



Canadian Press photo

Receiving Frank Tindall Trophy as Coach of the Year in Canadian intercollegiate football is Frank Smith (right), head coach of UBC Thunderbirds. Smith keeps the small trophy he is holding, and his name will be inscribed on the large permanent trophy. Presentation was made by Bruce McGregor, Carleton alumnus, last Thursday night in Toronto. Trophy honors Frank Tindall, head coach of Queen's University Golden Gaels for 29 years. Frank Smith's Thunderbirds, picked to finish third in the West this season, made it all the way to the College Bowl. They end their season this Saturday night at Empire Stadium when they take on Simon Fraser University Clansmen in the Shrum Bowl for the United Way.

## 'Birds wind up season against SFU Saturday

The UBC Thunderbirds, after failing to bring home the College Bowl from their Canadian intercollegiate football final against Queen's on Saturday in Toronto, will be out to end their season on a high note this Saturday night at Empire Stadium.

Occasion is the renewal of the Shrum Bowl between the 'Birds and the Simon Fraser University Clansmen, with proceeds going to the United Way. Game time at Empire Stadium is 8 p.m., with the west side of the stadium reserved for UBC supporters.

Tickets are available at the Athletic Office in the War Memorial Gym, at all Eaton's stores and Vancouver Ticket Centre outlets — \$5 under cover and \$3 in the open. UBC students can buy tickets for seats under cover at \$2 each at the AMS business office in SUB, Room 266, with a limit of two tickets per student.

Although four of the five earlier Shrum Bowls resulted in one-sided victories for SFU, football experts are predicting a close contest this time around. UBC's football program has improved considerably since the last Shrum Bowl in 1971 (won 42-0 by SFU) and the 'Birds hit their peak this season by going all the way to the College Bowl in Toronto for the first time.

In the College Bowl, played before a near-record crowd of 19,124 mostly pro-Queen's fans, at the University of Toronto's Varsity Stadium, the Golden Gaels from Queen's showed clearly that their record as the best defensive team in the country was no fluke.

They shut down what has been a potent UBC offence and held the 'Birds to a solitary field goal by Gary Metz. The Queen's attack was largely contained by the 'Birds, but a couple of UBC fumbles led to a field goal and touchdown by the Golden Gaels. Final score was 16-3.

"We made too many mistakes at critical times," said Thunderbird head coach Frank Smith, who was named last Thursday night as coach of the year in Canadian college football.

Despite the defeat, UBC quarterback Dan Smith set two records for a College Bowl — most passes at 35 and most completions, 18.

Quarterback Smith also was nominated for the Hec Crighton

Trophy as the outstanding intercollegiate football player in Canada, but lost out in the balloting to quarterback Jamie Bone of the University of Western Ontario.

Further honors came to UBC with the selection of a 24-player 'All-Canadian' team that will meet the U.S. college all-stars in the Can-Am Bowl in Florida in January. UBC running back John MacKay and linebacker Kevin Konar were named to the Canadian starting team and tight end Chris Davies was selected for the reserve team.

Unfortunately for Canada, and for UBC this Saturday night, a leg injury will keep MacKay out of the Can-Am Bowl and the Shrum Bowl.



## Football ticket could win you a holiday trip

Faculty, staff and public: \$5 under cover, \$3 in the open. Tickets available at Athletic Office in War Memorial Gym, any Eaton's store, all Vancouver Ticket Centre outlets.

UBC students: \$2 under cover, limit of two tickets per student. Available in AMS business office, Room 266 of SUB.

Seat prize: Air Canada tickets for two to Florida or Caribbean.

Program prize: Two weeks in Hawaii for two, all expenses paid.

Shrum Bowl, 8 p.m. Saturday, Nov. 25, Empire Stadium. UBC vs. SFU, Canadian football.

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# UBC reports

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## Coal program gets approval by UBC Board

UBC has been given the green light to expand coal teaching and research.

The development will make UBC the premier university in Canada in coal education and will have a significant impact on the provincial economy.

UBC has received permission from the Universities Council of B.C. to build a Coal Research Centre. The council had already approved as a new program a fourth-year option in coal engineering.

The federal Ministry of State for Science and Technology has indicated support for coal research at the new centre. The combined support of Victoria and Ottawa will better prepare the province to exploit its huge reserves of coal.

### Coal large revenue earner for B.C.

Coal is already a large revenue earner in the province. Coal production rose dramatically in B.C. during the 1970s to about 10 million tons per year, ranking second only to forest products in value of exports.

All of the coal has been used in blast furnaces. The market for this type of metallurgical coal is projected to increase. Predictions are that the demand for other uses of coal — for example, thermal coal for the production of gas and liquid fuels — will go up dramatically both in B.C. and the rest of Canada and abroad.

In spite of huge coal resources in B.C., little is known about them. Their precise location and composition are not clearly defined. And there has been little effort to relate the deposits to the different applications for coal.

"Coal isn't simply dug out of the ground and sent to market anymore," said Prof. John Evans, head of UBC's Department of Mineral Engineering. "It's broken down into its various compounds and reconstituted in different combinations to eliminate waste, and more important, to produce coals for specific uses. The coal product is custom made."

