



UBC Reports

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Gene deficiency cause of disease, study shows

by Debora Sweeney

Genetic makeup is often more important in determining what diseases will strike an individual than the environment.

A major study by UBC's head of medical genetics has found that eight per cent of the world's population will show signs of genetic disorders by age 25.

Genetics clinic moving to Shaughnessy

by Debora Sweeney

The UBC/Grace Hospital medical genetics clinic is moving to University Hospital, Shaughnessy site, from Grace Hospital.

The move, which is scheduled for year end, will give the clinic much-needed space for its expanding service to B.C. families.

"The details were worked out by the hospitals, the university and the Ministry of Health and will benefit everybody," said Dr. Patricia Baird, head of medical genetics at UBC. "We have been existing in conditions which are sub-optimal. Our filing cabinets are in hallways in the clinic, secretarial work stations have taken over the waiting room and doctors are sharing offices."

When the clinic moves into University Hospital it will occupy 8,000 square feet, which is twice the size of its present setting.

Last year, the clinic was contacted by more than 6,000 B.C. families. Its services include diagnosing children with physical and mental abnormalities, advising people who have accidentally come in contact with toxic chemicals, providing prenatal testing for couples concerned about having abnormal babies and managing adults who have had early heart attacks. The clinic also provides referrals for tests which are unique in North America, such as tests which can predict the presence of Huntington's Disease before its symptoms appear.

"The clinic provides a unique service to British Columbians because doctors combine leading-edge university research with clinical experience to give patients the most up-to-date treatment available," said Baird.

"We believe that the relocation of this world-recognized function to University Hospital will allow it to continue to provide the service our patients have come to expect," commented Major Gerald McInness, Executive Director of Grace Hospital. "Space has become a major constraint at our hospital and we are fortunate that through the cooperation of University Hospital, the service will continue to be available at the Oak St. site."

Both Major McInness and Wayne Keddy, President of University Hospital, remarked on the success of the program under the direction of Dr. Baird and are confident that the move will enable the genetics program to continue its leading role of meeting the needs of British Columbians.

Dr. Patricia Baird analyzed the records of more than one million young people born in B.C. to find out how many of them were treated for health problems caused by genetic disorders.

Based on those statistics, Baird has concluded that "who gets what diseases and when is not a matter of the outside environment, it's a matter of what they are born with."

"It will be those who are genetically predisposed who would come down with illness after exposure to our western high-fat diet, smoking and environmental pollutants," Baird added.

"This is the largest study to date and the best data available on this question at this time," she said. "This really has shown that genetic disorders, rather than being rare birds, in fact are a very important determinant of the health of the population."

Genes give the directions on how proteins should form in an embryo, which molds the body and determines its function. Flawed genes give the wrong instructions and the result is a body that is not formed or does not function properly.

Data from the B.C. Health Surveillance Registry provided Baird with extensive informa-



Baird

are also included, then eight per cent of the population will be affected.

A single gene disease for which one in 10 people are carriers is hemochromatosis. Its victims store too much iron, which can cause serious damage to the heart, liver and pancreas.

"A simple way of preventing it, if you know somebody has that genetic constitution, is to have the person give blood at regular intervals. It gives normal blood to other people and means the person loses some iron and can have a perfectly normal life," said Baird.

An example of a partly genetic disorder is spina bifida, a congenital defect that leaves the spine incompletely developed, and may result in paralysis of the lower body. It is believed that folic acid deficiency in some genetically predisposed women may result in their children getting the disease.

"You need to know the magnitude of genetic diseases existing in our population before you can plan rational health care strategies. If you have identified those who are at risk, you may be able to prevent the consequences of the disease."

Baird plans to extend her study to the adult population when data becomes available.

"Nobody in the world has looked at the adult group, but most common genetic disorders have an adult onset," she said. "This study is to age 25, but you can at least double the number of genetic disorders, maybe even triple it, when the adult population is followed through to old age."

"The bottom line is that far from being a rare cause of disease, genetics is a very important determinant of health or illness."



Photo by Warren Schmidt

Student actors Allison Sanders, Neil Gallagher and Michael Cavers rehearse for the upcoming Stage Campus production of *Lulu Street*, a play about the Winnipeg General Strike as seen through the eyes of residents of a boarding house. Directed by Catherine Caines, *Lulu Street* opens at the Frederic Wood Theatre June 29 and runs until July 9. For reservations and information phone 228-2678.

Hiring coup nets 2 computer experts

by Debora Sweeney

The appointment of two world-renowned computer scientists to UBC's faculty has been called Canada's biggest hiring coup in the field in 10 years.

Maria Klawe becomes Head of Computer Science Sept. 1. Her husband, Nicholas Pippenger, joins the university as a professor of computer science and will work with the Centre for Integrated Computer Systems Research (CICSR).

The couple is recognized internationally for research in theoretical computer science, especially algorithms and computational complexity.

"These hirings really have put us on the map internationally — everyone knows about the coup," said Jim Varah, Director of CICSR. "At least half a dozen other first-rate institutions were vying for the two, including the University of Texas, Stanford and the University of California, San Diego."

Varah announced the hirings at a recent meeting of heads of computer science departments from across the country. "It was the biggest news of the meeting," he said.

The team comes to UBC from the IBM Almaden Research Centre in San Jose, Ca. Klawe, who was born in Toronto, is currently a

discipline specialist, responsible for assessing research and teaching cooperation between universities and IBM. Pippenger is a research staff member and an IBM Fellow.

Contacted at a computer science conference in San Francisco, Klawe said she and her husband are excited about the move.

"We're happy UBC is so supportive of the computer science department and is interested in making it as good as it can be," she said. "I intend to build a world-class department which would compare with major departments in the United States. It takes a whole department to do that and I think we have a good chance of succeeding."

"UBC is very fortunate that they have chosen to come," said Robert Miller, Dean of Science. "They will have a wide influence on many areas of research here."

Klawe earned her PhD in mathematics at the University of Alberta. She did her graduate studies in computer science at the University of Toronto, where she became assistant professor after just one year. Pippenger, a native of the U.S., earned his PhD at the Massachusetts Institute of Technology.

Mission statement published in insert

A draft of UBC's mission statement, outlining the university's goals and objectives for the upcoming decade, is published as an insert in this issue of UBC Reports. UBC President David Strangway said he welcomes feedback from faculty, staff and students.

Dr. Strangway:

"This draft of UBC's mission statement has resulted from a wide consultative process over the past two years. It is, however, still a draft

and is being published in this form so that all members of the university community can have an opportunity to make comments or suggestions. We welcome comments from faculty, staff and students, and would appreciate these before the early fall. A deadline of Sept. 15 will permit us to revise this draft into final form. When that is complete we will prepare a one to two-page

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Advanced credit approved for some science courses

UBC's Senate has voted to grant top high school students in enriched academic programs advanced credit for selected UBC science courses.

Senate passed a motion on May 18 to grant advanced credit for some first-year courses in physics, chemistry, mathematics, biology and computer science, and to allow advanced standing for selected second-year courses.

Until now, UBC has reviewed requests for advanced standing on an individual basis but has not granted advanced credit.

Senate also approved a policy to allow Grade 11 and 12 students in B.C. to enrol in up to six

units of concurrent study at UBC.

Prof. David Williams, who chaired a presidential task force subcommittee on advanced standing and credit last year, said only the top students graduating from Advanced Placement and International Baccalaureate programs will be considered for these options.

"Typically, the top 30 per cent of students in these enriched programs will be eligible for either credit or placement, depending on the judgment of the discipline involved," said Williams. "Our standards are now in line with those of such

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Pace of asbestos cleanup quickens

by Gavin Wilson

Wayne Green, a tradesman in plant operations, looks like he's ready for a walk in outer space with his white protective suit, goggles, mask, boots and gloves.

He's not. In fact, removing asbestos takes him no farther than the Scarfe Building, but his outfit is needed to guard against microscopic airborne fibres that are potentially life-threatening.

Green's elaborate gear is just one of many precautions being taken as UBC steps up its program to remove or safely contain asbestos insulation in campus buildings.

Asbestos was sprayed onto walls and wrapped around pipes as insulation in many of UBC's 500 buildings because of its ability to withstand high temperatures.

Its use as a sprayed-on insulation was discontinued on construction sites in 1971 when it was linked to lung cancer and respiratory illnesses. Since then, its use in other building construction products has declined.

Since 1983, the university has spent about \$1-million to minimize the asbestos hazard in campus buildings. Another \$1-million was committed recently as the pace of work accelerated.

The latest concern, with increasing pressure coming from the Workers Compensation Board, is for the safety of trades people who frequently work in areas containing asbestos insulation.

"A large proportion of relatively routine renovation jobs invariably have asbestos control as a component," said David Bell, UBC's Occupational Hygiene Officer. "It generally requires anything from a cleanup to allow trades people to work safely in the area to a full blown removal job."

"All the high-risk work is contracted out, we don't want our trades people involved," he said.



Photo by Warren Schmidt

Wayne Green safely removes asbestos.

Whenever asbestos is being removed or contained on campus, elaborate precautions are taken to insure there is no risk to either the workers or building occupants.

Bell explained that all work is done in airtight enclosures sealed off with plastic sheets. Workers, equipment and materials leaving the work area are cleaned before leaving. Air samples are continuously monitored.

Because asbestos is dangerous only if its airborne fibres are inhaled, the insulation is thoroughly soaked before work takes place. Asbestos which is removed is, where possible, cut off right into the bag in which it will be discarded.

For more information on the asbestos program, call the Health and Safety Office at 228-2643.

Ottawa grants Goelman \$1.2 million for national daycare study

by Lorie Chortyk

Education professor Hillel Goelman and three other Canadian researchers have been awarded \$1.2-million to conduct Canada's first comprehensive survey on daycare.

The study, funded by Health and Welfare Canada, will provide a complete picture of how Canadians arrange care for their children, what they seek in child care, how much they pay for different types of care, and how satisfied they are with the care available. The project is one of the first two initiatives funded through the federal government's Child Care Initiatives Fund.

Goelman and colleagues Donna Lero of the University of Guelph, Alan Pence of the University of Victoria (project directors) and Lois Brockman of the University of Manitoba will each study a different aspect of the child care situation in Canada.

"I plan to focus on two areas — child care for single-parents families and informal child care settings such as family daycares," said Goelman. "The team will also be looking at rural daycare, parental preferences, the effect of day care

policies in different regions of the country, and the implications of day care policies for the tax system and unemployment benefits.

"The study encompasses care for preschool and school-age children, including infants, toddlers, three- to five-year-olds, and the so-called latch-key children aged six to 12."

Information will be gathered through telephone and personal interviews with more than 30,000 parents identified by Statistics Canada.

"Our core study examines the national picture, but some provinces are opting to participate in additional studies of their region," said Goelman.

He said planning for the three-year study began in 1983, when university experts from across Canada met at UBC to identify priorities for research on child care.

"There's an urgent need for information on daycare in Canada. There's still a lot we don't know," said Goelman.

Results of the survey will be made available to government and to the academic community, Goelman said.

UBC sponsors farewell for Nathan Nemetz

by Gavin Wilson

Retiring B.C. Chief Justice Nathan Nemetz receives a fond farewell tonight from more than 1,000 friends and colleagues at a tribute dinner sponsored by UBC Chancellor Leslie Peterson and president David Strangway.

Nemetz, whose association with UBC spans nearly 60 years, retires from the bench this September at age 75.

Proceeds from the \$250-a-plate dinner at the Vancouver Trade and Convention Centre at Canada Place go toward a \$1-million fund being raised to establish a Chair in Legal History and a Centre for Alternate Forms of Dispute Resolution in UBC's Law Faculty, both of which will be in the Chief Justice's name.

Nemetz, BA (UBC '34), graduated from Vancouver Law School and was called to the bar in 1937. He has been Chancellor of the university (1972-75), Chairman of the Board of Governors (1965-68) and a member of Senate (1957-66.)

He received an Honorary LLD from UBC in 1975, and university students presented him with their Great Trekker Award in 1969.

Nemetz was appointed B.C. Supreme Court Judge in 1963 and was made a Chief Justice of the Supreme Court of B.C. in 1973. In 1979, he became the Chief Justice of the B.C. Court of Appeal, the highest position in the province's judiciary.

Known for his commitment to continuing education, Nemetz is in demand as a speaker at universities throughout North America. Through



Nemetz receives an honorary LLD at UBC's Spring Congregation in 1975.

his work with the Canadian Institute of Advanced Legal Studies, he has been responsible for lectures and seminars given to members of the legal profession and the judiciary at Cambridge, Stanford and Canberra universities.

No advanced credit in Faculty of Arts

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institutions as Yale, Harvard, Stanford and Princeton."

He said the new policy offers a tangible demonstration of UBC's interest in well-prepared, motivated students.

"I believe our policy will encourage such students to continue their education in the province."

Williams noted that first-year students granted advanced standing in physics and mathematics this year had scored close to the top of their classes in their second-year courses.

Arts Dean Robert Will said his faculty decided against offering advanced credit because material offered in Advanced Placement and International Baccalaureate programs wasn't equivalent to the first-year arts curriculum.

"In science there's more of a black and white nature to the material and students tend to either know the information or not," said Will. "In the humanities and social sciences it's much more subjective and interpretive. What students learn and experience in arts depends largely on their interaction with professors and fellow students in the context of the classroom."

Will said the faculty will accept students for advanced standing in appropriate courses.

Will said he doesn't believe his faculty's stand will scare off potential students.

"The decision about where to go to university

isn't determined by any one or any number of specifically identifiable factors or circumstances," said Will. "Sometimes the decision is pre-determined by economic or geographical considerations. In other cases the family and student may have opted at an early date for an away-from-home experience, often outside the province."

"I doubt if anyone is going to be influenced significantly by the fact that if they come to UBC they will not receive three, or six, units of advanced credit that would allow them to graduate with one, or two, fewer courses taken at university."

"We are told that experience shows that most students getting advanced credit end up taking the same number of courses at university anyway," said Will.

"By granting advanced standing, the faculty is recognizing the importance of these enriched programs, not at the expense or in the place of what might otherwise be taken at university, but as something that enables the very able student to enter directly into more advanced courses, and therefore get more out of his or her university experience as well."

Senate admissions committee chairperson Jean Elder, who brought the motions before Senate, said the committee will monitor the performance of students entering UBC from enriched programs.

"Advanced Placement and International Baccalaureate students will have special notations on their transcripts," said Elder. "I think we'll have to review the situation over three or four years before we can really say anything meaningful about how well these students are doing at the university level."

UBC Vice-President Academic and Provost Daniel Birch said he's pleased with the decisions by both the Faculties of Arts and Science.

"Overall I think it's a very positive move. It's important that we show we value high achievement," said Birch. "We will get information about the new policy out to schools as soon as possible."

Comments sought

Continued From Page 1

mission statement which we will take to Senate and the Board for approval.

"I look forward to your comments. The current draft has been submitted to the government as UBC's input to the provincial planning process now under way. The revised and final version will be submitted in September."

\$250,000 awarded to perfect pesticide

by Gavin Wilson

A UBC entomologist and a Victoria company have received a \$250,000 grant to perfect a natural, biodegradable pesticide that would protect crops without harming the environment.

Murray Isman and UBC doctoral student Don Champagne are members of a research team that is developing an insecticide from the extract of the seed of the neem tree, which grows readily throughout the tropics.

They will be working in cooperation with Safer Ltd., a Victoria, B.C., company which manufactures natural pesticides. Funding was made available through a Cooperative Research and Development grant from the Natural Science and Engineering Research Council's University-Industry Program.

Most pesticides in use today are neurotoxins, explained Isman. They kill insects, but they are also toxic to humans, fish, birds and

animals because their central nervous systems share the same biochemical basis.

The active chemical in the neem seed extract, azadirachtin, is not a neuro-toxin, but it acts against insects in three other ways.

Neem extract is a potent anti-feedant, so repugnant to insects that they stop eating any plant treated with the spray. As well, it interferes with the hormones which control moulting, the process by which young insects shed their outer shells as they grow. In adults, disrupting these hormones causes sterility.

"What this means is that this chemical is very, very potent against insects but has essentially zero toxicity to animals. It's less toxic than ethyl alcohol," said Isman.

The only drawback with the neem pesticide, one common to other natural products, is that it degrades too quickly to be effective for more than a few hours.

Isman and Champagne will be helped in their research by scientists from Safer Ltd. and the University of Ottawa.

THE UNIVERSITY OF BRITISH COLUMBIA

MISSION STATEMENT

Fifth Draft - June 1988

LETTER OF TRANSMITTAL

31 May 1988

The Honourable Mr. Stanley B. Hagen
Minister of Advanced Education
and Job Training
Legislative Buildings
Victoria, B.C. V8V 1X4

Dear Mr. Minister:

This letter accompanies a preliminary version of the University's mission and strategic planning statement. This document has been in the development stage for some time and has been presented for comment to Senate (April 20) and to the Board of Governors (May 5). It is nevertheless a draft document and is still being revised as a result of campus-wide consultation. We will publish a revised version of this document in June so that every faculty member, staff member and student, as well as alumni and community members, will have an opportunity to comment. It is our intention to seek the approval of Senate for the recommendations on academic issues that arise from the document, and of the Board of Governors for the overall document. A final document will be submitted to you in September.

The University of British Columbia is the first university in this province and has a distinguished record of service to the people of the province. The attached Table 1 illustrates that our graduates can be found throughout the province. As demand for places in postsecondary education has increased, UBC has shown leadership in advising on the creation of additional places for the people of British Columbia.

The other provincial universities and colleges were created following the recommendations of a former UBC president. Today, the province is at a new turning point. The demand for postsecondary places continues to rise. It is our expectation that in the increasingly complex, competitive and interconnected world, the trend will accelerate. However, the British Columbia university system is now saturated and cannot respond to the increasing demand.

We believe that, as the senior member of the postsecondary system, our role should not be one of responding to the ever increasing demand for more places, but to maintain current total enrolments and to continue the commitment to be a university of international stature. It is thus our view that as the demand for places continues to rise, the province, within five years, ought to consider the question of whether there should be one or more liberal arts and science, four-year degree granting college(s) in the interior. Meanwhile, we are actively engaged in planning with Okanagan, Cariboo and New Caledonia colleges for the delivery of degree completion programs in the three regions.

In fully developed systems of postsecondary education there are several levels of institution. Only if there is a fully developed system of two-year colleges, four-year colleges, and universities of different kinds, can the province aspire to have a system that serves the multiple needs of our society.

The Carnegie Foundation of the United States classifies universities and colleges into several kinds. One of these is referred to as Research I. These are universities that receive more than \$33.5 million (U.S.) in federal research support and graduate more than 50 doctoral students a year (as recorded in 1985-86). In the United States, there are over 60 such universities; in Canada, there are only three (Table 2). These universities, although called research universities, are indeed first-rate centres of both teaching and research. This is UBC's tradition, which we will continue.

It is our belief that with sufficient funding and an appropriately established system, it will be possible for this province to aspire to have the best postsecondary education and research system in Canada. We believe that this is a necessary objective if British Columbia is to compete in the changing world. We believe that the province must be

committed to a fully differentiated system and reinforce the role of UBC as a university of international calibre.

It is a tribute to the faculty, staff and students of this university that over the past 25 years or more they have achieved a high quality of performance in the face of serious obstacles.

Many of the university buildings were built many years ago as temporary buildings. Our library collection continues to grow, space is a serious limiting factor for research, and an increasing number of our buildings have been condemned for occupational health and safety reasons. It is our estimate that in the next ten years we will require \$300 million in new or replacement buildings if we are to continue to serve the province effectively (Table 3). Present buildings require \$135 million to bring them to acceptable standards. There will be operating budget needs associated with utilizing new space.

In the modern technological world, equipment for teaching and research is increasing rapidly in sophistication and in cost. If we are to produce graduates who are ready to take their place in this new world, and if we are to sustain the research that leads to so much activity, then we must have recognition of the costs of research in our future budgets.

The operating grant level in the province on a per-student basis is lower than in most jurisdictions in Canada, and far lower than in those jurisdictions in the United States with whom we compete for first rate faculty. This competition will increase dramatically in the coming years as more and more jurisdictions are coming to understand that universities are crucial to future social and economic well being.

Our plans for the coming decade do not involve a growing university. But this does not mean a static institution — quite the contrary. We are embarking on a remarkable period of change, an absolute necessity in these changing times.

1. We will continue to serve British Columbians from all parts of the province and from all walks of life and to ensure that, in spite of high and increased admission standards, other barriers to admissions are minimized.

2. We will admit only those students who have a high probability of succeeding. On this basis, while the number admitted may decrease, we do not expect the number graduating to decrease in number. This is possible only in the presence of a comprehensive first rate system with many opportunities for access. We now recognize and give credit to those students who have taken additional challenging programs in high school such as advanced placement and international baccalaureate. We believe this reinforces those schools that challenge their students to do well.

3. We intend to increase our graduate enrolments. At present we carry out the major part of British Columbia's research and we provide much of the highly qualified manpower. As these needs increase in society and in the private sector, we intend to continue to provide scientifically and technologically qualified people as well as qualified people in the social sciences and humanities. This has been a major role for UBC and, given an adequate funding level, it will continue to be a commitment. We are now introducing a widely acclaimed joint master's degree in business, science and technology, for example.

4. We intend to increase our numbers of out-of-province and international students (at present about one per cent of our undergraduates comes from outside Canada). We see this both as a source of expanding international horizons for our students, and as a source of future international cooperation. We expect to have 4 to 6% of the undergraduate body from outside Canada. These students would come from both developed and developing countries. Scholarships to attract outstanding stu-

dents are a pressing need.

5. We intend to review the undergraduate curriculum to ensure that there is enough breadth so that our graduates will be able to adapt in a rapidly changing world. This is the time to reinforce the commitment to a first rate liberal arts and science program at the undergraduate level as there is increasing emphasis on the master's degree as the career entry degree.

6. We will continue to have ongoing external reviews of each academic unit every five years, to provide a recurring audit of the quality of each program and to ensure that each unit is achieving its potential.

7. Increasingly, we will develop new activities that build on a range of disciplines across faculty and department boundaries. This will permit us to continue to be the major western university for teaching and research in such disciplines as biotechnology, robotics and artificial intelligence, space science, cosmology, advanced materials, aquaculture, environmental studies, ocean sciences, mining, forest sciences, computers and the law, journalism, ethics, and many others. We must retain the flexibility to rise to new opportunities as they appear.

