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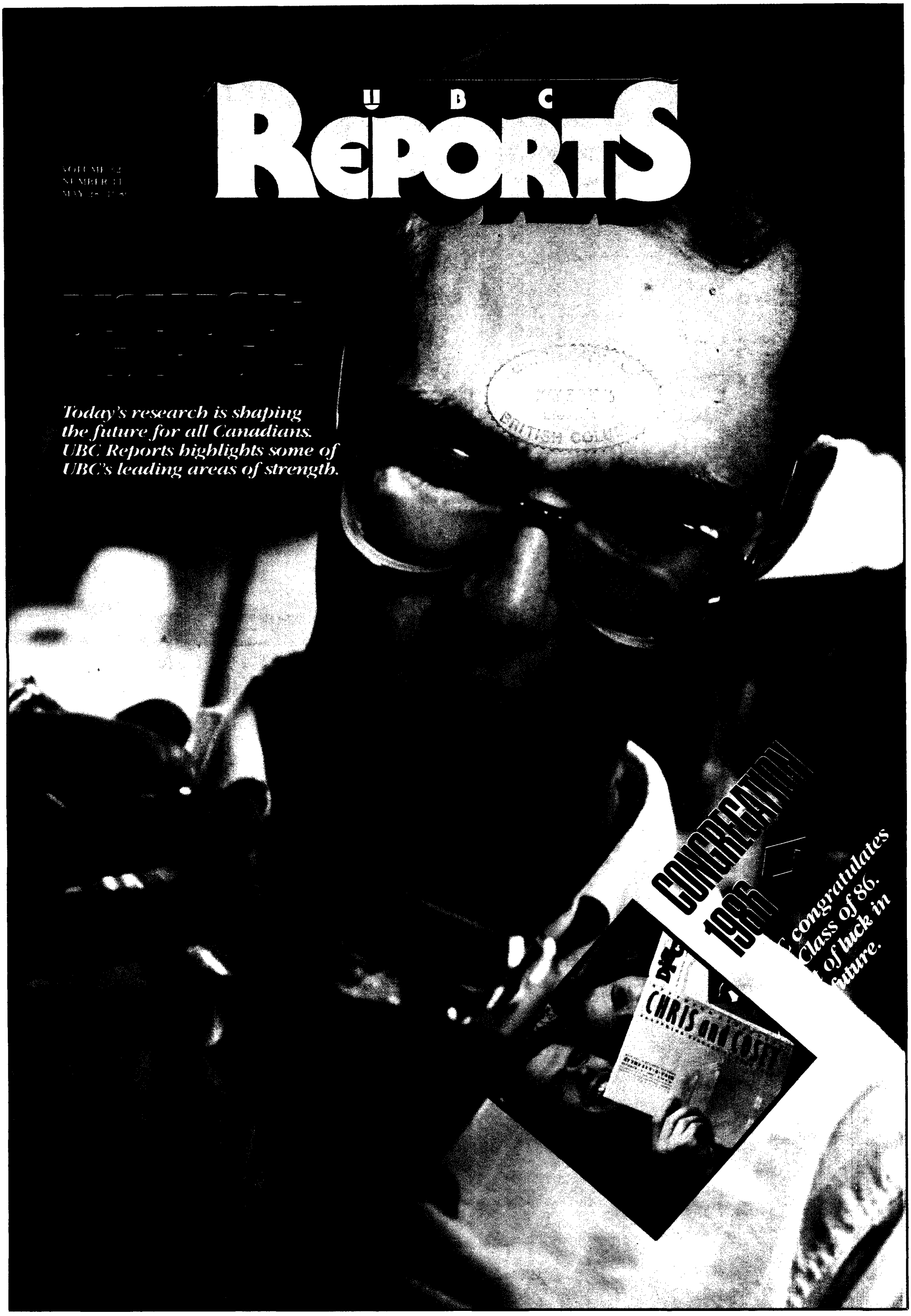


WELCOME TO CONVOCATION

Welcome to UBC's 1986 Congregation. At ceremonies beginning at 9:30 a.m. and 2:30 p.m. on May 28, 29 and 30, the University will confer academic degrees on 5,142 students and honorary degrees on seven individuals who have made outstanding contributions to public life, the private sector or university life.

The 1986 graduating class is made up of 4,012 students whose degrees were awarded on May 21 and 1,130 whose degrees were approved in the fall of 1985.

The ceremony which visitors will witness contains echoes of customs and traditions which had their origins nearly 1,000 years ago in the first European universities.

The gowns, hoods and hats worn by students and faculty members and the degrees to be conferred are linked to the dress and academic customs of the high middle ages, which extended roughly from the 11th through the 13th centuries.

All three items worn by graduates at today's ceremony – gown, hood and, in the case of women graduates, a mortarboard cap – have their histories rooted in the ordinary medieval apparel worn in bygone days.

The hood worn by graduating students, lined with a specific color to indicate the degree to be conferred, is all that remains of the real hood that was attached to the outer medieval garment and which could be pulled up to cover the head in cold or inclement weather.

At UBC's graduating ceremony, all candidates for degrees, with the exception of Doctor of Philosophy candidates and honorary degree recipients, enter the War Memorial Gymnasium wearing their hoods and carrying their degrees, which they were handed as they left the Student Union Building, where the Congregation procession assembles.

Because the Ph.D. degree is the highest academic degree awarded by UBC, doctoral candidates have their hoods placed over their shoulders after being presented to Chancellor W. Robert Wyman.

Similarly, honorary degree recipients receive their hoods after UBC's President David Strangway presents the candidate to the Chancellor and reads a citation which outlines the reasons for conferring the degree.

At UBC's Congregation ceremony the dean of each faculty, or his nominee, presents to the Chancellor the students who have met all the requirements for the degree offered by that faculty.

When the student's name is read out, he or she advances across the platform and kneels on a padded stool in front of the Chancellor, who taps the students on the head with his mortarboard and says, "I admit you."

At this point, the student has officially graduated and entered the ranks of Convocation, the body largely made up of all the graduates of the University, which elects the Chancellor and some members of Senate every three years.

Special recognition is given during the Congregation ceremony to those students who stand first academically in their graduation class. When class leaders are presented to the Chancellor, the medal and/or prize that he or she has won is also announced. Awards are presented by President Strangway, who stands on the Chancellor's left during the degree-granting ceremony.

A special presentation is made of the Governor-General's Gold Medal to the head of the graduating class in the Faculties of Arts and Science.

Rick Hansen receives degree

UBC's "Man in Motion," Rick Hansen, will be the first paraplegic to receive an academic degree in physical education at spring graduation ceremonies on Thursday morning (May 29).

Hansen, who is currently wheeling through Japan, is now more than half way through a 40,073-kilometre, round-the world wheelchair tour to raise funds for spinal cord research, rehabilitation and wheelchair sport.

Rick Hansen

The degree of Bachelor of Physical Education will be conferred on Hansen *in absentia* by UBC's chancellor, W. Robert Wyman.

Hansen, who will be 29 in August, has gained an international reputation as a wheelchair athlete since he was paralyzed from the waist down at the age of 15 in a car accident.

He's participated in just about every international wheelchair athletic meet held in the last 15 years and has 25 gold, silver and bronze medals to show for it.

He's also been the recipient of numerous awards. He was named National Disabled Athlete of the Year in 1979, 1980 and 1982. In 1983 he shared with hockey great Wayne Gretzky the prestigious Lou Marsh Trophy as Canada's outstanding athlete of the year. And just this month he was named the winner of the Champion of Champions Award, which has been renamed for John E. Bassett, the Toronto sportsman who died recently.

Hansen is due back in North America in the early summer to begin the last leg of his man-in-motion world tour. From Miami, he'll wheel north to Maine and then cross Canada from Newfoundland to Vancouver.

To date, the tour has raised just over $1 million. Donations can be made the the Man in Motion Fund and sent to P.O. Box 13132, Vancouver, V6B 4W6

Congregation Schedule

Here's a day-by-day schedule for UBC's 1986 Congregation, listing the honorary and academic degrees to be conferred at ceremonies beginning at 9:30 a.m. and 2:30 p.m. each day in the War Memorial Gymnasium. Everyone attending Congregation is invited for coffee, tea and refreshments immediately following each ceremony on the plaza adjacent to the Student Union Building. In inclement weather the reception will be held inside the Student Union Building.

Wednesday, May 28

9:30 A.M. – The honorary degree of Doctor of Laws (LL.D.) will be conferred on Vancouver businessmen and philanthropist Joseph Cohen. The following academic degrees will be conferred in the disciplines of Agricultural Sciences, Engineering, Forestry, Architecture, Community and Regional Planning and Interdisciplinary Studies: Ph.D., M.A., M.Sc., M.A.Sc., M.Eng., M.F. M.A.S.A., M.Arch., B.Sc.(Agr.), B.L.A., B.A.Sc., B.S.F., B.Sc. (Forestry), B.Arch. Congregation speaker – Mr. Joseph Cohen. Valedictorian – Mr. Nelson Borch, Faculty of Applied Science.

2:30 P.M. – The honorary degree of Doctor of Science (D.Sc.) will be conferred on world-renowned chemist Jack Halpern. Academic degrees to be conferred in the field of Science are: Ph.D., M.Sc. and B.Sc. Congregation speaker – Dr. Jack Halpern. Valedictorian – Mr. Michael Purdon, Faculty of Science.

Thursday, May 29

9:30 A.M. – The honorary degree of Doctor of Laws (LL.D.) will be conferred on former Bishop of Prince George John Fergus O'Grady. The following academic degrees will be conferred in the discipline of Education: Ph.D., D.M.A., M.A., M.Ed., M.P.E., B.Ed. – Elementary, B.Ed. – Secondary, B.Ed. – Special Education, B.P.E., B.R.E, Diplomas in Education. Congregation speaker – Bishop John Fergus O'Grady. Valedictorian – Ms. Lauri MacDougall, Faculty of Education.

2:30 P.M. – The honorary degree of Doctor of Letters (D.Litt.) will be conferred on internationally-known Maestro Kazuyoshi Akiyama and an honorary Doctor of Laws (LL.D.) degree will be conferred on anthropologist Audrey Hawthorn. Academic degrees will be conferred in the disciplines of Arts, Music and Library, Archival and Information Studies: Ph.D., D.M.A., M.A., M.Sc., M.F.A., M.Mus., M.L.S., M.A.S., B.A., B.F.A., B. Mus., Diplomas in Applied Linguistics, Art History, Film/Television Studies, French Translation, German Translation. Congregation speaker – Maestro Kazuyoshi Akiyama. Valedictorian – Cheryl Batty, Faculty of Arts.

Friday, May 30

9:30 A.M. – An honorary Doctor of Laws (LL.D.) degree will be conferred on former Prime Minister the Rt. Hon. Pierre Elliott Trudeau. Academic degrees will be conferred in the following disciplines – Dental Science, Medicine, Pharmaceutical Sciences, Audiology and Speech Sciences, Family and Nutritional Sciences, Nursing, Rehabilitation Medicine and Social Work: Ph.D., M.A., M.Sc., M.H.Sc., M.S.N., M.S.W., D.M.D., M.D., B.M.L.Sc., B.S.N., B.Sc. (Pharm.), B.Sc. (O.T.), B.Sc. (P.T.) B.H.E., B.S.W., Diplomas in Dental Hygiene and Periodontics. Congregation speaker – The Rt. Hon. Nathaniel Nemetz, Chief Justice of British Columbia. Valedictorian – Andrew Clarke, Faculty of Medicine.

2:30 P.M. – The honorary degree of Doctor of Laws (LL.D.) will be conferred on the Rt. Hon. Robert George "Brian" Dickson, Chief Justice of the Supreme Court of Canada. Academic degrees will be conferred in the areas of Commerce and Business Administration and Law: Ph.D., M.Sc. (Bus. Admin.), M.B.A., LL.M., B.Com., Lic.Acct., LL.B. Congregation speaker – The Rt. Hon. Brian Dickson. Valedictorian – Moira Barr, Faculty of Commerce.

Double honors student wins medal

The student who has topped the 1986 graduating class in the Faculty of Arts is contemplating a number of offers to undertake graduate work while he whiles away the summer working in a lumber mill.

Twenty-two-year-old Robert E. Marsh, winner of the University of B.C. Medal for Arts, graduates with double honors in political science and philosophy and a first-class average of nearly 88.5 per cent.

Marsh was "an absolutely delightful student" to tutor, according to Dr. Howard Jackson of the Department of Philosophy, who says he never suspected that the person he was dealing with was also a top student in political science.

Talking to Marsh, Dr. Jackson added, was really like dealing with a colleague, "a young colleague, one who makes mistakes, but certainly not the uphill work that it can sometimes be. He's a mature young man with a wide range of interests."