Prof. Evans said UBC is firmly committed to coal engineering studies to help prepare the province for future development of its coal resources. No other Canadian university offers programs to train coal scientists and engineers. And there is no other coal research establishment in B.C.

### Emphasize exploration, production

He said the centre will concentrate on the coals of the Western Cordillera in B.C. and Alberta, and it will work in conjunction with B.C. Research, the provincial applied research agency on campus, and with the B.C. Institute of Technology, which is interested in training coal technologists.

Initial work at the centre will concentrate on exploration and production.

"On the exploration side, we want to delineate the deposits, define their exact location and extent and their main utilization characteristics. Out of this will come a B.C. coal reserve data base," Prof. Evans said.

"Production studies will cover a wide range of subjects. We want to know what variety of coal products we can produce from our coals, including coal that is now being rejected by operating mines or has been rejected or ignored in the past.

"We also want to increase the yield and quality of the coal we mine, establish safe operating conditions, anticipate environmental aspects and study different methods that could be used to transport the coal."

Eventually, the centre would evaluate unique B.C. coals to see if they can be used for specific applications, and would try to discover new methods of extracting more value from the coals.

UBC's Board of Governors has authorized capital expenditures totalling \$1.3 million to enable expansion of the coal teaching and research program.

### Mineral Engineering will move

Part of the funds will be used to complete unfinished space in the Frank A. Forward Building for metallurgy. Completion of the unfinished space will enable the Department of Mineral Engineering to move to the Forward Building from its present quarters at the corner of the West Mall and University Boulevard.

A 150,000-square-foot Coal Research Centre will be built adjacent to the Forward Building to provide teaching and research space for work being done in the Departments of Mineral Engineering, Metallurgy, Chemical Engineering and Geological Sciences.

## TRIUMF prepares for cancer therapy role

A major step has been made by the provincial government to provide a new form of cancer radiation therapy treatment for British Columbians.

TRIUMF, the nuclear research project on UBC's south campus, will have the first neutron radiation therapy unit in Canada.

TRIUMF is already experimenting with meson radiation therapy.

So British Columbians will have at their disposal two unique radiation treatments for cancer in Canada — neutron and meson radiation therapy.

The neutron radiation therapy machine is a model CP42 cyclotron made by the Cyclotron Corp. of the U.S. A cyclotron is a machine that accelerates sub-atomic particles to tremendous speeds to study the inner structure of atoms. Cyclotrons also have practical applications, particularly in medicine.

The CP42 has an energy of 42 million electron volts. It will be in addition to TRIUMF's main 500-million-electron-volt cyclotron.

The CP42 will be used for neutron radiation therapy of certain types of cancer tumors. But its main purpose will be to back up the main cyclotron's production of radioisotopes for use in medicine.

Neutron therapy is among the newest forms of radiation treatment for cancer. Experiments in the U.K. in neutron radiation therapy have shown promising results. Two such machines are now operating in the U.K. and the U.S. has ordered three. The National Cancer Institute in the U.S. has made the CP42 the standard for future work in neutron therapy.

Cost of the CP42 is \$1.7 million. TRIUMF was about to order a CP30 cyclotron (30 million electron volts) for \$1.3 million. This less-powerful cyclotron was to produce radioisotopes for a growing medical market, but would have been much less effective for neutron therapy. The provincial government, realizing the possibilities of the CP42, is giving TRIUMF the extra \$400,000 so that they can purchase the more powerful machine.

About \$1.5 million of additional equipment will be needed before the CP42 can be used for radiation therapy.

When the CP42 becomes available for neutron radiation therapy, TRIUMF will have two radiation facilities for use against cancer.

The other form of radiation is from mesons themselves, produced by the main cyclotron. A research program is now underway at ve meson radiation therapy will be. The program is being conducted by the B.C. Cancer Foundation and the B.C. Cancer Control Agency.

There are other benefits to buying the CP42 rather than CP30. The extra power of the CP42 means that a greater amount and wider variety of radioisotopes can be made than would be possible with the CP30.

TRIUMF will produce radioisotopes under an agreement reached earlier this year with UBC, the commercial products division of Atomic Energy of Canada Ltd., and the B.C. Development Corp.

Under the agreement, BCDC will lend \$3.5 million for construction of a building and to buy the CP42. Repayment of the money by UBC is guaranteed by Atomic Energy of Canada Ltd., which will sell the radioisotopes.

After Atomic Energy of Canada Ltd. has recovered its costs, sale revenues will be split between Atomic Energy of Canada Ltd. and TRIUMF. TRIUMF's share will be in the form of research grants.

Although TRIUMF's main cyclotron is capable of producing many of the radioisotopes, there are periods when the main machine is shut down. Radioisotope buyers want a guaranteed supply, so a second machine was needed to back up production by the main machine.

Isotopes are different forms of an element with fewer or more neutrons than the atomic nucleus normally has. Stable isotopes occur in nature. Man-made unstable isotopes have been used for years in medicine as tracers. They can be detected as they pass through the body and provide important information on how well organs and other parts of the body are working and whether disease is present.

After isotope is administered to a patient, it emits gamma rays from a site in the body, and the rays can be picked up by a gamma camera which produces a picture similar to an x-ray plate.