8. Major changes have recently been implemented in the Faculty of Education. It has moved to a post-baccalaureate program for secondary teachers, and the program for elementary teachers requires a minimum of three years in an arts or science faculty. From this base we will increasingly focus on research on teaching. We will coordinate our teaching programs with those of the other universities.

9. Continuing education will continue to be important and central to our mission. Increasingly, it will be focussed on those topics that are unique to UBC. It will move to a full cost recovery basis in which the user pays the cost.

10. We will continue to be a major partner in the health care system of the province, teaching and training a broad range of health care professionals in many unique programs, and conducting research leading to solutions to the problems of disease and disability. We will put increasing emphasis on programs of instruction and investigation dealing with prevention of illness, health promotion, and the provision of cost-effective health care services. The range and depth of our health-related programs, combined with the service capabilities of our six affiliated teaching hospitals represents a unique base in western Canada for further development of an internationally renowned medical/health sciences centre.

11. We have Canada's most active program in Asia-Pacific studies and we will reinforce this.

12. We intend to continue to increase our national and international competitive research in a wide range of fields to ensure that British Columbia is able to attract the best and brightest from the province, from Canada, and from around the world. Given new competitive funding opportunities in provincial and federal governments, and provided buildings, equipment and infrastructure costs are covered, we can double our research grants within 10 years. At present, we bring in more than \$75 million in research grants and contracts and more than our share of federal funding.

13. For many years we have had a very successful industry liaison program. We can claim 60 spin-off companies that did over \$250 million worth of business in 1987. We plan to continue to strengthen the industry liaison activity providing education, research and advice to a wide range of companies. For example, we have more NSERC Industrial Chairs than any other university in Canada. We are in the top five universities in terms of

direct industry grants and contracts.

14. It is difficult to recruit and retain faculty members unless we can pay competitive salaries. As the retirement rate increases, and as more and more jurisdictions come to realize that universities are essential to their future, we must be given the ability to compete.

15. To be competitive and to ensure that students have up-to-date training, it is essential that the university have adequate state-of-the-art equipment. We will continue to press for an annual allocation from the province for equipment replacement and renewal.

16. Computing and computing networks are central to modern societies. We must be able to develop a first rate computing capacity so that every student has access to the new tools and so that researchers have access to even greater computer use. As we move to decentralize (machines and dollars) our computing, we must ensure that we also acquire supercomputing capacity. Further developments for administration can make services more responsive and more cost effective in areas such as library operations, student registration and many others. Already, for example, we have introduced telephone registration for students, and data network access to the library catalogue.

17. We have made considerable savings in recent years by taking steps to reduce energy consumption, making our services more efficient by tight management, purchasing a new, more efficient telephone system, participating in a national university insurance scheme, and others. We will continue to seek such opportunities in all aspects of our operations.

18. We will examine in detail the question of creating a specialized facility to attract full cost-paying international students to UBC. In order to finance this, we may request a capital grant from the province.

19. We will continue to develop plans to seek financial returns from our land. The creation of the UBC Real Estate Corporation will enhance this. We have plans to develop 27 acres for market housing, and will consider a hotel in the future.

20. UBC is a major focal point for national and international conferences and workshops. It is also a centre that attracts large numbers of visitors to lectures, to its museum, to its unique gardens, and to many other activities. We will continue to be a focal point for visitors from near and far.

21. We will strengthen ties with our alumni in B.C., Canada, and internationally. In addition to branches in the province, we will have active branches in New York, Washington, D.C., Houston, Denver, Seattle, San Diego, San Francisco, Los Angeles, Tokyo, Hong Kong, Taipei, Singapore, London and others.

22. We have launched a major capital fund raising drive to take place over the next three years. At the end of this, we expect that our ability to carry out ongoing fund raising activity will be substantially increased.

The plan for UBC is one of no growth in numbers of students. But the plan is for continuing changes in our activities and in the continuing evolution of UBC's unique role. We believe that as the senior partner in a large system striving to be Canada's best, we must be given every incentive to fulfill the role of being one of Canada's premier universities, fully competitive with the best internationally. British Columbia needs such a place. To achieve this will require courage and commitment on the part of government. We must be funded adequately to achieve this goal.

We must continue to be accountable to both our peers and our community. This we will

continue to do. Recently, a public opinion poll showed that 5% of the people in the province attended UBC's Open House. It also showed that 20% of the people of the province have at one time taken a course from UBC. These figures provide some measure of the university's service to the province and of the province's support of it.

We urge the recognition of the formula system based on appropriate weightings. We urge the creation of new funds for research incentives separate from enrolment increase incentives. In addition to our lower per student allocation, we receive \$12 million less in connection with our medicine related activities. Making up this differ-

ence has further impoverished the rest of the university.

The province now has a chance to reaffirm a vision of the future. One important element of this vision will be to share and support our plans for the future of the University of British Columbia. We believe this planning to be one of the cornerstones, if this province is to move forward confidently into the 21st century.

Yours sincerely,

David W. Strangway,
President

SECOND TO NONE

A statement of the mission of the University of British Columbia for the decade preceding the 21st Century

"I want to congratulate you upon having entered upon the actual duties for which you have for some time been so assiduously preparing, and to congratulate the people of British Columbia upon their at last possessing an institution that will some day rank with the great universities of this continent."

The Honourable Sir Richard McBride
Premier, The Province of British Columbia
September 17, 1915

May 1988

SYNOPSIS

THE MISSION

When the University of British Columbia was founded in 1915, it was expected that it would serve virtually all of the postsecondary education requirements of the province. Today, a comprehensive system of higher education has evolved. UBC has become a full fledged multiversity of 30,000 students with a well developed graduate enrolment of 4000 and continues to educate students from all parts of the province.

At the same time, the university has built a national and international reputation for excellence in research. With annual external research funding of \$75 million, UBC is consistently regarded as one of the top three universities in Canada, and ranks with the best state-funded universities of the United States.

The path for the future is clearly marked. It is the hope and expectation of the university that it will continue to be one of the best universities in Canada, if not the best, and among the best in North America; that its stature as a research intensive university will grow; and that it will continue to serve the province as a main spring for economic, social and cultural development.

To respond to the pressures for greater enrolment and readier access for students from the interior of the province, UBC is actively engaged in planning with Okanagan, Cariboo, and New Caledonia colleges for the delivery of degree completion programs.

THE PROGRAMS OF STUDY

The programs of study of the various postsecondary education institutions in the province should be complementary. UBC will offer a core of arts and basic science, the traditional core professional areas, and specialized training in a wide spectrum of academic disciplines and professions.

The programs of study will provide students with a broad cultural background, specific expertise, an ability to think creatively and independently, and to communicate clearly and effectively. The undergraduate curriculum must thus encourage breadth as a base for subsequent specialization.

The university will build upon its existing strength in graduate work and research. Organizational mechanisms for fostering multidisciplinary research and graduate work, such as centres and institutes, will be reviewed.

The quality of instruction is constantly under review, but to help achieve a more uniform excellence, more attention will be paid to the methodologies of teaching. More extensive use will be made of modern technologies. The possibilities of additional programs of cooperative education with business and industry will be pursued. Distance education techniques will be exploited where appropriate.

Instruction other than the regular winter session may be loosely called "continuing education" and thus encompasses courses taken for credit in the evening, and in spring and summer sessions, as well as non-credit courses. The administrative arrangements are complex, defy logical analysis, and will be reviewed.

THE RESEARCH INTENSIVE UNIVERSITY

As the heart of the province's research effort, UBC should continue to expand its research activities, by the year 2000 doubling sponsored research income, doubling the percentage of research income derived from the private sector, and quadrupling royalty and dividend income. The merits of establishing a university research corporation will be kept under review.

A special effort will be made to campaign for federal and provincial government support for research in the humanities and social sciences. The transfer of technology to help build the British Columbia economy will be encouraged. International research activities will be expanded. The congruence of the research funding and educational functions should be given attention as a continuing factor in university development.

UNIVERSITY GOVERNANCE

The present system of university governance has served UBC well and should be maintained. The partly elected and partly appointed Board of Governors is responsible for financial matters. A Senate, also partly elected and partly appointed, is responsible for the academic programs. The division of the university programs into Faculties is sound. Using the principles enunciated in this statement, each faculty and unit will be asked to prepare five year plans. These plans will, in due course, become incorporated in a part of the overall mission and will be useful guides in the budgeting process.

THE FACULTY

The policies and procedures for appointment, promotion and tenure of faculty, and the terms and conditions of their employment, are crucial elements in the successful implementation of the mission of the university. They are the subject of ongoing discussion and negotiation between the university administration and the Faculty Association.

Looking to the future, it is perceived that, in common with other North American institutions, UBC has a large proportion of faculty members in age groups that would retire in the mid 1990s, and relatively few faculty members retiring now. To help achieve a more uniform age distribution and to take advantage of the present availability of bright young prospective faculty, the university will continue to encourage early retirement, offer reduced work load appointments to older faculty, and secure bridging funding for positions for new appointees.

Equally, if not more important, is the retention of good faculty members by ensuring competitive salaries and excellent working conditions. In this respect, the university will give high priority to restoring the position of UBC in comparison to other major Canadian universities.

The university is committed to the principle of employment equity and will systematically analyze the present status of women, native peoples, the disabled and identifiable minorities.

Consistent with its aspirations to be a university of international stature, UBC grants tenure to faculty members only after five years, and only after several thorough reviews of teaching and research performance. The principle of tenure is sound: faculty members should be free to speak out on any issue without fear of losing their positions.

THE STUDENT BODY

UBC's enrolment policy is shaped by the availability of physical and financial resources, its role in the educational system, and its goal of becoming a research intensive university. Present enrolments cannot be increased without greater resources unless quality is sacrificed. The limited number of places should be filled by the best students from all areas of the province. There should be more opportunities for part time study, expanding the offerings in the evening and in spring and summer sessions. Graduate enrolment should be increased to 6,000, maintaining or raising present standards of admission.

Admissions policy will be geared to selection of the best students and at the same time be more flexible with respect to gifted students, and the granting of credit for Advanced Placement and International Baccalaureate courses. The numbers of foreign students should be increased, especially at the graduate level. The possibility of special programs for international students will be explored. The principles underlying employment equity will be applied to admissions to ensure equal opportunity of access to programs. Student aid and scholarship support are inadequate to meet present need and should be enlarged.

STUDENT SERVICES

Student services at UBC are in general in the process of review. The Office of the Registrar will, in future, provide better service to students, will make greater use of modern technology, and will operate with greater efficiency. The functions of the Office for Women Students will be reviewed.

SUPPORT SERVICES

The support services for the university have recently been substantially restructured to achieve cost savings and greater efficiency. There remains room for further improvement in management to ensure responsiveness to the needs of the university community. The Physical Plant group of services will be reorganized; Plant Operations will be fully automated and a campus maintenance program established. Purchasing will be automated and procedures standardized for high volume, low cost items. Information Systems Management will complete the overhaul of administrative computer systems.

The Community Relations Office has been substantially enlarged in the past three years. The university must better advertise what it offers to the community as a cultural centre, as a provincial resource, and as an attraction for tourists.

ANCILLARY SERVICES

Ancillary services such as the Bookstore, Food Services, Student Housing and Parking will operate on a full break even basis. UBC Press will continue to receive a subsidy, but in time is expected to pay its own way. Student housing should accommodate 25% of the student body. The Athletics program will be operated independently of the School of Physical Education and will continue to be subsidized to a limited extent by the university.

LANDS AND BUILDINGS

The university will establish a UBC Real Estate Corporation to manage the lands which it owns that have potential for real estate development. The university will continue to support the proposal that most of the University Endowment Lands should have formal status as a park, but the university will also advocate that some portion of the lands be made available to meet the original objectives of developing revenues to help fund the university, and that an additional 40 hectares be reserved for future research and development activities.

The UBC campus is known throughout Canada as being "unfinished." Of the total building space, 40% is over 30 years old, 26% over 40, and 9% over 50 years old. Much of this older space is "temporary" in the form of World War II army huts. A significant capital component will be built into the forthcoming fund raising campaign to help finance a five year program of construction: a University Services Project, a Pacific Centre for Forest Sciences Research and Education, a Centre for Integrated Computer Systems Research, and Advanced Materials and Process Development Laboratories. A second 5 year plan is in preparation. The total cost over the 10 year period will be \$300 million.

THE LIBRARY

The UBC Library, a \$315 million provincial resource, is central to the mission of the university. It faces three problems: It is running out of space; the collections must be maintained in the face of increasing costs; and techniques must be improved for handling collections. UBC has fallen behind other universities in fostering the use of computing equipment by library users. A review of the library is in progress.

COMPUTING AND THE LIKE

Computer networking and telecommunications systems have become essential parts of the

university infrastructure, and there is much to be done to further enhance UBC facilities. There will be installed a new budgetary system which encourages users to make informed choices as to which type of equipment or service is most effective, desirable and affordable for their purposes.

SPECIALIZED EQUIPMENT

Aside from the need for library materials and computing facilities, the university has a substantial continuing pressure for the acquisition and operating costs of specialized equipment for teaching and research. A systematic plan for equipment replacement is urgently needed and a proposal will be made to the provincial government for an annual provision for this purpose.

THE ALUMNI

The difference between an ordinary university and a great university is its alumni. There are now more than 130,000 graduates of UBC, many of whom make significant contributions to their university. That participation should be widened and can be widened if better track is kept of graduates, and if they are kept better informed of university activities. The branch network of alumni will be expanded and strengthened. The Alumni Association will also assist in encouraging academically well qualified students to come to UBC.

The essential foundation for community support of the university is an understanding by potential donors of what the university is doing and the nature of its current needs. UBC will launch a major fundraising campaign in 1988, the first campus wide campaign in 20 years. This document was prepared as part of the process of reviewing priorities prior to the campaign.

THE GOAL

The goal of the University of British Columbia is clear: to become a university of international stature. In many areas of its activities it has already achieved that goal; in others, it has made significant progress.

To maintain its status as a first class university, UBC reaffirms its dedication to excellence in teaching and research. It will encourage and recognize the value of good teaching in the arts and sciences, in its professional faculties, and in its graduate programs. It will build and expand on a research capability that is already of world stature.

The essential ingredients for the implementation of this mission are many: a first class faculty; intelligent and well motivated students; excellent libraries; excellent computer and communication systems; adequate space and equipment; and a smooth functioning array of support services. More broadly, it must have the support and confidence of the community it serves.

By fulfilling its mission, the university will best serve the people of the province. It will play an integral, yet unique, role in the postsecondary education system, providing leadership in the cultural, social and economic life of the province.

In the world of tomorrow, every region that aspires to civilized progress and economic success will need a world class university. With the support of the community, The University of British Columbia will meet that need for British Columbia.

FOREWORD

This document is the product of two years of discussion and consultation at the University of British Columbia. It began as an internal review, as an attempt to assess the directions in which the university should be heading and what should be done to make some progress toward achieving some short term objectives along the way. What happened, of course, was that the exercise of thinking about goals for the future prompted many immediate responses. Much of what is recommended is already being implemented. Much of what might have been recommended is already done. As is often the case, the process is probably more valuable than the product.

Nevertheless, the document warrants completion and publication as a record of a comprehensive review of the mission, objectives, policies and procedures of the university in which the university community as a whole participated. Vice Presidents, Deans, Department Heads and Directors, both academic and non-academic, saw many versions as the statement gradually took form. The Board of Governors, the Senate, the Faculty Association, the Past Presidents Alumni Association, and the Student Leaders Group joined in on the penultimate version. Many of the various suggestions and comments were incorporated. Some comments cancelled out with the comments of others. Several comments reflected the opinions of small minorities and were not included because the document is meant to reflect an approach to the future rather than a consensus or a representation of a comprehensive spectrum of views. It was, in most respects, a familiar process. The university thrives on continually examining new ideas and criticizing current practices.

As a review, this mission statement makes a few broad assumptions. The history of UBC SPECIAL REPORT - June 23, 1988

British Columbia, the cultural context of the university, is taken as known. Much of what the university has been, is and will be, is a reflection of the growing maturity of the province. British Columbia is now engaged in the transition from a largely resource-based to a more diversified economy, doing so in a world that is increasingly interconnected and rapidly changing. Very soon, if not already, British Columbia will become a node in a global network of sophisticated and knowledge rich communities that have strong influence on world opinion and development. That state of incipient maturity is assumed and will drive growth and change of the whole educational system of the province.

It is also assumed that the reader is familiar with the invisible evolution that occurs continuously at a university. Professors are expected to be aware of the literature in their field and to constantly be changing their courses of instruction. Physics 100 of today is a far cry from Physics 100 of 50 years ago, or even 10 years ago. The review thus doesn't deal with the subject areas into which knowledge may be pigeonholed, nor which of them will be given particular emphasis in the next 10 years. It is sufficient to say that a university should keep abreast of the expanding frontiers of knowledge, ensuring that the curriculum is always serving the purposes of both education and training. All the rest is detail.

This document makes one other assumption: that the university will continue to flourish with the spirit of participation embodied in its motto, Tuum Est. The student body was the moving force behind the Great Trek that brought the university to its present campus. Student donations built the Student Union Building, the War Memorial Gymnasium, and a large part of the Aquatic Centre. Alumni have made contributions in many ways to the activities of the university. Public spirited citizens have donated generously to help build a university in which the community can take pride. It is assumed that it will continue to be so in the future. The university will thrive in direct proportion to the number of those who share the responsibility to make it thrive.

INTRODUCTION

In discussing the future of our university, it is necessary to talk of things that are of a mundane nature—of facts, figures, and finances. These are important and the university neglects them at its peril. But there is a danger that the need to speak of them will overshadow those things which are a university's main concern. A university is a place for the adventure of the mind and of the spirit, an adventure that enriches the members of the university community and, in so doing, enriches the society of which they are a part.

This adventure begins in the home and continues in school. It should come to full flower at a university where students, in their chosen disciplines, communicate with the great minds of the past and of the present. The range of what is available defies adequate description. In the basic arts and sciences, students may explore their own or other cultures through the riches of literature; they can read the philosophers whose ideas have shaped and are continuing to shape our world; they can study the works of scientists whose research has revealed and continues to reveal the wonders of the earth we live on and of the universe of which it is a part.

The university student confronts the struggle to apply the basic wisdom and knowledge of mankind to the issues of our time. In the health sciences, one builds on basic science to attain understanding of the functioning of the human mind and body, enabling the development of a myriad of ways for keeping people healthy or of caring for them when they are sick. In many faculties and departments related to resources, technology and commerce, the student is faced with the challenge of applying basic knowledge in the development of natural resources, in the construction and working of cities, the development of industry and the functioning of society in all its various aspects.

In law, the lessons of history, of philosophy, of political science, are brought to bear on some of the fundamental issues of society—how we govern ourselves, the relationship between the individual and the state, and the fair and just resolution of disputes that inevitably arise in a complex modern society. In education, the student must think about how, in our schools, we can best impart knowledge and wisdom to new generations.

Students are not simply passive recipients of information. As undergraduates they are expected to challenge the received wisdom, to test its truth and value against the issues of our times. At the graduate level, they are faced with a greater and more exciting challenge: Can they add something to the store of knowledge? Can they take an old idea and shed a new light on it, or apply it in a new way? Can they develop a new idea of their own and effectively probe its value? The graduate student's adventure of the mind is the most exciting of all—exploring where no one has explored before.

If universities do a proper job, students will carry for the rest of their lives this sense of

adventure about things of the mind and of the spirit, and their relevance to the world in which we live. For those who become faculty members of universities, that sense of adventure should be the prime motivation of their lives.

Faculty members, like students, must be continually refreshing their knowledge of the past and keeping abreast of the developments of the present if they are to help shape the future. They must be continually rethinking and reassessing the disciplines in which they work. This is the essential foundation for carrying out their twin functions of teaching and research, and in so doing, to serve the community at large.

The faculty member must be, in the broadest sense of the term, knowledgeable about a subject, excited by it, and think it important to impart that knowledge and excitement to others. In that way, student and professor both share in the excitement of learning. But faculty members at a university of national or international stature have more than the obligation of teaching, they must through research retest the received wisdom of the past and add to the existing store of knowledge. This dual responsibility is indeed the main distinction between a research university and colleges which devote their energies solely to teaching.

The adventure of the mind and spirit that is the essence of a university is crucial to the well being of society as a whole. Scientific and technological developments offer unprecedented opportunities, opportunities that expand at such a rate that today's cutting edge may quickly become tomorrow's obsolescence. But opportunity carries with it a challenge. Of all that we might do, what should we do, and how is it best done?

We could no doubt expand our exploration of the universe at an accelerated pace; but should we, and, if so, how? The great powers could continue to develop weapons of mass destruction and, by design or accident, use them: How is that to be prevented? We seek to ensure that all nations and peoples have sound and prosperous economies: What are the best ways of defining and achieving that end? If our own nation is to prosper, it must meet the tests of international competition in business and industry: How may that best be done? We must remember that industrial and economic development can threaten the fragile environment of our planet: How are development and conservation to be balanced? We must remember, too, that universities have a special obligation to conserve the culture and values of society: How may they best do this in the context of so many demands being made upon them? In the developed countries, improved medical services bring health to many and longer life expectancy to all: How are we to deal with the accompanying issues of ethics and values? And, in the developing world, how are the ravages of hunger and illness to be countered?

Society needs to give thoughtful and informed consideration to these and many other issues. They raise not simply issues of technique, which a good technological training may equip students to deal with, they raise fundamental issues of ethics, and values, and vision. The university is one of the institutions which can provide leadership in the debate on these questions, for the adventure of the mind and the spirit prepares the student and the faculty member for the task of coping creatively with change, and for creatively bringing change about.

Universities must ensure that their faculty, their students and their communities are equipped to lead the debate. Modern university education requires more than a training in how things are done today. It must provide more than a training which will enable its graduates to adapt to how things are to be done in the future. It must ensure that its students and faculty ask why and whether things should be done; that they can give thoughtful responses on which one of a range of options should be selected; that they can analyze how the option selected may in all its aspects best be carried out.

Students who have been trained to think in these terms will be better members of society. Faculty members who think in such terms will be better teachers of the next generation, better researchers capable of providing sound intellectual leadership in a changing society, and better able to contribute to their community. In a sense they will be critics of society, for the issues of which we speak have the potential for controversy. The debate may often be vigorous, but it is the obligation of those who are at or who have attended university to contribute to the debate.