Robert Marsh hasn't yet made a firm decision about where he'll enrol for graduate work in political philosophy. He's waiting to hear from Cambridge University in England. The London School of Economics and the University of California at Berkeley are also possibilities.

He says his graduate work will probably be an extension of a topic that neatly combines his two academic disciplines and which has interested him as an undergraduate – individual responsibility and the provision of welfare by the state.

Marsh, who has lived in Richmond since the age of two and is a graduate of senior secondary schools in Steveston and Richmond, takes part in sports when he wants a bit of rest and relaxation.

He says he didn't find the double honors program he was enrolled in particularly onerous even though it involves more units of work than a majors program. "It was a fun program," is the way he puts it. "I really enjoyed it."

A message from President Strangway

It gives me great pleasure to extend to each of you a warm welcome to the campus of The University of British Columbia for the annual conferring of honorary and academic degrees. Like most university graduates, you will look back on this day as one of the significant milestones in your life. The University itself regards this day as one of the most significant of the academic year.

This is, of course, a day of celebration for graduates and their spouses, parents and friends. For those who receive their degrees today, this ceremony symbolizes the completion of many years of intellectual struggle to master a body of knowledge in the discipline of your choice. The justifiable pride in your accomplishments by family and friends reflects the support of every kind that has been given to you during your years as a student.

I hope that when the celebrations are over you will take a moment to reflect on why you decided to pursue a higher education, why you chose UBC as the place to pursue it and what you have derived from that experience. Since I am a "new boy" here, having become president only last November, it might be useful if I told you why I decided to come to the west coast.

First and foremost, my decision to come to UBC was rooted in the fact that this University is one of the major academic centres of Canada, noted for the quality of its faculty and students as well as for its academic programs. The credential you receive today will be recognized everywhere as one that reflects the high standards which UBC expects of the students it admits. My perception of UBC as a centre of excellence in Canadian higher education has been confirmed since I arrived here. I have found many areas of strength that remind me that the University has a strong academic reputation today and which will continue in the future.

The concern within the University about excellence has been a hallmark of UBC since the days of the first president, Frank Wesbrook. In recent years it has become clear that our economy will not continue to expand at an ever-increasing rate and that growth is no longer a primary objective of society. This is causing us to reexamine ourselves and to ensure that the commitment to quality remains central.

One of the difficulties for universities is to provide measures of our accomplishments, since our successes cannot be set out in the balance-sheet terms familiar in the business world. Universities measure their success in terms of opportunities they create for young people to prepare for rewarding careers, in terms of the understanding and preservation of our culture and heritage and in terms of the long-range research and development they carry out. Our bottom-line criteria are those associated with quality, and excellence must be our measuring device.

There are some specific and measureable things we can point to, however. Every day, more than 40,000 people come to the campus to learn, teach, work, volunteer, enjoy or sample the riches of the second largest university library in Canada. At least an equal number benefit from continuing education programs.

Our annual expenditures are about $360 million. Some $60 million of this comes each year from granting agencies, industry, foundations and other sources which provide funding on a competitive basis. The fact that funds of that magnitude are awarded to UBC is yet another measure of the success of this University. We have just begun to identify and measure the impact of those companies that have evolved as a direct result of research done at UBC. So far we have compiled a list of 53 companies with estimated annual revenues of $87.5 million directly employing 1,600 British Columbians.

UBC looks forward to expanding areas of strength in many areas – computer systems, biotechnology, Pacific Rim studies, international business, forestry and links with cultural industries, to mention just a few. Our ability to do first-rate work in those and other fields is dependent on a solid infrastructure that provides people, services and facilities.

One task I have concentrated on since coming to UBC is drafting a mission statement as part of an assessment of the University's role in higher education in B.C. Whatever the precise final form of this statement we must ensure that we hold fast to our commitment to excellence and that we continue to have enough flexibility to allow us to play our role in the development of educational and research opportunities for all who can benefit from them.

Earlier, I suggested that you take a moment to reflect on why you decided to go to university, why you chose UBC and what you derived from it. I hope you decided to go to university to satisfy your curiosity and that you chose UBC because you perceived it to be, as I did, an institution noted for its faculty and its academic programs. In any event, I hope that as you leave here, you leave with a sense that there is always more to learn and that you have developed a passion for enquiry.

Finally, each of you receiving a degree today can take pride in the fact that you are about to graduate from UBC. You will find your fellow graduates in leadership positions in all parts of the country. I have no doubt that this University will continue to have a major impact on the economic, professional and cultural life of Canada. I can think of no better reason for asking for your continuing support to ensure that we can maintain and strengthen the best of what we have to offer for our future students.

I wish you Godspeed and good luck in the years ahead.

President David Strangway

UBC pays tribute to seven outstanding individuals

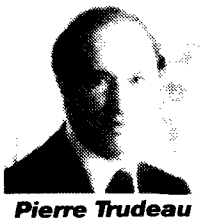
Joseph Cohen

Jack Halpern

J. Fergus O'Grady

Kazuyoshi Akiyama

Audrey Hawthorn



Pierre Trudeau

Brian Dickson

The University of British Columbia will confer honorary degrees on seven people who have made outstanding contributions in the artistic, business, legal, religious and academic worlds during its three-day spring congregation May 28-30.

UBC's Chancellor, W. Robert Wyman, will confer the degrees following the reading of citations by President David Strangway. The degrees are awarded by the Senate of the University on the recommendation of its Tributes Committee

In addition to the seven honorary degrees, a total of 5,142 students will receive academic degrees awarded in the fall of 1985 and at the May meeting of Senate.

Vancouver businessman Joseph H. Cohen, widely known for his community service contributions in Vancouver, will receive the honorary degree of Doctor of Laws (LL.D.) at the first of six degree-granting ceremonies on Wednesday, May 28, beginning at 9:30 a.m.

Born in Winnipeg and a Vancouver resident since 1945, Mr. Cohen has combined a successful business career with fund-raising and other leadership roles on behalf of many organizations, including the Boy Scouts of Canada, the YMCA, the Variety Club, St. Vincent's Hospital, the Vancouver Symphony, Vancouver College, the Justice Institute of B.C. and UBC.

The honorary degree of Doctor of Science (D.Sc.) will be conferred on Dr. Jack Halpern, an internationally known chemist, at the May 28 afternoon ceremony beginning at 2:30 p.m.

Dr. Halpern, who taught at UBC from 1950 to 1962, has been honored in the past for his contributions to inorganic, bioinorganic and organometallic chemistry. He has held teaching positions at Britain's Cambridge University, at Harvard and Princeton Universities and the California Institute of Technology in the U.S. and is currently associated with a major research institute in West Germany.

The honorary degree of Doctor of Laws (LL.D.) will be conferred on J. Fergus O'Grady, Bishop of Prince George and a religious leader widely known for his educational activities, particularly within native Indian communities.

Bishop O'Grady, who will be honored at the 9:30 a.m. ceremony on May 29, was ordained a priest in 1934 and shortly after began his work in B.C. He administered Indian schools in Mission and Kamloops and developed the first high school for native Indians.

The 2:30 p.m. ceremony on May 29 will see two individuals honored – internationally acclaimed conductor Kazuyoshi Akiyama, conductor of the Vancouver Symphony from 1972 to 1985, and Audrey Hawthorn, one of the key figures in the creation of UBC's Museum of Anthropology and a faculty member from 1947 until her retirement in 1982.

Mr. Akiyama, currently conductor of the Tokyo Symphony and principal guest conductor of the Osaka Philharmonic, has conducted orchestras in major American centres – New York, Boston, Cleveland and San Francisco – and abroad, including London's Royal Philharmonic, the Berlin Radio Symphony and the Symphony Orchestra of Brazil. He wil receive the honorary degree of Doctor of Literature (D.Litt.).

Prof. Audrey Hawthorn, in addition to playing a major role in building the outstanding collection of Northwest Coast Indian artifacts housed in UBC's Anthropology Museum, also pioneered the creation of museum training courses in Canada, assisted in the development of a number of community museums in B.C. and played a leading role in the formation of the B.C. Museum Association. The honorary degree of Doctor of Laws (LL.D.) will be conferred on Prof. Hawthorn.

The former prime minister of Canada, Pierre Elliott Trudeau, will receive the honorary degree of Doctor of Laws (LL.D.) at the 9:30 a.m. ceremony on May 30, the final day of the UBC awards ceremony.

Mr. Trudeau will be honored for his contributions to the Canadian scene as a lawyer specializing in labor law and civil liberties cases; as a teacher of law at the University of Montreal specializing in constitutional law and civil liberties; and as a member of the House of Commons from 1965 and leader of the Liberal Party for 18 years from 1968 to 1984, during which period he was also Prime Minister, except for the period June, 1979 to February, 1980.

The honorary degree of Doctor of Laws (LL.D) will be conferred on the Chief Justice of the Supreme Court of Canada, Hon. R.G. Brian Dickson, at the 2:30 p.m. Congregation ceremony on May 30.

After 23 years in private practice, during which he also lectured at the University of Manitoba, Mr. Dickson was appointed in 1963 to the Manitoba Court of Queen's Bench and four years later to the Manitoba Court of Appeal. His elevation to the Supreme Court of Canada took place in 1973.

Enrolment controls set to preserve excellence

The defence of educational quality at the University of B.C. is reflected in the recent decisions by its two main governing bodies, the Senate and Board of Governors, to approve recommendations from its two largest faculties to control new enrolments.

Prof. Daniel Birch, UBC's vice-president academic, said the intent of the enrolment-control regulations is to provide the best possible educational experience for those students whose records indicated they were suited to university-level studies.

The enrolment-control motions provide for the admission of a maximum of 1,500 first-year students into the Bachelor of Arts program and 1,400 into the first year of the Bachelor of Science program in the 1986-87 academic year beginning in September.

A second Faculty of Arts motion limits to 750 the number of students from other colleges and universities who will be able to transfer into the second and third years of the Bachelor of Arts program in September.

These figures compare with 1,484 first-year admissions in Arts and 1,312 first-year admissions in Science and 749 transfers into Arts from universities and colleges last year. The aim of the enrolment-control motions is to stabilize enrolments in the two faculties at approximately current levels.

Prof. Birch said that if the University is committed to excellence and quality education, "we have to be certain about the upper limit on the numbers we can accommodate in each of these basic faculties."

There is no doubt in the minds of the deans who head the Faculties of Arts and Science, where the enrolment-control motions originated, about the need for controls.

The enrolment control of 1,400 first-year students in the Faculty of Science is "simply an insurance policy against unmitigated disaster," according to Dean Robert Miller, whose faculty has lost about 30 teaching positions to retrenchment in recent years.

"There is an absolute limit to the number of people we can handle," he said, "because of space limitations, the availability of teaching assistants and laboratory supervisors and the resources to purchase equipment and supplies, which have been escalating in cost at a far higher rate than the Consumer Price Index."

His concern about educational quality is echoed by the head of the Faculty of Arts, Dean Robert M. Will, who said unlimited enrolment is "a sure-fire guarantee of a decline in the quality of UBC's arts program."

The arithmetic of the problem in Arts is simple – over the past five years, while student numbers have increased by nearly nine per cent, the number of faculty members employed on a full-time equivalant basis has declined by 10.6 per cent or 63 people.

One of the problems his faculty faces is shifting student preferences in what they want to study. Today's pressure points, Dean Will said, are areas such as economics, psychology and Japanese and Chinese language training.

Dean Will said the criticism levelled at the University by regional colleges in reaction to the control of transfer students is understandable, since it probably means that in the future college students who have had fairly unrestricted access to UBC will not in every case get in if they meet present minimum standards for admission.

The impact on college transfers, Dean Will said, is likely to be minimal in 1986-87 and in the short run. The impact can be lessened in the longer run if students remain at the colleges for two years instead of the one year the majority now elect.

There is no lack of unanimity on the part of all three of these UBC administrators about how excellence is measured at UBC.

A key objective of enrolment limitations set by UBC is to preserve the one-on-one teacher and student relationship that is critical to any successful university. Pictured above are Dr. Michael Blades of UBC's Chemistry Department and graduate students working under his direction. Close student-teacher contact is particularly important at the graduate level of study.

Vice-president Birch puts it this way: "Excellence means we have the capacity to do scholarly work of the very best quality in the fields that are represented at UBC.

"What flows from that is the enhancement of the quality of undergraduate education by outstanding scholars who bring to the classroom the discoveries made in their own and other laboratories or by keeping abreast of new knowledge through library resources. Research and teaching are really obverse sides of the same coin."