Almost all radioisotopes used in medicine are by-products of nuclear reactors which add neutrons to the nucleus of stable atoms. TRIUMF produces isotopes with fewer neutrons than normal. An important advantage of these isotopes is that they give the patient much less radiation.



Jim Bantam photo

**Bad News 'Birds** — UBC's women's hockey team — were laden down with friendship dolls and trophies when they returned from Japan recently where they won all their games in a round-robin tournament sponsored by Isetan, a major department store chain. Left to right are: assistant captain Diane Abbott, Physical Education 3; team captain Louise Tenisci, Physical Education 4; and assistant captain Anne Stevens, an Arts and Education graduate who is currently in her qualifying year for Graduate Studies.

## Senate rejects study of degree policy

UBC's Senate has narrowly defeated a proposal by a student senator to set up an ad hoc committee to carry out a wide-ranging study of policies for granting bachelor's degrees.

Law student Eric Warren, who made the proposal at the Nov. 15 Senate meeting, asked that the committee also consider and make recommendations on the following topics:

1. Should some degree of competence in a language other than English be required for bachelor's degrees?;
2. Should more exposure to the sciences (including mathematics) be required in non-science programs?;
3. Should some degree of competence ... in both written and spoken English be demanded beyond that which is presently required?; and
4. Should the University institute a "general studies" bachelor's degree with students having a free choice of courses?

Mr. Warren told Senate he hoped the motion would be interpreted in a broad sense and that the committee would not be restricted to considering only those matters listed in the motion.

He said he wanted the study to indicate the future direction of the University in terms of its policy for granting bachelor's degrees.

Should the University opt for relaxing standards and maintaining arts and science faculties that feed professional schools, he asked, or should it aim at providing a "genuine" bachelor's degree which would enable the University to say of its graduates, "Here is a person who has a liberal arts education."

Objections to the motion came from Prof. Trevor Heaver, of the Faculty of Commerce and Business Administration, who said it would be futile to establish a committee with as wide a mandate as that proposed by Mr. Warren, and from Arts Dean Robert Will, who said the matters proposed for study were the concerns of individual faculties and were therefore outside the purview of Senate.

Senate's chairman, President Douglas Kenny, said he hoped any

Senate committee would consult faculties on the questions raised in the motion and added that Senate could refer back to the faculties any recommendations it felt infringed on faculty prerogatives. Certainly, he said, Senate has the authority to consider and recommend to the Board of Governors revisions in degree programs in all faculties and departments of the University.

He said he hoped Mr. Warren wasn't serious about a general studies degree, which he characterized as "cafeteria-style education." President Kenny said such a degree would be "contrary to everything this University has stood for."

Mr. Warren replied that he was not supporting the idea of a general studies degree, but was merely asking for a study of the possibility.

Following defeat of the motion, President Kenny said Mr. Warren should be "encouraged and commended" for trying to grapple with a fundamental issue. "Mr. Warren shouldn't be disappointed with the outcome (of the debate) and I'm certainly prepared to look at this issue again."

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## Enrolment climbs in all continuing education areas

UBC provided continuing education services to nearly 60,000 British Columbians in 1977-78, UBC's Senate was told at its November meeting.

Prof. Donald MacDougall, who chairs Senate's continuing education committee, said every UBC unit offering outreach programs experienced an increase in enrolment last year as compared to 1976-77.

A statistical summary showed that the Centre for Continuing Education enrolled 35,436 persons in 1977-78 compared to 33,777 the previous year. Continuing Education in the Health Sciences increased its enrolments from 8,515 in 1976-77 to 11,246 in 1977-78.

Commerce and social work also experienced enrolment increases.

Prof. MacDougall said that in the coming year the Senate committee would be considering policies to guide the University in its continuing education activities, which he said had been organized up to now on an "ad hoc basis."

President Kenny, commenting on the report, said UBC probably mounts "the most massive and extensive and exciting program in continuing education" of any university in Canada. "I don't think there's a university in North America that can compare themselves with the activities of our Centre (for Continuing Education)," he added.

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## Department goes; becomes division in dean's office

UBC's Senate eliminated a department in the Faculty of Medicine and recreated it as a division within the dean's office at its Nov. 15 meeting.

On the recommendation of the medical faculty, the Department of the History of Medicine and Science became a division in the office of Dean William Webber, who told Senate that a director for the division would be appointed "with an academic appointment in a suitable department." He said the faculty also hoped for a cross appointment in the Department of History in the Faculty of Arts.

## Survey result surprises

When it comes to breast cancer, the wives of UBC faculty are true to their socio-economic status. Their incidence of the disease is higher than among the general population.

But curiously, the incidence among faculty women is about the same as among society at large.

For some years researchers have known that breast cancer is associated with higher socio-economic status and late childbearing or lack of childbearing.

Various hypotheses have been put forward to try to explain this. One of the most popular today is diet, which is often suggested as the cause of many little-understood diseases.

Last spring Dr. Brenda Morrison, assistant professor in UBC's Department of Health Care and Epidemiology, did a survey of UBC women faculty and faculty wives. She suspected that the higher incidence would show up among faculty women. But the reverse was the case.

Thirty-five cases of breast cancer were reported in wives of male faculty and seven in female faculty. Compared with the incidence in the general population, the expected numbers would have been 12 and 5 respectively.

