ubc reports

Vol. 22, No. 39, Nov. 10, 1976. Published by Information Services, University of B.C., 2075 Wesbrook Mall, Vancouver, B.C. V6T 1W5. ISSN 0497-2929. Judith Walker, editor.

# 'Lower Fraser won't be the same again'

**UBC's Westwater Research Centre, established in 1971, completed its first major study earlier this year — an investigation of the condition of the Lower Fraser River from the town of Hope to the sea. The centre's findings were published in a book entitled *The Uncertain Future of the Lower Fraser. UBC Reports* talked to Westwater director Dr. Irving Fox about the Fraser study and the future activities of the centre.**

**UBC REPORTS: What were the aims of Westwater in studying the Lower Fraser?**

PROF. FOX: to provide a foundation for two things — first, for the improvement of policies relative to pollution and, second, to suggest ways of improving the institutional arrangements — the legal and administrative arrangements — for managing the Lower Fraser.

**UBCR: In general terms, what condition is the Lower Fraser in?**

PROF. FOX: If we limit the question to pollution, the Lower Fraser was found to be in surprisingly good shape. One reason for this is that it's a remarkably big river — the third largest in Canada — and has the capacity to take quite a lot by way of insults.

But there's a dark cloud on the horizon — that's why the phrase "uncertain future" was used in the title of our research report. The Fraser is receiving large amounts of toxic material from a number of sources, including sewage treatment plants, storm sewers, industrial plants and run-off from urban and rural lands, either through river tributaries or from farms that border directly on the river.

**UBCR: Can you be specific about the sources of toxic materials reaching the river?**

PROF. FOX: We know that the major sources of pollution are associated with urban-industrial development. But we don't have a good handle on the significance of the discharges to the river by industries because there are no good records of the quality of such effluent.

Industries such as metal finishing, which use toxic materials in their processing activities, are undoubtedly an important source.

Sewage treatment plants are another obvious source, since not all the toxic materials are removed when

PROF. IRVING FOX

sewage is treated. There are other complicating factors, for example, the Iona Island plant south of Vancouver receives run-off from both sanitary and storm sewers.

When a rainstorm hits Vancouver — and that's fairly frequently at this time of year — the Iona plant can't handle

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# UBC looks at needs of handicapped

An investigation of the needs of handicapped students has been launched at UBC.

A permanent committee on the concerns of handicapped students, established by President Douglas Kenny, plans to hold its first public meeting next Thursday (Nov. 18) at 1:30 p.m. in the Conference Room of the Sedgewick Library.

Dick Shirran, chairman of the committee and director of UBC's Office of Student Services, said one of the problems faced by the committee is gathering information about the number of handicapped students registered at UBC and the nature and extent of their problems.

Initially, he said, the committee would be concerned with the needs of students who have ambulatory problems, particularly those confined to wheelchairs.

"I hope any student who has a problem getting around the UBC campus will attend the meeting to outline the difficulties they face as students," he said.

He said the committee would eventually broaden its investigation to include students who are blind or partially sighted.

Students who are unable to attend the meeting can get in touch with Mr. Shirran at 228-4326 or by visiting his office in Annex F adjacent to the Ponderosa Cafeteria.

# Gym scene of war service

UBC and community organizations will take part in traditional Remembrance Day ceremonies beginning at 10:45 a.m. in the UBC War Memorial Gymnasium tomorrow (Thursday).

Representatives of the groups participating in the ceremony will each place a wreath at the foot of the Memorial Wall in the main lobby of the gymnasium during the ceremony, which will be presided over by the Rev. Henri C. M. Taudin-Chabot, rector of St. Chad's Anglican Church and chaplain of the Royal Canadian Legion, Branch 142.

The traditional Last Post will be sounded at 11:00 a.m., followed by two minutes of silence.

# WESTWATER

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the volume of material reaching it. The plant has a by-pass system in periods of heavy run-off which results in quantities of raw sewage reaching the river before undergoing treatment.

I don't think people realize how many pollutants reach the river through storm sewers. For instance, most of the lead that reaches the river comes from urban run-off. It reaches the streets through the exhausts of cars that use unleaded gasoline. A heavy rain simply washes it into streams and the storm-sewer system.

While some storm sewers are connected with treatment plants, such plants do not remove all toxic substances, and in the case of the Iona plant it is necessary to by-pass the plant when a heavy storm occurs.

**UBCR: Would better treatment plants eliminate the pollution problems on the Lower Fraser?**

PROF. FOX: To a certain extent treatment plants will greatly reduce bacterial pollution. But we think there could still be a high bacterial count in the river because of the run-off from lands that drain into the river, which carry such materials as animal wastes that cause bacterial pollution.

Also, there appear to be cross-connections, probably inadvertent, between domestic and storm sewers in the Lower Mainland, and this isn't helping to keep the river clean.

**UBCR: Can you summarize the report's recommendations.**

PROF. FOX: I think our most important recommendation is that public agencies should attack the pollution problem in a comprehensive fashion. Such a program would include efforts to control pollutants at their source and generate better data for management purposes as well as utilize sewage treatment plants.

Of major importance is the need to develop a better understanding of the aquatic ecosystem so that the effects of pollution, in the long and short runs, can be estimated more precisely.

We recommend that the Greater Vancouver Regional District — the organization representing the cities and municipalities bordering on the river — launch a study to find the specific sources of toxic discharges so they can be controlled at source and never get into the sewer system. I've already mentioned the metal-finishing industry in this regard and there's some evidence that the City of Vancouver is taking steps to control toxic materials from this source.