It may be said, therefore, that the mission of any university is to provide an environment for an adventure of the mind and spirit. The adventure cannot be divorced from the pragmatic things of which at times it will be necessary to speak. Nor should it be forgotten that, like all great adventures, it involves much hard work. Neither students nor faculty can afford to think in terms of working a fixed number of hours per week. Rather, they must put in whatever time is needed to do the job. As is true of many fields, hard work is an essential foundation of success. A university must bring together

faculty and students, and must provide them with an environment in which they can best work to respond to all of the challenges of the times.

These pages, then, will deal with facts, figures, finances, and other such practical things. They assume the hard work that underlies all that a great university does. They do not reiterate on every page the sense of adventure which permeates the whole enterprise but, in a great university, that sense

PART I: THE MISSION OF THE UNIVERSITY

THE PATH FOR THE FUTURE

The first students to attend the University of British Columbia enrolled for classes in 1915. The university will celebrate its 75th anniversary in 1990, and its 85th at the turn of the century. Significant anniversaries and milestones inevitably elicit reflections about the past and visions of the future, but there are more substantive reasons than the passage of time for rethinking the mission of the university.

The world is now, in contrast with 1915, a global community. Values are being questioned as people become more aware of what others believe. Competition for trade is increasingly intense. Canada, like other countries, and British Columbia, like other provinces, must plan thoughtfully for a future in which the system of higher education must play an increasingly vital role.

When the University of British Columbia was founded, it was expected that it would serve virtually all the postsecondary education requirements of the province. At that time, the only other postsecondary institution was UBC's affiliated Victoria College which, until well after World War II, provided Vancouver Island students with the first two years of university training. As a result of the report of the President of UBC, John B. Macdonald, in 1962, the province embarked on an expansion aimed at making postsecondary education more readily available to a wide cross section of the growing population. In 1963, Victoria College was transformed into the University of Victoria, and Simon Fraser University was born. A network of community and regional colleges was established to offer vocational programs and also academic programs which could lead to transfer of credits to one of the three universities for degree completion.

Now, after 25 years of development, a comprehensive system of higher education has evolved. Simon Fraser and Victoria are substantial universities, each with enrolments of approximately 10,000 students. Both offer a diversity of graduate programs. The community and regional college network is heavily used, serving its twofold purpose across the whole of the province. UBC has become a full fledged multiversity of 30,000, with a core of arts and sciences, a constellation of professional faculties and schools, and a well developed graduate enrolment exceeding 4,000 students. UBC continues to educate students from the whole of the province. One in five students resident in the province has at one time or another taken a course at UBC.

At the same time, the University has built a national and international reputation for excellence in research. With an annual external research funding of \$75 million, UBC is consistently regarded as one of the top three universities in Canada, and ranks with the best state-funded universities of the United States. It is comparable to those in the first of the 10 categories by which the Carnegie Foundation for the Advancement of Teaching classified 3,400 colleges and universities in the United States.

The path for the future is clearly marked. It is the hope and expectation of the University of British Columbia that it will continue to be one of the best universities in Canada, if not the best, and among the best in North America; that its stature as a research intensive university will be enhanced; and that it will continue to serve the province as a mainspring for economic, social and cultural development.

Being the mainspring does not mean that the University must strive to excel in every subject of academic interest and provincial relevance. Some subjects, of course, cannot be ignored: university graduates should be both literate and numerate, capable of expressing themselves in English verbally and in writing, and handling the logic of mathematics and computer science with facility. A scientist must have a strong base in physics, chemistry and biology. An economist should have a grasp of history and philosophy. These are but two of

of adventure will inevitably be there, to the benefit of its faculty and students and to the benefit of the community it serves, no matter how large or geographically distant. Some people face the future with doubt and fear, and it would be blind not to recognize that mankind faces increasing challenges. Universities offer the individual and the community the opportunity of facing those challenges with vision and with confidence.

many building blocks that are integral parts of training in a discipline or training in a profession. The faculties of arts and science are the core of the university.

As the primary provincial university, UBC has also undertaken responsibility for what might be called the traditional core professional areas: medicine, law, dentistry, pharmaceutical sciences, agricultural sciences, engineering, education, commerce and business administration and, in British Columbia naturally, forestry.

Beyond these core essentials there are many subject areas and professional fields that a university may or may not choose to develop. Obvious factors influencing the choice are the relevance of the geographic setting of the province and the major contributors to the economy. In British Columbia, this means such things as oceanography, fisheries, mining and Pacific Rim related studies of language, literature, history and economics.

Also to be considered is the great variety of other professional specialties that are in demand in contemporary society. For example, UBC offerings include: nursing, rehabilitation medicine, architecture, social work, community and regional planning, landscape architecture, family and nutritional sciences, physical education, audiology and speech sciences, and library science, archival and information studies. In total, UBC offers 140 different graduate programs leading to various professional and disciplinary specialties.

A large modern university would not be complete without strong emphasis on the fine arts and the performing arts. At UBC this development came late and expansion of the activities in music, art, and theatre, is an obvious option for the future, if the university is to keep pace with the cultural tempo of the times.

Faced with these and many other demands, the university must make difficult choices about what to pursue. Many, if not most, initiatives are generated by faculty members who are well placed to see emerging new trends in the growth of knowledge. Virtually every fiscal opportunity for new development is met by a large number of new proposals. Which proposals are supported follows a great deal of evaluation at various levels of university administration, with the final decision resting with Senate. Management of the university enterprise thus involves a judicious mixture of centralized leadership, individual enterprise, and collegial discussion.

The choice is made more difficult because the other provincial universities may choose to do the same things. In some cases, duplication may be sensible, but in others it may be evident that it is prudent to do them well at only one institution. This problem has faced every province that has more than one university, and has been addressed with limited success by mechanisms such as the recently disbanded Universities Council of British Columbia. It is a problem that will perhaps be dealt with on a continuing basis by the three university presidents, either through the mechanism of their recently formed Tri-University President's Council, and through other mechanisms of consultation.

During the next decade it will be important to accelerate the evolution that has taken place in the provincial system of postsecondary education. The University of British Columbia should aim to consolidate its role as a fully fledged, research intensive university of international stature. It should offer a full range of high grade academic and professional programs, and contribute in a major way to the economic, social and cultural development of the province. The other universities, including new ones that may be established, will have more circumscribed roles as generalists, with their fields of concentration covering a narrower spectrum with less focus on unique professional programs and graduate research activities.

The complementarities of university offerings extend well beyond provincial boundaries. Within western Canada, the various universities offer much the same core of courses and programs, but each has specializations that serve the whole of

the region. The University of Saskatchewan, for example, has the only veterinary school, and UBC the only school of audiology and speech science. The same is true at national and international levels. There is, of course, no grand strategic scheme for rationalizing the programs of all of the universities of the world, or of North America, or of Canada. But by a continuing process of competition and consultation, there is a steady evolution of networks of cooperation.

The trend in many parts of North America and Europe is to greater differentiation of universities that collectively comprise postsecondary education systems. Some universities become research intensive and, having become so, become more research intensive. Others remain as undergraduate institutions, eschewing graduate work and research so as to focus on a broad liberal arts education. Some specialize in a limited number of subject areas for graduate work and research while others offer a wide spectrum of advanced professional and specialized training. The same process of differentiation will take place in British Columbia.

Meanwhile, there are continuing pressures for greater enrolment at all of the postsecondary institutions and for opportunities for students to take a full degree program while living at home. In recognition of this growing need, UBC has entered into discussions with Okanagan, Cariboo and New Caledonia colleges for the delivery of degree completion programs in the three regions.

Seventy-five years ago, UBC was a small provincial institution serving the needs of a pioneering population. It is now a large, many dimensioned university of national and international stature. The next step is for UBC to become a great university—second to none.

THE PROGRAMS OF STUDY

1. TEACHING AND LEARNING

The university perspective on teaching and learning may be approached by asking ourselves what our graduates might be expected to have gained from a university education. They could look for three things:

- a broad cultural background;
- specific expertise in a particular field of knowledge;
- an ability to think creatively and independently, to solve problems, to exercise judgment, and to communicate clearly and effectively.

A BROAD CULTURAL BACKGROUND: THE INITIAL YEARS

In recent years there has been considerable criticism of the university curriculum in North America. It has been suggested, for example, that it has become too narrow and too sharply focussed. Each discipline and subdiscipline feels that its students need to know more and more about its ever expanding knowledge base. Each quite rightly seeks to preserve the knowledge of the best of the past, so that knowledge may be used to assess the present, and to ensure that future generations will have that base on which to build. But today, more than ever before, it is obvious that it is impossible to teach all there is to know about the past or the present, or to anticipate in detail the future; in a rapidly changing world, there is a danger of spending too much time on what will turn out to be the minutiae of the moment. An equally grave danger is that the student will know little or nothing about the greater world of knowledge of which a discipline is but a part; will not be able to see the interrelationship between one discipline and another; will not be able to judge, by any criteria external to the discipline, its value and true worth.

If a university allows its curriculum to become too narrowly focussed, it is cheating its students, depriving them of an adventure of the mind and the spirit; and depriving the community of the benefit of people with the breadth of vision that a well rounded education should develop.

The university must thus consider how it can keep an adequate breadth in its curriculum. Do students begin the process of specialization too early in their university careers? It may well be, for example, that universities should structure the first two years of the curriculum so that all students are exposed to the accumulated wisdom and ways of thinking on a broader range of subjects, and so come to respect the background of disciplines other than their own. There may now be a need to re-establish the links between the humanities and the sciences and as well, perhaps, to build bridges within the humanities and within the sciences.

If there is to be restructuring of the university curriculum, it must be done with care and flair. The curriculum cannot be so general that students receive such a superficial exposure to other disciplines that they feel it is an irrelevant hurdle to be surmounted before getting on with what is really significant. For any curriculum to be successful, it must indeed challenge students, provide them with

what they truly see as a once in a lifetime adventure of the mind and spirit.

SPECIALIZATION

A university must also provide more specialist education, one that builds on a broad based introduction to learning. Intellectually curious students must be encouraged to probe more deeply into particular subjects and ideas, for in a multitude of activities, the community needs people with specialized skills.

The timing of the move toward specialization usually begins after the first or second year of an undergraduate degree in the humanities or the sciences. But the philosophy underlying a broad liberal education could, in many cases, form the basis for a full undergraduate degree program. Such a broadly based first degree would be valuable in itself and would also provide a base for work in various disciplines, particularly the professions. The increasing emphasis on a master's degree for specialization creates new opportunities to rethink the role of the undergraduate degree.

Universities obviously should provide opportunities for professional and graduate education. The University of British Columbia is already a major centre in the province and should therefore build upon this existing strength as part of its mission to become a major research university.

Students who choose to specialize must be highly motivated and inspired to push more deeply into a chosen field. They need first class faculty who are capable and who show an interest in assisting them. The link between teaching and research is of prime importance. If students are to work at the forefront of their chosen disciplines, faculty must be leaders in their own disciplines and must be fully committed and engaged in active research. Specialization can be successfully undertaken in a research institution only if it offers the opportunity to work at the frontier of expanding knowledge. Finally, specialized work needs first class equipment and facilities. It requires excellent libraries, computer systems, and laboratory equipment if students and faculty are to work at the level that provides the greatest return.

In providing professional and graduate programs, the university should not forget the value of a broad based liberal education. The value and wisdom gathered there cannot be discarded later. There is the risk that the excitement of specialization may push breadth into the background. One way in which that may be avoided is by providing the opportunity for more work that builds on several traditional disciplines, especially at the graduate level. Students with an initial broad educational experience can best work with specialists from other fields, for they have some familiarity with the methods and processes of other disciplines. There are already many examples of this type of multidisciplinary work at the university. The possibility of its expansion should be explored.

In common with other universities, UBC has spawned various institutes, centres and research groups to facilitate, particularly at the graduate level, training and research in subject areas that involve collaboration among several disciplines. Typically, the focus is on a subject of particular national or regional relevance, such as microelectronics, fisheries, Asia-related studies, water resource management, integrated computer systems, and so on. Also typically, there is a substantial contribution of external funds to support the "centre" for its first five years. Like faculties and departments, the centres are periodically reviewed. Some may persist for several years and eventually become departments, but more commonly it is perceived that they should be phased out and replaced by new initiatives that are responsive to current needs as perceived by faculty members and prospective students.

Policies for the establishment and administrative responsibilities for institutes and centres have not been reviewed recently. The increasing availability of funds for support of these kinds of enterprises which reintegrate disciplines, suggests that a review would be timely.

CREATIVE AND INDEPENDENT THINKING

In carrying out their duties of teaching and research, universities such as UBC seek to preserve, expand and disseminate knowledge. Knowledge encompasses more than an understanding of the substantive content of the various disciplines. It encompasses a quality of mind characterized by an ability to work with concepts, a capacity for criticism, judgment and discernment. It includes an ability to analyze and synthesize, an ability to identify problems and to develop solutions. This concept of knowledge defines what should be dealt with at a university. If an area of activity is not based on a conceptual framework and may be carried on with a minimum of thought, it has no place at a university. A university is a place not for rote learning, but for creative and independent thinking.

This view of a university has a profound impact on what a university should expect of its

students, and indeed, on what students should expect of a university. Students should not only "know" their disciplines, they should be able to work creatively and independently. They must have sufficient depth of understanding that they can be self reliant and can adapt to the changes that will inevitably take place when they leave the university. Those who have worked at the graduate level should have the capacity to not only adapt to change, but to lead change. The university will have failed its students if they simply acquire information. They must be encouraged to think, to re-think, to speculate, and to explore. That is the essence of the adventure of the mind and spirit that the university must offer.

METHODOLOGY OF TEACHING

Universities have traditionally paid little attention to the methodology of teaching. It has been assumed often that if a person knows a subject, has an interest in teaching it, and is reasonably articulate, he or she will, in the early years of being an instructor, develop an effective teaching technique. Over the years, that system has worked by and large, with more senior and experienced faculty offering advice and example, and with the university wide routines of teaching evaluation.

If, however, the university is to attain a uniformity of excellence in its teaching, it should pay more attention to methodology than it has done in the past. Conventional teaching techniques can be improved, whether for a large class or small seminar group, especially with the range of supplementary teaching materials now available, such as audiovisual equipment and computers. The possibilities for computer-assisted and self-paced learning need thoughtful evaluation. A more systematic approach to the development and use of teaching methods would benefit both faculty members and students.

The development of cooperative programs with industry and professional associations has also been a feature of university offerings in recent years in many Canadian universities. Students get invaluable experience from instruction at a prospective work site, both in helping them to appreciate the ways in which their knowledge may be applied, and in enabling them to better choose a career path. The further development of cooperative programs should be considered.

DISTANCE EDUCATION

Distance education is a teaching method. In general terms, it is understood as the provision of education at a distance from the campus. Courses may be taught in the conventional manner at off-campus location, or taken by correspondence, and increasingly with the aid of television, video cassette, or similar kinds of equipment.

Distance education is often associated with non-credit continuing education and is often used in that context, but it can be and is used to provide courses for credit.

In light of the new methodologies, the university should keep abreast of and use distance education techniques where appropriate. The whole field is ripe for systematic research of its possibilities and limitations.

Response to the opportunities for distance education should take place within the context of its perceived role in the postsecondary education system in the province. The university should therefore restrict its distance education to those areas where it has some special expertise, providing primarily advanced and professional upgrading courses. It does not make sense, for example, to duplicate the wide range of courses that may be available at a local level in the community colleges.

THE NEED FOR CONSTANT REVIEW

There are no final answers to the questions of what should be taught and how it should be taught. The important thing is that the university should not be complacent about what it is currently doing. Departments and faculties should continually review their programs and courses. A regular process of departmental reviews ensures that the teaching commitment is maintained and course content reflects the current level of world knowledge.

The university must continually remind itself of and recommit itself to its teaching mission. Faculty and students should be aware of the university's emphasis on teaching. Excellent teaching should be rewarded. Poor teaching should be improved. If the ethos of the institution engenders an enthusiasm for teaching, there will be a solid foundation for dealing with questions of what and how to teach.

OBJECTIVE AND ACTIONS

OBJECTIVE

To provide students with an education which preserves the best of the past and opens up the disciplines of the future; which preserves a proper balance between generalism and specialization;

which inculcates the joy of learning and enhances ability to adapt to and help shape a changing world.

ACTIONS

—A presidential task force will explore more fully and make recommendations on principles which should underlie curriculum planning and development.

—All academic units will review their substantive curriculum and mode of teaching to ensure that teaching objectives are being met.

—Senate should review rigorously curriculum proposals to ensure that they are compatible with the orderly development of individual disciplines and the overall objectives of the university.

—The university should continue to review academic units to obtain independent assessments of teaching and curriculum. These reviews should be done on a regular basis, and in any event during the period immediately preceding the termination of a dean or head's term of office.

2. THE RESEARCH INTENSIVE UNIVERSITY

The word, research, captures the spirit of the 21st century, which is scarcely a decade ahead. Each discovery of something that until then was not known, or each new insight into human affairs, marks a step in human progress. Today, as the products of research and scholarship influence every facet of our existence, it is blindingly obvious that the capacities for doing research and for applying the stored knowledge of mankind are synonymous with being in the vanguard of social, economic and cultural development. If British Columbia aspires to be among the most advanced provinces of the nation, to be a significant achiever in the world, it must have its own strong research community for the next century.

The heart of the province's research effort is The University of British Columbia. With an annual inflow of \$75 million in grants and contracts, as the site of the library which is a major provincial resource for scholarship, and as host to a constellation of government and industry laboratories as well as to the joint venture national facility, TRIUMF, the UBC campus generates more than 60% of the total research activity (public and private) in the province. Research must be encouraged at each of the provincially-funded universities and must be developed in the private sector of the province, but the dynamo of the provincial research thrust will be for many years The University of British Columbia.

The dimensions of the research enterprise are manifold. They range from the search for new cures for cancer to the techniques of teaching deaf children; from the analysis of the diaries of Captain George Vancouver to the invention of narrower saw blades; from semiotics to Canadian studies; from the use of computers by lawyers and judges to the development of improved strains of forest trees; from Korean archeology to European history; from the Canadian economy to international trade. The examples are endless. At any one time, there are more than 2000 faculty research projects under way at UBC, and twice that many student projects.

Students are at one and the same time the dominant work force and the major product of the university's research activity. They learn how to do research by doing research. Their inventiveness and originality can best be cultivated in a research environment that is rich in world class scholars and provisioned with comprehensive library facilities, state-of-the-art equipment, and adequate buildings.

Students also have the opportunity to address various kinds of research questions. Some questions are of a fundamental nature and, if answered, can have far reaching implications. Einstein's theory of relativity is the most frequently cited example, but there are examples to be drawn from every field of knowledge. Other research questions may be more immediately related to problems facing society, or to perceived opportunities for industrial or societal development. Typically, the answers to these kinds of questions require contributions from several fields of knowledge. For example, to answer such a question as, "How should Canada's water resources be managed?" will require contributions from hydrologists, economists, biologists and political scientists.

At current rates, world knowledge is doubling every fifteen years. Canada does less than 5% of the world's research, and British Columbia does less than one-half of 1%. But in the world of today and tomorrow, participation in research across a comprehensive range of subjects is the only way to ensure a share in the rewards of human achievement and understanding. As the pipeline that brings the knowledge of the world to our doorstep, a strong research and scholarly community is essential to the maintenance of our economic prosperity and cultural enrichment.

It is in this context that the university has set as its prime objective attainment of stature as a world class research intensive institution. In recent

years, UBC has consistently been one of the top three universities in Canada in external grant and contract funding, most of which is obtained in national and international competition. Increasingly, as the university has recruited for research and scholarly potential, faculty members have received wide recognition for their achievements. Many participate extensively in national and international panels that adjudicate research proposals. Many are involved in the editing of scholarly journals. Virtually all are engaged, and are encouraged to be engaged, in the collegial networks of researchers that ensure speedy communication of new discoveries. Each year UBC hosts about 100 scholarly conferences that bring thousands of researchers from all parts of the world to report their findings to their peers. The university is well "plugged in" on a world wide basis, to the latest information on an enormous range of subjects. There is an awareness of what is happening as it is happening.

UBC's research activities extend far beyond the geographic limits of the campus. Researchers collaborate with colleagues in a wide variety of institutions. Six teaching hospitals are the site of a full-spectrum of clinical research. There are close associations with the Cancer Control Agency of British Columbia. The three provincial universities and the Universities of Alberta and Calgary jointly operate the Bamfield Marine Biological Station on the west coast of Vancouver Island. UBC also operates a number of facilities that are essential for a variety of research activities. For example, there is a farm at Oyster River on Vancouver Island, two research forests (one at Maple Ridge and another at Williams Lake), a tree nursery, a botanical garden, an anthropological museum with a superb collection of North West native artifacts, a university press for publishing scholarly works, and fine arts collections.

The University of British Columbia library is the second largest in Canada, serving an invaluable role as a provincial resource for research and as the library of reference for western Canada. For research in the humanities and social sciences, the library is the essential tool for excellence. The UBC collections of Pacific Rim materials concerned with the language and literature of Asian Countries are especially comprehensive, and that's a major factor in the eminence of UBC in Pacific Rim related subjects. The library system is also fully equipped for computer searches of international data bases of literature and patents.

It is crucial to the university enterprise that the accumulated knowledge and awareness of new knowledge should be made available not only to the students and faculty, but also to the larger community that the university serves. Much of this role is captured in the day-to-day contacts of professors with their professional colleagues in business, industry and government, and through the many associations and community and university-sponsored activities.

Beyond this broad bustle of informal exchanges, UBC has for many years, and especially recently, undertaken collaborative research projects and exchanges with governments and industry. The Pulp and Paper Institute of Canada, Agriculture Canada, Forintek Canada Corp., the Biomedical Research Centre and the International North Pacific Fisheries Commission, all have laboratories on the campus. On the adjacent Discovery Park, the British Columbia Research Council and the Pulp and Paper Institute of Canada conduct applied research of particular relevance to provincial industries.

Contract research for government and industry, both national and international, has played an increasing role in the research activities of the university. It brings a sense of urgency and immediate purpose to research and is especially useful in giving students experience that is valuable for their subsequent careers, frequently careers in government and industry. At present, industry supported research accounts for 5% of total research funding. This is about the North American average and could be increased to advantage.

Linkages with researchers in sectors other than the university have led to an enhanced interest in the patenting and licensing of the inventions that arise from university research. Following the lead of institutions in the United States and the United Kingdom, the university has substantially expanded these sorts of activities that are so critical to commercial use of discoveries.

Each year, 30 to 40 patents are filed and subsequently followed up with licensing agreements. An income of over half a million dollars a year from royalties, shared equally between the university and the inventors, and the acquisition of equity worth several million dollars, is testimony to an increasing attention to the commercialization process.