"From this it appears that there is little increased risk among faculty women but there is a doubling or tripling of risk among the wives of faculty men," said Dr. Morrison.

"It must be kept in mind, however, that 40 per cent of the men did not reply and, perhaps, a smaller proportion of these men's wives had breast cancer."

The wives that did get breast cancer had their first child three years later on the average than wives that did not have the disease. Strangely, this distinction among faculty women who had the disease and those that did not was not observed. Dr. Morrison said this may be because the number of faculty women with the disease is small.

A majority of wives had the disease before their menopause while most of the faculty women were diagnosed after theirs.

Dr. Morrison is sending out another letter to those who didn't respond to try to increase the response rate. Letters will also go to Simon Fraser faculty.

At UBC, the Faculty of Forestry had the highest response rate and the Faculty of Law the lowest. Among departments, Anatomy in the Faculty of Medicine had the highest and Agricultural Economics and Mineral Engineering tied for the lowest.

"Those physicians whose livelihood is directly benefitted by the disease gave a poor response," Dr. Morrison said, "surgeons 45 per cent and radiologists 40 per cent."

"The non-respondents among the men tended to be the middle-aged and older faculty — the men who should be most concerned. Among the women there was no particular age group."

"Fifty-three men and five women did not identify themselves on the outside ballot envelope. Five of these men's wives had breast cancer — an unrepresentatively high proportion. None of the five faculty women had the disease."

"The conclusion from this is that for men, there is still a great stigma attached to the disease."

## Habitat conference just a beginning

Hanging on office walls throughout this campus are posters left over from the Habitat conference held in Vancouver more than two years ago. But Habitat's over, you say. Finished.

Only for some. Others are working hard to make sure that the ideas and problems raised at the United Nations Conference on Human Settlements (Habitat, for short) do not die now that the noise and publicity are gone.

Two groups located at UBC, specifically, have been involved with the concerns of Habitat — the UBC Centre for Human Settlements and Vision Habitat: The United Nations Audio-Visual Information Centre on Human Settlements. Tomorrow marks the opening of new quarters for the two groups. (See story this page.)

Up till now space has been borrowed from other areas on campus, but the new Library Processing Centre will house the joint facilities permanently.

The director of the UBC Centre for Human Settlements, and the man very much involved in the birth and growth of the organization, is Dr. Peter Oberlander. "Our mandate is to stimulate and carry out research in the field of human settlements," he says. The UBC centre is administratively part of the Faculty of Graduate Studies and works very much as other graduate level, multi-disciplinary research units on campus do, such as the Centre for Transportation Studies or the Institute of Oceanography, Dr. Oberlander explains.

### Resident scholars

Learning about human settlements problems and solutions takes several forms within the Centre for Human Settlements. There have been six "scholars-in-residence" to the centre so far, scholars who have already established a reputation and who can continue their research through the use of the vast collection of audio-visual materials produced by more than 130 countries for the Habitat conference in 1976. That collection of materials is housed at UBC.

The scholars also take part in seminars and public lectures — the most recent visitor, Dr. Harry Anthony from the School of Environmental Design at the California State Polytechnic University has just completed a four-part series of lectures on strategic urbanization in Europe's industrialized countries, using London, Stockholm, Paris and Moscow as examples.

The work of some of the earlier scholars is already in print, published by UBC Press or the Centre for Human Settlements itself.

Invitational seminars, such as the one held in May of this year on Managing Water Resources for Human Settlements, are also a major part of the research thrust of the centre.

Of course, one of the major resources now for any research on human settlements issues has to be that huge world-wide collection of audio-visual materials prepared for Habitat, mentioned earlier.

It's presently located in the bowels of the Woodward Instructional



The official opening of joint facilities for Vision Habitat — the United Nations Audio-Visual Information Centre on Human Settlements — and the UBC Centre for Human Settlements will take place tomorrow (Thursday) at 4 p.m.

Over the past two years, the two groups have been working in space borrowed from other campus departments and now they will be housed on the fourth floor of the new Library Processing Centre, nearing completion just west of the Woodward Biomedical Library.

The actual opening of the space will be performed by His Excellency Dr. A. Ramachandran, an Under-Secretary General of the United Nations and executive director of the UN Centre for Human Settlements. Also attending the ceremony will be Enrique Penalosa, who was secretary-general of the Habitat conference held in Vancouver in May, 1976.

Representing the Canadian government, which through the ministry of state for urban affairs has funded the initial operations of Vision Habitat and supports in part the UBC Centre for Human Settlements, will be Senator Ray Perrault. And representing the provincial government, which through the ministry of education has financed the new facilities and equipment both for Vision Habitat and the Centre for Human Settlements, will be education minister Patrick McGeer.

Resources Centre, not highly visible for campus users. But its location doesn't seem to have deterred those whose interests touch on human settlement issues.

Last month alone, 520 students made use of the collection, students from fields as disparate on the surface as metallurgy and commerce, dentistry and geography, civil engineering and Spanish.

In fact, many of the students watching the audio-visual material are language students, because each presentation has been translated into six languages, the official languages of the Habitat conference.

