau 3800
Montréal (Québec)
H4Z 1E8
Tel: (514) 283-8185

Local Offices:

Alma
Tel: (418) 668-3084
Drummondville
Tel: (819) 478-4664
Québec
Tel: (418) 694-4451
Rimouski
Tel: (418) 722-3282
Sherbrooke
Tel: (819) 565-4713
Trois-Rivières
Tel: (819) 374-5544
Val-d'Or
Tel: (819) 825-5260

Ontario

P.O. Box 98
1 First Canadian Place, Suite 4840
Toronto, Ontario
M5X 1B1
Tel: (416) 365-3737

Local Offices:

London
Tel: (519) 679-5820
Ottawa
Tel: (613) 993-4963
Sudbury
Tel: (705) 675-0711
Thunder Bay
Tel: (807) 623-4436

Manitoba

P.O. Box 981
400-3 Lakeview Square
185 Carlton Street
Winnipeg, Manitoba
R3C 2V2
Tel: (204) 949-6163

Local Office:

Thompson
Tel: (204) 778-4486

Saskatchewan

105-21st Street
6th Floor
Saskatoon, Saskatchewan
S7K 0B3
Tel: (306) 975-4400

Local Offices:

Regina
Tel: (306) 359-6108
Prince Albert
Tel: (306) 764-7169

Alberta

Cornerpoint Building
10179 - 105th Street, Suite 505
Edmonton, Alberta
T5J 3S3
Tel: (403) 420-2944

Local Office:

Calgary
Tel: (403) 292-4575

British Columbia

P.O. Box 49178
Bentall Postal Station
Bentall Tower IV
1101 - 1055 Dunsmuir Street
Vancouver, British Columbia
V7X 1K8
Tel: (604) 666-0434

Local Offices:

Victoria
Tel: (604) 388-3181
Prince George
Tel: (604) 562-4451

Yukon

Suite 301
108 Lambert Street
Whitehorse, Yukon
Y1A 1Z2
Tel: (403) 668-4655


Northwest Territories

P.O. Bag 6100
Precambrian Building
Yellowknife, Northwest Territories
X1A 1C0
Tel: (403) 920-8568 or 8571

If undelivered return to:

Canada Commerce

Dept. of Regional Industrial Expansion
Ottawa, Canada, K1A 0H5

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