Even more significant is the impact of these activities in fostering the attitudes that prompt students, and sometimes professors, to themselves embark on the commercial application of their discoveries and accumulated knowledge. Over the past 15 years, the university has "spun off" more than 70 companies in British Columbia that currently gener-

ate more than \$256 million per year in sales and employ over 2300 people.

To facilitate these industry-related research activities and the "spin off" of new "start up" companies, UBC five years ago established a University-Industry Liaison Office. Subsequently, given supporting funds from the provincial and federal governments through the science and technology funds of the Economic Development Regional Agreement (ERDA), the office has greatly expanded the scope and intensity of industry-related research.

Under the Societies Act, UBC has recently established UBC Research Enterprises to assist in the development of prototypes and to facilitate the incubation of promising inventions, bringing them to the stage where they are attractive to venture capital. It is anticipated that as this organization develops, it may subsume many of the more commercially-oriented activities, perhaps to the point of taking over patenting, licensing and contract research. As it develops, there will be a careful evaluation of the new society, with particular emphasis on the taxation and liability implications for the university of this type of operation.

The involvement of students and professors in commercially-oriented activities is highly beneficial for society, but it can pose some challenges to traditional university principles of openness of information. For this reason, the university insists that all research results must be in the public domain and that they will only be held confidential for a period of time sufficient to secure proprietary rights. UBC will not engage in "secret" or "classified" research for which the findings are not to be published.

It is also important that the university keep in mind that its central mission is education. Research activities should involve students. The university should not strive to become a contractual research organization, competing with and replacing private sector research enterprise. The focus must be on involvement with others for the enhancement of education; the benefits to students and to society will follow automatically.

Fifty years ago, the faculty members of the university largely concerned themselves with the local business and government community, proud of their contributions to the growth of the province through education and extension activities. Today, they may also deal with sophisticated teams of investigators from large multinational corporations, which in a year may spend more on research and development than is spent in all of Canada.

At the same time, professors and their students may be engaged in research in the most poorly developed countries in the world, under the aegis of the International Development Research Centre, the Canadian International Development Agency, the World Bank, and other such organizations. Caught up in the rapidly changing times, the university is challenged to serve many more masters and in so doing to bring the world's new knowledge and experience to British Columbia's future citizens.

Entrained in the mission of research intensiveness there is a wide range of costs which are not covered by grants for research. These so-called indirect costs of research which include the provision of space and facilities, library and computer resources, and administrative services—the infrastructure that is necessary for research—and are at least equal to half the research funding. Thus, every million dollars of operating grants received by the university costs its operating budget at least half a million dollars (CAUBO, Report of the Study of the Costs of University Research, 1982).

It is still not clear that this cost is included in the Established Programs Financing (EPF) formula for federal support of higher education; and if it is, it is even less clear that the distribution of EPF funds by the provincial government reflects the level of research activity at the various postsecondary institutions. Despite perennial discussion and a multitude of reports, these questions remain unresolved. Meanwhile, the research intensive universities have reached the point where their capacity to do more research is constrained by the lack of funds to cover the indirect costs of research.

The increasing size and complexity of the research mission entrains a concomitant demand for more comprehensive and knowledgeable administration of research. In the 1960s, when UBC began to emerge as a significant research enterprise, the administration of research involved the disseminating of information of sources of research funding, the orderly submission of proposals and management of funds, and the monitoring of research to ensure the highest standards of ethical conduct in research involving human subjects and research involving the use of animals. For these purposes, there was established a Research Administration Office within the President's Office. Today, through the newly constituted Office of Research Services and Industry Liaison, these responsibilities continue to be discharged for a much greater number and variety of research projects.

Recognizing the growing necessity for broad supervision of research activities, the university in 1981 established a position for an Associate Vice President Research, which was changed in 1985 to the position of Vice President Research. This recognition not only symbolized the increased and increasingly important role of research, but also signalled one of the major thrusts for the future.

Provided with the advice of an Executive Committee on Research, the Vice President Research is expected to play an important role in helping to shape the character of UBC's research enterprise. The executive committee is representative of all of the Faculties in major subject areas of the university. It considers matters of policy and develops university responses to major federal and provincial government initiatives.

It is abundantly evident that in the past decade the university has rapidly assumed the characteristics of a maturing world class, research intensive university. This trend will be fostered with the expectation that, by the turn of the century, UBC will fulfil its promise of being not only the premier institution of postsecondary education in the province, but also of being a leading Canadian and internationally-recognized centre for advanced study and research.

The foregoing might suggest that there is little that need be done except to set targets for the future and to continue to pursue opportunities for expansion of research funding and the transfer of knowledge.

Reasonable annual targets by the year 2000 might be: doubling the sponsored research income from the present level of \$75 million to \$150 million; doubling the percentage of private sector research funding from 5% to 10%; and quadrupling the royalty and dividend income from \$600,000 to \$2.5 million. It might also be stressed that the university should continue to campaign for greater funding for the national granting councils and greater funding for research from the provincial government.

It is noteworthy that the humanities and social sciences have not had substantial new opportunities for research funding in the past decade. With their attention focussed on science and technology, governments have not increased the funding for the humanities and social sciences in a commensurate manner. This is surprising, if only because science and technology have had and will have major impacts on society, posing ethical, legal, economic, political and social questions that can be addressed with experience and vigor by scholars in the humanities and social sciences. A campaign to increase funding at both federal and provincial levels should be undertaken.

There has been much talk in the past few years of the importance of universities to provincial and national development, and there have been many favourable omens for greater funding for research and scholarship for graduate students. The greatest needs now seem to be for adequate modern buildings to house the researchers and state of the art equipment with which to keep up with contemporary methodologies. Given this wherewithal, it should not be difficult to substantially increase the research funding and research productivity.

But perhaps the time is coming to more formally consider how the research enterprise and the educational function are best coordinated. Should the availability of research income dictate the priorities of hiring new faculty? Should the university accept research funding if the department head or dean of faculty says "no" on the grounds that the infrastructure costs will be too great a burden? To what extent should research grant funds be used to support the core educational activities of the university?

It is only by asking these kinds of questions that the university can develop a coherent point of view with which to influence national and provincial policies. At present there is no single forum that is entirely appropriate for addressing these kinds of questions.

OBJECTIVES AND ACTIONS

OBJECTIVES

—To continue to enhance the research capabilities of the university by facilitating and encouraging faculty members to obtain external research grants and contracts.

—To continue to encourage the transfer of technology from the university to the benefit of the provincial and national economies.

—To ensure that the research thrusts of the university are congruent with its educational mission.

ACTIONS

—The university should strive to become increasingly more research intensive, doubling sponsored research income by the year 2000. Private sector contractual research should increase from the present level of 5% to a level of 10%. Annual royalty and dividend income should increase to \$2.5 million.

—The provincial government should be pressed

to conclude EPF discussions with the federal government to resolve the question of responsibility for indirect costs of research.

—A presidential task force should consider what steps might be taken to develop university policies that deal with the interrelationship between research funding and educational programs.

3. CONTINUING EDUCATION

LIFE-LONG LEARNING

Of necessity, education is and always has been a life-long experience. The rapidly changing nature of our world makes it more imperative than ever that people constantly update their educational experience, either to upgrade our knowledge and skills for work, or to pursue new areas of interest.

The university sees both these forms of education as important outreach activities. Much of the teaching and research at universities have a significant impact on what people are doing in their jobs and professions. It should be available to those who wish to keep up to date. But the university has a more general obligation to contribute to the general cultural, social and political advancement and awareness of the community, and offers courses in such areas as current affairs, domestic and international economic development, the sciences, the health sciences, the arts.

Continuing education is a two-way street. It benefits both participants and faculty members, particularly in the professional fields. Students in continuing education courses often bring experience in the workplace, or just plain experience which enriches the course for both student and teacher.

THE NATURE AND ORGANIZATION OF CONTINUING EDUCATION

Instruction carried out other than in the regular winter session may be loosely but misleadingly called "continuing education." It encompasses education for non-credit purposes that does not result in the award of a degree or diploma. Some include such credit education as is not full time; i.e., evening courses and spring and summer session courses. (Of the students taking evening, spring and summer session courses, half are full time and half are part time.)

Non-credit continuing education in the arts, humanities and the sciences is the responsibility of the Centre for Continuing Education. Continuing education in the professional faculties is, in general, provided by the faculties themselves, or with strong faculty involvement.

Courses for credit in the spring and summer sessions, and in the evening in the winter session, are administered through the Office of Extra-Sessional Studies and not through the faculties whose courses the students may be taking. Correspondence courses are administered by the Office of Guided Independent Study.

This is a complex administrative arrangement and may be necessarily so. However, there has not been a thorough review of the non-credit and credit continuing education activities since 1970. Since then, there have been significant changes in views about continuing education and in distance education techniques.

NON-CREDIT CONTINUING EDUCATION

Many institutions in the province offer continuing education opportunities. The university's contributions should be seen in that context, building on the strengths in arts and sciences, in the professional faculties, and in research, finding their base in the teaching and research in which the university is engaged.

The university should be mindful of its obligations to communities outside the Lower Mainland, and should explore ways of bringing its special expertise to communities outside the greater Vancouver area. In some cases, this may be cost effective only if courses are delivered by distance education techniques and intense short-courses, on-site, may be most effective.

Non-credit continuing education is a field in which demand and opportunity can change rapidly. Therefore, the university should not establish a large permanent infrastructure, and financing should be on a fully self-supporting basis. It is reasonable to expect those who are upgrading their work skills, or their employers, to pay at least the operating costs of continuing education. It is equally reasonable to expect costs to be paid by those who wish to explore areas of personal interest. Important though it may be, continuing education should not represent a charge against the general operating funds of the university.

OBJECTIVE AND ACTIONS

OBJECTIVE

Ensure that continuing education, however, defined, reflects the academic programs of the university and serves the public in a way that brings credit to its unique role. Non-credit continuing

education should be a financially self supporting endeavour.

ACTION

—A task force will be established to review what

PART II: THE PEOPLE

UNIVERSITY GOVERNANCE

In many respects the university is akin to a large, many faceted, highly democratic corporation. A Board of Governors, partly appointed and partly elected, is ultimately responsible for financial affairs. A Senate, also partly appointed and partly elected, is ultimately responsible for the academic programs that are offered by the university. The Universities Act gives the university autonomy, an arrangement that has served UBC and the province well, ensuring public accountability as well as academic freedom.

The executive head of the university is the president. A primary function of the President's Office is to guide the linkage of budgeting with planning in each of the administrative units of the university.

For administrative purposes, the academic work of the university is divided into faculties, each of which is the responsibility of a dean, who reports to the vice president academic. Depending on the size of the faculty, a dean may delegate responsibility to heads of departments, or to directors of schools. On the non-academic side, several vice presidents delegate various responsibilities to directors of service units. Throughout the whole structure, appointments to administrative positions and to Senate and the Board of Governors, are for limited terms.

The division of the university into faculties has proven to be sound. The principles enunciated in this document and the policies and procedures which flow from it will be used as a basis for five year plans for each faculty. The plans will be used to help guide the budgeting process.

On virtually all matters of university policy, there is discussion at the department, faculty and executive levels, and by Senate or the Board of Governors; or, in some matters, by both Senate and the Board of Governors. Students and faculty are represented at all levels; staff are represented on the Board of Governors.

A faculty association represents faculty members in negotiation with the university administration on terms and conditions of appointment. Several unions and associations represent the various staff groups.

From time to time, there has been debate about the system of university governance. With minor variations, it is typical of Canadian universities and there have been no compelling reasons for a major change in the way the university is organized. The present system works with continuing and healthy tensions between its components, particularly with respect to their various roles.

THE FACULTY

INTRODUCTION

The fulfilment of the university's teaching and research mission is related directly to the quality of its faculty. The policies and procedures for appointment, promotion and tenure, and the terms and conditions of employment, are crucial elements in the successful implementation of the mission. There are potential problems in making new appointments. The appointment process must respond in a positive way to the requirements of "employment equity." To preserve academic freedom, the system of tenure must be retained. The conditions and terms of appointment need constant review, not only with respect to salaries and other economic benefits, but in regard to a host of other factors—quality of libraries, quality of laboratories, adequate supplies and equipment. In recent years, the university has ceased to be as competitive in these areas as it once was and ought to be. Unless it can regain that competitive edge, its ability to carry out its teaching and research mission will be increasingly compromised.

These and many other issues related to the terms and conditions of employment of the faculty members are under constant review, and redefinition in agreements between the Faculty Association and the university. The agreements have been developed over a period of more than 20 years and are concerned with aspects of faculty employment. Lively and productive discussions between the Association and the university administration ensure continuing attention to the importance of maintaining an attractive environment for faculty members.

RECRUITMENT

The ideal complement of faculty strikes a balance between stability and change. There should

the university is and should be doing in the field of continuing education, both credit and non-credit, with the mandate of considering, among other things, the administrative and financial basis of the activity.

not be sudden and major reductions if good teaching and research programs are to be maintained. But it is equally desirable that there be turnover to provide freshness and new ideas. Some turnover will occur inevitably through resignation and retirement. With a more or less uniform age distribution, there would be a smooth flow of faculty replacement amounting typically to about 6% per year on a continuing basis. This is an objective to be achieved in an essentially no-growth environment.

In consequence of the rapid expansion in faculty numbers in the 1960s, UBC, like other Canadian universities, is faced with a distorted age distribution. In 1985/86, faculty members aged 40-54 were 57% of the total. Only 19% were under 40 and 24% were over 55. This age distribution poses a short term problem and a long term opportunity.

The immediate problem for UBC is how to make an adequate number of new appointments, not just in developing areas, but also in established disciplines. The university should not miss the opportunity to make appointments from among the pool of bright young people who are currently looking for academic employment.

There are significant financial obstacles to making the number of new appointments that might be regarded as desirable. It is unrealistic to assume that all the monies that are needed will come from additional provincial government funding. The university went through a period of severe financial restraint in the 1980s reducing its faculty complement by over 100. By 1986-87, there were welcome signs of an improving financial position.

New appointments can, in theory, be funded from monies released by resignations and retirements. However, during the years of financial restraint, long term reductions in the budget were based in large part on monies that were, or were expected to be, released by resignations or retirements. It will not be until the mid 1990s, when faculty begin to retire in substantial numbers, that retirements will release significant funds for new appointments. Until the mid 1990s, then, an ageing professoriate will add to rather than decrease the total university salary bill.

There are a number of things the university should be, and indeed is, doing. Reduced workload appointments are being offered to older faculty. Early retirement is available on attractive terms to those who are interested. "Bridge" funding has been secured to pay salaries of new appointees for a few years before a vacant position comes free from a retirement. These and similar options assume continuance of the current policy of mandatory retirement at age 65, but they are sound in principle regardless of whether or not retirement is mandatory.

A second problem of some immediacy is how to be competitive for new appointees in such areas as business administration, or in rapidly developing areas such as biotechnology, computer engineering and computer science. Once the flow of retirements begins in the 1990s, this problem will become university wide. Given UBC's goal to become a university of international stature, it will be competing for faculty in all disciplines, not only in Canada, but in a world market, which will include not only other universities but government, business, industry and the professions.

The university needs to make appointments now before the competition of the international market place becomes overwhelming. The long term objective will continue to be to recruit and retain only the best faculty, and then to ensure that salaries and working conditions are the best that can be offered.

EMPLOYMENT EQUITY

There is a growing demand for attention to the issue of employment equity. Some groups in the community are under represented in the work force. Employment practices have had the effect of denying such groups the opportunity to compete fairly for positions that are available. This is not only unfair to those denied opportunity, but limits opportunity for employers to select from the largest possible pool of qualified applicants.

The make up of the pool of potential appointees is related to the make up of previous cohorts of graduates. With some exceptions (for example, engineering, nursing, and elementary education), there now appear to be reasonable numbers of both male and female students in all undergraduate programs. Some graduate programs still have a disproportionate preponderance of men. A crucial first step in appointing women is thus the attraction into graduate programs of an increasing number of women students. That should be one of the priorities in recruitment into graduate programs.

But the problem is not one that can be resolved by a single institution—it needs to be addressed on a national basis.

There must also be a willingness to recruit women faculty. There is no evidence that departments discriminate against women in making appointments, and there have been a number of recent appointments of women. The university should, however, restate its appointment procedures to ensure that this is indeed the case; should, if need be, make suggestions to ensure that women are actively encouraged to apply for academic and administrative positions; and, finally, should ensure that once appointed, women are fairly treated with respect to salary and advancement.

The university has already started such a review not only with respect to women, but with respect to native peoples, the disabled, and identifiable minorities. It has signed a Certificate of Commitment under the federal government's Contractors' Program, and has thereby committed itself to a systematic analysis of the present employment of those in the four groups, and to developing goals for ensuring that they are more fairly represented in its workforce.

APPOINTMENT, PROMOTION AND TENURE

In keeping with its aspirations to be a university of international stature, UBC applies the highest standards in making decisions on appointment, promotion and the award of tenure. Nonetheless, it may be appropriate to state more fully the position on tenure, an aspect of university appointment policy which is often misunderstood.

The typical initial university appointment is at the rank of Assistant Professor. The appointee is not eligible for consideration for the award of tenure until the fifth year of appointment. If tenure is granted, it becomes effective at the beginning of the sixth year of service. If tenure is not granted, then the appointment is terminated with the sixth year of service being the terminal year.

A person appointed as assistant professor will normally have completed a bachelor's, a master's, and a doctoral degree, and in some disciplines may also have some postdoctoral experience. To be granted tenure an assistant professor's record is formally assessed on at least four occasions. The first is at the time of initial appointment for two years. Reappointment for a second two years comes after a careful review of teaching and research; after the fourth year of service, reappointment must again be considered, and again the teaching and research record is given careful scrutiny.

The decision on tenure is taken only after a rigorous selection procedure, perhaps the toughest in society. There is an assessment of teaching by formal evaluation, and assessment of research by at least three referees from other universities in Canada and abroad. In the typical case, a recommendation to award tenure is first made in the department. It is then considered by the dean of the faculty who, after consultation with a faculty advisory committee, sends a recommendation to the Senior Appointments Committee. This committee comprises all the deans and twelve tenured full professors drawn from the university at large. The committee makes a recommendation to the president, who has the final responsibility for making a recommendation to the Board of Governors. In recent years, more than 10% of those considered have been denied tenure. Others have already dropped out along the way.

The protection afforded by the award of tenure is considerable, but it is not absolute. A faculty member may be dismissed for cause. That seldom occurs, because the vast majority of faculty do their work conscientiously and well. A faculty member may be dismissed if programs in which the faculty member is teaching are discontinued, or if there is a financial exigency. Dismissal, redundancy and discontinuation for reasons of financial exigency are serious matters and are dealt with in the agreement with the Faculty Association.

Those who are awarded tenure may subsequently be promoted to associate or full professor rank. Salary increases, based on progress through the ranks, go only to those who are promoted in accordance with normal expectations, and merit increases go only to those whose work is outstanding. As a result, as between those with tenure, there can be considerable differences in salary, reflecting judgments that have been made about the quality of their work.

Tenure, therefore, is not awarded automatically, does not render faculty members immune from dismissal, and does not prevent differential treatment with respect to promotion and salary. It is, however, an essential element of the university. Faculty are expected to give leadership in debates on matters of controversy that increasingly face society. Faculty should be free to express their views in teaching, in public statements, and in writings. There are, regrettably, instances in Canada where universities have come under pressure to dismiss faculty whose views, for one reason or another, were unpopular. It may be true that only some faculty will contribute to the public debate on controversial issues, but if society is to deal effectively with the

challenges it faces as it moves toward the 21st century, it is essential that those who ought to speak out should be free to do so.

SALARIES

The university competes in a North American and, in some cases, in a world market for faculty. The competition exists not only in making appointments, but also in retaining existing faculty. Many factors influence a decision to come to or to stay at a particular institution—location, quality of students, quality of colleagues, teaching conditions, quality of such support facilities as libraries and laboratories, research funding and opportunities. But however significant these and other factors may be, it is imperative that salary levels be competitive with those at other excellent universities.

In recent years, UBC salary levels have fallen below that standard. In 1980/81, the average professorial salary at UBC was at the highest in Canada; by 1986/87, it had dropped to 16 of a group of 20 universities.

If the university is to maintain its reputation for excellence, a competitive salary structure must be regained; the Board of Governors has passed a resolution stating this to be a goal. There is a pressing need for a rethinking of the level of government support and the operating grant for 1987/88 was a welcome sign of that rethinking, for it enabled an increase in salaries of 4.98%, as well as providing for career progress, merit, and inequity and anomaly payments.

Salary policy must reflect the goal of the university—excellence in teaching and research. Salary increases should therefore be a reward for excellence. They must be merit driven. Across-the-board increases should be kept to a minimum.

The implementation of such a policy requires that there be well understood criteria for judging excellence in teaching and research, and equally well understood procedures for applying those criteria such as are detailed in the Agreement on Conditions of Appointment for Faculty. It is relatively easy to make judgments about quality of research. It may be more difficult to make judgments about the quality of teaching. Teaching techniques vary considerably. What is effective in one discipline or course may not be effective in another; the effort that goes into good teaching may not be as fully appreciated as the effort that goes into good research. The university needs to ensure that faculty are aware of what is expected of them in the Agreement and that there are in place, and functioning, well publicized procedures for regular assessment of performance in both teaching and research.

OBJECTIVES AND ACTIONS

OBJECTIVES

—Continue to make appropriate new appointments now to provide faculty renewal and to prepare for the anticipated shortage of faculty in the next decade.

—Ensure that there are no impediments to the appointment, career advancement, promotion or proper remuneration of women, native peoples, the disabled or visible minorities.

—Establish and maintain a salary structure that is competitive with peer universities.

—Establish a salary policy and fair procedures to implement it, which will reward excellence in teaching and research.

ACTION

—A task force on employment equity has been established. It will make recommendations on the employment of women, as well as native peoples, the disabled and visible minorities.

—An Employment Equity Officer will be appointed.

—The university has signed the Certificate of Compliance under the federal Contractors' Program.

—Give high priority to ensuring UBC regains salary competitiveness with other institutions.

THE STUDENT BODY

THE WINTER SESSION

In the 1986/87 winter session the full time, first degree enrolment at UBC was 21,700; the full time graduate enrolment was 4,000; and the part time enrolment was 6,000. (A full time, first degree student is a student who is enrolled in 12 or more units. A student taking a full load of courses would take 15 or more units of course work. A full time graduate student devotes at least three-quarters of his or her time to university work.)

