

# UBC REPORTS

Volume 41, Number 21

December 14, 1995



Mark Munzell photo

Fourth-year engineering student Christine Yeung (left) helps a young student use the "nerve-o-meter." The simple electrical circuit is one of the tools Yeung and other engineering students will be taking to schools in B.C. as part of a new program aimed at creating interest in and understanding of engineering and technology among children in grades 3 through 7.

## Engineers aim to spark science in young minds

by Stephen Forgacs

Staff writer

A group of engineering students is gearing up to take the wonders of engineering to the elementary school classrooms of the Lower Mainland beginning next May.

GEERING UP is the name of a program developed by undergraduate and graduate students from several of the nine engineering disciplines within UBC's Faculty of Applied Science.

The GEERING UP team hopes to reach more than 3,000 students between May and August, 1996 through classroom visits and summer engineering camps to be held at UBC.

"So much of our formal learning as kids is done through lectures, memorization and exams," said GEERING UP Director Christine Yeung, a fourth-year Mechanical Engineering co-op student. "We want to teach kids how to apply what they learn, and how that knowledge relates directly to what is going on around us every day."

Some of the hands-on activities used by GEERING UP include the "nerve-o-meter," a simple electronic circuit that is used to teach children about electricity; and OOBLIK, a corn starch and water mixture that looks like a liquid but acts like a solid and is used to teach material properties.

Volunteers met with success when they put their methods to the test during UBC's Open House in October.

The program's components—student and teacher workshops, and summer camps—are designed to leave both teachers and students with new knowledge and skills.

Yeung developed the program idea with three other students for a class project to design a product that will benefit society.

Applied Science Prof. Sidney Mindess said that while the faculty is providing a grant to help get the program underway, as well as some logistical support, the students have been responsible for developing the program.

The students behind GEERING UP are now looking for more student volunteers from within the Faculty of Applied Science, and the financial and material support they need to cover material and operational costs.

Yeung estimates an annual budget of \$90,000 is required for the program, which will operate on a non-profit basis. The amount includes bursaries for a number of students who would otherwise be unable to attend the summer camp.

In late January, GEERING UP will hire a staff of four student instructors to visit the schools and run the summer camps.

See **STUDENTS** Page 2

## Resnick, Emerman elected governors

Anatomy Prof. Joanne Emerman and Political Science Prof. Philip Resnick have been elected as faculty representatives to UBC's Board of Governors.

Emerman, a Vancouver native, received her PhD and post doctoral training at the University of California at Berkeley. She joined UBC in 1980 as an assistant professor of Obstetrics and Gynaecology in the Faculty of Medicine.

A current member of the research co-ordinating committee and mentoring committee in the Faculty of Medicine, Emerman is a former chair of the faculty's curriculum evaluation committee. She was acting head of the Dept. of Anatomy from 1992 to 1993.

Emerman has been a member of UBC's Faculty Association executive for the past six years, and currently serves as the association's treasurer.



Emerman

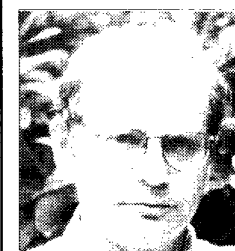
She is actively involved with UBC's Senior Appointments Committee, the Faculty Development Mentoring Network, the Women's Resources Centre advisory committee, the Status of Women Committee and the Academic Women's Association. Between 1990 and 1992, Emerman served on the President's Advisory Committee on Sexual Harassment.

The recipient of a National Cancer Institute of Canada scholarship from 1981 to 1987, she currently participates on the boards of several international associations for cancer research.

"As a member of the Board of Governors, I plan to promote positive interaction between the administration and faculty," Emerman said in her campaign statement.

"I am concerned with a number of issues, the most important being the

See **BOARD** Page 2



Resnick

## Festivities planned for students far from home

by Connie Filletti

Staff writer

Fröhliche Weihnachten. Buon Natale. Joyeux Noël. Gelukkige Kerstfeest. Maligayang Pasko.

The languages may be different but the meaning will be the same for some 200 international students on campus who won't be going home for the holidays.

They'll be welcomed by banners wishing them a Merry Christmas in everything from Greek to Chinese when they arrive for a festive feast at International House on Dec. 22.

For the third consecutive year, the UBC chaplains and student services units are organizing a traditional Canadian Christmas dinner for international students and students living in residence who will be alone over the holidays.

"For many of the international students, it is their first experience with a traditional Canadian Christmas," said Sarah Dench, an adviser in the Women

Students' Office and volunteer coordinator for the event.

"Students who have joined us for dinner in previous years have told us that, although our Christmas customs may not be the same as theirs, the dinner is an opportunity for them to celebrate and avoid loneliness."

This year, students will be invited to share elements of festivities that they may celebrate close to Dec. 25th in their cultures.

Two sittings are planned for noon and 3 p.m. Tickets are \$2 in advance or \$5 at the door. Vegetarian meals will be available.

The United Church is assisting with the food costs and local businesses have donated gifts, but food donations are still needed for the dinner, especially turkeys and vegetables. Desserts will be provided compliments of the UBC Food Group.

Volunteers who can help with decorating, food preparation and kitchen clean-up are welcome. Please call Dench at 822-4941 or e-mail sarah.dench@ubc.ca.

### Inside

#### Lost Literature

3

Offbeat: Books that strayed find their way home

#### Dragon Bones

3

Linguist Ken Yakashima translates tales told on bone

#### Timely Treats

7

If you can't buy it, bake it

#### Down Deep

8

Feature: Beneath our feet are keys to mysteries waiting to be solved

# Faculty, staff give electronically

"Thanks for the e-mail. Please continue my gift."  
 This is just one of many positive responses received by Simone Carnegie, faculty and staff coordinator for UBC's Annual Fund, in response to an innovative e-mail approach to renewing donors.

"Faculty and staff who give to the fund every year have told me they're happy not to have to go through the additional steps involved in mailing in renewal forms year after year," Carnegie said.  
 This year, for the first time, staff at the Development Office

sent e-mail messages to faculty and staff donors asking if they wish to renew their donation.

Carnegie said contacting past donors by e-mail has extended the appeal's reach.

"I received a pledge from a professor in the Faculty of Education who was on sabbatical in France but still receiving messages through her campus e-mail address," she said.

The 1995-96 Faculty and Staff Appeal has had 88 per cent of its payroll donors renew. Many give through payroll deduction.

This year the Development Office introduced continual payroll deductions to facilitate the renewal process for donors. Under this plan the donor can, at any time, change the designation of their gift, change the amount or cancel the deductions.

So far the Faculty and Staff Appeal has raised \$72,436 from 195 donors. Faculty and staff who want to take advantage of this tax-deductible donation before the end of the year are encouraged to call fund-raising coordinator Simone Carnegie at 822-8630, fax 822-8151, or e-mail [simone.carnegie@ubc.ca](mailto:simone.carnegie@ubc.ca).

The UBC Annual Fund comprises five separate appeals: the Parents Appeal, Alumni Appeal, Faculty and Staff Appeal, Wesbrook Society Appeal, and the Class Act Appeal.

## Board

Continued from Page 1

continuation of teaching and research excellence at the university."

Emerman cited tenure, pensions, faculty housing and equity issues among her other concerns.

Resnick, a graduate of Montreal's McGill University and the University of Toronto, joined the UBC faculty in 1971.

In 1990-91, he received the Harold Innis Book Award from the Social Science Federation of Canada for *The Masks of Proteus*. His other publications include *Letters to a Québécois Friend*, *Toward a Canada-Québec Union* and *Thinking English Canada*.

Resnick has served as a board member and member of the executive with the Canadian Political Science Association and was a UBC Senator from 1990 to 1993.