He adds: "One measure of excellence lies in the very fact that we *are* under pressure to admit ever increasing numbers of students. I think it's safe to say that we would be very disappointed if demand didn't exceed our capacity."

Dean Miller said the fact that UBC receives some $60 million annually in research grants and does 80 per cent of the research carried out in B.C. reflects the fact that UBC is perceived by the national bodies that make the grants as a centre of excellence in a variety of fields.

He adds: "If UBC standards are diluted through uncontrolled enrolment, it does not mean that another Canadian university will overtake and pass us as a centre of excellence. It means that a centre of excellence will simply disappear from the Canadian scene. I can't believe that Canadians in general and British Columbians in particular are prepared to let that happen."

Congratulations to UBC's top students for 1986

HEADS OF GRADUATING CLASSES
(from Vancouver unless otherwise noted)

Association of Professional Engineers Proficiency Prize, $500 (most outstanding record in the graduating class of Applied Science, B.A.Sc. degree): Jonathan Bruce Hacker.

Helen L. Balfour Prize, $850 (Head of the Graduating Class in Nursing, B.S.N. degree): Susanna Jane Linthwaite (Delta, B.C.).

British Columbia Recreation and Parks Association, Professional Development Branch Prize (Head of the Graduating Class in Recreation, B.R.E. degree): Linda Sharon Scratchley.

Dr. Maxwell A. Cameron Memorial Medal and Prize (Head of the Graduating Class in Education, Elementary Teaching field, B.Ed. degree): Caroline Louise Adderson (Alberta).

Dr. Maxwell A. Cameron Memorial Medal and Prize (Head of the Graduating Class in Education, Secondary Teaching field, B.Ed. degree): Stephen M. Gorby (Victoria, B.C.).

Ruth Cameron Medal for Librarianship (Head of the Graduating Class in Librarianship, M.L.S. degree): Jane Marie Knight.

College of Dental Surgeons of British Columbia Gold Medal (Head of the Graduating Class in Dentistry, D.M.D. degree): Stephen Robert Crowley (West Vancouver, B.C.).

College of Dental Surgeons of British Columbia Gold Medal in Dental Hygiene (leading student in the Dental Hygiene program): Marcia Karen Lerner.

Professor C.F.A. Culling—Bachelor of Medical Laboratory Science Prize, $250 (greatest overall academic excellence in the graduating class of the Bachelor of Medical Laboratory Science degree): Carmen Maria Pavan (Quebec).

Dr. Brock Fahrni Prize in Occupational Therapy, $150 (Head of the Graduating Class in Rehabilitation Medicine, Occupational Therapy, B.S.R. O.T. degree): Susan Christine Filek (Summerland, B.C.).

Dr. Brock Fahrni Prize in Physiotherapy, $150 (Head of the Graduating Class in Rehabilitation Medicine, Physiotherapy, B.S.R. P.T. degree): Alison Maria Hoens.

Governor-General's Gold Medal (Head of the Graduating Classes in the Faculties of Arts and Science, B.A. and B.Sc. degrees): Raymond Tak-Yan Ng (Surrey, B.C.). Faculty of Science.

Hamber Medal (Head of the Graduating Class in Medicine, M.D. degree, best cumulative record in all years of course): Harvey Lui.

Horner Prize and Medal for Pharmaceutical Sciences, $300 (Head of the Graduating Class in Pharmaceutical Sciences, B.Sc.Pharm. degree): Rubina Abdul Alladina (Richmond, B.C.).

Kiwanis Club Medal (Head of the Graduating Class in Commerce and Business Administration, B.Com. degree): Shelagh Elizabeth McLeod (West Vancouver, B.C.).

Law Society Gold Medal and Prize (call and admission fee) (Head of the Graduating Class in Law, LL.B. degree): Richard John Harold Berrow (Richmond, B.C.).

H.R. MacMillan Prize in Forestry, $350 (Head of the Graduating Class in Forestry, B.S.F. degree): Catherine Anne Bealle.

Dr. John Wesley Neill Medal and Prize (Head of the Graduating Class in Landscape Architecture, B.L.A. degree): Sukhpal Singh Sangha (Burnaby, B.C.).

Physical Education and Recreation Faculty Prize in Physical Education, $100 (Head of the Graduating Class in Physical Education, B.P.E. degree): Kara Lynn Moroz (West Vancouver, B.C.).

Royal Architecture Institute of Canada Medal (graduating student with the highest standing in the School of Architecture): James Keith Nicholls (Alberta).

Wilfrid Sadler Memorial Gold Medal (Head of the Graduating Class in Agricultural Sciences, B.Sc.Agr. degree): Kathy Vandalen (Burnaby, B.C.).

Special University Prize, $200 (Head of the Graduating Class in Special Education, B.Ed. degree): Sacha Kenward Innes (Alberta).

Special University Prize, $200 (Head of the Graduating Class in Fine Arts, B.F.A. degree): Paul Adolf Skutshek (Kelowna, B.C.).

Special University Prize, $200 (Head of the Graduating Class in Family and Nutritional Sciences, B.H.E. degree): Jane Kathryn Little.

Special University Prize, $200 (Head of the Graduating Class in Music, B.Mus. degree): Eric Grant Hannan (North Vancouver, B.C.).

University of B.C. Medal for Arts and Science (proficiency in the graduating classes in the Faculties of Arts and Science, B.A. and B.Sc. degrees): Robert Frederick Marsh (Richmond, B.C.). Faculty of Arts.

Expo gets a helping hand from UBC

In the basement of UBC's Civil and Mechanical Engineering Building, a team of 20 students is working feverishly on their entry for the Innovative Vehicle Design Competition, an international Expo 86 special event organized by UBC engineering students.

Meanwhile, students and staff at the UBC Museum of Anthropology are still involved in work related to eleven Expo pavilions they helped design and install for the world's fair. In yet another area of campus Dr. Trevor Heaver, director of the University's Centre for Transportation Studies last week closed his files on the very successful Fourth World Conference on Transport Research, which was held in conjunction with Expo.

UBC's substantial contributions to the 1986 world exposition often resemble a relay team. When one group's project is finished, another is just beginning.

UBC's involvement in Expo 86 is as varied as the many departments and units that make up the University. One of the most interesting projects organized by UBC for Expo is the Innovative Vehicle Design Competition, which runs from July 11 to 18.

The ten teams competing in the vehicle design competition come from California State University, Fresno; Western Washington University; Mankato State University; Switzerland's Institute of Transport and Traffic Engineering; Masashi Institute of Technology, Japan; Nippon Institute of Technology, Japan; the University of Sherbrooke, Queens' University; and the University of B.C.

Contest rules stipulate that vehicles must be able to carry two people and to travel on existing roadways. They must have storage space for at least three shopping bags and have at least three wheels. Vehicles must also achieve a speed of 65 kilometres an hour.

Vehicles will be judged in five categories – performance, functionality, safety, energy efficiency and innovation. Fifty per cent of the final score in the competition will be based on innovation.

Bruce Hodgins, a mechanical engineering student who graduates this week, coordinated the team working on the UBC entry. "We've been working on this project for two years now and it's been exciting to put our ideas together and work as a team. We've come up with a light, aerodynamic vehicle with a dual fuel engine and a regenerative system to employ normally-wasted braking energy." Hodgins adds that the vehicle will also have a microprocessor to monitor engine and suspension functions.

Expo 86 is offering endowed university scholarships worth a total of $250,000 to the top four schools in the competition. Among the nine highly qualified judges will be Ted Robertson, director of Canadian Engineering, General Motors of Canada, Ltd., Tony Rudd, managing director of Lotus Engineering Ltd. and Kazuo Moroshoshi of Toyota Motor Corporation, Japan.

A special key-turning ceremony is planned for the first week of July to honor the more than one hundred sponsors who contributed parts for the vehicle. If you'd like a sneak peek at the UBC entry, call 228-2809 for details. Testing of the vehicles will take place on campus beginning July 11, and the entries will be seen on parade and on display at Expo on July 14.

Staff and students at UBC's Museum of Anthropology have made a major contribution to the installation of Expo 86 pavilions. For example, tucked away in the shadow of B.C. Place just west of the B.C. pavilion, lies the peach-colored South Pacific Island Pavilion. Its interior is structured as "an abstraction of a collection of villages," says Herb Watso the Museum of Anthropology designer who was responsible for the design and hiring of staff for the pavilion.

For five weeks Watson travelled the South Pacific Islands, including Papua New Guinea, Western Samoa, Fiji, Tonga, the Cook and Solomon Islands and the republics of Nauru and Vanatu to gather artifacts for the Expo display.

Another Museum of Anthropology designer, Bill McLennan, was on loan to the Expo Corporation as a designer and registrar for 18 months. One of his accomplishments was to track down the transportation vehicles for the Land Plaza, the boats for the Marine Plaza and the planes for the Aviation Plaza.

Working on the pavilions has provided UBC museum students with first-rate training, says McLennan. "It's one thing to have textbook experience, but it's another thing for students to actually be involved in real-life work situations, particularly those as exciting as the Expo projects."

Among the pavilions that staff and students at the museum contributed to were the Canada and B.C. Pavilions, the Folklife Pavilion, the Pakistan Pavilion, the Kenya Pavilion, the Northwest Territories Pavilion, the Costa Rica Pavilion and the Expo 86 Theme Pavilion.

Geoffrey Smedley and Richard Prince, professors in UBC's Fine Arts Department, have also made artistic contributions to Expo 86. Both were commissioned to create sculptures for the Expo site

Mr. Smedley's sculpture, *The Rowingbridge*, stands at the West Gate Plaza of Expo. The sculpture combines the image of the Japanese *Tori*, or ceremonial arch, with the skeleton of a stylized boat. The boat's 20 oars move at approximately three cycles per minute at the same angle as that of the earth to its orbit. The geometry of the design is taken from Plato's dialogue *Timaeus*.

A Miracle Play – The Alchemy of Invention is the title of the work created by Richard Prince. The sculpture, which is located at the Canada Pavilion, is an assemblage sculpture which represents the theme of "invention in Canada". Mr. Prince uses the image of alchemy, the medieval chemistry that attempted to turn base metals into gold, to represent the imagination and creative potential of Canadians.

UBC professors are also taking time to ensure that British Columbians get the most out of their visits to Expo pavilions. For example, Prof. Hanna Kassis of UBC's Religious Studies Department has travelled throughout the province, from the Lower Mainland to centres such as Kamloops and Prince George, to give free lectures on the life and times of Ramses II. His lectures are designed to give Expo visitors a better understanding and appreciation of the Egyptian monarch who is featured in one of the fair's most popular pavilions.

UBC has also planned many on-campus special events during Expo for visitors to B.C. and local residents alike.

The Museum of Anthropology is sponsoring several major exhibits throughout the summer, including "Hands of Our Ancestors: The Revival of Salish Weaving at Musqueam", "Jack Shadbolt and the Coastal Indian Image", "Bill Reid: Beyond the Essential Form", and "Cowichan Indian Knitting."

UBC's Asian Centre is sponsoring three special exhibits this summer, and in September the Department of Theatre will present an evening of sketches, readings and other entertainment by famous UBC graduates.

Mechanical Engineering student Bruce Hodgins, front, is coordinating the team of UBC engineers responsible for UBC's entry in Expo's Innovative Vehicle Design Competition. The vehicle, shown above in its in "shell" form, will be compete with nine other entries from around the world. Vehicles will be judged on performance, functionality, safety, energy efficiency and innovation.

Raymond Tak-Yan Ng

Computer whiz wins 1986 Gold Medal

Raymond Tak-Yan Ng is, it appears, unique.

Administrators responsible for UBC's annual graduation ceremony cannot recall that the Governor-General's Gold Medal has ever before been awarded to a transfer student who has been at the University for less than two years.

Raymond Ng is a 22-year-old landed immigrant from Hong Kong who will receive the gold medal Wednesday afternoon (May 28) as head of the graduating classes in the Faculties of Arts and Science.

Raymond will graduate with a 94 per cent average from the Department of Computer Science, where he is regarded as "self-motivated, conscientious and the best teaching assistant I've ever had," by Prof. James Varah, the head of the department.

Usually, Dr. Varah adds, transfer students take a year or more to make the adjustment to the environment at a new university. "Raymond is one of those mature and exceptional students who pop up once every few years and sail through with a minimum of supervision."

Raymond did two years of academic work at the University of Hong Kong before applying to seven universities in Canada for admission.

He says he found the academic work at UBC "tougher than I expected. But hard work here in Canada means better marks, which is not always the case in Hong Kong."

The Hong Kong university is modelled on the British system, which puts enormous pressure on students because course marks depend almost entirely on a single, final examination, he explains.