The university's enrolment policy at both the undergraduate and graduate level is shaped by three principal factors: first, its physical and financial resources; second, its role in the post-secondary educational system in the province; third—an essential component of the second—its goal of becoming a major research university. These factors and the interplay between them are the prime determinants of the university's undergraduate and graduate enrolments.

Major constraints on UBC's enrolment are its physical and financial resources. The univer-

sity has space problems even with its current enrolment. It is in urgent need of funding to upgrade existing space and to add new space to accommodate present teaching and research programs.

There is an equal difficulty in accommodating the present number of students on present operating budgets. In the academic year 1986/87, on a per student basis, the British Columbia university system was more poorly supported than any other province in Canada, except Nova Scotia, and was funded at only 40% of the level of funding of universities in the University of California system. Despite these restraints, UBC reduced enrolment only slightly. The financial position has improved in the last two years. Nonetheless, UBC is still far from being able to make available the supplies and equipment necessary to its operations. On its present operating budget, it had no capacity for increasing enrolment; rather, it is still faced with the question of whether it can properly accommodate the number of students it enrolls.

There is an urgent need to reconsider the numbers in postsecondary education in the province as a whole. At the undergraduate level the participation rate in British Columbia of those aged between 18-24 is 17.23%, the third lowest in Canada. More places need to be made available if the increased demand for participation is to be met. That increase should be absorbed by the system as a whole, and there should be no increase in undergraduate enrolment at UBC.

More "academic stream" places may need to be created at the colleges, absorbing many students whose high school performance does not qualify them for direct entry to university, or who may wish to begin their postsecondary education in their own community.

The role of UBC in undergraduate education should be that appropriate to a major research university. It should seek to enrol those students who have the ability to benefit from and contribute to the educational environment of such a university, and whose standard of achievement on admission suggests a high degree of probability that they will complete the program in which they enrol. The university should therefore admit only the best students to its undergraduate programs and, in keeping with its provincial role, enrol the best students from all areas of the province.

There is reason to doubt that UBC is achieving its goal of enrolling only those students who have a high probability of success. Some indications suggest that too high a proportion of students now entering undergraduate programs fail to complete their first year. They withdraw, fail the year, or complete only a partial program.

If this is a recurrent problem, then there is an inefficient use of resources and of a student's time and money. The university needs, therefore, to determine the extent of the problem. Are some students not properly prepared to work at the level that UBC should expect? The university will conduct a thorough study of admission to and performance in the first year of university. The expected consequence of the review is a significant reduction in the number of undergraduate students enrolled but no reduction in the number of those reaching graduation. For the immediate future, admission will be assured to those who have a high school grade point average of 3.00 or better.

Participation in graduate programs is also lower in British Columbia than in most other jurisdictions.

A flourishing graduate program emphasizing research is an essential element of a major research university. A strong graduate program is also a vital element in the university's provincial role. In the future, more students will find it necessary to undertake graduate work to complete minimum qualifications for the careers they wish to pursue; and more people, having completed first degrees and gone out into the work force, will find it necessary to return for graduate study.

The present number of graduate students is less than is needed if the university is to fulfill its provincial responsibilities and to become a major research institution. That was indeed recognized almost 20 years ago, for in 1970 the university decided that, as a matter of general policy, it should increase its graduate enrolment to 5,500. Nine years later, "The Mission of the University of British Columbia" (p.28) stated that the university should plan for a graduate enrolment of at least 6,000 students, using the then or higher criteria for admission and performance. At a minimum, the university should be aiming at this latter figure. An enrolment of 6,000 graduate students at UBC would mean that graduate enrolment would be given the same emphasis as in comparable universities in North America.

There are two essential preconditions to an increase in graduate student numbers. First, the criteria for admission and completion should be as high, or higher, than they are at present. Second, the university will need more space, more equipment and more operating funds. In particular, there will be an increased need for adequate graduate fellowships and other forms of direct student support. These needs must be targeted in the solicitation of

government and of private funding. Graduate education is expensive.

If additional funds do not become available to increase graduate enrolment, there will have to be an even larger corresponding reduction in undergraduate numbers.

This change in emphasis must be seen in light of three general considerations. First, the university has an obligation to expand its research, and therefore its graduate potential. Second, the university should admit only those who have a high probability of succeeding. Third, UBC is now part of a provincial system of postsecondary education; thus students have a range of educational opportunities available to them. If the system as a whole is properly supported, the young people of the province will not be deprived of educational opportunities, and at the same time UBC can more effectively serve its students and the province.

SPRING AND SUMMER SESSIONS

In 1986, UBC had a total "head count" enrolment in its Spring (May-June) and Summer (July-August) Sessions of 11,000 students. The Spring and Summer Sessions are useful for undergraduate students, providing them the opportunity for taking extra courses, completing programs faster than would be possible by taking Winter Session courses only, or retaking a course that was not completed in the Winter Session. They also afford an extra opportunity for part time study.

At the graduate level, in the majority of cases, it is inevitable that programs operate on a year round basis. Graduate students working on a full time basis on research projects are paid in the summer from a variety of sources—research grants, government programs, university monies. In the interests of both its graduate and undergraduate students, the university is committed to flourishing programs year round.

PART TIME STUDENTS

Part time students may be divided into two groups. First, are young students completing a first degree who may not be able to attend university on a full time basis. Increasingly, students in the 18-24 age range find they cannot afford to attend university full time, so they work and enrol on a part time basis. These are often excellent students who are prepared to make considerable sacrifices to obtain a university education. The second group of part time students are older, may or may not have prior university experience, and may undertake part time study for a variety of reasons—because they need the training in light of changes that are taking place in their workplace, because they are contemplating a change in careers, or simply because they wish to sample what a university has to offer.

For both groups, the university must ensure that regulations governing admission and the completion of programs do not contain unnecessary obstacles to part time study, and should offer more late afternoon, evening, spring and summer session courses as part of the standard teaching mission.

There are limitations on the extent to which the university should or can offer the opportunity for part time study. It may not be appropriate in some disciplines. There are financial limitations on what the university can do. It may therefore be necessary to make some fine judgments on the balance between full time and part time enrolments. Finally, and most important, the university must ensure that the educational opportunity offered to part time students is the equal of that offered full time students. It would not be in the interests of part time students or of the university to devalue the quality of their education.

SELECTION OF STUDENTS

The prime objective of the university should be to admit only those who are best qualified to benefit from and contribute to the programs in which they are enrolled, and whose records suggest that there is a high probability of their completing those programs.

To achieve this objective the university must show more flexibility in its approach to admissions at the undergraduate level. Three recent initiatives provide examples of a willingness to take that approach.

On the recommendation of the President's Task Force on Liaison, Recruiting and Admissions, Senate has now approved a proposal that gifted high school students with superior records enrolled in grades 11 or 12 can take a course or courses at the university and receive appropriate credit if subsequently enrolled at UBC. This scheme will serve as an indication of the university's desire to recruit the best students and to take a more flexible approach in accommodating them.

Another recommendation from the task force has been approved by Senate so that appropriate credit will be given for Advanced Placement and International Baccalaureate courses taken before high school graduation.

The Advanced Placement program has been operating in the United States for over 50 years. It is governed by the participating universities, including many of the prestigious private and state

institutions. Course contents are determined, examinations set and graded by or under the control of the universities. Each institution itself determines the courses and level of achievement for which it will grant credit.

The International Baccalaureate program has been operating for 20 years. It is administered from Geneva and involves a rigorous course of study and a set of examinations intended to challenge the gifted student. As with Advanced Placement, individual universities determine the courses and level of achievement for which credit will be granted.

The great majority of undergraduates at UBC come from the Lower Mainland of British Columbia, and come directly from high school. But the university must be responsive to others who should be afforded the opportunity of attending, particularly students from high schools in areas other than the Lower Mainland. The university must therefore maintain and strengthen its ties with all of the secondary school districts in the province. It is also important to provide for the transfer of students from the community colleges, an obligation inherent in the structure of the post-education system.

The student body should not be drawn solely from British Columbia. There should be students, both graduate and undergraduate, from the rest of Canada, just as many students from British Columbia go to universities in other provinces for some part of their university education. Students from other provinces benefit from a change of educational environment and they make a significant contribution to the teaching and learning process of the institutions they attend.

Similar considerations apply in the case of foreign students. At the moment only 1.3% of the undergraduate students are from outside Canada. This is a low percentage even for an institution that didn't aspire to international stature. As in the case of students from other provinces, foreign students not only benefit from what the university has to offer, but make a major contribution to the educational enterprise from their varied backgrounds and different perspectives. On their return to their home countries they become ambassadors for Canada, for British Columbia, and UBC, and are valuable links in the networks of education, research, commerce and government.

In its final report the 1987 Task Force on Liaison, Recruiting and Admissions recommended that the university seek to increase its enrolment of foreign students to between 4 and 6 per cent of undergraduate enrolments. Standards for admission will be high, and Senate has approved a minimum grade point average of 3.5 and a score of at least 570 on the Test of English as a Foreign Language. The report recognizes that the university will also need to improve its services in housing and counselling as well as financial aid.

A second president's task force has suggested that special programs could be created for international students on campus. They would be of high quality but possibly distinct from existing programs and designed to suit the requirements of the students. Students in these special international programs would not be eligible for transfer into regular university programs or courses. The admission standards would be uniformly high and all applicants would have to demonstrate a sound command of English.

Two factors affecting the viability of any such undertaking are operating budget and space. To be self-sustaining financially, tuition fees would need to be in the region of \$15,000 per annum. The university has not at present adequate space to carry on its regular programming. Any new program directed at international students would require significant initial capital expenditures.

There are major obstacles to be overcome and some difficult policy decisions to be made before any special program for international students is launched. In due course, the task force will also consider the possibility of providing special programs abroad for international students.

If it is highly desirable that there be some representation of students from other provinces and from outside Canada in the undergraduate student body, it is essential that they be strongly represented at the graduate level. Graduate work and research are closely linked, and research is a national and an international enterprise. Students who seek to do graduate work look for the best in their fields, and a university with flourishing graduate programs draws on the best graduates it can obtain. As graduate enrolment increases a large proportion of its students will come, as they come now, from countries other than Canada.

There is virtually equal representation of male and female students in the total undergraduate programs of the university, but in some Faculties there is quite unequal representation. For example, in 1986/87 only 11% of the undergraduate students in engineering were women. Only 4% of nursing and 12% of elementary education undergraduates were males. Where there are such imbalances the university should make it known that there are no institutional barriers to the enrolment of men or

women, and should make sure that the environment in the faculty or department concerned is equally welcoming of men and women.

At the graduate level, 48% of all master's degree candidates were women in 1986/87. In the Master of Arts program 66% were women, in the Master of Science 41% and in other master's programs 44%. Of those enrolled in doctoral programs 30% were women, and there was a considerable variation between disciplines, (e.g. 3% of those in engineering, 46% of those in arts). If women are to be equitably represented in those areas where graduate experience is a prerequisite to employment, the first step is to increase the level of graduate enrolment. That can be fostered by graduate fellowship programs restricted to women, or to minority groups.

If the native peoples of Canada are to take the place they seek for themselves in Canadian society, they must be assured of access to the educational system at all levels. The university has made considerable progress in enabling native people to take advantage of a university education. It needs to do more.

A significant step was taken by the establishment, with the aid of the Donner Foundation, of the First Nations House of Learning, a focus for teaching and research of relevance to native peoples. This initiative will increase enrolment of native students in all faculties through active recruiting, provide support services for native students through consultation with native peoples to determine what programs might be developed at the university, and identify and promote areas of research of particular significance for native peoples, such as the legal status of land claims, self government, management of food fisheries, enforcement of the economic base and delivery of social services.

Native peoples need greater opportunity for advanced education and UBC will provide them.

Students who have taken part in French immersion programs are now beginning to reach the universities, and some may wish to continue some part of their education in French. It is impractical for a variety of reasons for an English speaking institution to offer parallel courses in the French language. Much better is that students attend a French speaking institution. UBC is developing exchange programs that provide for a year abroad in various European and Asian countries, and will seek the cooperation of government and other institutions in exploring a number of possibilities.

The university can at present admit only a small percentage of aspiring first year students who apply for admission. Additional pressures will arise as people increasingly realize how vital it is to have university training in a knowledge intensive world. It will be necessary therefore to review admission criteria and processes to ensure that they are working as fairly and efficiently as possible.

From the standpoint of prospective students the admission process should provide information to help them decide if they wish to attend the university. From the university's perspective the process should attract the very best students. It is thus important that prospective students be fully aware of the advantages that will accrue from attending UBC.

Information should be presented well and in a timely fashion. Regular and systematic communication with schools and colleges is essential and to this end a School and College Liaison Office has been established.

The mechanics of admission should be as simple as possible. A new registration system, to be fully in operation by the 1988/89 academic year, will make admission a simpler and speedier process.

STUDENT AID

Undergraduate students

Financial support to students serves two purposes: to help those in need, and to reward those with superior academic performance.

Need-based financial assistance comes mainly from government, both federal and provincial, either through grants or loans, or a combination of the two. In recent years many students have incurred unrealistically high debt loads. Students who must pay room and board to attend the university, and students from other parts of the province, are specially in need of support.

Needy students may also be supported from private donations and institutional funds. The university must continue to ensure that financial assistance is appropriately targeted and should seek to increase the funds available.

Scholarships and prizes help to attract, retain and reward superior academic performance. Students are strongly influenced in their choice of a university by the availability of substantial scholarships. The establishment of the Major Entrance Scholarship Program in 1985 gave UBC a high scholarship profile in the province, but this position should be consolidated and improved. To attract a higher proportion of out-of-province and foreign students, scholarships are needed for students from other provinces and from abroad.

The present annual expenditure on schol-

arships and prizes approximates \$2 million. This is an impressive figure, but not all deserving students receive awards, and many awards are smaller than is appropriate. Private support tends to be concentrated in the professional programs with relatively little support in the humanities. More scholarship support is needed for part time students.

Graduate students

In the 1986/87 academic year the total amount available for graduate fellowships was about \$2.8 million. Graduate students earned a further \$16.7 million from work related to their courses of study. The amount available for fellowships is not yet sufficient to provide adequate financial assistance for even the present graduate student enrolment. To attain the objective of a 6000 graduate enrolment, there must be twice as many awards available to graduate students.

In 1986/87, less than one-third of the candidates nominated received fellowships, and many of those who did not had first class records. In addition, the value of fellowships has failed to keep up with inflation and has not been adjusted to reflect the significant recent increase in fees.

Some Canadian universities provide additional grants to students who already hold other major competitive awards. UBC has chosen not to do this, as it could be done only by reducing the number of awards, but it is clear that superior graduate students are being lost to other universities.

An increase in support for graduate students, both in terms of present enrolment and anticipated increases in enrolment, is a high priority. The development of the graduate program and the training of students to take their place in an ever changing economy is totally dependent on strong financial support.

OBJECTIVES AND ACTIONS

OBJECTIVES

—Increase the number of graduate students to a total of 6,000 within five years, without compromising high admission standards.

—Admit as undergraduates only those applicants who are most likely to succeed in UBC's rigorous academic setting.

—Ensure that good students from all parts of British Columbia, from Canada and from outside Canada who can be expected to do well at UBC are given current and timely information about enrolment standards and procedures.

—Ensure that good students from the colleges have a fair and equitable opportunity for transfer.

—Ensure that there is sufficient scholarship, bursary and teaching assistantship funding available.

—Make UBC more accessible to part time students who meet academic standards.

—Provide advanced and professional credit courses to those beyond the Lower Mainland who cannot physically attend UBC.

ACTIONS

—A Task Force on Liaison, Recruiting and Admission, under the chairmanship of the Vice President Academic, has addressed a number of the objectives raised in this section and appropriate action has been taken.

—The new position, Vice President Student and Academic Services, has been created and filled.

—A new automatic registration system has been implemented.

—A review of counselling services and their effectiveness is being undertaken.

—An Office of School and College Liaison has been established and has begun implementing a long term plan for development of a many faceted liaison program with Canadian secondary schools and colleges.

—A review will be made of the past performance in their year of entry, of students entering university from high schools, or transferring from colleges, to determine how much UBC should raise its admission standards and consider additional criteria.

—A review will be made of the use of available scholarship funds and the freedom to use these in connection with support for good students from around the province and across the country. This will form the base for a component of the forthcoming matching fund raising drive.

—A task force will be established to examine how to make part time studies for credit more available in British Columbia.

STUDENT SERVICES

Many non-academic services of the university are student oriented and are paid for from the general operating budget; they contribute to both the academic and personal needs of the students in many ways, and can do much to create a supportive atmosphere.

The Office of the Registrar maintains student records; supplies information on admission, curriculum and other academic matters to faculty, students and the public; develops timetables and makes room assignments for teaching and examinations; conducts elections for the Chancellor, the Senate, each of the faculties and various university

bodies; and, through the Registrar, acts as secretary to faculties and to Senate and its committees.

The Office of the Registrar has recently been reviewed by a presidential task force, which recommended the establishment of a standing advisory committee representing the various elements of the university with which the office has close contact. The task force also recommended attention to the level and quality of service provided to students; the use of modern technology; and the need for review of staffing levels and space requirements.

The Office of Awards and Financial Aid administers two programs: one designed to recognize academic achievement through prizes and scholarships, the other to help students in financial need through a system of bursaries and loans.

The Student Counselling and Resources Centre provides a wide range of personal, career, educational and specialized counselling services. In addition to individual counselling, workshops are held on topics of educational, career, and social concern. Personality, career, and aptitude tests, as well as professional and academic entrance exams, are administered by the centre. Specialized counselling and educational services for disabled, mature, international, and women students are offered. The centre also maintains a comprehensive career and self-help resource library.

International students are given a place to meet and to receive advice and assistance at International House. Built almost 30 years ago with the assistance of Rotary International, the facilities have been a gathering place and a focal point for assistance for students from all parts of the world.

The Student Health Service is available to all students registered for credit courses. It provides many services, including care of illness or injury, preventive medicine, counselling and antigen and immunization administration and, where required, can arrange for hospitalization.

For prospective and currently enrolled women students, the Office for Women Students offers counselling on personal, educational, financial, social and career concerns. The changing role of women in contemporary society has added new dimensions to the functions of the office. The provision of adequate day care facilities is a case in point, to which the university is currently responding. For example, it would be useful if the office were to have a role in encouraging women to enter non-traditional areas of graduate study, and in promoting research related to women students. A review of the functions of the office will be done.

The President's Permanent Advisory Committee on the Disabled has recently been reactivated. The committee will offer advice on a wide range of concerns of the disabled, including an existing program to ensure easier access to the campus facilities.

These several student services are important to the mission of the university and it is imperative that they function at the optimum level.

OBJECTIVE AND ACTIONS

OBJECTIVE

—To provide services for students and, in the case of the Office of the Registrar, for the faculties, that are fully supportive of the university's academic goals, and that are supportive of the personal needs of students.

ACTIONS

—Implement as speedily as possible the recommendations of the President's Task Force on the Office of the Registrar.

—Ensure that the university can provide effective scholarship, bursary and teaching assistant funding at both graduate and undergraduate levels.

—Ensure that counselling and resource, health and other like services are in a position to provide adequate support to all students who require it. A review of the Office for Women Students will be undertaken.

SUPPORT SERVICES

INTRODUCTION

The university is a large community which must be fed and housed. Each day during the Winter Session, 30,000 people come to the campus; for many of them, meals are provided by the Department of Food Services; over 4,000 students live in residences, run by the Department of Student Housing. It takes little reflection to appreciate the time, hard work, and planning that goes into the provision of services, and of their importance to the university. Buildings must be cleaned, heated, equipped, maintained in good repair. Thousands of financial records must be maintained; supplies and equipment costing millions of dollars annually must be ordered. Each day the university receives hundreds of visitors and telephone calls, and each day issues releases of news to the media. These and a wide range of other services underpin the operations of the university. They are essential to its well being; without them, the academic mission of the university could not be achieved.

NON ACADEMIC SERVICES

A large university like UBC needs cen-

trally operated support services. The five essential services are: personnel, physical plant, financial services, purchasing, and budget, planning and systems management.

The Department of Personnel Services has charge of personnel and labour relations of the non-teaching staff, those in clerical, administrative or technical positions, who provide support to the academic departments. The goals of Personnel Services are: to ensure that UBC is an outstanding employer with fair employment practices and safe working conditions; to have fully trained employees; and to have a good human resources information system.

The department currently provides a wide range of functions and services:

- recruitment and selection of staff;
- contract negotiations for and administration of five collective agreements;
- personnel policies and procedures for all non-union staff;
- job evaluation and classification, and salary administration programs for all staff;
- pension and benefits administration for faculty and staff;
- development and maintenance of employment records for faculty and staff;
- manpower planning, training, and development;
- occupational health and safety policies and programs;
- management of parking and security operations.

The physical plant group has consisted of the Department of Facilities Planning, the Department of Plant Design and Construction, and the Department of Plant Operations. A planned organization change will integrate the first two of these into one department, Physical Planning and Development, which will be responsible for the growth and change of the physical environment of the university.

Physical facility development activity on campus involves between 300-400 projects per year, varying in cost from a few thousand dollars to major new facilities such as the \$16 million Chemistry-Physics building. The new department will act as liaison with the architect, manage the construction after the contract has been awarded, and bear the responsibility for ensuring conformance to national and provincial codes and regulations.

The Department of Plant Operations, through an ongoing program of inspection, cleaning, maintenance and repair, protects the investment in buildings and their component systems; utility distribution systems; and the university grounds. The total replacement value of the physical assets of UBC has been estimated at \$800 million. There are 450 buildings of varying quality located throughout 400 hectares of campus, 80 kilometers of underground piping and electrical cables, 86 hectares of landscaped areas, and 32 hectares of roads and lanes.

Immediate goals of plant operations are the development of a fully automated and totally integrated maintenance system, completion of the installation of a campus preventive maintenance program, and the achievement of further savings in energy costs.

The Department of Financial Services performs basic accounting functions and aims to provide timely, reliable financial information for decision making and policy formulation, and good service to the campus and external communities. Each month the department completes 16,700 payroll items, 16,000 vendor payments, and 10,000 cash receipts.

Financial advice is given on capital financing, investment, lease and contract administration. Expenditures from operating, research grant, endowment and trust accounts are monitored to ensure compliance with granting agency guidelines, legal trustee requirements and university policies. The department implements internal financial controls to ensure that financial resources are properly and efficiently managed and that cash resources achieve maximum rates of return.