The collection, now transferred to videotape for UBC's use and catalogued, is by no means a static collection, doomed to be of archival interest only as time wears on. It has been expanded by bits and pieces since being made available for public use in May of last year.

"That collection is only as good as it remains an active and usable collection," says Dr. Oberlander.

The people making sure the collection remains usable — and is used by those facing human settlements problems — belong to the other group that will be moving to the Library Processing Centre.

The United Nations Audio-Visual

Information Centre on Human Settlements prefers to be known by its shorter name: Vision Habitat. And the world-wide headquarters for this UN organization are located here under our very noses. In fact, this is only the second UN agency to have headquarters in Canada, the other being located in Montreal. Vision Habitat is under the direction of Michael Hayward, a career officer with the United Nations.

Jim Carney, deputy director of Vision Habitat explains how the UN group and UBC's Centre for Human Settlements co-operate: "All the material in the audio-visual collection produced for Habitat is owned by the UN. In effect, the Centre for Human Settlements borrows the material for academic and educational purposes within the campus and Greater Vancouver."

### World distribution

Vision Habitat's distributional thrust is on a world-wide scale, with regional audio-visual centres in Bangkok, Mexico City, Dakar, Nairobi and Geneva. A centre will shortly be set up in Amman, Jordan.

The original collection of 232 audio-visual presentations made by countries contributing to the Habitat conference has been multiplied to more than 2,500 copies, through money made available by the Canadian federal government. Now each regional centre for Vision Habitat has copies in the appropriate languages of the majority of the Habitat productions and an inventory of the complete collection. The regional centres are associated with regional arrangements for training, education, research and information exchange on human settlements problems throughout the region.

"Our essential mandate," says Jim Carney, "is to ensure the distribution and utilization of the existing collection. But our equally important job is to generate additional information on human settlements around the world."

To that end Vision Habitat has set up programs to encourage third world countries to produce new films, and thereby increase information on human settlements: a Vision Habitat film script competition this year; a human settlements television award next year; regional communication clinics.

"We hope to increase the collection by 10 per cent a year. Financial and technical assistance will be given to each winner of the film script contest in each of the five regions," Mr. Carney adds.

### In constant touch

Vision Habitat headquarters is in constant touch by telex and telephone with the regional centres.

In the overview, Vision Habitat and the Centre for Human Settlements are an interesting combination — Vision Habitat in the field, encouraging third world peoples to document how they're solving their human settlement problems; UBC's Centre for Human Settlements learning from that documentation and encouraging research to solve future problems.

The Habitat conference was really just a beginning.

# UBC Calendar

## UBC CALENDAR DEADLINES

Events of the week of

Dec. 9-9 Deadline is 5 p.m. Nov. 23  
Dec. 10-16 Deadline is 5 p.m. Nov. 30  
Dec. 17-23 Deadline is 5 p.m. Dec. 7

Send notices to Information Services, Main Mall North Administration Building, Campus. Further information is available at 228-3131.

## THE VANCOUVER INSTITUTE

SATURDAY, NOV. 25

Professor emerita Margaret Ormsby, Department of History, UBC, on **British Columbia's History: New Perspectives.**

Lecture is held in Lecture Hall 2, Woodward Instructional Resources Centre, at 8:15 p.m.

## SUNDAY, NOV. 26

3:00 p.m. **MUSEUM OF ANTHROPOLOGY.** Janos Bak, associate professor in the UBC Department of History, discusses **Early Christmas Customs in Rural Europe.** 6393 Northwest Marine Dr.

7:00 p.m. **SUBFILMS** presents George Burns and John Denver in **Oh, God.** Admission \$1 with library/AMS card. Auditorium, Student Union Building.

## MONDAY, NOV. 27

10:00 a.m. **URBAN LAND ECONOMICS SEMINAR.** Prof. John Herzog, SFU, on **Housing Affordability and Mortgage Terms in an Inflationary Environment.** Penthouse, Angus Building.

12:30 p.m. **BRASS ENSEMBLE CONCERT,** with Gordon Cherry, conductor. Recital Hall, Music Building.

**SLAVONIC STUDIES LECTURE.** Dr. Gleb Zekulin, Department of Slavic Languages and Literature, University of Toronto, on **Solzhenitsyn the Artist: Reflections of a Reader.** Room 2238, Buchanan Bldg.

3:30 p.m. **HEALTH CARE AND EPIDEMIOLOGY RESEARCH SEMINAR.** Dr. Charles A. Laszlo, Health Systems, UBC, on **Evaluation of Self-Assessment of Weight/Height/Frame.** Room 146, Mather Building.  
**CHEMICAL ENGINEERING SEMINAR.** Dr. John Grace, McGill University, on **Forces on Tubes and Other Objects in Gas Fluidized Beds.** Room 206, Chemical Engineering Building.

3:45 p.m. **MECHANICAL ENGINEERING SEMINAR.** A.O. Steeves, mechanical engineering graduate student, UBC, on **Effect of Body Forces During Rapid Depressurization of Liquid-Filled Pipes.** Room 1215, Civil and Mechanical Engineering Building.

**MANAGEMENT SCIENCE SEMINAR.** Yigal Gerchak, Ph.D. candidate, Commerce, UBC, on **Markovian Models Allowing Interaction Between Individuals.** Room 415, Angus Building.