Raymond is interested in sports and for rest and relaxation plays soccer, badminton and table tennis, either with friends or with casual pickup teams in Computer Science.

He's been the recipient at UBC of numerous scholarships and awards. This summer he holds an undergraduate summer scholarship awarded by the Natural Sciences and Engineering Research Council, one of the three major federal granting agencies that makes grants to universities for research.

Until the end of July, when he leaves for the University of Waterloo to take up graduate work leading to a Master of Science degree, Raymond will spend his time in the computer science department debugging a program that will enable two different computer systems to understand each other.

Two of the driving forces behind the development of Industry-Liaison at the University of B.C. are Dr. James Murray, left, UBC's director of University-Industry Liaison and Dr. Peter Larkin, UBC's vice-president for research.

Russ Fraser praises universities

Speaking in the Legislature on April 15th, 1986, the Hon. Russ Fraser, Minister of Post-Secondary Education, told the House that he has confidence in the province's universities.

"I have visited a number of campuses and universities in our system and can assure you that it is the most vital and important system in our economic renewal drive in the province of British Columbia."

The minister made special mention of the distinguished service universities have provided to the province.

"They will continue to make significant contributions to the educational and social culture and the economic well-being of B.C.

Mr. Fraser singled out the success of some of UBC's spin-off companies while remarking on the economic impact they are making.

"The universities are also contributing to the economy with their spin-off from basic research. We can look at two or three B.C. companies that are doing extraordinarily well that actually were probably born in the labs of the university: MacDonald Dettwiler, which does satellite mapping and other things, a company now doing about $35 million worth of business a year; Mobile Data, which started there, now does some $40 million worth and has about 60 percent of the international market in data movement – quite remarkable; Moli Energy, a new battery company in B.C. which, of course, was spawned in the university atmosphere; and Vortek Industries.

"A number of spectacular opportunities which are indicating that we can do it here and that what we really want to do is get into a business here which can lead us to develop projects that we can ship anywhere...High value, low weight – that means you can build them anywhere."

Special accolades were reserved for the accomplishments of UBC's University-Industry Liaison Program.

"The University of British Columbia's Industry Liaison Office .... expects that in 1986 it will increase its revenue from royalties and licences to $1 million, a dramatic increase from $10,000 in 1984. We expect universities to benefit enormously from this in the future, and, of course, that makes it easier for the taxpayers and probably easier for the students."

UBC attracts research funds

Pure and applied research at UBC has become a "growth industry" that is increasing at an impressive rate. Over the past five years or so, UBC research funding has doubled and in the past decade the rate of increase has been of the order of 225 per cent.

This year, UBC researchers will receive nearly $60 million from national and government agencies, North American businesses and foundations and individuals, making it the number two centre in all of Canada for scholarly work in the sciences and the humanities.

Grants from the Natural Sciences and Engineering Research Council (NSERC) to UBC now total close to $20 million. Only the University of Toronto at $30 million gets more than UBC.

Looked at in another way, however, NSERC awards to UBC researchers are the highest in the country in terms of the average award based on the number of applicants. In short, UBC's overall success rate in obtaining NSERC research grants is the highest in Canada.

UBC is a member of the Big Three when it comes to grants for research funded by the Medical Research Council of Canada (MRC). In 1984-85 (the last year for which figures are available) UBC was awarded nearly $12.2 million by MRC. Only McGill and the University of Toronto got more.

Nearly $2 million reaches UBC annually from the Social Sciences and Humanities Research Council (SSHRC). In the current year, 24 UBC faculty members were awarded SSHRC leave fellowships, again making it second in Canada to Toronto, where 37 were awarded.

Looked at solely in provincial terms, UBC receives 80 per cent of the research money that comes from outside agencies.

UBC EXPERTISE BOOSTS ECONOMY

UBC is an important provincial resource. The expertise of faculty and staff, the Library and computing facilities, the Botanical Garden and museum collections all contribute to the cultural, historical, scientific and technical richness of British Columbia.

In keeping with its role as a resource for all British Columbians, the University has always responded to requests from the public. Whether from business and industry, the media, or requests from individuals, experts have been available for information and comment. Traditionally, this has been the most familiar aspect of UBC's relationship with the community. In recent years, however, there has been a new kind of outreach resulting from research activity on the campus.

New companies are being started up with know-how gained from research being conducted on the UBC campus. These companies are producing new products and offering services which translate directly to job creation and an improved economy.

In 1985 alone, $87.7 million worth of business was generated by companies which were started up as spin-offs from UBC. So far, UBC has identified 52 companies which it can claim as spin-offs – businesses which have contributed almost 2,500 direct and indirect jobs.

Creating companies this way – taking the results of research and making them commercially available as a product, process or service – is called "technology transfer". Normally this is accomplished through one of two routes – practicing what has been learned through course work and research (such as operating as a consultant, developing specialized products or refining an existing process) or by licencing patented technology or know-how from the University.

UBC recognizes the importance of its relationship with industry. The Office of Research Services and Industry Liaison was created by the University to act as a catalyst in encouraging technology transfer and to promote collaborative research with the private sector.

Over the past year, UBC entered into research agreements with 216 provincial, national and international companies. A broad spectrum of research interests includes forestry, oil and gas, environmental, computer, medical and nutritional studies.

Dr. Peter Larkin, UBC's vice-president for research, says that building strengths at the University in all fields of research, both the basic and applied levels, is essential if Canada is to be a competitor in today's "technological olympics." "Without research British Columbians are not going to be plugged into the discoveries that shape our future," said Dr. Larkin.

Another key figure in UBC's Industry Liaison program is Dr. James Murray. With his appointment as director for University-Industry Liaison in 1984, Dr. Murray now has the opportunity to play an active role in promoting one of his longstanding interests – collaboration between the University and the business community. In doing so, he draws upon his background as an academic researcher and scientific consultant to oceanographic, mining, oil and engineering companies. "I have always felt that by working together, both the University and the business community can be stronger. Industry can learn and obtain new ideas and technologies from the University. The University can understand the needs of industry for both fundamental and applied research."

The needs of both partners in co-operative research arrangements must be respected to ensure that the interest of each is considered and protected. Dr. Murray is proud of what has been accomplished so far. "It is gratifying to see the results of these transactions. They have been very beneficial to both parties."

One example is the licencing of an electronic messaging software program to Sydney Development Corp. This software allows different computers to communicate with each other, thereby allowing the transfer of messages and files to any computer anywhere in the world. The technology, developed in UBC's Department of Computer Science, generates millions of dollars in sales and will influence communications on an international scale.

Products of UBC-born technology range from specialized industrial equipment and processes, satellite communications and medical equipment to computer software programs and even the development of new foods! Some companies are growing to the point where they are becoming quite diversified; others are spinning off new companies of their own. These represent another level – a kind of "second generation" development of UBC spin-offs. The potential for such expansion is limitless. UBC has many "firsts" to its credit, and expansion into new industrial frontiers seems logical for an institution dedicated to excellence and optimism for the future.

Visitors to Expo '86 will find many of UBC's spin-off discoveries on display.

An impressive contribution to the Canada Pavilion has been made by MacDonald Dettwiler & Associates, a spin-off from UBC's Computing Centre and Department of Electrical Engineering. As specialists in digital data processing and satellite ground stations, MDA is featured in the film "Earthwatch". The company's Landsat images display views of Vancouver and other regions of the province as well as a dozen other Canadian cities. Progressive satellite photographs show Vancouver, the Lower Mainland and moving farther up, images of the earth as seen from space.

Look for 35 foot archways of light over the Monorail and outlining murals on walls in the Canadian Pacific pavilion. These are constructed of "Light Pipe", a product developed in a physics laboratory at UBC and now manufactured by TIR Industries Ltd. (Total Internal Reflection). TIR has provided extensive use of its technology as entertainment lighting for the fair. The stalactites and stalagmites featured in the U.S.A. pavilion are also constructed of Light Pipe material.

Expo visitors will also be afforded an opportunity to eat some of UBC's technology. A non-dairy (vegetable protein) dessert called "Tripple" is on sale at all Expo spaceship food kiosks. The first flavor produced, strawberry, is reputed to be indistinguishable from real ice cream at half the calories! Developed by UBC's Department of Food Science, the formula and rights to produce it have been licenced to a B.C. company, Nu Food Research Corp.

For more information concerning spin-off companies or the possibilities for collaborative research with UBC, please contact:
Dr. James Murray, Director
University-Industry Liaison
Office of Research Services
The University of British Columbia
Vancouver, B.C. V6T 1W5
Telephone: (604) 224-8580

UBC's library: A major resource for B.C.

UBC's library system – one of the largest and most extensive systems in Canada – has been the backbone of the University's teaching and research programs since UBC first opened its doors. But not everyone realizes that members of the public are welcome to use the enormous resources in UBC's library as well, through in-library use of materials, extra-mural library cards and world-wide inter-library loans.

In just over 70 years, the University's library system has acquired almost 2.6 million books and 4,580,000 items in other formats such as microforms, maps, phonograph records and films, making it the second largest university library in Canada and high on the list of major research libraries in North America. The library subscribes to more than 35,000 serials that keep scholars and students abreast of the latest research developments in their field of interest.

The UBC system also includes many rare and specialized collections that attract scholars and students from all over the world.

The Asian Studies Library, for example, houses a 45,000-volume P'u-pan collection of rare books on China, including ancient records, manuscripts, gazetteers and literature as well as the oldest book in the whole UBC library – a 10th-century rarity containing notes on phonetics.

The Asian Studies Library, which has the largest collection of Asian material found anywhere in the country, also serves as the Canadian "deposit library" for a wide range of publications issued by the Japanese government, making it a mecca for governments, researchers and students who want up-to-date statistical information on Japanese population, housing, labor, research and development and wages and salaries, to name only a few of the topics covered in this collection, which grows at the rate of about 1,000 items a year.

UBC's decentralized library system has a total of 21 branches and service divisions located on and off the campus. Specialized units serve users in social work, law, mathematics, music, education, forestry and agriculture and Asian studies.

The Woodward Library in the campus Health Sciences Centre houses books and journals related to the health and biological sciences as well as rare medical and biological books dating from 1467 and specialized items such as a collection of 162 letters written by or to Florence Nightingale. A collection of more than 188,000 volumes, chosen for the use of undergraduate students, is housed in the Sedgewick Library, a unique "underground" facility, constructed beneath the Main Mall. This very heavily used branch accounts for one-third of a million circulation transactions a year.

Some of the units that make up the library system include material that is not available anywhere else in the world.

The special collections division in the Main Library houses rare and historical books and photographs as well as the historical archives of the University itself.

The Map Division in the Main Library boasts a collection of 110,000 maps and 2,094 atlases, 262 gazetteers and 1,002 reference works. The division's collection of modern maps (post 1900 for the Americas and post 1800 for Europe), is swelled by gifts from faculty members returning from visits abroad and collections donated by individuals and government agencies.

Yet another Main Library division that is a unique provincial resource is government publications and microforms, which houses one of the largest Canadian collections of material issued by every level of government – municipal, provincial and state, federal and foreign, as well as publications from the United Nations and intergovernmental organizations. The division also has nearly 3.2 million microforms – the largest collection of its kind in Canada – including collections in literature, history, drama, fine arts and newspapers (old English newspapers dating from 1622 are part of the last category).

Not all the library's holdings are in the familiar book form.

The Wilson Recordings Collection housed in the Sedgewick Library has 35,000 records of music, prose, drama and spoken word, partly chosen to supplement academic studies in such departments as music, theatre and English. Some 78 turntable-headset units are available to play records on the spot without charge; borrowing privileges are available to students, faculty and staff for an annual fee of $10; $35 annually for extra-mural readers.

The UBC Data Library in the Computer Sciences Building has computer readable files of statistical and other types of information such as survey results, Canadian census data, stock market prices, even literary works. The data files are stored on magnetic tapes in the UBC Computing Centre.

Another valuable service available at several locations on and off the campus is the online computer search that will provide a user with a printed list of citations on a specific topic. Some 20 trained searcher-librarians can ask 1,200 data bases located all over North America for citations on the most current material, which may include books, journal articles, conference proceedings, dissertations, etc., on hundreds of topics.

Although much of UBC's library collection is irreplaceable, it is valued for insurance purposes at more than $290 million.

The UBC system's loan rate is the highest of 92 North American libraries that report statistics to the Association of Research Libraries, headquartered in Washington, D.C. In the last academic year UBC libraries recorded nearly two million direct loans, or an average of 5,350 a day. Loans to users elsewhere through the Inter-Library Loan Service totalled 14,736 and document delivery through the Health Sciences Network, which links the campus system to branch libraries in three Vancouver teaching hospitals, totalled 33,558 items.