He is a frequent media commentator on public affairs and

currently writes a weekly column for Montreal's *Le Devoir* newspaper.

"There is concern about the centralization of power into the president's office and lack of effective faculty input into decision making," Resnick said in his campaign statement.

He added that there also was concern about "priorities that have turned UBC more into a development park than into an academic community (and) of actions by the administration, for example, its suspension of admissions into the graduate program in political science, that have denied due process and put a serious chill on academic freedom."

Emerman and Resnick begin their three-year terms as faculty representatives to the Board of Governors on Feb. 1, 1996.

## Students

Continued from Page 1

Four high school students will also be hired to work as group leaders through the summer months, Yeung said.

For more information on GEERING UP call 822-2858, or e-mail [geering-up@unixg.ubc.ca](mailto:geering-up@unixg.ubc.ca).

**SELF SERVE**  
**Canon**  
**COLOR LASER**  
**COPIES**

**85¢** ea.  
8 1/2 X 11 ONLY

University Village  
 2nd Floor 2174 W. Parkway  
 UBC, Vancouver, B.C.  
 fx: 224-4492  
**224-6225**  
 Open 7 Days a week  
 Mon-Fri • 8-9 — Sat & Sun • 10-6

**copies plus+** DISCOVER THE FRIENDLY COMPETITION

**DEDICATED TO SERVICE**  
**PWT INC.**

**PROFESSIONAL WORLD TRAVEL**

**Christine Wisenthal**  
**Travel Consultant**

200 - 1847 West Broadway  
 Vancouver, B.C. V6J 1Y5  
**Tel: (604) 739-9199**

**Complete Travel Arrangements:**  
 Air, Rail, Cruise, Car Rental, Accommodation, Tours, Special Interest Travel

## Call for Applications



UBC invites applications for the position of **Director of the Centre for Research in Women's Studies and Gender Relations**. The successful candidate will be a scholar of high standing with demonstrated commitment to research and teaching in Women's Studies and Gender Relations, administrative ability, a proven record in obtaining research grants and other fund-raising activities, and capacity to work with scholars from a wide variety of disciplines to encourage all areas of research. She or he will have a tenurable cross-appointment in a regular academic department and will carry up to a 50% teaching load there.

The initial appointment as Director will be for a period of five years, with the possibility of an extension for a second five-year period. Only internal candidates will be considered. Applicants should send a letter describing their interest in the position, a curriculum vitae and names and addresses of at least three references to whom we can write in confidence to Dr. Frieda Granot, Associate Dean, Faculty of Graduate Studies, The University of British Columbia, #180-6371 Crescent Road, Vancouver, V6T 1Z2. The deadline for applications is Jan. 15, 1996. It is expected that the appointment will begin July 1, 1996, but there is some flexibility in this.

## Berkowitz & Associates

Statistics and Mathematics Consulting

- research design
- data analysis
- sampling
- forecasting

**Jonathan Berkowitz, Ph.D**  
**4160 Staulo Crescent, Vancouver, B.C., V6N 3S2**  
 Office: (604) 263-1508 Home: (604) 263-5394

## Wax - it

Histology Services

Providing Plastic and Wax sections for the research community

George Spurr	RT, RLAT(R)	Kevin Gibbon	ART FIBMS
Daytime	(604) 266-7359	Daytime	(604) 856-7370
Evening	(604) 266-2597	Evening	(604) 856-7370
E-Mail	<a href="mailto:spurrwax@infomatch.com">spurrwax@infomatch.com</a>		

# Snow?

"The University will remain open during snow storms but may cancel or reschedule classes on a university-wide basis and/or curtail non-essential services in response to the conditions."—UBC Policy on Disruption of Classes/ Services by Snow, May 1994

In the event of extreme snow conditions, listen to CBC Radio, CKNW and other local radio stations for information.



## Technical Support for Social Science Projects

- \* Course & Instructor Evaluations
- \* Scannable Forms (multiple-choice)
- \* Data Collection
- \* Statistical Analysis
- \* Custom Reports/Graphics
- \* Questionnaire/Survey/Test Design



## Applied Research and Evaluation Services

(formerly Educational Measurement Research Group)

University of British Columbia  
 Room 2 Scarfe Building  
 2125 Main Mall



**Dr. Michael Marshall**  
 Executive Director  
 Tel: 822-4145 Fax: 822-9144

## Edwin Jackson

224 3540

Best Wishes and Glad Tidings to you this Holiday Season.

E-Mail: [102343.1610@compuserve.com](mailto:102343.1610@compuserve.com)  
<http://ourworld.compuserve.com/homepages/EdJackson>

Financial, Retirement, Income, Estate Planning

Term Deposits, RRSP/RRIF's  
 Competitive rates with leading financial institutions.

Mutual Funds licenced through Ascot Financial Services Ltd.

Annuities, Life and Disability Income Insurance



## UBC REPORTS

*UBC Reports* is published twice monthly (monthly in December, June, July and August) for the entire university community by the UBC Public Affairs Office, 310 - 6251 Cecil Green Park Road, Vancouver B.C., V6T 1Z1. It is distributed to most campus buildings and to Vancouver's West Side in the Sunday *Courier* newspaper.

**Associate Director, University Relations:** Steve Crombie ([stephen.crombie@ubc.ca](mailto:stephen.crombie@ubc.ca))  
**Managing Editor:** Paula Martin ([paula.martin@ubc.ca](mailto:paula.martin@ubc.ca))  
**Editor/Production:** Janet Ansell ([janet.ansell@ubc.ca](mailto:janet.ansell@ubc.ca))  
**Contributors:** Connie Filletti ([connie.filletti@ubc.ca](mailto:connie.filletti@ubc.ca)), Stephen Forgacs ([stephen.forgacs@ubc.ca](mailto:stephen.forgacs@ubc.ca)), Charles Ker ([charles.ker@ubc.ca](mailto:charles.ker@ubc.ca)), Gavin Wilson ([gavin.wilson@ubc.ca](mailto:gavin.wilson@ubc.ca)).

Editorial and advertising enquiries: (604) 822-3131 (phone), (604) 822-2684 (fax).

*UBC Reports* welcomes the submission of letters and opinion pieces. Opinions and advertising published in *UBC Reports* do not necessarily reflect official university policy.

Material may be reprinted in whole or in part with appropriate credit to *UBC Reports*.

# Earliest Chinese script dissected by linguist

by Charles Ker

Staff writer

Di Xin, last king of China's Late Shang dynasty, went missing one day in 1070 BC and his victim's skull survived to tell the tale.

The king's version of the story relates how he and his entourage were set upon by a local chieftain. Di Xin prevailed, called for the chieftain's head and ordered that the entire incident be inscribed on it.

According to UBC Prof. Ken Takashima, it was common practice to inscribe daily observations and anecdotes from the royal court on bones. He concedes, however, that Di Xin may have broken new ground with his use of a human skull. It seems ox shoulder blades, or scapula, and turtle bellies, or plastrons, were the parchment of choice among his Shang predecessors.

"The stories were always told from the court's point of view," says Takashima, who recently finished translating an ancient collection of turtle plastrons. "There are few references to the daily lives of ordinary people."

Ironically, it was illiterate peasant farmers who eventually dug up the Shang fragments and catapulted the dynasty from myth to reality.

Takashima explains that until the turn of this century, the Shang dynasty was believed to exist in imagination only.

Then, in 1903, scholar and novelist Liu Teyun was picking up some malaria medication for his benefactor when he noticed something strange about the drugs being ground by the pharmacist. He ordered the druggist to stop his grinding and sell him the medicinal scapula fragments with the unmistakable etching. Until then, farmers referred to the fragments as dragon bones. To Liu, the fact that these bones contained writing was as incredible as the mythical dragons themselves.