4:00 p.m. **ASTRONOMY SEMINAR.** Dr. Philip Gregory, Physics, UBC, on **How Time Variable is the Radio Sky?** Room 318, Hennings Building.

**BIOCHEMISTRY SEMINAR.** Dr. P.P. Dennis, Biochemistry, UBC, on **Genetic Organization, Cloning and Expression of RNA Polymerase and Ribosomal Protein Genes.** Lecture Hall 3, Woodward I.R.C.

4:30 p.m. **ZOOLOGY/PHYSIOLOGY SEMINAR.** Dr. William R. Gray, Biology, University of Utah, Salt Lake City, on **Toxins of the Venomous Cone Snails.** Room 2449, Biological Sciences Building.

8:00 p.m. **ARCHEOLOGY LECTURE.** Dr. John Olesen, University of Victoria, on **Greek and Roman Pumping Devices: A Case Study in Applied Technology.** Dining room, Graduate Student Centre.

**IMMUNOLOGY SEMINAR.** Dr. Karol Sikora, Stanford University Medical School, Calif., on **Tumor Rejection Antigens.** Salons B and C, Faculty Club.

## TUESDAY, NOV. 28

12:30 p.m. **BOTANY SEMINAR.** Dr. John Miller, UBC postdoctoral fellow, on **Phenotypic Variation and Cytogeographic Patterns in *Claytonia perfoliata*.** Room 3219, Biological Sciences Building.

1:30 p.m. **ELECTRICAL ENGINEERING SEMINAR.** Dr. R. Parsons, UBC, on **Aspects of Optical Communications at BNR.** Room 410, Electrical Engineering.

3:30 p.m. **APPLIED MATHEMATICS AND STATISTICS COLLOQUIUM.** Prof. G. Whitham, Department of Applied Mathematics, California Institute of Technology, on **Waves on Beaches.** Room 104, Mathematics Building.

**OCEANOGRAPHY SEMINAR.** R. Lueck, Oceanography and Physics, UBC, on **The Rise and Fall of the Hot Film Probe.** Room 1465, Biological Sciences Bldg.

4:30 p.m. **CHEMISTRY RESEARCH SEMINAR.** A.G. Marshall, Chemistry, UBC, on **New Cloverleaf Secondary Structures for 5S and 5.8S RNA.** Room 250, Chemistry Building.

6:00 p.m. **GENETICS SEMINAR.** C. Hay and R. Devlin on **Chromatin Structure in Diverse Cell Types.** Room 5460, Biological Sciences Building.

## TUESDAY, NOV. 28 (Continued)

7:00 p.m. **MUSEUM OF ANTHROPOLOGY.** Mini-film series with general title **What is Anthropology? A Visual View.** Three films in the field of cultural anthropology will be shown: **Cree Way, Sikularmiut and The Land - A New Priority.** Admission \$2; \$1 for members, students and seniors. 6393 Northwest Marine Dr.

8:30 p.m. **UBC PUBLIC AFFAIRS** presented by UBC's Centre for Continuing Education. Dr. David Bates, Medicine, UBC, speaks on **The Nuclear Hazard: Who Takes The Risk? Who Gets The Benefits?** Host, Gerald Savory, Channel 10, Vancouver Cablevision. This program will be repeated on Friday, Dec. 1 at 1 p.m.

## WEDNESDAY, NOV. 29

12 noon **PHARMACOLOGY SEMINAR.** Dr. Thomas L. Perry, Pharmacology, UBC, on **GABA in Huntington's Chorea and Schizophrenia: An Update.** Room 114, Block C, Medical Sciences Building.

12:30 p.m. **NOON-HOUR CONCERT.** Jane Martin, flute; and Robert Rogers, piano, perform **Music of Berry, Bozza and Riegger.** Recital Hall, Music Building.  
**UBC LIBERALS SPEAKER** is Warren Allmand, federal minister of consumer and corporate affairs, Rooms 207-209, Student Union Building.

1:00 p.m. **DEVELOPMENTAL MEDICINE SEMINAR.** Dr. S. Katz, Pharmacology, UBC, on **The Regulation of Calcium Transport in Cardiac Muscle.** Centre for Developmental Medicine, 811 W. 10th Ave.

3:30 p.m. **APPLIED PROBABILITY AND STATISTICS WORKSHOP.** Prof. George Bluman, Mathematics, UBC, on **The Transformation of a Diffusion Process into a Wiener Process.** Room 214, Angus Building.

**ECONOMICS SEMINAR.** T. Wales and A. Woodland on **A Limited Dependent Variable Model for a System of Share Equations with an Application to Meat Consumption.** Room 351, Brock Hall.

**CHEMICAL ENGINEERING SEMINAR.** J.C.P. Weiss on **Operating Experiences With The Synchro Project.** Room 206, Chemical Engineering Building.

4:00 p.m. **BIOCHEMICAL SEMINAR.** Dr. Haydn Pritchard, Biochemistry, UBC, on **Studies on the Control of Hepatic Glycerolipid Metabolism.** Lecture Hall 3, Woodward Instructional Resources Centre.

**GEOPHYSICS SEMINAR.** Dr. Ross Mackay, Geography, UBC, on **An Experiment on the Growth of Permafrost.** Room 260, Geophysics and Astronomy.