You don't have to be on campus to make use of UBC's library. Through inter-library loans, users throughout Canada and other countries around the world are able to borrow material from UBC. Library staff have played major roles in the development of cooperative and networking arrangements in the province.

UBC has also responded to the growth of distance education in B.C. by developing a separate Extension Library for students in other centres of the province. The "Dial-A-Book Service" enables any UBC distance-education student taking a credit course to call the extension service collect to request library materials or seek help from a librarian.

The many-faceted functions of the UBC library system give rise to some incredible statistics. For example reference specialists in the library's 21 branches and service divisions answer more than 370,000 queries a year. The social work branch library, for instance, recently helped users find information on everything from motivating handicapped people to bingo as a social problem. Recent callers to the science and humanities and social sciences divisions of the Main Library had questions related to animal behavior as a means of predicting earthquakes, the effects on the environment of high voltage transmission lines, calculation of the economic value of natural parks, the menu for the Lord Mayor of London's 100 guinea dinner of 1850 to raise money for the Great Exhibition of 1851, the exact time the first hydrogen bomb was exploded and the amount of cotton yarn produced by Germany in 1907.

In a library system as complex and diversified as UBC's, it would be surprising if those who run it did not have some concerns about the present and future.

Present concerns centre on declining purchasing power that limits the enhancement of book collections, and staff and other resource shortages that prevent the library from moving ahead rapidly on major projects, such as further exploiting current technology for the improvement of services for users.

The major future concern of the library is dwindling space. The University has set aside a site on the central campus for a new eight-level research library and possibilities for securing the necessary funding are being explored.

CAMPUS PEOPLE

Several UBC faculty members will be distinguished with honorary degrees at Convocation ceremonies at other North American universities this month.

Dr. David Suzuki of UBC's Zoology Department will receive three honorary degrees this spring, bringing the total number of honorary degrees he has received to seven.

Dr. Suzuki, Canada's foremost science broadcaster, will receive his latest awards from Lakehead University at Thunder Bay, Ontario, the University of Calgary and Governors State University at University Park, Illinois. His previous honorary degrees are from the University of Prince Edward Island, Acadia University in Nova Scotia, and from two Ontario universities, Trent University and the University of Windsor.

Last week Dr. Suzuki was named the recipient of this year's $100,000 Royal Bank Award for Canadian Achievement. He also recently received the Governor-General's Award for Conservation for his eight-part CBC television series "A Planet for the Taking" that was broadcast last fall.

Dr. Rudy Haering of UBC's Physics Department will receive an honorary degree from Memorial University in Newfoundland. A UBC faculty member since 1973, Dr. Haering led a group of scientists who have revolutionized battery technology. The group has developed a rechargable lithium molydenum disulphide battery that has a shelf life of eight to ten years compared with the four to six month shelf life of conventional nickel cadmium batteries.

Another member of UBC's Physics Department, **Prof. Erich Vogt**, will receive an honorary degree from the University of Regina. Dr. Vogt, who is director of the TRIUMF Project located at UBC, has also recieved honorary degrees from the University of Manitoba and Queen's University.

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Dr. Michael Smith of UBC's Biochemistry Department has been elected a fellow of the prestigious Royal Society of London. He is the fourth UBC faculty member so honored. Dr. Smith has an international reputation for his basic research in genetics. He developed a method to modify specific genes on cell chromosomes, a technique now used in genetic laboratories around the world. **Dr. Pieter Cullis**, also of the Biochemistry Department, recently was awarded the Ayerst Award of the Canadian Biochemical Society for his research on the structure of cell membrances. His more recent work focuses on a new method of delivering anti-cancer drugs to malignant cells.

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Dr. Neil Towers of UBC's Botany Department has received the coveted Flavelle Award and Medal of the Royal Society of Canada. The award is made every two years for an outstanding contribution to biological sciences during the preceding 10 years.

. . .

Five current members and one former member of the UBC faculty have been elected to the Royal Society of Canada, this country's most prestigious academic organization.

They are: **Dr. David Aberle**, professor emeritus of anthropology and sociology; **Prof. Anthony G. Phillips**, Psychology; **Prof. William New**, English; **Prof. Lawrence Mysak** of Mathematics and Oceanography; **Dr. Anne B. Underhill**, honorary professor of Geophysics and Astronomy; and mathematician **Dr. Robert Goresky**, a former member of the UBC faculty.

UBC'S AREAS OF STRENGTH:

Pages 8 to 12 of this issue feature some of the leading edge research taking place on the UBC campus. Our first story focuses on research being conducted on a material called "gallium arsenide"...

Gallium arsenide. Somehow, the words don't ripple off the tongue the way "silicon" does. On the other hand, gallium arsenide's relative obscurity has saved it from being invoked by the media every time a new technology centre comes into existence. We'd be surprised to read about a community dubbed "Gallium Arsenide Valley North"! So far, silicon has that kind of sobriquet all to itself. Still, gallium arsenide has begun to mount a challenge in areas that have been exclusively silicon's until now, and researchers at the University of British Columbia are playing a key part in that challenge.

Like silicon, gallium arsenide is a semiconductor. This means it can be forced to carry an electrical current by a process known as "doping". In doping, impurities known as "dopants" are carefully inserted into the material to create areas of positive or negative charge, and to form switches (transistors) that either stop or allow the passage of a current between those areas.

Semiconductors are fundamental to today's microchip or integrated circuit technology. The semiconductor silicon has ruled that technology up to now because it is cheap and easily purified. But, as is frustratingly evident to anyone trying to carry out massive calculations on mainframe computers (such as those at the UBC Computing Centre), silicon circuits can be less than speedy! There are other disadvantages, too – they start to fail in temperatures at or above 100 degrees Celsius and in the presence of certain kinds of radiation including cosmic rays. So silicon is far from perfect.

Enter gallium arsenide. Electrons can race along gallium arsenide circuits at speeds up to five times those on silicon. Gallium arsenide circuits can in theory operate at temperatures up to 200 degrees Celsius and they are much more tolerant of radiation. Furthermore, gallium arsenide and its related compounds can generate infra-red waves or light waves. Yet, if you probe the integrated circuits in your computer, digital watch, radio, video cassette recorder or telephone equipment you'll find a silicon chip there, not a gallium arsenide one. Obviously, gallium arsenide has its problems, too, and that's where the research being conducted at the University of British Columbia comes in.

David Hui, a doctoral student in UBC's Electrical Engineering Department, holds a gallium arsenide "wafer". UBC researchers are working to make this "material of the future" a valuable material of the present.

Dr. Lawrence Young of the Electrical Engineering Department is in charge of one of the UBC teams investigating the properties and applications of gallium arsenide. Another group is headed by Dr. Fred Weinberg in the Department of Metallurgical Engineering.

Dr. Young began his current research into gallium arsenide in 1981. That year, Cominco Ltd. opened Canada's first commercial gallium arsenide production facility at Trail, in which the new Czochralski method was employed. Gallium and arsenic are combined under a high temperature and pressure and the crystal is pulled out of the melt after about thirty-six hours. This method produces a milk-bottle-sized "boule" of 99.9999 per cent gallium arsenide. The boule is then sliced into wafers.

Together, Cominco scientists and Dr. Young secured grants totalling $350,000 over four years from the Science Council of British Columbia. The money enabled them to look at some of the problems people had experienced with the substance and to try to find a wider range of applications for it.

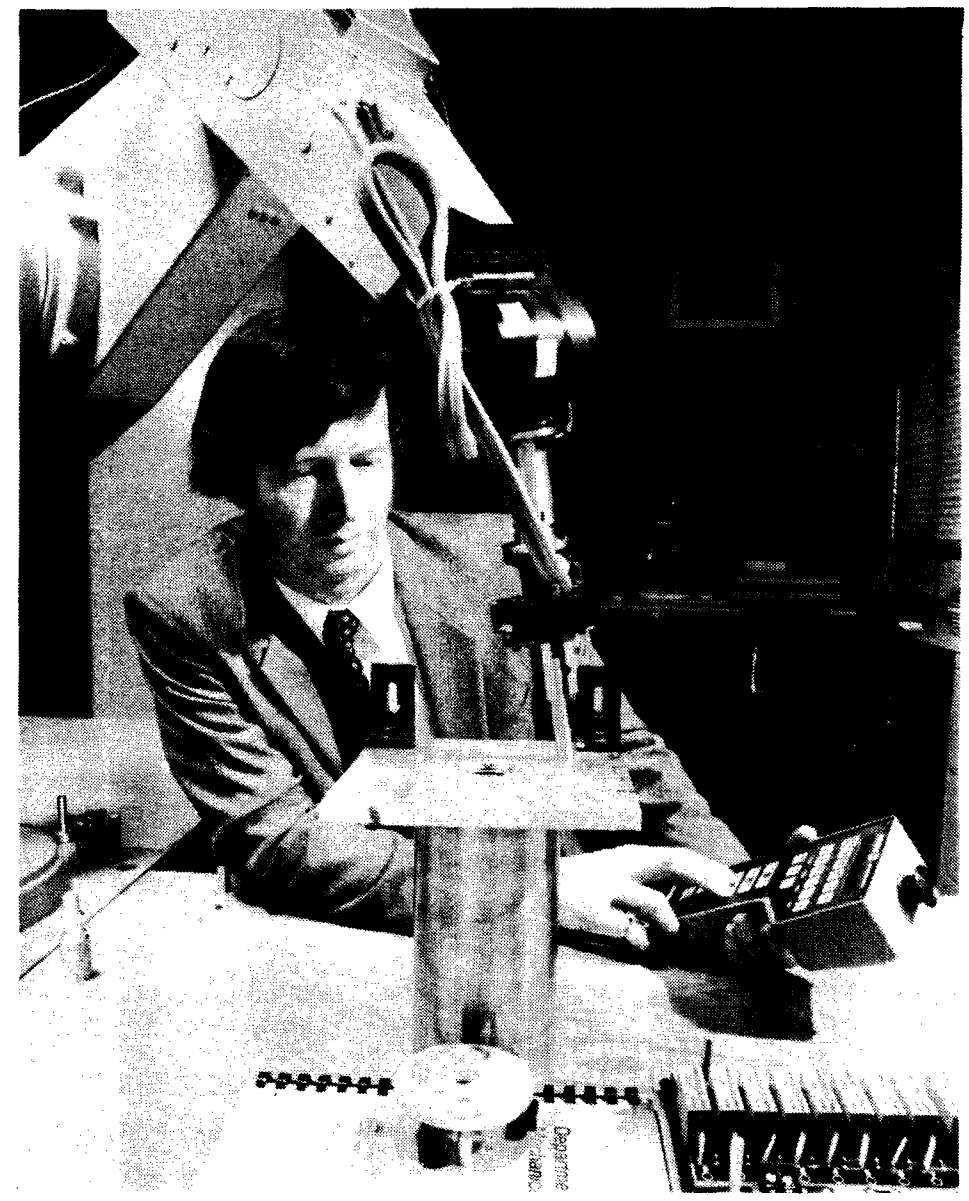
"Part of our work here at UBC is in helping Cominco develop their material. We make devices with it and check the characteristics. We're trying to build up expertise in the technology of making devices."

A problem that continues to nag gallium arsenide is the presence of crystal defects call "dislocations". When the surface of a crystal is etched, the dislocations show up under a microscope as tiny pits. Typically, there are thousands of them per square centimetre. While the chances of one hitting a transistor location are still quite small, each pit has a little sphere of influence around it that either repels or attracts impurities.

Dr. Fred Weinberg and his group in the Department of Metallurgical Engineering are trying to grow gallium arsenide crystals free from dislocations. At this point, however, no one is quite sure what causes them, although they originate at some point in the fabricating process. Some people feel that eventually this may be the factor on which gallium arsenide will stand or fall. One way of preventing dislocations may be to add small quantities of other elements to the mix. Or perhaps changes will have to be made to the temperature gradient as the boule is pulled from the cooker to cool.

Whether or not gallium arsenide will replace silicon in microchip technology remains to be seen. Meanwhile, it is being used in more and more situations where its advantages outweigh its disadvantages, and where silicon can't compete. Its resistance to radiation and heat, for instance, makes it ideal for circuits in earth satellites and guided missiles, and its speed and low-energy requirements make it preferable for ultra-high speed digital integrated circuits and microwave integrated circuits.

The "material of the future" is rapidly becoming a valuable material of the present. Scientists and engineers at the University of British Columbia can take pride in the part they are playing in its success.



Putting a round peg in a round hole is no easy task for a robot, but a UBC research team under the direction of Dr. Dale Cherchas of the Mechanical Engineering Department, has developed sensors which help the robot fit the part into place. This research is aimed at replacing human beings with robots in dangerous work areas, such as radiation environments.