Liu's benefactor, himself an expert in bronze inscriptions previously considered the oldest known Chinese writings, con-

firmed the historical significance of the dragon bone inscriptions. They, in fact, represented the earliest writings from the country's oldest historical period.

Their authenticity was further bolstered by the fact that they were discovered at Yinxu, the mythical birthplace of the dynasty located about 500 kilometres south of Peking.

Takashima says the ancient script found on the so-called oracle bones consists of some 4,000 different symbols, few of which resemble modern-day Chinese characters. Plastrons and scapula can contain a few symbols covering divinatory or historical events on a single day or up to 500 characters spanning a half a year. As with Liu and his benefactor, Takashima had to master first the language of the bronze inscriptions before he tackled the linguistic puzzle posed by the oracle bones.

Unlike the ancient clay tablets from Mesopotamia, which contain mostly economic information from the times, the Shang oracle bones are rich in religious, political and social commentary. They document kings' dreams, hunting expeditions, wars against foreign tribes, prominent births and harvest information supplied by court diviners and scribes. Takashima can tell the exact day and time some fragments were inscribed because they refer to solar eclipses or other phenomena which can be calculated backwards using modern astronomical science.

Takashima, a linguist by training, has spent five years meticulously compiling an annotated English translation of 613 turtle plastrons from the *Archaeologica Sinica* collection dating back to 1300 BC. The 19,000-piece collection, covering the first 50 years of the Late Shang dynasty's 250-year rule, was scientifically excavated for more than a decade until it was whisked away to Taiwan when Chiang Kai-shek fled China in 1947.

Takashima, who translated the oracle fragments mostly from ink rubbings and photographs, is currently in the process of editing his six-volume, 4,000-page project.



Charles Ker photo

**Asian Studies Prof. Ken Takashima is compiling an English translation of ancient Chinese scripts that record rich daily details of the legendary Late Shang dynasty.**

"These were the ancestors of what has become the world's oldest continuous civilization," he says. "Many of the cultural attitudes shaping Chinese civilization derive directly from attitudes and practices already visible in these early societies."

The professor claims the Confucian concept of heaven and earth is already evident in the use of turtles; the plastrons possibly representing earth and the shell, heaven. Also, philosophical elements of Yin and Yang can be found in the oracle bone statements which are frequently counterbalanced by positive and negative phrases.

While there have been numerous archaeological and historical studies of oracle bones, Takashima is the first scholar to undertake a precise linguistic dissection of China's national treasures. The *Archaeologica Sinica* is considered the most complete and authentic oracle bone collection of the more than 150,000 pieces unearthed to date.

Takashima's next project will be more

historical in nature as he plans to probe the power structure of the Shang dynasty.

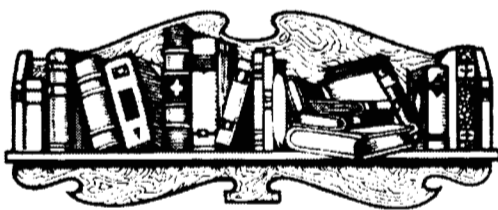
For example, the dynasty's first king, Wu Ding, had a contingent of close to 50 diviners overseeing about 25 court scribes. Di Xin, on the other hand, had four diviners and two scribes.

Takashima wants to find out where scribes and court technocrats came from and whether they were trained in the palace of the Shang capital or in the provinces. He also wants to find out how the kings and queens accumulated such immense power and wealth. Tombs excavated at Yinxu yielded caches of jade, bronze and ceramics which surpass treasures found in Egypt's fabled Tutankhamen site.

"Was there a change in the perception of divine intervention and power as the dynasty wore on?" Takashima asks. "I want to find out more about the mentality of these people who are at the root of Chinese civilization."

## Offbeat

by staff writers



Once upon a time, at a place called the University of British Columbia, there was a library full of books. There were big books and little books; old books and new books; serious books and fun books.

Over the years, many people came to the library to see the books, which, in the beginning, were filed in order and lived on shelves covering six floors of Main Library.

But with time, many of the books were moved by some of the people and ended up on the wrong shelf. Some were so badly lost, they were living on the wrong floor.

Throughout the year, the staff who took care of the books at Main Library would try to return them to their proper place, but they could only do so on a spot basis.

Then for one week this past summer—the first time in almost 10 years—about 300 people who work at UBC Library checked every shelf in the Main stacks and in the Fine Arts Library, looking for misfiled books to put back in order. They looked through enough books to reach from UBC to downtown Vancouver and back.

During the blitz, Main Library was closed between 9 and 11 a.m. Each staff member contributed about six hours of their time to work on an assigned section of stacks.

Many volunteers also helped the staff as they searched for the misfiled books, including University Librarian Ruth Patrick, John Gilbert, chair of the Senate Library Committee and Maria Klawe, vice-president, Student and Academic Services.

The North American literature and science and engineering books were badly misfiled, but the worst was the film section.

When the people came back to Main Library after the shelf reading was complete, many told the staff how much time they were now saving finding the books they wanted, and they all lived happily ever after.

The end.

# Capping tuition not a viable solution, Miller

Dan Miller, minister of Skills, Training and Labour, gave a simple answer when asked Nov. 24 if the provincial government would consider placing a cap on tuition at post-secondary institutions.

"No," said Miller, condemning the notion that a tuition cap would solve any of the problems facing universities and colleges.

Miller was speaking at a forum on post-secondary education sponsored by UBC's Alma Mater Society and attended by faculty members, students, and administrators from several educational institutions in B.C. Organizers hope that ideas, criticism and solutions that emerged from the conference will serve as reference points for future policy making.

Miller praised his government's performance in the post-secondary field while attacking federal Human Resources Minister Lloyd Axworthy and the provincial Liberals.

"We're looking at \$800 million in cuts from the federal government," Miller said.

MLA Linda Reid, who attended the forum as Liberal education critic, later criticized Miller for using the event as a campaign opportunity and said the government is using the reduction in federal transfer payments to B.C. as an excuse for cutting education and health care spending.

"He (Miller) is talking about \$320 million out of a \$20 billion budget and saying they have no choice but to impact negatively on education, and that is just rubbish," said Reid.

Michael Hughes, a student representative on UBC's Board of Governors who also participated in the forum, was more supportive of the provincial government's record, saying he finds it unlikely the government will support large tuition increases as a result of the federal cuts.

Miller said the New Democratic Party has shown its commitment to education by borrowing to build the infrastructure of the B.C. post-secondary system since it came to power four years ago.

"We have made a very deliberate decision to expand our investments in post-secondary education for a variety of reasons, one of which is that there is a direct link between the opportunities that you present in post-secondary education and your economy."

Throughout his speech Miller emphasized vocational and technical training—education that, he said, will ultimately provide jobs for the 70 per cent of high school graduates who do not pursue a university or college education.

He cited UBC's new Forest Sciences Centre as the sort of investment in education his government believes in, specifically, investments that will meet the needs of B.C. employers who require graduates with specialized skills.

Miller set the stage for further change. "There is no system in Canada that should be, and is, immune from looking at change... If we can't become more efficient... in the cost of delivering post-secondary education, we have to challenge ourselves."

# Calendar

## December 17 through January 13

### Tuesday, Dec. 19

#### Animal Science Seminar Series

The Nutrition Of Fish. What's So Different? Stewart Anderson, PhD candidate, Animal Science, MacMillan 158, 12:30. Refreshments. Call 822-4593.