The Purchasing Department is responsible for acquisition of materials, equipment and services for all parts of the university, each year processing 41,000 requisitions for an expenditure of \$55 million, and ensuring that purchasing activities are conducted with integrity, in compliance with the law and relevant policies of the university. The department's goals for the future centre on automating procedures to establish a paperless purchasing process, and developing procedures to standardize purchase of high volume-low cost items.

The Office of Budget, Planning and Systems Management assists in formulation, maintenance, and monitoring of the General Purpose Operating Fund Budget and the University Development Fund, and provides information, reports and analyses for the management of the university. These functions are reflected in their activities, such as the annual preparation and publication of the operating budget, other annual reports (e.g., the University Fact Book, and Profiles of Academic and

Administrative Departments), and intra- and inter-university analyses and responses to ad hoc requests relating to statistical aspects of the university operation.

Information Systems Management supports management planning and decision making, and the efficient performance of administrative functions, through application of current information technology to the development and maintenance of quality, integrated, cost-effective administrative systems. Together with other service departments, the division is undertaking phased redevelopment, over five to seven years, of core administrative systems (financial, student, alumni-development, human resources, and physical facilities), and a number of smaller stand alone systems associated with ancillary operations. The division has four personnel groups: development, production systems support, technical support, and information centre.

The objective of each of the five foregoing departments is to provide the needed services efficiently and economically. The administrative departments were recently included in a review by outside consultants whose recommendations, when fully implemented by 1988/89, will result in annual savings of \$1 million. Energy savings are also in excess of \$1.2 million per year.

On occasion, it is necessary to make initial extra expenditure to save money in the long term. For example, a new telephone system at a cost of \$4.8 million will provide an up-to-date service and will pay for itself in 10 years or less, and then make significant ongoing annual savings.

In 1985/86, insurance premiums rose from \$390,000 to \$1.1 million per year, an increase accompanied by reduced coverage and increased deductibles. Effective January 1, 1988, UBC joined with over 40 other Canadian universities in a mutual insurance scheme, the Canadian Universities Reciprocal Insurance Exchange (CURIE), enabling \$250,000 savings in premiums, and increased risk coverage, including earthquake coverage not previously obtainable at reasonable rates.

The Community Relations office provides a comprehensive program directed toward the campus community, the general public, government, business and industry, and the media. The primary goals are to increase public understanding and support of the university, and to keep the campus community informed about issues and policies.

The office provides news media with information about research activities and other matters of public interest, conducts a community liaison program that includes a Speakers' Bureau and campus tours, coordinates special events such as Open House, and provides public and media relations counselling to UBC academic and administrative units. Publications include the President's Report, the tabloid newspaper UBC Reports, a Faculty Experts Resource Guide, and various brochures and pamphlets.

There are many opportunities for specific community relations initiatives. For example, the university's Open House in March, 1987, was an overwhelming success, with an estimated 150,000 people attending. MLA days are an excellent means of letting elected Members of the Legislature know what is happening at the university. The Speakers' Bureau program, now a branch of the Community Relations office, was responsible for 200 lectures in 1986, but there is a much greater demand from throughout the province.

There are also new opportunities. For example, a series of three minute radio programs highlighting some of UBC's research accomplishments has been very well received by 240 radio stations throughout Canada on the Broadcast News Network. Similar series will continue to stimulate interest in the ever changing research mosaic.

The university should also better advertise the number of visitors it attracts to the province; what it offers to the community by way of cultural and recreational activities; and, that it is a major centre of tourism for the province, attracting conferences and workshops organized by provincial, national and international organizations, drawing participants from all across Canada and throughout the world.

In 1986 UBC hosted over 300 conferences, and in so doing, ran the largest hotel facilities in the province, renting 200,000 bed nights in student residences when they were not needed for students. Conferences are an essential element in enabling those who teach and learn at UBC to keep abreast of the most recent developments in their disciplines. They have the important side effect of bringing thousands of tourists to the province, contributing substantially to an important provincial industry.

The university contribution to the cultural and athletic life of the community is also substantial. Concerts and theatre productions are open to the public almost every week, and faculty and students perform in Vancouver and elsewhere in the province and in Canada. Athletic events attract many people from the Lower Mainland and bring in

teams from across western Canada and Pacific Rim countries. The university's gardens, research forests, and museums are in themselves major attractions. These several dimensions of the university may go unnoticed, but are important components of British Columbia society.

The service departments will do their jobs properly if those who work in them have the best possible working conditions and appropriate rewards and appointments. As part of its general response to the federal initiative on employment equity, adequate opportunities must be available for women, visible minorities, native peoples, and the handicapped. Equally, the university should recognize and reward performance by use of a fair and equitable system of evaluation and compensation.

OBJECTIVES AND ACTION

OBJECTIVES

—The objective of each department is to provide to the university community the best possible service in an economical and efficient manner.

—The university should provide working conditions that would be provided by a model employer.

ACTIONS

—The Vice President Finance and Administration will continue to review all areas of activity for possible cost savings.

—Procedures will be developed for ensuring that departments are responsive, within the area of their respective responsibilities, to teaching, research, administrative, and planning needs of the university.

—Employment practices will be kept under review to assure access to employment of all qualified members of the community and to provide the best possible working conditions to those employed at the university.

ANCILLARY SERVICES

A number of units at the university are designated ancillary services, and are intended to operate on a break-even basis, except where a subsidy from the university operating budget is provided for a specific purpose.

Units that provide service to the university as a whole include the Bookstore, UBC Press, Food Services, Student Housing, and Parking. All, except UBC Press, operate on a full break-even basis; the Bookstore, Housing and Parking also meet the costs of construction and maintenance of their buildings. Housing has developed \$38 million of new construction over the past five years. The Bookstore moved into a new \$6 million building in 1983. A new \$6 million parkade is currently under construction.

UBC Press has a distinguished record of publication of books written by UBC faculty members. Many publications have been highly effective in conveying the work of the university to the broader community. But, like all university presses, UBC Press publishes many books that would not be successful commercially because of their highly specialized nature, which are nevertheless valuable contributions to scholarship. The university provides UBC Press with an operating 'subsidy' of \$200,000 per year, and services space. Consistent with maintaining the standards of the Press, the subsidy will be reduced and, as in the use of other ancillary services, the operation will be reviewed from time to time.

Two ancillary services, Housing and Athletics, relate specifically to students.

The university can provide on-campus accommodation for almost 20% of its students, but more is needed. For students from other parts of the province, on-campus accommodation is highly desirable. Even for students who live in the Lower Mainland, a daily journey to and from the university is time consuming and expensive. Graduate students from elsewhere in Canada or abroad are best housed on campus. The target is to provide housing for about 25% of the student body by the turn of the century, and at the same time to replace the army huts that were brought to the campus shortly after World War II. In the last ten years approximately 1200 new student accommodation units have been built.

Financing student housing is on a full cost-recovery basis and for any new accommodation includes capital costs.

A vigorous athletic program is an important aspect of any university community. It provides needed recreational opportunities for students, and fosters university spirit and community interest. A flourishing intramural and recreational sports program must be encouraged. This has always been a feature of university life and is of added significance in a society that places increasing emphasis on good health and fitness.

It has been decided that UBC also should remain committed to competition at the national level, in women's and men's sports. But there is a limit, in large measure financial, on the range of sports in which the university can effectively compete. The athletics program will be operated inde-

pendently of the academic programs of the School of Physical Education. There will continue to be contacts in a variety of ways between the academic enterprise and competitive and recreational athletics.

The bulk of the income to support athletic activities will continue to come from dedicated student fees and university operating funds, but opportunities for revenues through community involvement should be more fully explored. A coordinated management strategy for all athletic and recreational facilities is being developed.

OBJECTIVES AND ACTIONS

OBJECTIVES

—To continue to operate all ancillary services so that they provide first rate service to those who use them.

—To operate all ancillary services on a full break even recovery basis.

—Specifically, (a) to provide, as financial circumstances permit, on-campus housing for 25% of the student body by the turn of the century; (b) to maintain a rigorous intramural and competitive athletics program.

ACTION

—The appropriate vice president will prepare a five year plan for each of the ancillary services to ensure that they can efficiently continue to meet their basic objectives.

LANDS, BUILDINGS, LIBRARIES, COMPUTING AND EQUIPMENT

The UBC campus is essentially a small city which must be effectively managed if the university is to become a world class institution. Campus development must be carefully planned. The university's various activities must be adequately housed. There must be first class libraries, first class computer systems, and state-of-the-art equipment.

THE UBC CAMPUS AND THE UNIVERSITY ENDOWMENT LANDS

A master plan was developed between 1979 and 1982, which laid out development rules and recommendations for the campus, indicating that the existing academic core can be developed more densely. An 11 hectare parcel of land on the corner of Wesbrook and 16th Avenue is planned for development as market housing without endangering foreseeable future needs for academic purposes. To this end, the university has formed a subsidiary company to develop the land, providing over 600 living units on long term leaseholds, providing an annual return in excess of \$4 million. The subsidiary company will be looking at other campus lands for potential development in the interest of the university community. For example, a feasibility study for a campus hotel to serve the many campus and hospital visitors will be undertaken.

A government resolution on the future of the University Endowment Lands, a Crown land area of about 700 hectares adjacent to the campus, may be forthcoming. The university has maintained throughout past discussions that most of the area should have formal status as a park, of benefit not only to the community as a whole, but to the university for teaching and research purposes. But, some portion should be made available to meet the original objectives of developing revenues to help fund the university. For example, many decades hence, 115 hectares for market housing could yield in excess of \$50 million annually. The university has also advocated reserving 40 hectares of land adjacent to UBC Discovery Park for future research and development activities.

BUILDINGS

The UBC campus is known throughout Canada as being "unfinished." There is still a great deal of temporary space that has been temporary for far too many years; there are chronic needs for space for long standing activities, and space is needed for new areas of development as the mission of the university changes. At present there is a total of 5.5 million gross square feet of space on campus, and approximately 600,000 gross square feet of space in the six teaching hospitals.

A significant portion of the existing campus space is grossly inadequate. Forty per cent of the total square footage is 30 years old, 26% is over 40 years old, and 9% is over 50 years old. Many buildings can no longer be used effectively or safely, and need replacement or total renovation to meet acceptable standards. Many activities still take place in the old World War II army huts. Over 500,000 square feet of space is in "temporary" buildings, much of it built in the 1920s, with an intended lifespan of 25 years.

The changing mission of the university has also created a demand for a new and different style of space. The increasing emphasis on graduate work and research has created a need for new accommodation in the sciences, in those profes-

sional faculties that build on a basic training in the sciences, as well as in other disciplines.

In the late 1970s, the Senate Academic Building Needs Committee developed a five year building plan. The plan could not be implemented because of lack of funds, particularly during the government financial restraint years of the early 1980s.

The reality that government funds alone will not be enough to provide the needed facilities has led to the inclusion of a significant capital component in the forthcoming fund raising campaign. It is expected that the monies raised, coupled with government matching funds, will help to finance construction for the following five year plan high priority projects: University Services Project, \$16.5 million; Pacific Centre for Forest Sciences Research and Education, \$40 million; Centre for Integrated Computer Systems Research, \$13.8 million; UBC Library and David Lam Management Research Library, \$30.9 million; Performing Arts Centre, \$28.4 million; Advanced Materials and Process Development Laboratories, \$17.1 million; for a total of \$146.7 million.

The total cost of buildings over the full ten year period of the two plans is \$300 million.

The government has indicated a willingness to encourage the replacement of costly inefficient hut or trailer spaces by alterations to existing permanent buildings or the building of new space. Several projects are in the planning stage, including: relocation of the traffic and security offices, the key centre, and telephone communications; reorganization of Faculty of Education space, now in 18 locations, including over 30,000 square feet of WWII army hut space; and a small building project to house the Child Study Centre of the Faculty of Education.

A new building for Chemistry and Physics, funded by a grant of \$16.4 million from the provincial government, is now under construction.

Projects at the planning stage, but which have been funded, include: an expansion to the Museum of Anthropology to house the Koerner ceramic collection; development of the David Lam Asian Garden Centre in the Botanical Garden (no net operating cost); establishment of a Medical Alumni and Student Centre at the Vancouver General Hospital, to be funded through a special appeal and student donations, and to be at no net operating cost to the university.

Either with respect to its existing space or additional space, there are other ongoing issues. Space must be effectively used. All space is a university resource and should be assigned to the highest priority use. New buildings should be built in as flexible a manner as possible so that they can be adapted to meet changing university need. There must be regular monitoring of the use of existing space to ensure efficient and appropriate use. A study of medical space and related hospital space is now underway.

It is imperative that the university's buildings and grounds be properly serviced and maintained. This is not only a necessity for efficient functioning, but in the long run makes sound economic sense. In times of budget restraint, servicing, maintenance and renovations have not been done as regularly or as quickly as desirable. The estimated replacement value of the university's buildings is \$800 million. It will require \$136 million to bring them up to modern standards; a further \$18 million is needed for grounds and utilities renewal. On an ongoing basis, there is need for between 1.5% and 2% of the replacement value of buildings each year; i.e., between \$12 million and \$16 million.

The provincial government has been regularly pressed for a realistic allocation for these purposes, and public works and renovations funding has increased significantly over the last three years.

OBJECTIVES AND ACTIONS

OBJECTIVES

—To provide the university with adequate space for its existing needs, and to ensure new space is made available in a timely fashion for new and changing initiatives.

—To establish a regular pattern of current maintenance and repair of existing buildings, as well as making up the backlog of deferred maintenance and repair.

—To keep space allocations under review to ensure that space is being used effectively and in accordance with the university's priorities.

ACTIONS

—To implement the five year building plan.

—To review and determine priorities for the construction of new space on the campus.

—To continue to refine the existing procedures for determining priorities with respect to alterations.

—To prepare the second five year building plan in detail.

—To develop policies for space allocation and reallocation which reflect changes in teaching, research and other activities.

LIBRARIES

In his first annual report as President, Dr. Strangway focussed on the library. The decision to speak only of the library was an indication of its central position in the university.

The UBC library is a large and complex system, consisting of the main library and 15 branch libraries, three of which are located in teaching hospitals affiliated with the university. The system contains over 2.7 million books, 4.7 million units of microfilms, films, records and other pieces of materials. The total collection is valued at \$315 million; effectively, it is beyond price.

The library is a fundamental resource for teaching and research. In addition to its use by UBC faculty and students, it is used extensively by faculty, teachers and students from other universities, the colleges, and the schools; by business people, professional people and by government; and by private citizens. It is very much a provincial resource, and is the primary research library in British Columbia, indeed in western Canada.

There are significant national and international dimensions to the library. It is the second largest research library in Canada, and is one of the main links in a national library system which, particularly in the social sciences and humanities, is found almost exclusively in Canada's universities.

The library is part of a network of North American libraries from which it benefits and to which it contributes. UBC collections are accessible to libraries across North America; in return, UBC draws from the holdings of other libraries. Some exchanges go beyond the continent. For example, the Crane Library sends copies of its "talking books" for the blind and visually disabled to libraries and individuals around the world.

It is the professional staff, the librarians, who make the resources of the library available to its users and who are endlessly engaged in teaching new users how best to take advantage of what the library has to offer. Their dedicated service has been a major factor in the continued contribution of the library to the educational mission of the university.

Three problems face the library: the availability and quality of space, the maintenance of collections, and the need to continue to develop and improve techniques for handling increasingly large collections of conventional and unconventional materials.

Over the years, the library has not expanded at a rate sufficient to keep up with normal growth. In two or three years the system, with the exception of the law library, will have reached full working capacity.

Much of the existing space is well below adequate standards. The main library had fallen short of building code requirements. The defects were cured, in part, by the installation of a new fire alarm and sprinkler system at a cost of \$1 million, but the building remains in urgent need of extensive renovation and restoration.

To deal with pressure on space, the library has given a high priority to the purchase of microfilms. It has now the largest microfilm collection in Canada, and the twelfth largest among the 106 libraries of the Association of Research Libraries in North America. Parts of the collection have been moved into storage making it difficult to retrieve.

In recent years, the library has not been able to maintain its collections. Purchasing power has been adversely affected by financial restraint, inflation, and the drop in the value of the Canadian dollar in relation to other world currencies. The level of purchases has been maintained, but there has been a world wide increase in rates of publication.

In an effort to protect purchasing power, library staff has been reduced by 50 positions since 1980. Computers handle the circulation of materials at half the cost that would otherwise be necessary. External services are cost-recovered. There is, however, a limit to the extent to which efficiencies, automation, and cost-recoveries can result in savings.

As the library moves into the electronic age, it will need more computing equipment and more highly trained personnel to assist users in working in an electronic environment. In this regard, UBC has fallen behind other Canadian universities. There are too few terminals and insufficient computing capacity. The library catalogue prior to 1978 is still not in machine readable format.

OBJECTIVES AND ACTIONS

OBJECTIVES

—To develop the library in a way that is appropriate to a world class university.

ACTIONS

—To renovate existing space and to build new space that is adequate for the existing and medium term needs of the library.

—To continue to protect and to increase funds for library acquisitions.

—To explore ways of providing a high standard of service at a reasonable cost, particularly through automation.

COMPUTING, NETWORKING AND TELECOMMUNICATIONS SERVICES

Computing and data networking services have become essential parts of the university's infrastructure, and are extensively utilized for teaching, research, and administration. Growth in the use of new technology has not been uniform throughout the various academic and administrative departments. There is much to do to enhance the computing and networking environment.

A large proportion of the research at UBC would not be possible without state-of-the-art distributed and central computer facilities. The computer is increasingly a recognized teaching tool. As more and more incoming students are computer literate, it is imperative that teaching techniques match the skills of students. The administrative structure of the university is increasingly dependent on computer facilities. As in any large organization where there is a need for information storage and retrieval, a good integrated computer system comprising both distributed and central facilities is a necessity.

A major change in the university computing environment is in progress throughout the blending of distributed personal workstations, minicomputers and mainframe computer systems, and a comprehensive data network, supported by a variety of local and remote servers. The new telephone system and the associated cable plant will play a significant role in the development of a comprehensive data communication network on campus.

The university has made significant additions to its computer capabilities in recent years and will continue to do so. The Computing Centre has taken a leadership role in developing a data network (BCNet) linking the three provincial uni-

versities, TRIUMF, and the Advanced Systems Institute, with provisions for providing access to other research organizations in the province, and interlinking with the National Science Foundation in the United States.

There are, in relation to the provision of computer services, a large number of decisions to be addressed in the future. Experience in other jurisdictions indicates the success of budgetary systems which encourage users to make informed choices as to which type of equipment or service is most effective, desirable and affordable for their particular needs. A system of this kind is being put in place.

A broadly representative advisory group (Campus Advisory Board on Computing) has been established for regular consultation with the campus community on all matters affecting computing at UBC.

OBJECTIVES AND ACTIONS

OBJECTIVES

—To develop computing, networking and telecommunications policies, facilities and support infrastructure appropriate to a world class research intensive university.

ACTIONS

—Develop a comprehensive five year plan for computing, networking and telecommunication services, and develop related policies and protocols.

—Implement a system of decentralized budgeting for computing, networking and telecommunication services.

SPECIALIZED EQUIPMENT

Aside from the need for library materials and computing facilities, and from the requirements for all the usual paraphernalia associated with teaching, the university has a substantial continuing pressure for the acquisition and operating costs of specialized equipment. New technologies open the

door to new discoveries and are essential for economic competitiveness. To properly address its mission, the university must have specialized equipment that is of the latest and most advanced design. Students expect (and should expect) to get hands-on experience with state-of-the-art equipment if they are to be properly equipped for their careers when they graduate. Local industry looks to the university to provide access to such equipment, for that is the efficient way of meeting their occasional or part time needs.

Some typical examples from the science sector are: electron microscopes, centrifuges, gas chromatographs, mass spectrometers, nuclear magnetic resonance spectrometers, amino acid analyzers, protein sequencers, imaging devices of various kinds, controlled environment chambers and microprobes. The list is long, reflecting the sophisticated methodologies of the full range of contemporary basic and applied science.

The working life of most of this equipment is about 5 to 10 years, by which time it is either worn out or obsolete and no longer adequate for either research or teaching purposes. Consequently, there is a strong and consistent demand for equipment. The demand is heightened in some fields of study, particularly newer and highly competitive fields such as biotechnology and advanced materials science, because it is difficult to recruit young faculty members or to retain strong researchers without guaranteeing the availability of first class equipment and the funds for its operation.

The need for specialized equipment is by no means confined to teaching and research in science. While it is true that scholars in the humanities and social sciences depend primarily upon the library as their laboratory, and books as their "equipment," there are also requirements for highly specialized library materials and highly specialized equipment. For example, many researchers require access to the census data of Statistics Canada. Art history requires extensive collections of photographic equipment; music must have a large collec-

sector will be the key to future success. In the past, donors have made major contributions for the construction of buildings. They have supported teaching and research by donations for the purchase of books and equipment, and for the endowment of chairs and professorships. The list of available scholarships, prizes and bursaries is testimony to the generosity of the many organizations, individuals, and families whose gifts have provided recognition and financial help to outstanding and needy students.

The essential foundation for obtaining financial support is an understanding, by potential donors, of what the university is doing and the nature of its current needs. Fund raising must be systematic and coordinated. The university recently established a Development Office, funded in part from the base operating budget and in part from income generated from fund raising. A presidential advisory committee on development policy has been established to review fund raising policies and to coordinate fund raising activities across campus.

The immediate objective is to double both the number of donors and the number of donated dollars within a two year period. The Alumni Fund, in collaboration with the Westbrook Society, has increased alumni participation in the last two years from 7% to 10%, and the total amount raised from \$700,000 to \$1.5 million. The number of donors to the university has grown to over 12,000 individuals, corporations, foundations and other organizations. But more will have to happen.

The university now recognizes donors by offering, among other things, membership in "giving societies." Membership in the Westbrook Society is open to those who donate \$1,000 or more on an annual basis; the Chancellor's Circle is available to those who have donated in total \$25,000 or more. New giving categories are now being established, including the President's Circle (cumulative donations of \$1 million).

These societies do more than recognize donors. Through them, the university can maintain contact with donors, keeping them informed of current teaching and research developments so that, as ambassadors for the university, they may bring further community support.