Cancer cures doubled

A dramatic improvement in cure rates for a certain type of cancer has been achieved by two Vancouver cancer experts.

Drs. Paul Klimo and Joseph Connors of UBC's Faculty of Medicine and the Cancer Control Agency of B.C. have doubled the cure rate for a type of lymphoma, cancer of the lymph system.

The lymph system is made up of the lymph nodes, spleen and thymus that produce and store infection-fighting cells, and of a circulatory system of vessels carrying lymph, a colorless liquid. The lymph system is also essential for normal immunity.

Drs. Klimo and Connors have had success with a specific type of rapidly-growing cancer called large-cell non-Hodgkin's lymphoma. About 1,000 Canadians are found to have the disease each year.

"About five years ago only about 30 per cent of people with advanced forms of the disease and about half of patients with limited disease were cured," says Dr. Connors.

"We have been able to cure between 65 and 70 per cent of advanced cases and 85 per cent of patients with limited or localized disease."

Their treatment is unique in several ways and is much less expensive than older methods. "With the old method of treatment, patients received the highest possible dose of a combination of anti-cancer drugs," says Dr. Connors. "Then the patient was allowed to recover from the toxic side-effects of the drugs for three to four weeks before a high dose of drugs were administered again.

The cycle of treatment followed by recovery was repeated between six and 12 times over a period of six to nine months.

"Unfortunately, during the three to four week rest period between treatments, the rapidly-developing cancer regrows.

"We decided to try a regimen that would expose patients to lower doses of the anti-cancer drugs continuously, keeping the pressure on the cancer cells and not giving them an opportunity to recover."

Patients receive anti-cancer drugs intravenously once a week for 12 weeks. They also receive high doses of prednisone, a corticosteroid drug that attacks the lymphoma, as well as daily doses of antibiotics.

The antibiotics are to counter the effects of the anti-cancer drugs which in attacking the lymph system, weaken the body's defence system against infection from bacteria and fungi. The patients are treated as out-patients. Hospitalization is only necessary if there are complications.

"The result is a substantial increase in the cure rate," Dr. Connors says. "And patients that are cured return to work in a much shorter period of time.

"But there are also savings in treatment costs. Anti-cancer drugs are extremely expensive. About $7,000 of anti-cancer drugs are used in the old treatment method compared with drugs worth approximately $3,000 using our method.

"That may not seem like a great deal of money but if you take into consideration the number of patients we have treated in B.C. only, the saving so far has been about $1 million over the last five years."

The two cancer experts have been asked to speak about their work at the annual meeting in Los Angeles this month of the American Society of Clinical Oncology, the largest meeting of clinical cancer specialists in North America.

New technology for B.C. forest industry

Computers have already transformed our lives in banking, business and medicine. Now researchers in UBC's Department of Electrical Engineering are applying advanced computer technology to increase safety and efficiency in B.C.'s forest industry.

Telerobotics – or computer-aided machine control – is the concept behind the extensive research under way in the Electrical Engineering Department under the direction of Dr. Peter Lawrence. Dr. Lawrence is using computers to help machine operators control heavy pieces of harvesting equipment with greater safety and ease.

Using this new technology, operators can give voice commands to control the machine or manipulate the equipment manually using a digital control panel.

"At present operators control harvesting equipment from inside the machine, often using many individual levers on a control panel," says Dr. Lawrence. "Not only is it extremely difficult to simultaneously manipulate these levers, but it can be dangerous. Operators have inadvertently tipped over machines because they've attempted to place too heavy a load on the equipment.

"What we have done is to put a computer between the operator and the machine. The computer relays information back to the operator about the stress being placed on the machine so that overloading does not occur.

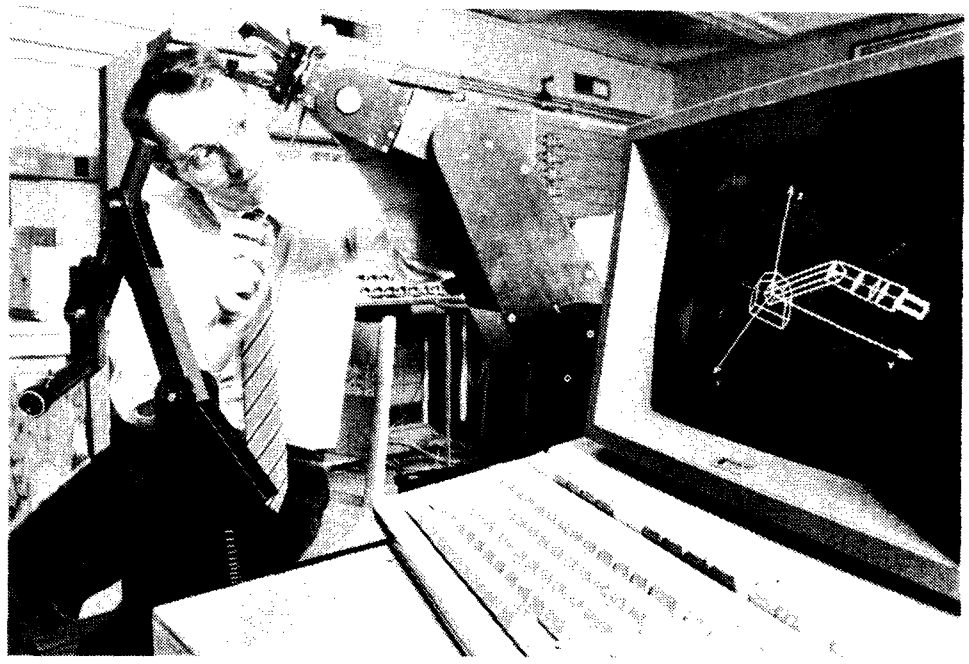
"It's even possible to build a safety check into the system so that a machine will not pick up a load if it is over a certain weight or is not balanced properly," says Dr. Lawrence.

A major safety advantage of this new technology is that industrial equipment can be operated from a remote location rather than from inside the cab of the machine. The operator controls the machine using stereo images obtained from video cameras attached to the machine.

"Remote control operation of machinery is already being used in sub-sea work," says Dr. Lawrence, "and we believe it can be applied successfully to the forest industry and to the mining and construction industries as well.

"Operators would still have control over the machinery, but they would be removed from any possible danger on the work site."

He adds that the use of computers with heavy machinery will likely result in less product damage and equipment maintenance.



Help for a helping hand: Dr. Peter Lawrence of UBC's Electrical Engineering Department makes some adjustments to a robotic arm that is being placed onto harvesting equipment for the forest industry.

"Operators sometimes damage the trees they are loading or pieces of equipment because they are applying too much pressure or haven't aligned their load properly. Computers will provide immediate digital feedback on stress and alignment factors so that operators can make the proper adjustments," says Dr. Lawrence.

Dr. Lawrence emphasizes that the application of computer technology to the forest industry will not mean fewer jobs.

"The forest environment is far too complex for machines to operate without some sort of human guidance. Value judgements and the human decision-making process are still critical in harvesting operations. Our goal is not to replace humans, but to free them from stressful or hazardous work environments."

Dr. Lawrence and his colleagues at UBC, MacMillan Bloedel Research and Robotic Systems International will evaluate the new technology during field tests being carried out in B.C. harvesting operations.

UBC contributes to B.C.'s booming film industry

One group of students at the University of B.C. who are optimistic about job prospects in 1986 are those who will graduate from the Film Studies program in the Department of Theatre.

The reason – the film industry in British Columbia is booming. Shot in B.C. last year were nine feature films, three high-budget docu-dramas, 11 television movies and five television series with a total of 52 episodes. Total budget for all productions was $141 million, of which $70 million went directly into the provincial economy, providing 2,500 direct and 3,500 indirect jobs.

Prof. Joan Reynertson, who heads the UBC Film Studies program, says a combination of B.C. scenery, a devalued Canadian dollar, and a pool of well-trained film production personnel has been instrumental in drawing American film companies to the province.

Hollywood North? That's British Columbia these days, and UBC film students Marco Ciccone and Cathy Golf hope to be part of the booming film industry that injected close to $150 million into the province's economy last year.

One of the major training programs for production crews in Canada is the film studies program at UBC. It has gained such an outstanding reputation that Prof. Reynertson receives numerous telephone calls a day from interested applicants around the world.

Currently, the department offers an undergraduate program leading to a bachelor's degree, which includes a balanced array of courses in production, history, theory and aesthetics, and master's degrees in film and television production and in history, theory and criticism.

Equipment and staff limitations have forced the program to restrict its annual intake of students to 12. The program could triple its annual intake if additional equipment and faculty were available. Seven graduate students are currently registered in the department.

Prof. Reynertson sees the department's primary mission as providing students with a solid grounding in script writing, directing, cinematography, editing, sound recording and animation as well as the history and aesthetics of film.

"Our most pressing need at the moment," she says, "is the replacement of aging equipment with a state-of-the-art production facility that will serve as an on-campus training and production centre."

The program, now in its 11th year of operation, already has close ties with the B.C. film industry, and Prof. Reynertson would like to see links with the industry further strengthened through the establishment of an internship program that would provide students with "hands-on" experience.

Among notable graduates of the UBC film program are Robert Fredericks, executive producer of The Beachcombers, the longest-running series in television history; Cal Schumiater, producer of the feature film My Kind of Town, recently screened across Canada; and Sturla Gunnerson, whose feature-length documentary After the Axe, produced for the CBC, was nominated for an Academy Award.

Also associated with the UBC program as a teacher is the award-winning Canadian film director, editor and producer Raymond Hall, who is currently the president of the B.C. Film Industry Association.

Robot used in surgery

The first use of a robot in a surgical operation in the world took place in Vancouver in March last year and more than 80 similar operations have taken place since.

The development is the result of cooperation between two Vancouver teaching and research hospitals associated with the University of B.C.'s Faculty of Medicine.

Creator of the robot is Dr. James McEwen, director of bio-engineering at both the Vancouver General Hospital and the Health Sciences Centre Hospital on the UBC campus. It was also designed in collaboration with the UBC's electrical engineering department where Dr. McEwen is adjunct professor.

It is used in a new type of surgery to repair damaged knees performed by Dr. Brian Day, assistant professor in UBC's orthopedic surgery department.

Although the robot was built at VGH, all operations so far have been carried out at the University hospital.

Dr. Day pioneered in Canada a new surgical procedure, called arthroscopy, to remove or repair knee cartilege using one-centimeter incisions. A surgical instrument is inserted into one incision and is guided in its work by an optical scope inserted into the second. Before the new operation was introduced, the entire knee joint had to be opened.

"Because I am completely occupied with the scope and surgical instrument, I need an assistant to hold and move the patient's leg into different positions during the operation," Dr. Day said. "The solution is a robot that manipulates the leg into precise positions for me." Dr. McEwen's group designed and built a pneumatically-powered robot, linked to an IBM personal computer, that holds the patient's leg and moves it on command.

"The prototype we developed can be operated by the surgeon either through a control panel or by voice command," Dr. McEwen said. "To control the robot Dr. Day can simply say 'attention', 'move the leg to the right', 'lower the leg' or any other of a variety of commands we can program the robot to understand."

"The robot tells Dr. Day through voice recordings that it has understood the command and carried it out. Communication between surgeon and robot is verbal."

He said the success of the prototype has shown that robots can be used in many other orthopedic operations where mechanical assistance is needed by the surgeon.

The robot was developed as a result of a research contract from Andronic Devices Ltd., a B.C. company seeking world-class capabilities in the area of medical and surgical robotics.

Andronics received financial assistance for the contract from the federal Department of Regional and Industrial Expansion and the National Research Council, and from the provincial Discovery Enterprise Program.

About $300,000 has been spent on the prototype so far.

Remote Sensing: Forestry of the future

"Remote Sensing Does It From A Distance" reads a sign on the wall of a small laboratory housed in UBC's MacMillan Building. But don't let the facetious motto fool you. The laboratory is home to one of North America's top researchers in the field of remote sensing, a highly sophisticated technology that is having a significant impact on the management of natural resources in our province. UBC researcher Dr. Peter Murtha explains the concept of remote sensing:

"Remote sensing is the gathering and interpretation of spacial and spectral (color) information which is collected using sensors on board satellites or airplanes travelling at various altitudes.

"Here at UBC remote sensing research is being carried out in forestry, civil and electrical engineering, computer science, geography, oceanography, soil science and geophysics and astronomy." Dr. Murtha, who hold a joint appointment in UBC's Department of Forest Resources Management in the Faculty of Forestry and the Soil Science Department in the Faculty of Agricultural Sciences, is applying this new technology to the management of B.C.'s forests.