### Wednesday, Jan. 3

#### Interdisciplinary Studies Seminar

Words And Their Discipline. Green College recreation lounge, 5pm. For PhD Students. Call 822-6067.

### Thursday, Jan. 4

#### Canadian Studies Lecture

Negotiating Alien Space In Recent Canadian And Australian Plays. Joanne Tompkins, Head, Dept. of Theatre and Drama, Monash University, Buchanan B212, 12:30pm. Call 822-5104.

#### Canadian Studies Workshop

Settler Society Theory. Alan Lawson, Dept. of English, U of Queensland, Green College small dining room 8pm. Call 822-5104.

### Friday, Jan. 5

#### Grand Rounds

Newer Concepts In Childhood Neuromuscular Disease. Dr. Elke Roland, Dept. of Paediatrics, Division of Neurology, GF Strong auditorium, 9am. Call 875-2307.

### Monday, Jan. 8

#### Green College Speaker Series

Kit Brennan On Her New Play "Tiger's Heart." Kit Brennan, playwright. Green College recreation lounge, 7:30-9:30pm. Call 822-6067.

### Tuesday, Jan. 9

#### Seminar

Overcoming Multi-Drug Resistance In Cancer Through The Use Of Liposomal Drug Carriers. Rajesh Krishna, grad. student, Faculty of Pharmaceutical Sciences and BC Cancer Cancer Agency, IRC#3, 12:30pm. Call 822-4645.

#### Medical Genetics Departmental Seminar

The Genetics Of Insulin-Dependent Diabetes: Finding Genes Predisposing To Multigene Disorders. Dr. Leigh Field, Paediatrics, U of Calgary, Wesbrook 201, 4:30pm. Refreshments 4pm, in 226. Call 822-5312.

#### Green College Speaker Series

Toward A History Of Scientific Philosophy. Alan Richardson, Philosophy, Green College recreation lounge, 5:30-6:30pm. Reception in Graham House 4:45-5:30pm. Call 822-6067.

#### Green College Speaker Series

Where Did It All Come From: The Origin Of Structure In The Universe. Robert Brandenberger, Physics, Brown U, Providence, Rhode Island, Green College recreation lounge, 7:30pm. Call 822-6067.

### Wednesday, Jan. 10

#### Seminar

Sati: The Event And The Ideology. Mandakranta Bose, Research Assoc., Centre for Research in Women's Studies, lecturer, Dept. of Classical, Near East and Religious Studies, Centre for Research in Women's Studies and Gender Relations, 3:30-5pm. Free. Call 822-9171.

### Thursday, Jan. 11

#### Seminar Series

The Japanese Business System And Economy: Changing Patterns. Prof. Masao Nakamura, Faculty of Commerce and Business Administration, Asian Centre 604, 12:30-2pm. Call 822-5612.

#### Law and Society

Evaluation Of A Constitutional Right For Minority Education: Section 23 Of The Canadian Charter. Prof. Angeline Martel, Sociolinguistics at Tele-universite, U. de Quebec, Green College recreation lounge, 5pm. Call 822-6067.

#### CICSR Distinguished Lecture Series

Fundamentals of Real-Time Scheduling. C.L. Liu, Dept. of Computer Science, U of Illinois, CICSR/CS Building 208, 4-5pm. Refreshments. Free lecture. Call 822-6894.



Please Recycle

### Friday, Jan. 12

#### Fisheries Centre Seminar

The Impact Of White Sucker Introductions On Brook Trout Population. Pierre Magnan, U. de Quebec (Trois-Rivieres), Fisheries Centre, Hut B8, Ralf Yorke room, 11:30am-12:30pm. Call 822-0618.

#### Lecture

Lipids And Neonatal Brain Development: Defining The Essential Fat. Prof. Sheila M. Innis, Dept. of Paediatrics, GF Strong Auditorium, 9am. Call 822-8633.

## Notices

#### Badminton Drop-In

Faculty/Staff/Grad Students are welcome to join in the fun at the Student Recreation Centre, Wednesdays and Fridays, 6:45-8:15pm now through March /96. Bring your library card. To check for cancellations e-mail jratkay@unixg.ubc.ca or call 822-6000.

#### Art Gallery

The Morris and Helen Belkin Art Gallery. Current exhibition Nov. 10, 1995 - Jan. 14, 1996. Seeing in Tongues: A Narrative of Language and Visual Arts in Quebec. Gallery hours are Tuesday - Friday 10am-5pm and Saturday, 12-5pm. 1825 Main Mall. Phone 822-2759.

#### UBC Nursing and Dept. of Counselling Psychology Study

Are you pregnant for the first time, currently working, living with a partner, and intending to return to work after the arrival of your

baby? Help us learn more about working and parenting so that we can help you. Volunteer for the "Transition to Parenthood for Working Couples Study" by calling Wendy Hall, Assistant Professor, UBC School of Nursing at 822-7447.

#### Christmas at the Shop in the Garden

Fresh festive wreaths, baskets and door swags made by the Friends of the Garden, a volunteer group. Also an exciting selection of gifts. All proceeds support the Botanical Garden. UBC Botanical Garden, 6804 S.W. Marine Drive. Shop hours: 11am-5pm. Call 822-4529.

#### Frederic Wood Theatre

*Tiger's Heart* by Kit Brennan, directed by Jan Selman. Frederic Wood Theatre, Jan 10-20, 8pm. Weekdays adults \$12, students and seniors \$8. Weekends adults \$14, students and seniors \$10. Preview Wed. 2 for \$12. Reservations and ticket information call 822-2678.

## Omission of WRIT 098D from Registration Guide

All sections of Writing 098D, Preparation for University Writing and the LPI, were accidentally omitted from the 1995/96 Registration Guide. These sections, aimed at students with English as a first language, are running as scheduled, and students may still register for them through TELEREG. The details are as follows:

Section	Catalogue #	Day and Time	Location	Dates
01E	34636	MWF 8:30	Buch D302	January 8
05E	56714	MWF 12:30	Buch B228	January 8
704	82061	W 7-10 pm	Buch B220	January 17

For details concerning Writing 098B (for students with English as an additional language), please refer to the last page of the Registration Guide.

Phone 822-9564 for information regarding these and other Writing Centre courses. New courses include Intermediate Composition, Advanced Composition, Essay Writing, Report and Business Writing, and Thesis Writing.



## UBC DEVELOPMENT APPLICATIONS

Students, faculty, staff and members of the public—**Does this affect you?** The following projects for the UBC Campus are currently being considered. You are encouraged to give us your opinions on these projects:

#### PERMIT REVIEWS IN PROGRESS

- new** — Horticulture Building Renovation & Greenhouse Addition
- new** — Public Art Sculpture "Cumbria" 1966-67, Artist: Robert Murray —Lasserre/Art Gallery Plaza
- new** — TRIUMF-ISAC—Phase I, site preparation
- new** — Temporary Trailers—CEME Building
- revised** — St. John's College—New Residential College
- hold** — New Chapel Building—St. Mark's College
- Earth Sciences Building—Phase I

#### PERMITS ISSUED

- Forest Sciences Advanced Wood Processing Lab

#### & FOR YOUR INFORMATION...

Permit Fees—changes are proposed to all UBC Development & Building Permit fees in 1996

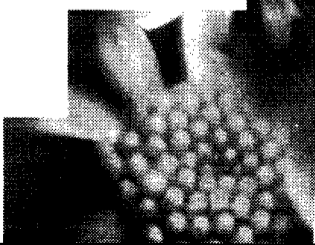
#### FOR MORE INFORMATION ON ANY OF THESE PROJECTS

please contact KATHLEEN LAIRD-BURNS AT 822-8228, laird@unixg.ubc.ca or visit our Campus Planning & Development Home Page on the Internet at <http://www.cpd.ubc.ca/cpdhome/cpdhmpg.htm>