UBC will launch a major capital fund raising campaign in 1988, the first campus wide campaign in 20 years. In preparation, the university has been reviewing its priorities and developing proposals with respect to support for teaching, student and research activities and funding for buildings and major equipment. The success of the campaign will depend on a clear articulation to the community of the needs of UBC; sound planning and organization, which is the responsibility of the Development Office; and the support of the friends of UBC in the community. The campaign will be a major factor in enabling the university to develop the capacities it needs to be the type of institution that its students and the province deserve. It will be the responsibility of the Development Office, Community Relations, and the Alumni, to ensure

tion of recordings, as well as musical instruments. Anthropology is helpless without museum collections of artifacts. Theatre requires costumes and sets; film studies needs cameras and editing equipment. These and many more examples illustrate the pressing requirement for equipment in all parts of the university enterprise.

Funds for the purchase of equipment have most commonly come from two sources: allocations from the provincial government, either in the operating budget or as debenture funding; and from the various research granting agencies, principally the national granting councils. In recent years, funds from both sources have been shrinking, particularly those from the province. Increasingly, the university is relying on the national granting councils for both major and minor items of equipment which are used for both research and teaching. The competition with other universities is intense, and although UBC has done well in the competitions, relatively speaking, the total number of awards falls far short of meeting the demand.

It is clearly necessary that there be developed a systematic plan for equipment replacement. The commonly accepted time period for a cycle of full replacement is eight years. The present value of equipment at the university approximates \$200 million. The equipment replacement and renewal expenditure should thus approximate \$25 million per year. In present circumstances, it is unrealistic to expect more than \$5 to \$10 million per year from grant sources. A provincially funded provision of \$15 million per year should be given high priority.

OBJECTIVES AND ACTIONS

OBJECTIVES

—To obtain continuing funding of \$15 million per year for equipment replacement and renewal.

ACTIONS

—Requests for funding to the provincial government will be renewed and reinforced.

PART III: THE UNIVERSITY AND THE COMMUNITY

ALUMNI, THEIR FAMILIES AND FRIENDS

It has been said that in addition to having outstanding faculty and students, the difference between an ordinary university and a great university is its alumni. There are now over 130,000 graduates of UBC; many make highly significant contributions to their university. That participation should be widened until all alumni are involved.

The first step is to know where the alumni are, to keep track of the 130,000 graduates and 4,000 or more a year who are added. At present, the address records of alumni are approximately 70% correct. A recently installed automated system will help attain an accuracy of 95% or better.

The next step is to keep alumni informed about university activities and to help them keep in touch with other alumni. The UBC Alumni Chronicle, published quarterly and distributed to all alumni, should be enlarged so that alumni may know more about the exciting things that are happening at the university, about the issues that confront it and how they are being addressed, and about the activities of the alumni themselves.

It is also important that alumni not only read about the university, but that they also talk about it and hear directly about what it is doing, hence the importance of class reunions. The Alumni Association provides groups with assistance in organizing class reunions and special events. Class reunions, of which there were 24 in 1986/87, are the most common, best attended, and most successful form of communication between alumni and the university. They contribute substantially to sustained and enhanced alumni support, both financially and in terms of good will.

The branch activities of the Alumni Association are of increasing importance. Nearly half of the alumni live outside the Lower Mainland of British Columbia, and many live in other provinces and other countries. Vigorous branch activity is a necessity if these alumni are to be kept informed and supportive. There is already a developing network of branches in the province (e.g., Victoria, Nanaimo, Prince George, Kamloops, Kelowna), in other provinces (e.g., Ottawa, Toronto, Montreal, Calgary, Edmonton), and outside Canada (e.g., New York, Washington, Denver, Houston, San Francisco, San Diego, Los Angeles, Seattle, London, Taipei, Hong Kong, Tokyo, Singapore, Kuala Lumpur). The branch network needs to be expanded and strengthened.

Given the size of UBC, many alumni feel a closer affiliation with a particular faculty, department or discipline than with the university as a whole. That sense of affiliation needs to be fostered. The Alumni Association encourages the establishment of divisions within the association, organized by faculty, department or discipline. There are now 21 active divisions, each with an elected board, a newsletter and/or at least one annual event. In 1986/87, 21 division events were held.

It is also the aim of the Alumni Association, in association with the Alma Mater Society and the Alumni Association's student affairs committees, to undertake recruitment initiatives to encourage academically well qualified students to come to UBC. It is imperative that students and parents receive sound information regarding UBC. What better person than an alumnus, faculty member or currently enrolled student to provide that information?

COMMUNITY SUPPORT FOR THE UNIVERSITY

The university receives support from the community in two forms. First, many give generously of their time through service on the Board of Governors, Senate, various boards and committees, and alumni groups. In several faculties, members of the community participate directly in teaching and research activities. Influential citizens speak out on behalf of and in support of UBC in political, business, cultural and other spheres. These contributions have helped build UBC and will have much to do with its future success.

Second, the community provides financial support. The provincial operating grant will not enable the university to develop as it could do at the margin of excellence. That extra touch of distinction can only come from the whole hearted financial support of those in the community with the foresight to see the ultimate benefits.

Through its own efforts, the university already does much and plans to do more to strengthen its financial base. The faculty are vigorous in their pursuit of research grants and contracts; they welcome competition as a spur to excellence. Inventions that flow from research yield royalties that in 1987/88 totalled \$600,000. The university has established a real estate corporation, the returns from which will also serve to enhance the financial base.

But the strong support of the private

that the momentum gained from the campaign is maintained.

The recent announcement by the Premier of British Columbia of matching funding of \$100 million has given the campaign even greater promise and has clearly indicated that the government, in the Premier's words, "is committed to working together with the universities, the colleges, and the private sector, to create a postsecondary educational system, second to none in Canada."

OBJECTIVE AND ACTIONS

OBJECTIVES

—To keep alumni, their families and friends, the community at large, and selected groups within it, informed about all aspects of the university.

—To enlist the aid of alumni through service and donations in advancing the interests of the university.

ACTIONS

—Develop and continually update the list of alumni and friends of the university.

—Continue to inform alumni and the community about the university through regular and special publications, through special events, and through publicity in all media.

—Undertake a major fund raising campaign, beginning in 1988.

—Strengthen the university's regular fund raising activities.

CONCLUSION

The goal of the University of British Columbia is clear: to become a university of international stature. In many areas of its activities it has already achieved that goal; in others, it has made significant progress.

To attain and maintain its status as a first class university, UBC reaffirms its dedication to excellence in teaching and research. It will encourage and recognize the value of good teaching in the arts and sciences, in its professional faculties, and in its graduate programs. It will build and expand on a research capability that is already of world stature.

The essential ingredients for the implementation of this mission are many: a first class faculty; intelligent and well motivated students; excellent libraries; excellent computer and communication systems; adequate space and equipment; and a smooth functioning array of support services. More broadly, it must have the support and confidence of the community it serves.

By fulfilling its mission, the university will best serve the people of the province. It will play an integral, yet unique, role in the postsecondary education system, providing leadership in the cultural, social and economic life of the province.

In the world of tomorrow, every region that aspires to civilized progress and economic success will need a world class university. With the support of its community, The University of British Columbia will meet that need for British Columbia.

TABLES

MISSION STATEMENT AND STRATEGIC PLAN CONSULTATIONS

1. CONSULTATIONS TO DATE

1986

JANUARY

A draft planning paper, Toward a Mission Statement for the University of British Columbia, 1986-2000, was circulated to a number of groups on campus. The paper raised a wide range of questions which needed to be considered in preparing a Mission Statement. Comments were requested on the draft.

MARCH-JUNE

Revised version of the draft circulated and comments requested from a number of groups and individuals, including the Board of Governors, Senate, Deans, Heads and Directors, Heads and Directors of Administrative Units, Faculty Association, student groups.

MARCH-APRIL

Meetings to discuss the revised draft were held with the following:

March 12	A.M.S. representatives
March 26	Faculty Association executive
March 27	Deans and Heads, Faculties of Agricultural Sciences and Forestry
March 28	Heads and Directors of administrative units
April 01	Deans and Heads, Faculties of Medicine and Dentistry
April 08	Deans, Heads, Directors, Faculties of Applied Science and Science
	Deans, Heads, Directors, Faculties of Education and Graduate Studies
April 09	Deans, Heads, Directors, Faculty of Arts
April 23	Faculty Women's Association

JUNE

Revised draft sent to approximately 270 professors emeriti and emerita with a request for comments. A large number of responses were received over the following months.

DECEMBER

Proposed Mission Statement discussed at a meeting with college principals.

1987

FEBRUARY-JUNE

A draft Mission Statement prepared.

AUGUST

Draft and a revised set of questions circulated to Deans.

AUGUST-SEPTEMBER

Meetings with Deans individually to discuss the draft, and written comments from Deans.

SEPTEMBER-NOVEMBER

A second draft of the Mission Statement prepared.

DECEMBER

The second draft circulated to Deans for comment.

1988

JANUARY

A third draft of the Mission Statement prepared.

FEBRUARY

Third draft circulated to various groups asking for comments. The following meetings were held to discuss the third draft.

Feb. 17	Deans, Heads, Directors, Faculty of Arts
Feb. 29	Deans and Heads, Faculties of Dentistry and Medicine

MARCH

March 01	Deans and Heads, Faculties of Agricultural Sciences and Forestry
March 02	Deans and Heads, Faculties of Applied Science and Science
March 15	Deans and Division Heads, Faculty of Commerce & Business Administration
	Deans and Heads, Faculties of Education and Graduate Studies
March 21	Heads and Directors, Administrative Units
March 25	President's Advisory Committee on Continuing Education and others involved in continuing education activities
March 29	Senate Budget Committee

MARCH-APRIL

A fourth draft of the Mission Statement prepared.

APRIL

The fourth draft was circulated and meetings to discuss it were held with the following groups:

April 20	Faculty Association executive
	Student representatives
	Alumni Senators
	Senate
April	Second meeting with Faculty Association
	Circulated to Department Heads and to Heads and Directors of Administrative Units
April	Meeting with Department Heads

MAY

May 05	Board of Governors
	Circulated to Alumni Association executive and to Alumni Past Presidents for comment.
	Circulated to Professors Emeriti for comment
May 31	Fifth draft prepared and published for wide circulation to faculty, staff and students requesting comments

2. PROPOSED SCHEDULE FOR COMPLETION OF MISSION STATEMENT

JUNE

Meeting with Past Presidents of Alumni Association
Meeting with College Principals (planned)

JULY-AUGUST

Preparation of final version of the Mission Statement

SEPTEMBER-OCTOBER

To the Board of Governors and Senate in its final form

TABLE 1

A 1986 UBC GRADUATES RESIDING IN KAMLOOPS

Arts	258
Science	134
Agriculture	37
Forestry	61
Medicine	21
Dentistry	14
Rehabilitation Medicine	13
Education	293
Pharmaceutical Sciences	33
Engineering	73
Nursing	20
Architecture	6
Law	82
Commerce and B.A.	64

Total 1,109

B UBC GRADUATES FROM RANDOMLY SELECTED BRITISH COLUMBIA PLACES OF RESIDENCE (1987)

Alert Bay, Ashcroft, Boswell
Chase, Creston, Horsefly,
Lumby, Mill Bay, Ruskin, Youbou --
1 each

Squamish	10
Duncan	15
Vernon	25
Chilliwack	26
Prince George	38
Kamloops	65
Victoria	75
Surrey	101
Burnaby	195
Richmond	233
North Vancouver	241

TABLE 2

CARNEGIE FOUNDATION CLASSIFICATIONS

RESEARCH I CATEGORY (USA) (Alphabetically by State)

University of Arizona
California Institute of Technology
Stanford University
University of California, Berkeley
University of California, Davis
University of California, Irvine
University of California, Los Angeles
University of California, San Diego
University of California, San Francisco
University of Southern California
Colorado State University
University of Colorado, Boulder
University of Connecticut
Yale University
Howard University (D.C.)
University of Florida
University of Miami
Georgia Institute of Technology
University of Georgia
University of Hawaii, Manoa
Northwestern University
University of Chicago
University of Illinois, Chicago
University of Illinois, Urbana-Champaign
Indiana University, Bloomington
Purdue University, Main Campus
University of Iowa
University of Kentucky
Johns Hopkins University
Louisiana State University and A&M C
University of Maryland, College Park
Boston University
Harvard University
Massachusetts Institute of Technology
Michigan State University
University of Michigan, Ann Arbor
University of Minnesota, Twin Cities
University of Missouri, Columbia
Washington University
Princeton University
Rutgers, State Univ. of New Jersey at New Brunswick
New Mexico State University, Main Campus
University of New Mexico, Main Campus
Columbia University
Cornell University

New York University
Rockefeller University
State University of New York, Stony Brook
University of Rochester
Yeshiva University
Duke University
North Carolina State University
University of North Carolina, Chapel Hill
Case Western Reserve University
Ohio State University, Main Campus
University of Cincinnati, Main Campus
Oregon State University
Carnegie Mellon University
Pennsylvania State University, Main Campus
University of Pennsylvania
University of Pittsburgh, Main Campus
University of Tennessee, Knoxville
Vanderbilt University
Texas A&M University, Main Campus
University of Texas, Austin
University of Utah
University of Virginia, Main Campus
Virginia Polytechnic Inst. and State Univ.
University of Washington, Seattle
University of Wisconsin, Madison

RESEARCH I CATEGORY (CANADA)

University of Toronto
University of British Columbia
McGill University

How they were determined: Text of the Category Definitions

The 1987 Carnegie classification includes all colleges and universities in the United States listed in the 1985-86 Higher Education General Information Survey of Institutional Characteristics.

It groups institutions into categories on the basis of the level of degree offered—ranging from pre-baccalaureate to the doctorate—and the comprehensiveness of their missions.

The categories are as follows:

Research universities I: These institutions offer a full range of baccalaureate programs, are committed to graduate education through the doctorate degree and give high priority to research. They receive annually at least \$33.5 million in federal support for research and development and award at least 50 Ph.D. degrees each year.

Research Universities II: These institutions offer a full range of baccalaureate programs, are committed to graduate education through the doctorate degree, and give high priority to research. They receive annually between \$12.5 million and \$33.5 million in federal support for research and development and award at least 50 Ph.D. degrees each year.

Doctoral-granting universities I: In addition to offering a full range of baccalaureate programs, the mission of these institutions includes a commitment to graduate education through the doctorate degree. They award at least 40 Ph.D. degrees annually in five or more academic disciplines.

Doctorate-granting universities II: In addition to offering a full range of baccalaureate programs, the mission of these institutions includes a commitment to graduate education through the doctorate degree. They award annually 20 or more Ph.D. degrees in at least one discipline, or 10 or more Ph.D. degrees in three or more disciplines.

Comprehensive universities and colleges I: These institutions offer baccalaureate programs and, with few exceptions, graduate education through the master's degree. More than half of their baccalaureate degrees are awarded in two or more occupational or professional disciplines such as engineering or business administration. All of the institutions in this group enroll at least 2,500 full time students.

Comprehensive universities and colleges II: These institutions award more than half of their baccalaureate degrees in two or more occupational or professional disciplines, such as engineering or business administration, and many also offer graduate education through the master's degree. All of the colleges and universities in this group enroll between 1,500 and 2,500 full time students.

Liberal arts colleges I: These highly selective institutions are primarily undergraduate colleges

that award more than half of their baccalaureate degrees in arts and science fields.

Liberal arts colleges II: These institutions are primarily undergraduate colleges that are less selective and award more than half their degrees in liberal arts fields. This category also includes a group of colleges identified with an asterisk that award less than half of their degrees in liberal arts fields but, with fewer than 1,500 students, are too small to be considered comprehensive.

Two-year colleges and institutes: These institutions offer certificate or degree programs through the Associate of Arts level and, with few exceptions, offer no baccalaureate degrees.

Professional schools and other specialized institutions: These institutions offer degrees ranging from the bachelor's to the doctorate. At least 50% of the degrees awarded by these institutions are in a single specialized field.

Specialized institutions include:
Theological seminaries. Bible colleges, and other institutions offering degrees in religion. This category includes institutions where the primary purpose of the institution is to offer religious instruction or train members of the clergy.
Medical schools and medical centres. These institutions award most of their professional degrees in medicine. In some instances, their programs include other health professional schools, such as dentistry, pharmacy or nursing.

Other separate health profession schools. Institutions in this category award most of their degrees in such fields as chiropractic, pharmacy or podiatry.

Schools of law. The schools included in this category award most of their degrees in law. The list includes only institutions that are listed as separate campuses in the Higher Education General Information Survey.

Schools of engineering and technology. The institutions in this category award at least a bachelor's degree in programs limited almost exclusively to technical fields of study.

Schools of business and management. The schools in this category award most of their bachelor's or graduate degrees in business or business-related programs.

Schools of art, music and design. Institutions in this category award most of their bachelor's or graduate degrees in art, music, design, architecture, or some combination of such fields.

Teachers colleges. Institutions in this category award most of their bachelor's or graduate degrees in education or education-related fields.

Other specialized institutions. Institutions in this category include graduate centres, maritime academies, military institutes without liberal arts programs, and institutions that do not fit any other classification category.

Corporate colleges and universities. These institutions are accredited, degree-granting colleges and universities established by profit-making corporations.

TABLE 3**

A. CAPITAL — UNDER CONSTRUCTION OR AT ADVANCED PLANNING STAGE

Building	Cost (Millions of \$)
1. Physics/Chemistry	16.4
2. New Parkade	6.0 *
3. Student Family Housing	7.0 *
4. Museum Extension	2.0 *
5. David Lam Asian Garden Centre	1.8 *
6. Day Care Facility	1.0 *

* at no cost to government

B. CAPITAL NEEDS — THE UNFINISHED CAMPUS

I. REQUIRED IN THE NEXT 5 YEARS

Building	Estimated Cost (Millions of \$)
1. University Service Projects	16.5
2. UBC Library and David Lam Research Library	30.9
3. Pacific Centre for Forest Sciences Research and Education	40.0
4. Performing Arts Centre, including Concert/Convocation Hall; Studio Resource Building; Art Gallery	28.4
5. Advanced Materials and Process Development Facility	17.1
6. Centre for Integrated Computer Systems Research	13.8
Sub-Total	146.7

II. REQUIRED IN THE NEXT 5 TO 10 YEARS

1. Biotechnology Laboratory	15.0
2. Field House for Athletics	10.0
3. Chemical Engineering	6.3
4. Geophysics and Astronomy	15.5
5. Health Sciences	17.0
6. Additional space to accommodate increased research	39.5
Sub-Total	103.3

III. RENOVATIONS

\$5 million per year for 10 years (replacement value of present buildings is \$800 million)	50.0
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OVERALL TOTAL 300.00

** Does not include replacement for original UBC "temporary" buildings (Mathematics, Math Annex, Geography, and Old Administration Building)

Aids Policy passed by Board of Governors

The Board of Governor passed a policy on Acquired Immune Deficiency Syndrome that aims to protect the dignity of AIDS sufferers and the health of staff and students.

The policy, adopted at the board's June meeting, allows people with AIDS to continue to work and study at UBC, as long as they pose no danger to the health of others and are capable of performing their duties or studies. The policy is:

"In accordance with general university policy, any persons suffering from any disease may continue working or studying at the university, unless they become incapable of carrying out their duties or studies, or unless their continuing to be at the university endangers the health or safety of others. It is the expectation of the

university that any persons who are suffering from an illness will conduct themselves so as not to endanger the health or safety of others.

The university will apply that general policy with respect to staff, students and faculty who may have contracted the Acquired Immune Deficiency Syndrome (AIDS) virus.

Although much research on AIDS has already been conducted, new developments in defining risk may occur; the university will be guided by the most up-to-date recommendations available.

It is expected that members of the university working or studying in the same area as an individual who contracted the AIDS virus will behave in a sympathetic, responsible and caring fashion."



Photo by Warren Schmidt

President David Strangway greeted some of B.C.'s top high school students at a luncheon at the Faculty Club earlier this month. His guests were the 25 winners of this year's UBC Essay Competition and 25 winners of the Euclid (mathematics) Competition.

Math students in B.C. are national leaders

by Gavin Wilson

B.C. high school students and schools continue to rank far ahead of their counterparts across the country in the annual Canadian Mathematics Competition, said UBC mathematics professor George Bluman.

A total of 2,082 students from 143 B.C. and Yukon schools participated in the 1988 Euclid Mathematics contest, part of the national competition which is administered by the University of Waterloo.

In all, about 11,000 students across Canada took part, said Bluman, who is B.C. coordinator of the Euclid contest.

Of the top 50 schools in Canada, 19 are from B.C., all but two of them public schools. B.C. also had 19 of the top 50 students in Canada, including the second place finisher, David McKinnon, of St. George's in Vancouver, who scored 97 out of 100.

Perry Pow of David Thompson placed sixth and Jason Herbert of Eric Hamber tenth nationally. The highest ranking school in B.C. was Sir Winston Churchill, which placed third overall in Canada.

The top score in Canada was 98 out of 100 achieved by David Lee of Saskatoon.

Of the other top 50 schools, 21 are from Ontario, five from Alberta, two from Nova Scotia and one each from Saskatchewan, Manitoba and Newfoundland.

The B.C. papers were marked at UBC by a team of B.C. secondary school teachers and faculty from UBC and UVic. The exam was written on April 19.

Based on curriculum at the Grade 12 level, the Euclid contest is designed to challenge university-bound students and to identify those with outstanding talent, said Bluman.

For Chinese businessmen, saving face is important

by Jo Moss

Saving face has a lot to do with how Chinese business executives handle a failing product.

They are more likely to invest further in it than Canadian executives because a good outcome is more important to them, said Commerce professor Donald Wehrung.

And if something goes wrong with a product, Chinese executives are more likely to replace it than their Canadian counterparts because Chinese culture places greater emphasis on protecting a person's reputation.

"Canadian executives are not as likely to incur the costs of replacement," Wehrung said.

Wehrung and UBC colleagues David Tse and Ilan Vertinsky have just completed a pilot study of how culture influences the way in which Chinese, Hong Kong and Canadian executives make decisions. The fourth partner in the study is Kam-hon Lee, a professor at the Chinese University of Hong Kong.

Wehrung, Tse, Vertinsky, and Lee presented a group of scenarios to 150 business executives in Hong Kong, China and Canada. Each executive played the role of a manager in a large multinational firm and was given four business scenarios that required him to make an important company decision.

"Each of the scenarios was ethnically accurate so that the manager was operating within a familiar cultural background," Wehrung explained. "The situations were ones that presented typical decisions to any marketing executive."

For the researchers, that meant translating the study into Chinese for the Chinese participants and using appropriate oriental names for the fictitious multinational company and its employees.

The study results overturned some widely held stereotypes of Chinese business strategy.