"To make effective decisions in forest management you must have detailed and up-to-date information on forest stands throughout the province. This includes ecological data, information on tree age, species composition and volume, tree condition and damage caused by insects, acid rain, pollution and disease. One very cost-effective means of obtaining this information is through the interpretation of remote aircraft and satellite images of forest stands."

One example of the precise detail obtained through remote imagery is a photo of Vancouver Island which hangs on the wall of Dr. Murtha's office. Clearly identifiable in the photo, taken from 283 miles in space, is the outline of a B.C. ferry crossing Georgia Strait.

"Remote sensing technology has improved dramatically over the past decade," says Dr. Murtha. "We can show you a dead branch on the side of a tree in a photograph taken from an altitude of 70,000 feet or overlay maps on satellite images using a personal computer."

The interpretation of remote sensing images takes skill, experience and often a bit of guesswork.

"What appears on the computer screen is an image of a particular area with different patterns and colors," says Dr. Murtha. "It's our job to determine what these patterns and colors represent in terms of land forms, forest stand characteristics, possible outbreaks of disease, etc."

Dr. Murtha describes the impact of remote sensing technology on forest management in the province as "revolutionary".

"The B.C. Ministry of Forests began computerizing all their forest maps in 1978. Ultimately they plan to have a main data base in Victoria which would be linked to microcomputers in all their field and district offices throughout the province. Each office would have remote sensing capabilities and would be responsible for updating data from their area.

"The impact of this new system on forest management in the province is going to be profound," says Dr. Murtha. "Remote sensing technology is advancing so rapidly that we are in the process of implementing technology that was virtually unheard of five years ago.

"This has led to an entirely new system of gathering and updating critical forest data," he says.

"We're moving from a system where forest management decisions were made using archival data that was up to ten years old to one where forest maps and other data are updated continously as changes occur and decisions are based on current, accurate data."

Prof. Peter Murtha uses images from satellites and other aircrafts to gather information that is critical for forest management in the province.

Dentistry team explores implant technique

Denture wearers who are plagued by ill-fitting false teeth now have an alternative. A new technique developed in Sweden allows a complete bridge of teeth to be secured by five or six posts permanently implanted into the jaw bone. The result is a set of teeth that ecstatic wearers say feel like their own.

The technique, developed in Sweden over the last 20 years, avoids the major problems associated with older implant techniques.

"Implant techniques in the past have had a justifiably bad reputation," said Dr. Monty Reitzik of UBC's Faculty of Dentistry.

"Old implants were biologically unsound. Typically, the gums where the posts protuded from the jaw became infected and the posts loosened and failed. But some wearers were willing to put up with periodic bouts of infection and sometimes constant pain rather than go back to conventional dentures."

The Swedish technique was discovered accidentally by Dr. Per-Ingvar Branemark, director of the Institute of Applied Biotechnology in Gotenborg.

He implanted a hollow titanium post into the bone of a laboratory rabbit to observe changes in bone structure. He discovered that the bone cells died at the comparatively low temperature of about 47 degrees Celsius, which would partly explain why other implant techniques fail since high speed dental drills used to drill holes in the jaw can generate temperatures of 90 degrees.

But he also discovered that the titanium posts could not be removed. They had formed a structural and functional bond with the living bone.

Pioneering basic research on the attachment of gum tissue to titanium has been carried out at UBC's Faculty of Dentistry by Drs. Don Brunette and Tim Gould.

The UBC team, drawn from the three departments in the Faculty of Dentistry, trained in the Branemark technique at a special program at the University of Toronto. So far, they have treated 30 patients with considerable success, Dr. Reitzik said.

The Branemark technique takes about six to nine months to complete.

The titanium posts are inserted into the jaw bone beneath the gum and the gums heal over them. When the posts have completely bonded with the bone structure, the gums are re-opened and a metal fitting is screwed into each post. The fittings protrude into the mouth and patients go onto a soft diet for two weeks while the gums heal. Then a fixed bridge is attached to the fittings.

"The Branemark technique does as little damage to the bone as possible. The posts are allowed to bond with the bone undisturbed for three to six months and, because they are underneath the surface of the gum during this period, they are protected from infection.

"The secret of success is the titanium used and the way the posts are introduced to the jaw to encourage bonding and eliminate the possibility of infection."

He predicts that within 10 years the technique will replace in most cases the current method of bridging across missing teeth in people who have lost some teeth only.

"By using titanium posts," he said, "we will be able to replace the missing teeth without touching adjacent whole teeth."

Manipulating the body's immunological defense system to fight cancer and other diseases is the focus of research by Dr. Julia Levy of UBC's microbiology department. She is currently collaborating with other UBC scientists to produce a "magic bullet", a complex molecule that would attach itself to cancer cells in the body and destroy them without harming surrounding healthy cells.

Waste not, want not

A waste product from the Canadian pulp and paper industry may become the source of pharmaceuticals worth millions of dollars.

The waste product is pitch which is found in tall oil, a by-product of pulp making. About half of the pitch consists of steroids which could be used in the pharmaceutical industry to produce birth control pills, anti-inflammatory drugs such as cortisone and other products.

A biotechnology research team led by Dr. James Kutney of UBC's chemistry department is using genetically-engineered micro-organisms to convert the steroids into valuable starting materials for the pharmaceutical industry.

"We know that certain bacteria are capable of transforming the pitch to steroids that can be used to produce drugs," Dr. Kutney says. "We're trying to make the conversion commercially viable."

The largest producer of tall oil in Canada and one of the largest in the world is B.C. Chemicals Ltd. of Prince George, a wholly-owned subsidiary of three Prince George forest companies – Northwood Pulp and Paper, Prince George Pulp and Paper, and Intercontinental Pulp.

B.C. Chemicals collects a by-product of the pulping process from its three parent companies and from B.C. Forest Products at Mackenzie, Cariboo Pulp and Paper at Quesnel, and others.

The by-product is converted by B.C. Chemicals to tall oil which it sells to Mitsui & Co. for use in Japan and to Reichhold Chemical in Louisiana. The two companies distil the tall oil to obtain products used in the paint industry and for sizing paper. The residue left over after distillation is pitch, which is burnt.

B.C. Chemicals' pitch is five times richer in steroids than the pitch from southern U.S. pulp producers.

"The high concentration of steroids makes the pitch very attractive to our biotechnology program," Dr. Kutney says. "Our tall oil is unique because it is an enormous storehouse of steroids which are now literally going up in smoke. We have to take advantage of our situation."

James Kutney

Dr. Kutney says his research team is able to convert with up to 85 per cent efficiency a substance in the pitch called betasitosterol into a family of compounds known as androstanes, basic starting materials in the steroid pharmaceutical industry.

"We have improved the efficiency of the micro-organisms that were already known to do the conversion to the specific requirements of our pitch.

"Our conversion efficiency of 85 per cent is in small laboratory batches. We now have to demonstrate that the efficiency can be maintained in large commercial batches. We need to scale up."

UBC IMAGING RESEARCH:

Imaging research using new technologies to reveal the structure and composition inside of human beings and other subjects is a major area of strength at UBC.

Featured on this page are just two of the many UBC research projects attracting international attention. Many of the projects use one or both of two facilities – the positron emission tomograph (PET) and the magnetic resonance imaging (MRI) scanners. The Queen officially opened the scanning facilities in 1983.

The PET scanner combines the expertise of UBC and the TRIUMF cyclotron project on UBC's south campus. It simultaneously provides a series of colored slice images of the chemical function of the brain. The slices are through the whole brain, from top to bottom.

The UBC-TRIUMF PET program is internationally recognized for studies into a variety of neurological disorders. Dr. Brian Pate of UBC's Faculty of Pharmaceutical Sciences, who led the TRIUMF team that built the PET scanner, said that the UBC-TRIUMF PET program is unique in the world.

"What makes it possible is the presence on the campus of a large number of University scientists in a variety of disciplines, the University hospital and the sophisticated expertise of TRIUMF," Dr. Pate said.

"Nowhere else in the world does this happy combination exist."

A second PET scanner is now being developed at TRIUMF that will scan the entire body, show finer detail, and will be much more sensitive that existing scanners. A PET manufacturing centre may be established in B.C. to serve a growing international market.

The MRI scanner uses a completely different technology and can image the entire body.

MRI works by vibrating or resonating the nuclei of atoms within the patient, using magnets and radio waves. When the nuclei resonate, they absorb or emit electro-magnetic radiation which can be detected by a receiver similar to a sensitive FM radio receiver. The information is transformed by a computer into black and white pictures or images which are displayed on a monitor.

"MRI shows the structure or anatomy of the subject but it reveals other information as well," said Dr. David Li of UBC's Faculty of Medicine, who is director of the MRI facility.

"The machine that we are using shows the changes in the distribution of water in the body – most of our body is made up of water. This gives us some indication of the biochemical changes that occur in health and disease. So our MRI scanner provides both anatomical and some biochemical information.

"Future MRI scanners will tell us much more about metabolic activity by revealing the distribution of phosphorus, sodium and iron.

"What makes UBC's imaging research facilities formidible is the combination of PET and MRI with more conventional imaging technology such as CAT scanners.

"Each method is like a map providing different information from the same area in the body in the same way that maps depicting climate, vegetation, elevation and road systems give different data about a geographic region such as B.C.

"We have the ability to look inside a patients' body in a variety of ways that few other centres in the world can."

Man behind the brain machine: Dr. Brain Pate of UBC's Faculty of Pharmaceutical Sciences led the team of TRIUMF cyclotron scientists who built the PET brain scanner that is attracting international attention. He is now building an advanced PET machine.

Parkinson's breakthrough

A major event in Parkinson's disease research occurred last year when American drug addicts were flown to the UBC-TRIUMF PET program. The addicts had used synthetic heroin contaminated with the neuro-toxin MPTP, which is known to cause symptoms resembling Parkinson's disease.

Six of the Californian addicts who had not developed any symptoms had their brains scanned at UBC. The scans revealed damage to the same brain cells that are destroyed in symptomatic Parkinson's victims.

Results were published in one of the most prestigious science publications in the world, the British magazine *Nature*.

"It was the first time evidence of the disease had been discovered in the brains of people who did not yet have any clinical symptoms," said Dr. Donald Calne of UBC's Faculty of Medicine.

"The scans indicate that the cause of the disease may precede the onset of symptoms by many years. If the patients eventually develop the disease, we will know that our scans provide an accurate method of diagnosing the disease in patients long before it physically affects them."

Imaging researchers begin new study

The U.S. government is flying patients with a unique combination of neurological diseases from the Pacific island of Guam to the Health Sciences Centre Hospital on the UBC campus for medical investigation.

The purpose of the study is to try to find out more about the origins and cause of the diseases using the imaging research facilities at UBC.

The patients have Parkinsonism, the best known of a group of degenerative afflictions of the central nervous system. But they also have symptoms resembling two other neurological disorders – dementia and amyotrophic lateral sclerosis (ALS), sometimes referred to as Lou Gehrig's disease, after the New York Yankees' first baseman who died of the ailment in 1941.

The research is being supported by the Dystonia Medical Research Foundation and the Medical Research Council of Canada.

Parkinson's typically strikes older people. It affects one person in 1,000, and one in 100 over 55 years of age. Victims develop a tremor and their muscles become rigid. It is profoundly disabling.

The disease was first described by English physician James Parkinson in 1817. Like dementia and ALS, it has no cure and the cause is unknown. Medical researchers are beginning to speculate that Parkinsonism is caused by environmental agents and some have suggested that it might be caused by one or more toxic compounds.

The six patients coming to UBC are Chamorro Indians from Guam. The incidence of Parkinsonism among Chamorros is 100 times greater than in Canada. Their traditional fish and legume diet is changing to conventional North American fare, and the incidence of the disease is actually decreasing, though there is no proof that their disease is caused by what they eat or the water they drink.

Dr. Donald Calne of UBC's Faculty of Medicine will be the principal investigator in charge of the patients. He is director of UBC's movement disorder clinic which is investigating dystonia, Parkinson's, Huntington's chorea, Alzheimer's disease and other brain disorders in which patients lose control over posture and body movement.

Collaborating with him on the study of the Chamorro Indians is Dr. John Steele of the Veterans Administration on Guam, and Dr. Wayne Martin and registered nurse Eileen Walsh of UBC.

Each of the patients will be accompanied by their spouses who do not have the disease. Both husband and wife will receive a battery of tests, including brain scans using the UBC's most sophisticated machines, the positron emission tomograph (PET) and magnetic resonance imaging (MRI) scanners.

The more important of the two scanners for investigating Parkinson's is the PET machine. Two PET and one MRI scans will be done on each subject.

Scans of the normal brains of the spouses will be used for comparison. The scans are made while the subjects are fully conscious and without them feeling any pain or discomfort.