4:30 p.m. **ECOLOGY SEMINAR.** Dr. Ray Hilborn, Animal Resource Ecology, UBC, on **An Ecologist's View of the B.C. Salmon Fleet as Predators.** Room 2449, Biological Sciences Building.

## EXHIBITS

On display at the Fine Arts Gallery in the basement of the north wing of the Main Library is **Walter J. Phillips: Works on Paper.** Mr. Phillips (1884-1963) was a Canadian artist best known for his color woodcuts. The exhibit presents sketches, water-colors, color-prints and tempera paintings as well as quotations from his unpublished manuscripts and letters. The exhibition was organized by Michael Gribbon, National Gallery of Canada, who is author of *Walter J. Phillips: A Selection of His Works and Thoughts.* Exhibit continues until Nov. 30. The gallery is open from 10:30 a.m. to 5:00 p.m. Tuesday through Saturday. A selection of 20 intaglio and relief etchings by Lionel Thomas, of the Department of Fine Arts, will be on display on the lower floor of the Faculty Club from Dec. 1 to 29. The works, which emphasize the pre-essional zodiacal constellations, are from Mr. Thomas' three travelling exhibitions currently being shown in U.S. cities. The works are to be included in a book entitled *Firmament - The Story of the Constellations*, by Mr. Thomas and Prof. Michael Ovenden, of the Department of Geophysics and Astronomy, both of whom will be at the Faculty Club exhibit from 1:00 to 1:45 p.m. on Dec. 7 to discuss the display and the forthcoming book.

## NIGHT SNACKS

The Bus Stop Coffee Shop will be open Monday through Thursday evenings from 8 to 11 p.m. in addition to the regular hours of 7:45 a.m. to 4 p.m. Monday through Friday. The evening operation will be for a trial period.

## SKATE UBC

Skate UBC begins its winter session Saturday, Nov. 25, offering a 10-week skating program for children and adults. Skating lessons are \$20, and there are also group lessons in power skating designed to develop stamina, balance and speed for hockey players, at \$36 per person. For more information, call Skate UBC at 228-5995 from 9 a.m. to 1 p.m.

## FINAL ORAL EXAMINATIONS FOR THE DEGREES OF DOCTOR OF PHILOSOPHY AND DOCTOR OF EDUCATION.

Listed below are scheduled final oral examinations for the degrees of Doctor of Philosophy and Doctor of Education at the University. Unless otherwise noted, all examinations are held in the Faculty of Graduate Studies Examination Room on the second floor of the General Services Administration Building. Members of the University community are encouraged to attend the examinations, provided they do not arrive after the examination has commenced.

Monday, Nov. 27, 2:00 p.m.: DONALD BOWEN, Zoology: **Social Organization of the Coyote in Relation to Prey Size.**

Tuesday, Nov. 28, 10:00 a.m.: FAROUK A. EL-FITIANY, Civil Engineering: **Analysis of Waterhammer Effect on Speed Change and Governing Stability of Hydraulic Turbines.**

Thursday, Nov. 30, 12:30 p.m.: DONALD H. STANLEY, English: **The Self-Conscious Narrator in Donald Barthelme and Vladimir Nabokov.**

Thursday, Nov. 30, 3:00 p.m.: JAMES A. HELBIG, Oceanography: **On the Interial Stability of Coastal Flows.**

Friday, Dec. 1, 10:00 a.m.: GLEN A. SINGLETON, Soil Science: **Weathering in a Soil Chronosequence.**

Friday, Dec. 1, 2:00 p.m., in SSOB, Faculty of Education: ROBIN C. BRAYNE, Education: **A Political Systems Approach to the Study of Demands on an Urban School Board.**

## WEDNESDAY, NOV. 29 (Continued)

7:00 p.m. **DUPLICATE BRIDGE.** Informal game at the Faculty Club. Faculty, staff and graduate students are invited to participate. \$1.75 per person includes refreshments. For further information, call Steve Rettig, 228-4865.

8:00 p.m. **SPECIAL STUDENT RECITAL.** An evening of chamber music and solo piano and violin featuring Lisa Challans, piano; Matt Kneifel, violin; Jackie Parker, piano; Ted Parsons, cello, who perform **Works of Dvorak, Chausson, Paganini, Perel and Wyness.** Recital Hall, Music Building.

## THURSDAY, NOV. 30

9:00 a.m. **MEDICAL GRAND ROUNDS.** Dr. R. Shulman, Psychiatry, VGH; and Mrs. W. Miller, psychiatric clinical nursing director, VGH, on **Suicide on the Wards.** Lecture Hall A, Faculty of Medicine Building, VGH.

12:30 p.m. **UNIVERSITY SYMPHONY ORCHESTRA,** directed by Douglas Talney, performs **Music of Stravinsky, Beethoven and Rossini.** Old Auditorium.

**ENERGY SEMINAR.** R. Cooke, Alberta Gas Trunk, Calgary, on **Problems of Construction and Management of Pipelines, together with their Place in an Energy System.** Room 1202, Civil and Mechanical Engineering.