"Many people had assumed that in working with Chinese businesses, decisions would be delayed because Chinese managers are reluctant to make a sharp decision," Wehrung said.

In fact, study results showed that Chinese managers had less difficulty coming to a decision than either the Hong Kong or Canadian executives.



Wehrung

"The delay that Westerners encounter with Chinese business decisions can be attributed to the institutional structure rather than personal and cultural characteristics," Wehrung explained.

Chinese culture tends to interpret the world as black and white, good and bad, he said.

"The Chinese executive encounters fewer ambiguities in defining his problem."

The most obvious difference between Chinese and Canadian decision-making styles is that in Chinese business, although the leader announces the decision, it's important that the majority are happy with it so harmony is maintained.

"In Canada, we tend to promote differences in decision-making styles," Wehrung said.

Information of this kind is important in an international business arena where understanding an adversary's approach to business leads to better business dealings.

"We've tried to provide insight into cultural ideas and look at the influence we have on each other internationally," Wehrung explained.

The study also indicated new products were received more favorably by Chinese business executives than by Canadian.

"Despite strong cultural traditions, Chinese people have a reverence for something that is new," Wehrung said.

The decision-making style of Hong Kong executives was found to be a mixture of the Chinese and Western business approaches.

"As expected, Hong Kong managers incorporated many Western values into their business decisions," Wehrung said. "But they acted similarly to Chinese managers in situations where personal pride was at stake. Saving face is very important to them too."

The study also showed that whereas competition in Canada is seen as survival of the fittest, in oriental cultures it is seen more as friendly rivalry. In a study scenario which called for executives to go into a joint venture with a competitor, "Executives in Chinese firms tended to think this was a good idea, whereas Canadian firms were more reluctant and tended to shy away," Wehrung said.

Not only can business managers learn from study results how their competitors operate, but they can incorporate the best approaches from each of the culturally different management styles into their own firm's operations, he said.

Wehrung said the researchers plan to expand the next phase of the study to include other Pacific Rim countries such as Japan, Singapore, Taiwan, Korea and Australia.

2 field hockey players chosen for Olympics

by Jo Moss

Two UBC field hockey players will get a chance to test themselves against the world's best at the Seoul Olympics.

Penny Cooper and Melanie Slade recently received late-night telephone calls to inform them of their selection to Canada's team.



Penny Cooper (left) and Melanie Slade

"It's kind of scary. I can't relate to it," said Cooper a first-year Arts student.

"I'll believe it when I get there," Slade added. "There's a lot of training and a lot of playing between now and then."

A total of 16 players were named to the squad that will play at the Summer Olympics in September.

Cooper and Slade left in May for training in Germany and test matches in England. On Aug. 14, they go to Australia for more training and acclimatization.

They return to UBC at the end of September to resume their studies.

Both students are veterans of Canada's Junior National Team. Slade, a fourth-year Physical Education student, was UBC's 1988 Athlete of the Year. A CIAU All-Star in 1984 and 1987, she was also a Canada West All-Star in 1987, and for the last two years has been named to the All-Canadian team.

Cooper was named a Canada West All-Star in 1987, her first year on UBC's field hockey team. She was also named CIAU All-Star, and selected for the second All-Canadian team.

Retired chemistry prof seeking adoption by school

by Gavin Wilson

Does anyone want to adopt a retired chemist? If so, just contact former UBC chemistry professor Douglas Hayward who is on a crusade to promote chemistry in elementary schools.

"The objective is to show students, teachers and parents that chemistry is safe, interesting and fun," says Hayward of his Do-It-Yourself Chemistry lecture-demonstration series.

Recognizing that he can't do the job by himself, Hayward is encouraging schools to "adopt" retired chemical professionals from the community to aid teachers in the classroom.

So far, two B.C. schools have taken up the proposal, and many others have expressed interest. As well, Washington State Governor Booth Gardner has endorsed the plan.

Backed by the Chemical Institute of Canada, Hayward has taken his message to 43 schools, 275 classrooms and 7,000 youngsters in the Vancouver area.

He also writes a bi-weekly column in the Richmond Review called Home Chemistry that is aimed at 11-year-olds. It offers instruction on simple experiments that can be done with common household items and has attracted a wide audience that includes many adults.

Hayward, who retired four years ago after 33 years in UBC's chemistry department, aims to counter the "chemo-phobia" he says is growing in our society. People fear the effects of chemicals without understanding how they work. It's this process he wants to demystify.

Hayward has also produced a book and

videotape of himself conducting experiments in the classroom to aid teachers.

"The idea behind the book is to get other professors and chemists to get into the act," he said.

Real Estate Corp. board approved

The Board of Governors has approved the appointment of a six-member board of the UBC Real Estate Corp.

The corporation was established as a subsidiary company to administer a market housing development on 27 acres of university land.

The board members are: Robert Lee, chairman of the finance and property committee of the Board of Governors and president of Prospero International Properties and Realty; Kenneth Bagshaw, also a member of the Board of Governors and senior partner at the law firm Ladner Downs; David Strangway, president, UBC; Bruce Gellatly, vice-president, administration and finance, UBC; Al Poettcker, president, Barbican Properties, Inc.; and James Houston, chairman, The Urban Projects Group.

The university is recruiting a Chief Executive Officer for the corporation.

It will oversee development of the land on the corner of 16th Avenue and Westbrook Mall. The property is owned by UBC and is not part of the University Endowment Lands.

Development is expected to take two to five years.



Students wait to talk to loved ones in China on UBC's powerful ham radio.

Students phone home on UBC's ham radio

by Jo Moss

UBC's ham radio operators are helping students from China keep in touch with family and friends back home where phones are still rare and overseas calls expensive.

"It's really exciting. There's nothing like hearing a person's voice," said Yin Yanan, a PhD student in Electrical Engineering who was one of the first to use the service. "I was writing to my wife once every two weeks, but the mail is so slow in China. News was always a month late."

Every Saturday at 7 a.m. a group of students gathers in UBC's amateur radio club room to chat to family and friends in Beijing.

Despite the early hour on the weekend, the linkup is so popular that calls must be limited to five minutes each.

The contact is made at such an early hour when conditions are ideal because of the weak signal from Beijing, said David Michelson, UBC's amateur radio club president.

Ham radio stations are new to China and most of the 24 stations in operation use equipment donated by amateur radio operators in western countries.

Before the ham radio link was established, some of the students hadn't spoken to family members for two or three years.

Ham radio stations like BYIQH were banned by the government of the new People's Republic of China in the 1950s. It wasn't until 1982 that amateur stations were allowed to broadcast again.

According to Michelson, Vancouver businessman Tom Wong played a major role in re-establishing amateur radio in China.

Opening up radio contact to China is just a small part of the club's community service involvement.

Last year, UBC's amateur radio operators logged more than 400 hours providing communication services to university and community events such as the Arts '20 Relay, Storm the Wall, and the Spanish Banks Downhill Derby.

A repeater station on the Walter Gage residences enables event organizers to use portable radios along the route.

The state-of-the-art high frequency antenna mounted on a 100-foot tower at Brock Hall annex, and an ideal location near the coast, enables UBC operators to contact ham operators worldwide.

"We're what's called a big gun station because when we come on air, everyone can hear us," Michelson explained. "When conditions are good, we can talk to anyone, anywhere in the world."

That capacity means that when natural disasters occur, VE7UBC is one of the few links between people in the disaster area and family and friends in B.C. After the Edmonton tornado last July, UBC operators worked around the clock to reassure worried B.C. residents that relatives were safe.

University to pay for additional insurance for some staff cars

UBC employees who need additional insurance because they are required to use their own vehicles on university business will be reimbursed to a limit of \$125.

As a result of changes to ICBC regulations, faculty and staff who drive their own vehicles more than 1,600 kilometres a year, or four days each month, on university business must have business coverage.

Business coverage is required even for driving between university buildings on public roads.

Failure to have the proper coverage will invalidate your policy in the event of an accident while on university business.

Employees should check with their supervisor, then arrange appropriate coverage.

People

Hansen fund contributes to UBC researchers

Rick Hansen's Man-In-Motion legacy fund has awarded three grants and a fellowship to the following UBC researchers:

Dr. Michael Janusz and Dr. Eric Jamieson, assistant clinical professors of surgery, \$41,475. Their project is designed to evaluate drug therapy in the prevention of spinal cord injury which occurs in up to 25 per cent of patients during repair of extensive aneurysms involving the aorta in the chest and abdomen.

Dr. Hjalmar Johnson, Dr. John D. Anderson, Dr. William Arnold and Dr. Christine Loock, physicians at Children's Hospital in the departments of pediatrics, urology and pathology, \$29,000. Their study investigates whether children with spinal cord injuries who are prone to urinary tract infections should be given antibiotics.

Dr. Peter Wing, associate professor, orthopedic surgery, \$5,670. Dr. Wing is

establishing a spinal cord database for B.C. which would provide consistent information on all people who are treated for spinal cord injuries.

Deirdre Webster, currently completing a PhD in zoology, has been awarded a \$25,000 fellowship for her work with **Dr. John Steeves**, which involves studying the brains and spinal cords of birds. Before birth, embryonic birds and mammals, including humans, have the ability to regenerate nerves in the body. Steeves' researchers are trying to understand what the criteria are for regeneration.

UBC benefactor **Walter Koerner** received the prestigious Masaryk Award at an annual assembly of the Czechoslovak Association in Canada recently. The award is given to individuals who have made a significant contribution to the cause of free Czechoslovakia or who have enriched the life of Czechs or Slovaks in

Canada. The award is named for Czechoslovakia's first president Thomas Garrigue Masaryk. Koerner is a former chairman of the UBC Board of Governors and is one of the university's greatest benefactors.

Prof. William Powrie, head of the Food Science Department, was recently honored by the B.C. Food Technologists. The group selected Powrie as the first recipient of the Barry Walsh Memorial Award for outstanding service and contributions to the profession and industry.



Powrie

Yale music professor **Arthur Weisberg** will be coming to UBC under the Canada Council's Visiting Foreign Artist program in March, 1989. Weisberg, a conductor, composer and bassoonist, is the founder of the world-renowned Contemporary Chamber Ensemble and the Orchestra of the Twentieth Century. At UBC, Weisberg will conduct an ensemble, coach chamber music and give seminars for composers and conductors.

Angus Livingstone's position in the Office of Research Services and Industry Liaison has changed from Assistant Director, Research Services to Assistant Director, Industry Liaison.

Karen Roberts will take over the position of Assistant Director, Research Services.

UBC Calendar

MONDAY, JUNE 27

Physiology Seminar

Central and Peripheral Release of Vasopressin and Oxytocin in Response to Stressful Stimuli. R. Landgraf, Professor and Head, Section of Biosciences, Dept. of Cell Biology and Regulation, Karl Marx University, Leipzig, G.D.R. For information call 228-3643 or 228-2726. Room 2606. D.H. Copp. 4:30 p.m.

TUESDAY, JUNE 28

Research Centre Seminar

Genetics of Delta Toxin Production in Staphylococci Associated with Necrotizing Enterocolitis. Dr. Aileen McKeivitt, Department of Paediatrics, Div. Infectious Diseases. Room 202, Research Centre, 950 W. 28th Avenue. 4:00 p.m.

Biotechnology Seminar

Incorporation of Phosphothiolate Nucleotides into DNA for Mutagenesis and Sequencing. Dr. F. Eckstein, Mac Planck Institute. ICR 3. 4:00 p.m.

TUESDAY, JULY 5

Summer Public Lecture Series

Vital Signs: When Theology Stirs the Church to Sing a New Song. Dr. Tom Troeger, Colgate Rochester Divinity School, Chapel of the Epiphany, Chancellor Building, Vancouver School of Theology. 7:30 p.m.

Music for Summer Evenings

Free Concert. Linda Lee Thomas, piano, and Kathleen Rudolph, flute. For further information call 228-3113. Recital Hall, Music Building. 8:00 p.m.

THURSDAY, JULY 7

Summer Public Lecture Series

Why Read the Books of Chronicles? Dr. Donna Runnalls, McGill University, Chapel of the Epiphany, Chancellor Building, Vancouver School of Theology. 7:30 p.m.

Summer Public Lecture Series

The Law of the Nisga'a. Bert McKay, Hereditary Chief of the Raven Tribe. Chapel of the Epiphany, Chancellor Building, Vancouver School of Theology. 7:30 p.m.

FRIDAY, JULY 8

Paediatric Grand Rounds

Why Do Paediatricians and Child Psychiatrists Disappoint Each Other? Dr. P. Graham, Walker Professor of Child Psychiatry, Hospital for Sick Children, Great Ormond St. London, U.K. For information call 875-2437 or 875-2451. Auditorium, G.F. Strong. 9:00 - 10:00 a.m.

Music for Summer Evenings

Jack Kessler Memorial Concert (former concert master, CBC Chamber Orchestra). Lee Kum Sing, piano, John Loba, viola, Gerald Stanick, viola and Paul Kiffner, cello. Free. For information call 228-3113. Recital Hall, Music Building. 8:00 p.m.

THURSDAY, JULY 14

Summer Public Lecture Series

The Place of Canon in Biblical Studies Today. Dr. John Van Seters, University of North Carolina. Chapel of the Epiphany, Chancellor Building, Vancouver School of Theology. 7:30 p.m.

Centre for Continuing Education Lecture

Ayurveda, India's ancient traditional medical system. Robert E. Svoboda, has a Bachelor of Ayurvedic Medicine and Surgery from The University of Poona, India. \$10, \$5 students. For information call 222-5238. IRC 4. 7:30 - 9:30 p.m.

FRIDAY, JULY 15

BBQ and Entertainment Evening

Sponsored by International House. Bring own meat, tofu, etc. for BBQ. International House will provide buns, condiments, salads, etc. For information call 228-5021. International House. 4:30 - closing.

UBC Reports is published every second Thursday by UBC Community Relations
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Photo by Warren Schmidt

B.C. Lions hopefuls are put through their paces at UBC under the watchful eye of coach Ron Smelzer. It is the first time in 14 years the Lions have trained on campus. The public is welcome to view the twice-daily practices at 9:15 a.m. and 4:15 p.m. until June 24, with an additional morning practice June 25 and an afternoon scrimmage June 26. Practices are held on the soccer field behind the Allan McGavin Sports Medicine Clinic.

Calendar Deadlines

For events in the period July 17 to Aug. 6, notices must be submitted on proper Calendar forms no later than 4 p.m. on Wednesday, July 6 to the Community Relations Office, 6328 Memorial Road, Room 207, Old Administration Building. For more information, call 228-3131.

TUESDAY, JULY 19

Summer Public Lecture Series

Reconciliation—The Realism of Grace in a Divided Society. Dr. James Torrance, University of Aberdeen. Chapel of the Epiphany, Chancellor Building, Vancouver School of Theology. 7:30 p.m.

THURSDAY, JULY 21

Summer Public Lecture Series

Religious Attitudes: A Canadian Perspective. Dr. Reginald Bibby, University of Lethbridge. Chapel of the Epiphany, Chancellor Building, Vancouver School of Theology. 7:30 p.m.

TUESDAY, JULY 26

Summer Public Lecture Series

Formation and Transformation: Ways Persons Become Christian. Dr. Doug Wingeler, Garrett-Evangelical Theological Seminary. Chapel of the Epiphany, Chancellor Building, Vancouver School of Theology. 7:30 p.m.

NOTICES

Free Guided Campus Tours

Bring your friends, visitors, community, school or civic group to UBC for a walking tour of the campus. Drop-ins welcome every Monday through Friday at 10 a.m. and 1 p.m.; 3 p.m. weekdays and weekend times available by reservation only. Groups will have the opportunity to see and learn about everything from the unique Sedgewick underground library to the Rose Garden and more. Tours commence at SUB and last approximately 2 hours in the morning and 1 1/2 hours in the afternoon. To book, call the Community Relations Office at 228-3131.

Stage Campus '88

Sponsored by the Theatre Department. June 29 - July 9 at 8:00 p.m. Lulu Street by Ann Henry. Directed by Catherine Caines. For reservations call 228-2678. \$5. Frederic Wood Theatre.

Neville Scarfe Children's Garden

Be sure to visit the Neville Scarfe Children's Garden located west of the Education Building. There is no charge to use the garden and it is open all year long. Families interested in planting, weeding and watering in the garden should contact Jo-Anne Naslund at 434-1081 or 228-3767.

Asian Research Exhibition

June 18 - 26, Monday to Friday 10:00 a.m.-5:00 p.m.; Saturday 10:00 a.m.-8:00 p.m.; Sunday 2:00-5:00 p.m. Vanity and Vexation of Spirit II. Anthony Luk. Exhibition of drawing, collage, photography, mixed media. Free. For information call 228-2746. Auditorium, Asian Centre.

Botanical Gardens Special Tours

Tour the Garden with David Tarrant and Friends. June 26 and July 31, 10:30 a.m., 12:30 p.m., 2:30 p.m. For information call 228-4208. Botanical Gardens, 6250 Stadium Road.

Special Issue on Africa and the French Caribbean

Contemporary French Civilization is pleased to announce the preparation for 1989 of a major special issue exclusively devoted to Francophone Africa (North Africa and Black Africa) and the Caribbean. Articles in English or in French, 15-20 typed pages long, must be submitted by March 1st, 1989, on any contemporary culture-civilization topic involving a country or a region of Africa, Madagascar or the Caribbean (including Haiti). For other Francophone countries, please check with the

guest-editor beforehand. Contributions should be of high quality in socio-cultural, socio-political, artistic fields, etc., showing an original approach to some aspect of the cultural complex of African, Malagasy or Caribbean society of the past 20-25 years. For information call Dr. Claude Bouygués, African Literature, French Department at 228-2879.

Job Link

Sponsored by the Alma Mater Society. Student run service linking UBC students with employers. We offer a prescreening and referral service. Our goal is to match employers with qualified students quickly and efficiently. Research positions welcome. For information call 228-JOBS. Room 100B, SUB.

Golf Lessons

Get into the swing of things this spring with Golf Lessons. Community Sport Services is once again offering Golf Lessons at the basic or intermediate level. The first set of lessons begin April 25th. Tuition waivers not acceptable. For information call 228-3688.

Copying in the Libraries?

Save time and money with a UBC Library copy card. \$5 cards sold in most libraries; \$10, \$20 or higher cards in Copy Service, Main or Woodward. Cash/Cheque/Departmental Requisition. For information call 228-2854.

Fitness Appraisal

Physical Education & Recreation, through the John M. Buchanan Fitness and Research Centre, is administering a physical fitness assessment program to students, faculty, staff and the general public. Approx. 1 hour. \$25, students \$20. For information call 228-4356.

Statistical Consulting and Research Laboratory

SCARL is operated by the Department of Statistics to provide statistical advice to faculty and graduate students working on research problems. For information call 228-4037. Forms for appointments available in Room 210, Ponderosa Annex C.

Language Exchange Program

Exchanging Languages on a One-to-One Basis. For information call 228-5021. International House. Office Hours 9:30 a.m.-4:30 p.m.

Walter Gage Toastmasters

Public speaking and leadership meeting, Wednesdays, 7:30-9:30 p.m. Guests are welcome to attend, ask questions, and participate. For information call Geoff Lowe at 261-7065. Room 215, SUB.

M.Y. Williams Geological Museum

Open Monday - Friday, 8:30 a.m.-4:30 p.m.. The Collectors Shop is open Wednesdays 1:30-4:30 p.m. or by appointment. For information call 228-5586.

Nitobe Memorial Garden

Open Daily 10:00 a.m.-8:00 p.m. May - August. Admission \$1. Free on Wednesdays.

Botanical Garden

Open Daily 10:00 a.m.-8:00 p.m. May - August. Admission \$2. Free on Wednesdays.

Language Programs

Three-week, non-credit, morning programs in French begin July 11, and August 2. All-day immersion programs begin July 11 and August 2. Three-week, non-credit, morning programs in Spanish, Japanese, Cantonese and Mandarin begin July 5 and July 25. For information call 222-5227.

Entomology Display

In anticipation of the international Congress on Entomology to be held on campus in July, a display of entomological books and specimens has been mounted in the foyer of the Woodward Library. For information call 228-4447.

Reading, Writing and Study Skills Centre

Increase your reading speed and comprehension, improve your writing, develop better study skills, prepare for the English Composition Test. The Centre offers 10 non-credit courses commencing the week of July 4, including Writing Improvement, Reading for Speed and Comprehension, Study Skills and English Composition Test workshops. During July, take advantage of the Basic Skills program—a special opportunity to master your writing, reading and study skills—Monday to Thursday mornings, beginning July 4. Learn techniques to help you speak and read under pressure—a second section of Thinking and Communicating on Your Feet is available the August 5-6 weekend. For registration information call the Reading, Writing and Study Skills Centre, Centre for Continuing Education, 222-5284.

Library Tours

Tours of the Main Library daily July 4 - 8 at 10:30 a.m. and 12:45 p.m. Meet at the Main Library entrance. Tour lasts 45 minutes. For information call 228-2076.

Selecting better trees focus of study

by Jo Moss

Tree breeder Judy Loo-Dinkins wants to find a better way to identify genetically superior trees—ones that grow bigger and faster.

The progeny of these select trees are used in a breeding program aimed at improving B.C.'s forests and producing higher quality wood for export.

Loo-Dinkins is working with the B.C. Ministry of Forests to develop a more accurate selection method.

"A number of factors influence how a tree grows," Loo-Dinkins explained. Differences in soil depth, moisture, and gradient all can affect the growth of similar trees on the same site.

Trees will be separated into what Loo-Dinkins calls 'neighborhoods' by these environmental differences.

"If one patch of the hillside is shadier and receives more moisture, those trees will be more alike than trees in other patches," she explained.

Loo-Dinkins will be investigating the size and shape of these patches to determine patterns of variability. The results of her research will be used to adjust measurements of trees and to correct for environmental effects. Tree selection will be more accurate because tree breeders will be able to determine how environmental factors have influenced tree growth.

"It's important to do a good job of separating the environmental factors from the genetic

effects," Loo-Dinkins said. "Standard genetic test designs don't take the neighborhood effect into account."

Tree breeders are not only interested in trees that produce more lumber, they also look at wood density, the number of branches on the tree, and branch size—features which affect the strength of wood products.

To identify good quality trees in the wild, they take shoots from the parent tree and graft or root them to establish a seed orchard. It takes about 12 years to determine if the descendants are as good as researchers expected them to be.

The project has recently been funded by the B.C. Science Council and will initially run for one year.



Loo-Dinkins