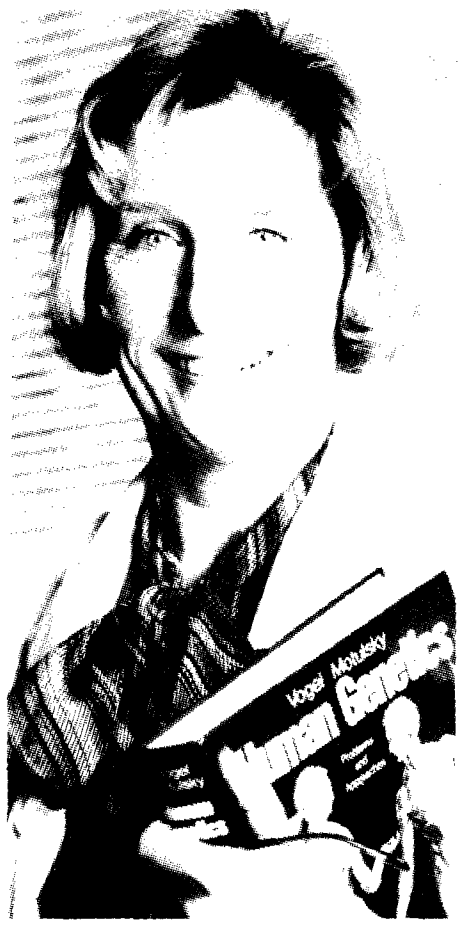
"The husbands and wives have both been exposed to the same environment and diet," said Dr. Calne. "We want to see how the brain scans of both relate to clinical signs of the disease. For example, we want to find out if the brains of the spouses show neurological impairment even though they don't now have the disease, and how the damage compares with the scans of the patients who are clinically affected."

In the two PET scans, short-lived radio-isotopes produced at the TRIUMF cyclotron are synthesized into the chemical form needed for the scans and then shot through an underground pipeline to the PET laboratory in the Health Sciences Centre Hospital. The pneumatic pipeline is the longest in the world and carries the scanning agent at speeds of more than 200 kilometers per hour.

For one examination, the scanning agent used will be a form of glucose, the sugar that the brain uses as a fuel, and for the second scan a form of dopamine, a substance that is deficient in the brain's of Parkinson's patients. Dopamine is a neurotransmitter, a chemical used by the brain to carry messages from one brain cell to others.

The scanning agent will be injected into the subjects. Gamma rays then released from the subjects' brains will be registered by an array of detectors in a ring surrounding their heads. The detectors will feed their information to a computer. After processing by the computer, the data are transmitted back to the PET team as colored images.

The first patient and his wife will begin a week-long series of tests on May 24. Other couples will arrive one at a time during June and July.



An early warning system to detect an increase in birth defects is one of many community services operated by UBC's medical genetics department under the leadership of Dr. Patricia Baird. Research in the department led to a test for diagnosing in the fetus the second most common form of mental retardation in Canada. The test is now being used around the world.

Preparation: The key to success in Asia

Companies in B.C. wanting to do business in Asia have enormous advantages over competitors – opportunities some companies are not making full use of.

Dr. Michael Goldberg of UBC's Faculty of Commerce and Business Administration, says that the development of new resources to prepare B.C. businessmen for transactions in Asia, and better use of existing resources are critical if the province is to increase economic activity through greater trade with Asia.

The expertise, advice, research and contacts available to B.C. businessmen are already well-established, says Dr. Goldberg. He outlines strategies for both small and large companies wanting to succeed in trading with Asia.

"No matter how big or small you are, to be successful you've got to do your homework," he said. "Asian cultures are old and homogeneous and differ tremendously from ours. It's imperative to understand something about the history and culture of the target country for the simple reason that they are proud of their own cultures.

"If you know more than your competitors about the people and culture that you're dealing with, your chances of success are that much greater."

Executives of small businesses with limited resources are faced with learning about Asia themselves. This may seem insurmountable, Dr. Goldberg says, but the resources available to B.C. businessmen are vast.

UBC has enormous resources in Asian economics, history, languages, art and culture. The University has the largest Asian library in Canada. It's all here waiting to be used.

"Businessmen outside of Vancouver can patch into UBC resources through continuing education programs and the provincial inter-library loan system."

He said the business community can also take advantage of the expertise of UBC's Faculty of Commerce and Business Administration.

"We sponsor workshops specifically aimed at the needs of the business community. A recent all-day meeting to prepare businessmen for business in China was over-subscribed and had to be moved from the boardroom of the Hong Kong Bank of Canada to the Asian Centre on campus. We've also taken Canadian businessmen to Beijing and Shanghai and organized one-on-one meetings for them with high-level representatives of Chinese industry and government. Another meeting on new legislation influencing trade with China was held for Canadian businessmen in Hong Kong and Macau.

"On behalf of the external affairs department we visited China to identify business opportunities for Canada. We are also educating Chinese students and university professors in business administration and management on behalf of the Canadian International Development Agency. All MBA students from China receive an orientation program at UBC

Michael Goldberg

before they go on to other Canadian universities," says Dr. Goldberg.

"So our contacts with Asia are extremely strong. The business community should take full advantage of them."

He has different advice for larger companies with more resources.

"Big companies have the advantage of size. They have the resources to hire someone with Asian skills, something that few of them actually do.

"For example, a large corporation can hire an Asian studies graduate who speaks one or more Asian languages, knows the culture and probably has lived in Asia.

"That person then does business for the corporation in Asia. The Asian customers are impressed because it shows the company cares about their culture. Competitors selling comparable products but without Asian cultural skills can be beaten out.

"I estimate that corporations can hire Asian graduates for as little as $20,000 a year, peanuts compared with the size of the potential business deals."

Dr. Goldberg says that an alternative is for a large firm to send one of their employees to live in Asia for a year or two to learn an Asian language and establish business connections.

Large companies, he says, think nothing of investing in a multi-million-dollar computer system as part of the cost of doing business.

"But that investment depreciates. For a fraction of the money a company can send someone to Asia and that smaller investment appreciates rather than depreciates. The person's knowledge of Asia and its markets increases each year and their value to the company increases."

UBC CALENDAR

Calendar Deadlines
For events in the period June 15 to July 13, notices must be submitted on proper Calendar forms no later than 4 p.m. on Thursday, June 5 to the Community Relations Office, 6328 Memorial Road, Room 207, Old Administration Building. For more information, call 228-3131.

MONDAY, JUNE 2

Cancer Research Seminar.
Regulation and Dysregulation of Auto-Immunity. Dr. Cicely Bergland, Pediatrics Oncology Department, Fred Hutchinson Cancer Research Center, Seattle. Lecture Theatre, B.C. Cancer Research Centre, 601 W. 10th Ave. 12 noon.

WEDNESDAY, JUNE 4

Continuing Education Lecture.
Hong Kong's Place in the World Economy. Stephen Fisher, Hong Kong Government Representative at the Hong Kong Pavilion, EXPO 86. Organized in conjunction with the 1986 Summer Program for Retired People. Free to the public. For further information, call 222-5270. Room 60, Family and Nutritional Sciences (Home Economics) Building. 12 noon.

Biochemical Discussion Group.
Transportation of Bacteriophage Mu DNA. Dr. George Chaconas, University of Western Ontario. Room 201, Wesbrook Building. 4 p.m.

THURSDAY, JUNE 5

Psychiatry Lecture.
Premenstrual Syndrome. Dr. Judith Gold, Psychiatry, Dalhousie University. Room 2NA B, Psychiatric Unit, Health Sciences Centre Hospital. 9 a.m.

Occupational Health and Safety Seminar.
Microbiological Hazards and the Sick Building Syndrome. Dr. Mike Noble, Medical Microbiology, UBC. IRC 3. 12:30 p.m.

SATURDAY, JUNE 7

Wesbrook Society Gardens Tour.
Tour of the Botanical Gardens followed by a Strawberry Tea, for Wesbrook Society members and their spouses or guests. RSVP Wesbrook Society, 228-3313. Main Garden Centre. 2-4 p.m.

MONDAY, JUNE 9

Cancer Research Seminar.
Lymphocyte Transfer for Tumor Therapy. Dr. Douglas G. Kilburn, Microbiology, UBC. Lecture Theatre, B.C. Cancer Research Centre, 601 W.10th Ave. 12 noon.

Pathology, Chemistry & Medicine Lecture
NMR Spectroscopic Imaging. Dr. Alan McLaughlin, Biochemistry, School of Medicine, University of Pennsylvania, Philadelphia. Room 225, Chemistry Building. 4 p.m.

American Association for the Advancement of Science Lecture.
History of the Canadian-Alaskan Boundary Survey. J. Thomas Dutro. IRC 6. 7:30 p.m.

TUESDAY, JUNE 10

Pathology, Chemistry & Medicine Lecture.
NRM Studies of Hypoxia and Ischemia in the Cat Brain. Dr. Alan McLaughlin, Biochemistry, School of Medicine, University of Pennsylvania, Philadelphia. Taylor-Fidler Lecture Theatre, Laurel Street Pavilion, VGH. The lecture will be shown concurrently via the Knowledge Network in the Vassar Lecture Room, Pathology, Acute Care Hospital, UBC. 9 a.m.

American Association for the Advancement of Science Lecture.
Flying Machines: Natural and Otherwise. Paul MacCready. IRC 6. 12 noon.

Electrical Engineering Seminar.
Interruption of Small Inductive Currents in Electric Power Systems. Dr. Gunter Langhammer, Electrical Engineering, Technical University Munich, Germany. Room 402, Electrical Engineering Building. 1:30 p.m.

American Association for the Advancement of Science Lecture.
It's Time We Made Evolution Respectable. William M. Thwaites. IRC 6. 7:30 p.m.

THURSDAY JUNE 12

Electrical Engineering Seminar.
Regression and Instrumental Variables Estimation of Systems. Prof. Otto Smith, Electrical Engineering, University of California, Berkeley. Room 402, McLeod Building. 1:30 p.m.

Notices

Campus Walking Tours.
The Community Relations Office offers free guided walking tours of the UBC campus at 10 a.m., 1 p.m. and 2:30 p.m. Monday to Friday throughout the summer. Tours last approximately two hours in the morning and one hour in the afternoon and can be geared to the particular interests of the group. To book a tour or for more information, please call the Community Relations Office at 228-3131.

Stage Campus '86.
Five Finger Exercise by Peter Shaffer will be presented from June 11 to 21. Regular admission is $5, $4 for students and seniors. Monday performances are two-for-one. For information and reservations, call 228-2678. Dorothy Somerset Studio. 8 p.m.

Mentoring Conference.
The First International Conference on Mentoring: Aid to Excellence will be held at UBC Training Institutes, July 21-22, 1986; Conference dates July 23-25, 1986. For further information, contact Marilynne Gray at the International Association for Mentoring at 228-0621 or 228-8898.

Language Programs.
Three-week, non-credit, morning programs in French begin June 2, July 14 and August 5; all day immersion programs begin July 14 and August 5. Three-week, non credit, morning programs in Spanish, Japanese and Mandarin begin July 8 and July 28; afternoon program in Cantonese begins July 8. For more information, call Language Programs and Services, Centre for Continuing Education, at 222-5227.

Symposium on Native Community Education.
Tuesday, June 3 – Saturday, June 7: International Symposium on Native Community Education. Leader: Dr. Willard Bill, Supervisor of Native Indian Education, Washington State. Registration fee: $295, or $465 with six nights accomodation at UBC. Scarfe 100, 9 a.m. June 3 and Angus 104 on June 7; Robson Square Media Centre, 9 – 5 p.m., June 4, 5 and 6. To be held in conjunction with: Roundtable Discussion on Indigenous People's Education. Wednesday, Thursday and Friday, June 4, 5 and 6. Ten indigenous educators from around the world comment on a discussion paper by Bill Mussell of the Sto:lo Nation of B.C. Summary by the Hon. Thomas R. Berger. 9 – 12 noon and 2 – 5 p.m. each day. Theatre, Robson Square Media Centre. $25 daily or $60 for three days. For details on both these events, call 228-4501.

Sunday Afternoon Teas.
Old-Fashioned English teas are offered every Sunday afternoon from 1 to 5 p.m. at Cecil Green Park, a beautiful turn-of-the-century mansion overlooking Georgia Strait. Enjoy English scones with Devonshire cream and preserves, fresh fruit and pastries, tea sandwiches and specialty teas and coffees. Price is $8.50 per person. For reservations, call 228-2018. Food Services also offers a Sunday food operation at the Botanical Garden Visitor's Centre. For more information, call 228-2616.

FIRST CLASS MAIL

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