#### Information supplied by:

Regulatory Services, a division of Campus Planning & Development, 2210 West Mall, Vancouver, BC, V6T 1Z4, 822-8228 (ph), 822-6119 (fax).

campus  
planning &  
development



# Deadlines 1996

DEADLINE AT NOON	Publication Date	Vol./ Issue	CALENDAR COVERS PERIOD:
Tues. Jan. 2	Jan. 11	42/01	Jan. 14-Jan. 27
Tues. Jan. 16	Jan. 25	42/02	Jan. 28-Feb. 10
Tues. Jan. 30	Feb. 8	42/03	Feb. 11-Feb. 24
Tues. Feb. 13	Feb. 22	42/04	Feb. 25-Mar. 9
Tues. Feb. 27	Mar. 7	42/05	Mar. 10-Mar. 23
Tues. Mar. 12	Mar. 21	42/06	Mar. 24-Apr. 6
Tues. Mar. 26	Apr. 4	42/07	Apr. 7-Apr. 20
Tues. Apr. 9	Apr. 18	42/08	Apr. 21-May 4
Tues. Apr. 23	May 2	42/09	May 5-June 15
Tues. May 14	May 23	42/10	no calendar
Tues. June 4	June 13	42/11	June 16-July 13
Tues. July 2	July 11	42/12	July 14-Aug.17
Tues. Aug. 6	Aug. 15	42/13	Aug. 18-Sept. 7
Mon. Aug. 26	Sept. 5	42/14	Sept. 8-Sept. 21
Tues. Sept. 10	Sept.19	42/15	Sept. 22-Oct. 5
Tues. Sept. 24	Oct. 3	42/16	Oct. 6-Oct. 19
Mon. Oct. 7	Oct. 17	42/17	Oct. 20-Nov. 2
Tues. Oct. 22	Oct. 31	42/18	Nov. 3-Nov. 16
Mon. Nov. 4	Nov. 14	42/19	Nov. 17-Nov. 30
Tues. Nov. 19	Nov. 28	42/20	Dec. 1-Dec. 14
Tues. Dec. 3	Dec. 12	42/21	Dec. 15-Jan. 11

For further information please contact *UBC Reports* at Public Affairs Office. Phone 822-3131. Fax 822-2684. 310-6251 Cecil Green Park Road, Vancouver, BC, V6T 1Z1.

# Calendar

*UBC Reports* carries a two-week calendar of UBC-sponsored events in each issue. Submissions are published free of charge and are accepted from all UBC departments. **To appear in the pertinent issue, submissions must be received by the deadline for that issue as noted in the accompanying Deadlines section.**

To submit an event for publication, please:

1. Type or clearly print your submission on the following form and limit it to 35 words.
2. Fax this form to the Public Affairs Office at 822-2684.

It is the submitting department's responsibility to ensure that all information is correct.

**Event:** Seminar    Lecture    Workshop    Concert  
(circle one) Other \_\_\_\_\_

**Date(s):** \_\_\_\_\_

**Title:** \_\_\_\_\_

**Speaker(s):** \_\_\_\_\_  
(please specify: name, title, department and other affiliations)

**Building:** \_\_\_\_\_ **Room #:** \_\_\_\_\_

**Time:** \_\_\_\_\_ **Tel. # for information:** \_\_\_\_\_

**Additional Information:** \_\_\_\_\_  
(fees, refreshments, etc.)

**Submitted by:** Name \_\_\_\_\_  
Department \_\_\_\_\_  
Telephone \_\_\_\_\_

For further information please contact *UBC Reports* at Public Affairs Office. Phone 822-3131. Fax 822-2684. 310-6251 Cecil Green Park Road, Vancouver, BC, V6T 1Z1.

## UBC REPORTS Advertising Rates 1996

**Circulation:** 37,000

**Distribution:** Twice monthly on the UBC campus and in *The Courier* on Vancouver's West Side except, once a month in June, July, August and December

**Mechanical Requirements**

**Page Size:** 260mm (W) x 390mm (H) (10.25" x 15.5")

**Columns:** five per page  
Black and white copy only

**Display ad rates:**

\$15.50 per column inch, GST not included

Full page (260mm x 390mm, 10.25" x 15.5" )	\$826.00
1/2 page (260mm x 195mm, 10.25" x 7.75" )	\$551.00
1/4 page (152mm x 178mm, 6" x 7")	\$331.00
1/8 page (100mm x 120mm, 4" x 4.75")	\$149.00
1/16 page (48mm x 127mm, 1 7/8" x 5" )	\$77.00
Business card (100mm x 50mm, 4" x 2")	\$62.00

**Classified ad rates:**

\$15.75 for 35 words or less, GST included. 50 cents for each additional word.

**Discounts:**

3-9 ads	10%
10+ ads	20%

**1/8**  
2 columns (100mm) x 120mm  
**\$149**

**1/16**  
1 column (48mm) x 127mm  
**\$77**

**Business card**  
2 columns (100mm) x 50mm  
**\$62**

**1/4**  
3 columns (152mm) x 178mm  
**\$331**

**1/2**  
5 columns (260mm) x 195mm  
**\$551**

For advertising information call Public Affairs at (604) 822-3131

## News Digest

Management and professional staff members at UBC will receive a 1.2 per cent salary increase for 1995-96, retroactive to July 1, 1995.

The Board of Governors approved the increase at its Nov. 16 meeting.

The Board also approved the establishment of a 2.5 per cent merit pool for discretionary increases for 1994-95 for M&P staff who performed beyond job requirements. The merit-based increase is retroactive to July 1, 1994.

Management and professional staff are the third major UBC employee group to reach a wage agreement with the university since the summer. The 2,000-member Faculty Association ratified a contract with the university last summer and 4,500 unionized employees, members of the Canadian Union of Public Employees (CUPE), ratified a five-year contract Oct. 5 that provides a six-per cent increase in wages and benefits during the life of the agreement.

• • • • •

The Corporate-Higher Education Forum is calling for nominations for two awards that recognize and promote excellence in furthering corporate-university co-operation in research.

The \$5,000 awards include the Bell Canada-Forum Award for outstanding researchers involved in co-operative research of major significance, and the Hewlett-Packard (Canada) Ltd.-Forum Award to honour remarkable achievement in facilitating corporate-university research co-operation.

Nominees may be individuals or groups and must have been engaged in collaborative industry-university research of major significance or have facilitated in organizing such research. Only work performed in Canada will be considered.

Selection of award recipients will be based on evidence of exemplary leadership in furthering university-industry co-operation in research, vision and creativity, and involving students in collaborative research projects, among other criteria.

Nominations must be received by March 1, 1996. For further information call (514) 876-1356 or fax (514) 876-1498.

The Corporate-Higher Education Forum is a leadership organization dedicated to developing stronger links between Canada's academic and business communities.

• • • • •

The Rev. Marcel A. J. Gervais, Archbishop of Ottawa, will deliver the 1996 Carr Lectures.

Gervais' first address, *The Sanctity of Family Life*, will take place on Friday, Jan. 12 at 8 p.m. in the Robson Square Conference Centre.

His second public lecture, *Christian Humanism and Family Life*, will be delivered on Jan. 13 at 2 p.m. in the Chapel of the Epiphany at the Vancouver School of Theology located on campus at 6000 Iona Drive.

The Carr Lectures are sponsored by St. Mark's College and the Newman Association of Vancouver.

For more information, call 822-4463 or 263-7559.