**ACADEMIC WOMEN'S ASSOCIATION MEETING.** Michael Edwards of McLeod, Young, Weir Investments, on **Making Your Money Make You Money.** Room 203, Buchanan Building.

**HISTORY LECTURE.** Prof. Richard R. Johnson, History, University of Washington, Seattle, on **Adjustment to Empire: The New England Colonies After the Glorious Revolution.** Room 104, Buchanan Building.

**DENTISTRY SEMINAR.** Dr. P. Macleod, Medical Genetics, UBC, on **Orofacial Genetics.** Room 388, Mather Building.

**CLASSICS LECTURE.** Dr. Carole Thomas, University of Washington, on **The Dorian Invasion?** Room 202, Buchanan Building.

2:30 p.m. **PHYSICS CONDENSED MATTER SEMINAR.** Daryl Crozier, SFU, on **EXAFS of Disordered Systems.** Room 318, Hennings Building.

3:30 p.m. **HISTORY SEMINAR.** Prof. Richard R. Johnson on **Mercantilism, Militarism, or Muddling Through: The Origins and Unfolding of English Colonial Policy, 1650-1700.** Penthouse, Buchanan Building.

**APPLIED MATHEMATICS SEMINAR.** Prof. Geoffrey V. Parkinson, Mechanical Engineering, UBC, on **Flow-Induced Nonlinear Oscillators.** Room 203, Mathematics Building.

4:00 p.m. **PHYSICS COLLOQUIUM.** F. Kapron, Bell Northern, on **Fibre Optical Communication: A Science, A Technology.** Room 201, Hennings Building.

**PHILOSOPHY COLLOQUIUM.** Dr. Keith Gundersen, University of Minnesota, on **The Mind as an Object of Knowledge.** Blue Room, Arts One Building.

7:00 p.m. **SUBFILMS** presents **The Return of the Pink Panther.** Subfilms are shown at 7 p.m. Thursday and Sunday and at 7 and 9 p.m. Friday and Saturday. Admission \$1 with library/AMS card. Auditorium, Student Union Bldg.

8:00 p.m. **LENORE NEVERMORE,** a theatrical treatment of Edgar Allen Poe and his works, written by Douglas Bankson, head, Creative Writing, UBC. Admission \$2; students \$1. Frederic Wood Theatre. For reservations, call 228-2678 or drop by Room 207 of the Frederic Wood Theatre. There will be performances on Friday, Dec. 1 and Saturday, Dec. 2 at 8 p.m.

**COLLEGIUM MUSICUM,** with John Sawyer and John Chappell, directors. Recital Hall, Music Building.

## FRIDAY, DEC. 1

12:30 p.m. **COLLEGIUM MUSICUM,** with John Sawyer and John Chappell, directors. Recital Hall, Music Building.

2:00 p.m. **WRESTLING.** UBC vs. Western Washington State University, Osborne Centre, Thunderbird Bld.

2:30 p.m. **HISTORY COLLOQUIUM.** Prof. W. Alan Tully, History, UBC, on **The Great Awakening - A View From Further South.** Penthouse, Buchanan Building.

3:30 p.m. **SOIL SCIENCE SEMINAR.** Dr. Alan Carter, Soil Science, UBC, on **The 'Roles' of Slugs, Earthworms, Millipedes and Some Other Animals in Soil Biology Research.** Committee room, Graduate Student Centre.

**COMPUTER SCIENCE COLLOQUIUM.** Dr. Edward D. Lazowska, Computer Science, University of Washington, Seattle, on **Hierarchical Analytic Models of Computer Systems.** Room 301, Computer Sciences.

**LINGUISTICS COLLOQUIUM.** Dr. David Ingram, Linguistics, UBC, on **Psychological Reality of Grammatical Rules in Children's Language.** Room 2225, Buchanan Building.

7:30 p.m. **ICE HOCKEY.** UBC Thunderbirds vs. Japan National Team. Thunderbird Winter Sports Centre.

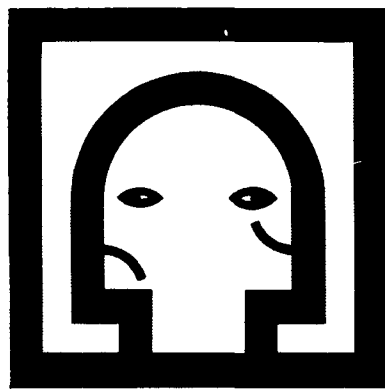
8:00 p.m. **UNIVERSITY SYMPHONY ORCHESTRA,** directed by Douglas Talney, performs **Music of Stravinsky, Beethoven and Rossini.** Old Auditorium.

**UKRAINIAN STUDIES SEMINAR.** Dr. Ivan L. Rudnytsky on **The Ukrainian Revolution: Success and Failure.** Room 157, Law Building.

8:30 p.m. **JAPAN EVENING,** presented by International House and Language Institute students, features Japanese culture, songs, dances and refreshments. Coffeeplace, International House. Free.

## SATURDAY, DEC. 2

2:30 p.m. **RUGBY.** UBC Thunderbirds vs. Pocamo Rugby Club. Thunderbird Stadium.



UBC Drama  
Thursday, Friday  
and Saturday  
8 p.m.

Brass Ensemble  
Monday  
at 12:30