## Classified

The classified advertising rate is \$15.75 for 35 words or less. Each additional word is 50 cents. Rate includes GST. Ads must be submitted in writing 10 days before publication date to the UBC Public Affairs Office, 310 - 6251 Cecil Green Park Road, Vancouver B.C., V6T 1Z1, accompanied by payment in cash, cheque (made out to UBC Reports) or internal requisition. Advertising enquiries: 822-3131.

The deadline for the January 11, 1996 issue of UBC Reports is noon, January 2.

### Accommodation

**POINT GREY GUEST HOUSE** A perfect spot to reserve accommodation for guest lecturers or other university members who visit throughout the year. Close to UBC and other Vancouver attractions, a tasteful representation of our city and of UBC. 4103 W. 10th Ave., Vancouver, BC. V6R 2H2. Phone or fax (604) 222-4104.

**TINA'S GUEST HOUSE** Elegant accom. in Pt. Grey area. Minutes to UBC. On main bus routes. Close to shops and restaurants. Inc. TV, tea and coffee making, private phone/fridge. Weekly rates available. Tel: 222-3461. Fax: 222-9279.

**JERICHO TOWN HOUSE** for rent. Fully furnished, near UBC. Delightful, bright and cosy, 2-bedroom home with den, 2 bathrooms, garage and pleasant garden. Renting from May 1996. 1-2 year lease to 2-3 people. Non-smoking, no pets. \$1500/month. References required. Call (604) 733-7986.



A New Spirit of Giving

### Accommodation

**GREEN COLLEGE GUEST HOUSE** Five suites available for academic visitors to UBC only. Guests dine with residents and enjoy college life. Daily rate \$50, plus \$13/day for meals Sun.-Thurs. Call 822-8660 for more information and availability.

**FALSE CREEK TWO BEDROOM**, two full baths, furnished condo, garage, balcony, spectacular view. Steps to Granville Island market. Available Jan. 1/96 for 7 months. Non smoker. \$1600/month. Call 739-0302.

**PLEASANT, BRIGHT APARTMENT** for rent. Comfortable one bedroom suite, fully furnished and equipped, patio. Close to UBC. Available for three months or longer from January. Reasonable rent in return for taking care of two affectionate cats. Please call 228-8825.

**FULLY FURNISHED AND RENOVATED HOUSE**, near UBC. Perfect for expatriates/professors. Mountain and park views. Excellent environment. Access to transport and shopping. Available from early Jan/96 to end August. No pets N/S. Reference required. For details call 224-3423.

**CONDOMINIUM SUITE** in hotel. Downtown Yaletown area, near new library. Fully furnished. Swimming pool, sauna, etc. \$1400/month inclusive. Perfect for single person, couple on sabbatical, visiting profs., mature students for short/long term. 730-0098.

**WEST POINT GREY** family house 3-4 bedroom, 6 appl., w/w, yard, top 2 flrs. \$1,800, entire house w/ basement suite \$2,100 lease. Refs. Call 739-6873.

**LARGE KERRISDALE CHARACTER HOME** with big yard. Available from mid-March through the end of May. Rent negotiable. Call 263-4126 or 732-2565.

### Accommodation

**BASEMENT SUITE**, fully furnished for single, non-smoker. All amenities. Private entrance. On West 11th Avenue, between Discovery and Trimble. Available end of December, for three to four months, or monthly. Call 224-6193.

### Services

**ESL PRONUNCIATION WORKSHOPS**. Intensive weekly classes for adult ESL speakers, starting January 26. Intermediate or advanced. West End Community Centre, 870 Denman Street. Enrolment limited. Contact instructor: Barbara Wakal 689-5918.

**FACULTY PENSION** and RRSP Asset Allocation Service. Let me remove the worry and hassle of making your pension and RRSP investment decisions! I use sophisticated computer software to analyse your investment personality and retirement goals to optimize your entire retirement portfolio. Call Don Proteau, B.Comm., R.F.P. at 687-7526 to receive a free Asset Allocation Kit. References available. RETIRE EARLIER WITH MORE!

**TIAA-CREF MEMBERS**. Arm yourself with the information you need to make the best investment decision. Call Don Proteau at 687-7526 and ask for the Asset Allocation Kit.

**WORD PROCESSING/TYPING** Secretarial services at reasonable rates: letters, essays, theses, reports, manuscripts, novels, etc. 30 years experience. APA specialist. 228-8346.

**Next ad deadline:**  
noon, January 2

**Honda Civic Hatchback GX**

Once a backpacker. Always a backpacker.

Your needs keep changing, but not your freedom-loving spirit. Which makes the new Civic Hatchback ideal for the way you live. The engine packs more punch, so you can go where you want. A longer wheelbase gives you more room inside enough to pack in over 375 litres of friends and/or life's necessities—skis, tent, snowboard—you name it. And the convenience of a 50/50 split fold-down rear seatback gives you more choices. Plus looks that set back the competition. Best of all, you won't be packing around heavy payments.

**\$235<sup>06\*</sup>**  
Per Month  
OAC includes  
PST & CST

YOUR B.C. **HONDA** DEALERS AS RELIABLE AS THE CARS THEY SELL

BUILT WITHOUT COMPROMISE.

**ABBOTSFORD**  
THE HONDA WAY  
Fraser Valley Automall  
857-1430

**PORT MOODY**  
WESTWOOD HONDA  
2400 Barnet Hwy  
461-0633

**SURREY**  
SUN-DEL HONDA  
15291 Fraser Hwy  
583-7421

**VANCOUVER**  
CARTER HONDA  
2390 Burrard St  
736-2821

**RICHMOND**  
RICHMOND HONDA  
Richmond Auto Mall  
270-1367

**BURNABY NORTH**  
HAPPY HONDA  
4780 E. Hastings  
294-2111

**LANGLEY HONDA**  
19515 Langley Bypass  
530-6281

**WHITE ROCK**  
WHITE ROCK HONDA  
2466 King George Hwy  
536-2111

**MAPLE RIDGE**  
MARY JONES HONDA  
20611 Lougheed Hwy  
465-5464

**REGENCY HONDA**  
445 Kingsway 873-3675

**BURNABY SOUTH, NEW WEST**  
MIDDLEGATE HONDA  
6984 Kingsway  
525-4667

**NORTH & WEST VANCOUVER**  
PACIFIC HONDA  
725 Marine Drive  
984-0331

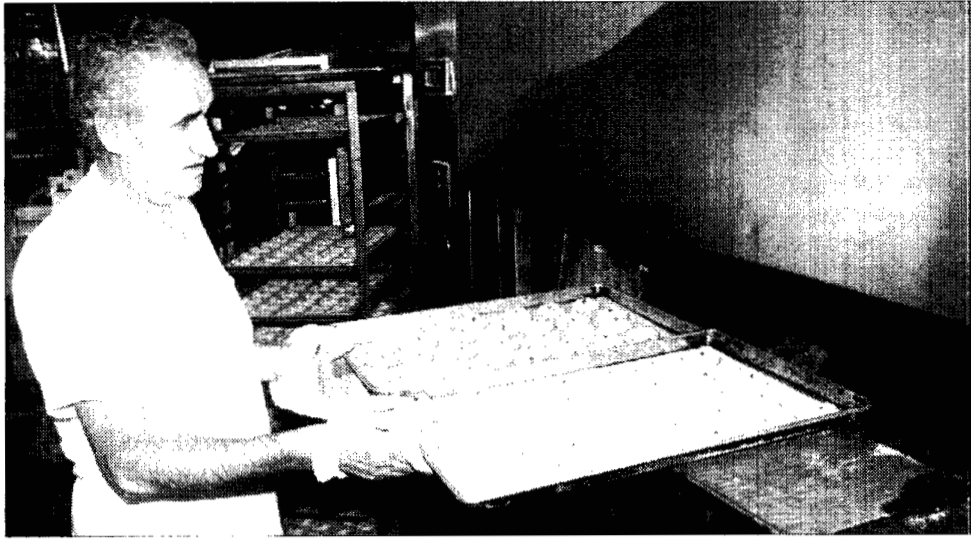
## Notice to UBC Staff Pension Plan Members

### ELECTION RESULTS

The results of the election for Directors to serve on the UBC Staff Pension Plan Board for a two-year period from January 1, 1996, to December 31, 1997, are as follows:

**Jon Nightingale**  
Deferred Member

**Shirley Reeve**  
Controller, TRIUMF



Stephen Forgacs photo

**Baker Tom Zorbakis removes some of the 6,000 shortbread cookies being made for the UBC Christmas Bakeshop from the oven. He'll also supervise the creation of 600 dozen Christmas Cherry Bars, a UBC favourite for the past five years. The recipe from *Treats to Remember* is reprinted below by permission.**

## Traditional baking snapped up quickly

Boiled Dark Fruitcake and Brown Sugar Shortbread are among the holiday season *Treats to Remember* on sale now in the UBC Christmas Bakeshop.

Edited by UBC Food Group director Christine Samson and administration manager Allen Leong, *Treats to Remember*, the latest collection of special recipes from the UBC kitchens, has been selling like hot cakes.

Among the muffins, cakes, cookies and quick breads, the treasury of treats includes 27 pages of Christmas baking. So

if you forget to place your UBC Christmas Bakeshop order by Dec. 18, try making some of UBC's most popular festive goodies at home.

*Treats to Remember* is available for \$12.50 (GST included) at the bakeshop located inside Pacific Spirit Place Cafeteria in the Student Union Building. Call 822-1812.

It's also available at the UBC Bookstore for \$11.95, or through mail order by sending \$14.95 (postage and GST included) to 2071 West Mall, Vancouver, B.C. V6T 1Z2.

### Christmas Cherry Bars

#### Crust & Filling

- 1 cup + 2 tbsp (280 mL) all-purpose flour
- 1 cup (250 mL) rolled oats
- 2 cups (500 mL) packed brown sugar
- 1 tsp (5 mL) baking soda
- 3/4 tsp (3 mL) salt
- 1/2 cup (125 mL) butter
- 2 eggs
- 1/4 tsp (1 mL) almond extract
- 1 tsp (5 mL) baking powder
- 1 cup (250 mL) coconut
- 1 cup (250 mL) halved maraschino cherries
- 1/2 cup (125 mL) pecan halves

#### Icing

- 1/4 cup (50 mL) butter
- 1/2 tsp (2 mL) almond extract

- 2 cups (500 mL) sifted icing sugar
- 3-4 tbsp (45-60 mL) milk or cream

#### Method

Preheat oven to 350°F (180°C). Grease 13x9x2 inch (32x22x5 cm) pan. Mix 1 cup (250mL) flour, rolled oats, 1 cup (250 mL) brown sugar, soda and 1/4 tsp (1 mL) salt. Add butter and mix until crumbly. Press into pan and bake 10 minutes. Beat eggs. Stir in 1 cup (250 mL) brown sugar and almond extract. Mix 2 tbsp flour, baking powder and 1/2 tsp (2 mL) salt and stir into egg mixture. Add coconut and cherries. Spread evenly over crust. Sprinkle with pecans. Bake 25 minutes or until lightly browned. Cool completely. For icing, beat all ingredients together until smooth and creamy. Spread over bars.

## Industry, research team up to strike gold, copper ore

by Gavin Wilson

Staff writer

Making valuable gold and copper ore deposits easier to find is the goal of a new project of the Mineral Deposit Research Unit (MDRU), part of the Dept. of Geological Sciences.

"What we're trying to understand is why these deposits occur where they do, and why some are better than others. If we can understand this, we will fulfill our scientific goals and industry can use this knowledge to aid in their exploration," said MDRU Director John Thompson.

Gold and copper deposits form as molten rock crystallizes and hardens, releasing water and interacting with surrounding ground water. In a long series of complex processes, metals are transformed from traces measurable only in parts per billion to much greater concentrations that are economical to mine.

"There are a great many processes at work. Our goal is to understand which are the most important," Thompson said.

Computer models will be developed to test theories of how these processes occur. If these models are borne out by real-world testing, they could be used to predict which areas contain significant ore concentrations.

Field work has already begun, with researchers mapping rocks in rugged terrain

from Alaska to Peru and analyzing samples and drill cores from mining companies.

Thompson said this project is a departure from earlier work at the MDRU, which focused primarily on B.C. mineral deposits.

"Being more international in scope matches the interests of Canadian mining companies," he said.

Seventeen mining companies are each donating \$10,000 a year to the four-year project, with matching funds from the Natural Sciences and Engineering Research Council, bringing the total to about \$1 million.

This is the seventh research project the MDRU has started since it was founded in 1989. Since that time it has greatly increased Geological Science's collaboration with industry and brought in more than \$6 million in research funding.

"We are filling a niche not adequately filled before. So far, we've been very well received," Thompson said.

The MDRU brings groups of companies together to fund projects, which involve teams of faculty, research associates, post doctoral fellows and graduate students.

Thompson said the new project has a particularly strong and diverse team with expertise in several sub-disciplines provided by Assoc. Prof. Kelly Russell, Assistant Prof. Greg Dipple and Visiting Prof. Jim Mortensen.

## People

by staff writers

**William Sauder**, chair and chief executive officer of International Forest Products and Sauder Industries Limited, was acclaimed as UBC chancellor last month. He begins his three-year term in July, 1996.

The university chancellor is elected by the alumni of the university and confers all degrees. The chancellor is also a member of Senate and the Board of Governors.

A UBC graduate (BCom '48), Sauder was a member of the university's Board of Governors from 1981 to 1987, and served as chair of the board for the last two years of his term. He received an honorary degree from UBC in 1990.

"I am very pleased at the election of William Sauder," said UBC President David Strangway. "He was chair of the Board of Governors when I came to UBC and I look forward to working with him again."

Sauder, his wife Marjorie-Anne and their eight children are long-time patrons of UBC and have supported several medical science initiatives at the university.

The Sauder Family Chair in Pediatric Diseases and the Sauder Family Chair in Viral Diseases of Children are named in recognition of the family's philanthropy.

In addition to his activities in the forestry sector, Sauder currently serves as a member of the board of directors and executive committee of the Toronto-Dominion Bank.

He also was a member of the executive committee of B.C. Hydro and the British Columbia Development Corporation, as well as director of both companies.



Sauder

UBC's Department of Housing and Conferences has appointed **Janice Robinson** to the position of assistant director, Residence Life.

For the past seven years Robinson has served as a residence life manager in several east campus residences including Acadia Park, Fairview Crescent and the University Apartments.

In her new position, she will provide leadership to five live-in residence life managers who supervise more than 100 student staff in UBC residences. The managers and student staff provide educational and community development opportunities and peer support to residents.

Robinson has a BA in Social Work from John Wesley College and an MSE from the University of Wisconsin at Platteville specializing in guidance and counselling.

The Dept. of Housing and Conferences manages on-campus accommodation for more than 6,000 residents.



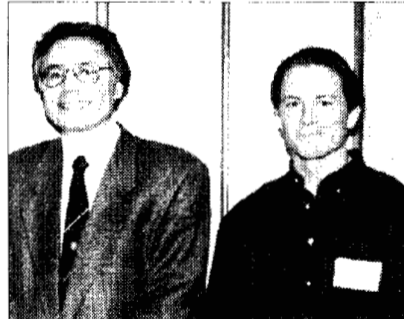
Robinson

Zoology Prof. **Peter Hochachka** was recently awarded the Fry Medal from the Canadian Zoological Society for his outstanding research. Hochachka is a pioneer in the fields of comparative biochemistry and physiological adaptations whose research has furthered our understanding of evolutionary processes. His research focuses on the effect on mammals of hypoxia, or lack of oxygen.

The award was presented at the society's 34th annual meeting, held this year in Rimouski, Québec.

Also receiving an award was Zoology graduate student **Hans Keirstead**, who was recognized for the best zoology doctoral thesis in Canada.

Keirstead, whose thesis supervisor was Prof. John Steeves, director of Collaboration on Repair Discoveries (CORD), wrote his thesis on the inhibitory role of myelin in spinal cord regeneration.



Hochachka (l), Keirstead

Associate Prof. of Music **John Roeder** is the recipient of the 1995 Outstanding Publication Award presented by the Society for Music Theory.

His award-winning article, "Interacting Pulse Streams in Schoenberg's Atonal Polyphony," appeared in the 1994 fall edition of *Music Theory Spectrum*, the society's journal.

Roeder, who joined UBC in 1985, also serves as director of the UBC School of Music's Multimedia Centre, a facility for aural training, music notation and the development of multimedia music software. His theories of 20th century music, computer applications and rhythm have been published in leading journals of music theory.

Roeder has served on the editorial boards of *Perspectives of New Music* and *Music Theory Spectrum*.

Fine Arts Prof. **Jeff Wall** has received dual honours in recognition of his outstanding achievements in the arts.

Wall was recently presented with the Eugene McDermott Award by the Council for the Arts based at the Massachusetts Institute of Technology. The award recognizes an artist for the highest standard of achievement at the national level in the visual, literary or performing arts whose work is underappreciated outside of the discipline. He also is the first recipient of the newly created Munich Art Prize, the largest cash award for the arts given in Germany.

Wall, a UBC graduate, joined the faculty in 1987 after serving teaching appointments at Simon Fraser University and the Nova Scotia College of Art and Design.

Accomplished in large scale photography, his work has been featured in exhibitions throughout Europe, Canada and the United States.

Wall's research interests include philosophical aesthetics and critical theory concerning problems of modernism in the arts since the Baroque period. He has received international prominence for his unique work with transparencies.

## Feature

# Probing earth's inner space

*Scientists seek understanding of forces that formed our continent*



**Geophysics Prof. Ron Clowes heads Lithoprobe, the largest earth science research project ever undertaken in Canada. Shown here examining seismic data are (l-r) Clowes and former graduate students John Hole, Deirdre O'Leary and Mike Perz.**

by Gavin Wilson

Staff writer

**T**oronto and Montreal are built on the remnants of a mountain range that may have been higher than the Himalayas.

A massive 35-kilometre-deep rift—the greatest the world has ever known—once threatened to break North America in two.

And beneath northern Québec is the key to a riddle that has puzzled scientists for generations—how did the first land rise above the waves of primeval oceans to form continents?

These are just some of the startling findings of UBC-based Lithoprobe, the largest earth science research project ever undertaken in Canada.

Headed by Ronald Clowes, a geophysics professor in the Dept. of Geophysics and Astronomy, Lithoprobe began in 1984. Its aim is to develop a comprehensive understanding of the geological evolution of the North American continent.

"In many ways, we probably know more about outer space than we do about inner space—the earth beneath our feet. Lithoprobe is designed to give us a better understanding of the forces that shaped this continent," Clowes said.

This journey through inner space has taken Lithoprobe researchers from Vancouver Island to Newfoundland and up to the Arctic, probing deep below the earth's surface to investigate four billion years of geological history.

An army of researchers was enlisted for this enormous task; more than 600 scientists associated with 28 universities, 17 private companies, and 13 federal and provincial government agencies.

The project's continuing annual budget of about \$5.6 million comes

from the Natural Sciences and Engineering Research Council and the Geological Survey of Canada. Mining and petroleum companies, provincial geological surveys and other sources provide additional funds, data and services to augment the base budget.

Even with this talent and funding, it would have been impossible to conduct this type of research until a few years ago. However, advances in seismology, other geoscience techniques and computer technology have enabled Lithoprobe scientists to map rock formations and structures up to 100 kilometres below the surface and infer what such measurements are indicating.

This region of inner space, the upper part of which is the Earth's crust, is known as the lithosphere—the rigid outer part of earth which includes the ever-shifting—and earthquake-making—mosaic of 12 major tectonic plates and many smaller ones.

**A**s well as answering fundamental scientific questions about how the continent was formed, studying the lithosphere can tell us, in broad terms, where resources are likely to be and help assess earthquake risks across the country, Clowes said.

The information is of particular interest to companies involved in mineral and petroleum exploration, since the crust contains the oil, gas, coal, base metals and precious metals that help sustain our civilization.

"It's not our objective to find mineral deposits, but we can help create an understanding of the underlying geology so that industry can better plan their own explorations," Clowes said.

"We are looking for unique clues to the processes that over billions of years have formed the continent as we know it. It's almost like being detectives in a

mystery novel. We gather evidence here and there, and then put it together to find the solution."

Among these sleuths' findings, which have been published in more than 700 scientific papers:

- A gigantic but now deeply buried rift under Lake Superior and Michigan. The largest ever discovered on earth, it was as deep as 35 kilometres and almost split the continent in two about a billion years ago.
- Under Lake Huron and in southern Ontario and Québec, evidence of a massive mountain range that once rivalled the Himalayas. It formed about 1.2 billion years ago when a continent at least the size of India collided with the existing North American land mass. The impact was so powerful it pushed up massive blocks of land over the Canadian Shield, creating a 5,000-kilometre-long mountain range extending from what is now Texas to Labrador. In the ensuing eons, the mountains eroded, leaving a relatively flat landscape.
- The most direct evidence to date of how land first appeared on earth, which at one time was covered by a vast sea, and formed continents.

**I**n an article published last summer in the journal *Nature*, Lithoprobe researchers explained how the discovery of a major boundary some 40 to 80 kilometres beneath northern Québec provides the answer.

Lava-spewing volcanoes created the first islands to rise above ancient oceans. These island arcs and plateaus, like the present Philippines and Hawaii, were pushed along as if on a massive wobbly conveyor belt by plate tectonics (also known as continental drift). They smashed into each

other and eventually piled up into mountainous continents.

Deep beneath Québec, Lithoprobe researchers found direct evidence that plate tectonics was occurring 2.6 billion years ago, 800 million years earlier than previous evidence had indicated.

B.C. provides a more recent example of continent building. Our province's land mass originated during the past 180 million years, when micro-continents migrated out of the Pacific from as far away as Australia and collided with North America's then-western shore. These collisions caused the land and sea bed to buckle and fold, creating wave after wave of mountain ranges.

The main technique Lithoprobe researchers use to make these discoveries is seismic reflection, which works like a ship's echo sounder reading water depths, but revealing instead the buried structures of rock formations.

**S**pecially-equipped 25-tonne trucks, called "dancing elephants" by the media, send vibrations down into the earth. On ships, technicians create vibrations with pulses of compressed air.

Whatever the source, the principle is the same. Vibrations travel down through the earth's lithosphere and are reflected or refracted at the boundaries of structural features along the way. The signals bounce back toward the surface where they are picked up by a network of geophone receivers.

The resulting images are processed and displayed on powerful computers, "and then interpreted much as a doctor would an X-ray or ultrasound," Clowes said.

Lithoprobe scientists have become world leaders in the use of seismic reflection, pioneering new techniques and applications, he added.