**UBCR: What about the Iona Island problem?**

PROF. FOX: We ask that a careful study be made of the by-pass system that combines sanitary and storm sewers. One device that might be considered is a system of storing water in the sewer system during a storm and then letting it out in controlled amounts after the storm is over.

The report also contains some suggestions for incentives to people and industry to keep toxic materials out of the river. We mention economic incentives — almost automatic penalty systems — for those who discharge toxic materials that will eventually reach the river.

**UBCR: Is there a need for some overall agency to co-ordinate a long-range program for the river?**

PROF. FOX: The problem is one for the Greater Vancouver Regional District. Its member cities and municipalities have to come to grips with the realities of the situation.

One of the interesting things about control of the river is that the various levels of government involved — federal, provincial, and municipal — are co-ordinated to the extent that they don't overlap and each knows what the other is doing. What is not happening is a comprehensive thrust by all parties to carry out the important studies of the kind we've proposed.

So we've recommended that the GVRD set up an environmental protection department, not to take over what other levels of government are now doing, but to add to what is currently being done and to co-ordinate a comprehensive research and control program.

We've suggested that these activities could be funded by a very modest tax based on the gallonage of discharges into the river. Even a modest charge would give such an agency more money annually than was spent by Westwater on its study of the river.

**UBCR: How much did you spend and who contributed?**

PROF. FOX: We spent about $600,000 over a four-year period. The major contributors were the Inland Waters Directorate of Environment Canada, the federal Fisheries Service, the Canada Council and UBC.

It's a bit difficult to be precise about the number of people involved in the study. Ten people devoted their full or part time to it and there were a substantial number of students involved, particularly during the summer.

The participants were drawn from a wide range of disciplines, including chemists, biologists, oceanographers, planners, economists and even a legal expert. It was a very broadly based interdisciplinary group.

**UBCR: Is there any evidence that your recommendations are being taken seriously?**

PROF. FOX: Yes, there is. I've already mentioned that the City of Vancouver has instituted an investigation to remove toxic materials at their source.

And the provincial and federal agencies have agreed to an on-going program of monitoring as a follow up to our studies to keep track of changes that are continually occurring in the river.

**UBCR: You're optimistic then about the Lower Fraser's future.**

PROF. FOX: I'm cautiously optimistic. As a result of the Westwater study, I don't think the Lower Fraser will ever be the same again. We've changed the whole perspective on the Lower Fraser and the various agencies are going to be very sensitive to what we've said. I think, too, they'll be very concerned about being criticized for not reacting to what we've proposed.

There's still the risk that a lack of action could result in a continuing build up of toxic materials which would result in some rather dramatic changes in a few years. Then a long period would have to elapse before the river could be brought back.

And we can ill afford to allow that to happen. The Fraser is extremely valuable to the economy of this province in terms of the salmon run alone. B.C. stands to lose a great deal if it doesn't respond to our findings.

**UBCR: Has Westwater been doing other things while the Lower Fraser study was going on?**

PROF. FOX: Yes, we have. With the help of a grant from the Rockefeller Foundation, David Le Marquand, of our staff, has been investigating the management of international rivers.

Over the past two years, he's been looking at the various factors — the politics, economics and physical factors — that foster or inhibit agreement on the management of four rivers that cross international boundaries or serve as borders between countries.

**UBCR: What were your conclusions?**

PROF. FOX: We found that countries are motivated to agree or disagree by a substantial number of political and economic factors. And in their efforts to devise agreements between countries on the management of rivers, the parties frequently fail to take these motivations into account and consider what each has to do to satisfy the needs of the other.

The study is now complete and will be published shortly as a book. It's

also attracted the attention of the United Nations and we've recently completed a paper for them on the management of international rivers for the World Water Conference to be held in 1977 in Buenos Aires.

**UBCR: Is Westwater planning any additional studies?**

PROF. FOX: There are two underway.

As a result of the study on international rivers, the Rockefeller Foundation has asked us to look into the role of the International Joint Commission in dealing with environmental problems on the border between Canada and the U.S. We have a grant to study the role of the IJC and determine whether there's any way of strengthening that body as an instrument for promoting agreement between the two countries. This study, incidentally, is being sponsored jointly with UBC's Institute of International Relations.

**UBCR: You said you had two studies underway.**

PROF. FOX: We're proposing to undertake a five-year research program on the management of coastal resources in B.C. It's widely felt that the land along the sea and the waters close to the land pose some very special problems in the development of policies for the wise and efficient allocation of resources.

This delta land, and the adjacent estuarine waters, are very sensitive and productive in a biological sense. The waters are valuable for fish production and oyster beds, to name only two factors, and the land near the water is valuable for agriculture and as a nesting area for wild fowl, for instance.

We can't study every little inlet on the B.C. coast, of course. Dr. William Rees, of UBC's School of Community and Regional Planning, is currently going over data on the coast and developing an overview of the current situation and the problems that exist. By next summer we hope to have some representative situations identified for more intensive study.

We're also working on the methodologies to evaluate the environmental effects of a given action in a specific coastal area. By next spring we'll move into a research program that will look at the problems of these areas from a policy point of view.

We'll be working closely with the provincial and federal governments on this study. Ultimately, our aim is to suggest an approach for policy development and decis on-making that will preserve and conserve these sensitive coastal areas.

**UBC quarterback Dan Smith, who helped to lead Thunderbird football team to a 36-10 victory over the University of Saskatchewan Huskies last Saturday, brandishes the Hardy Cup, emblematic of the western Canadian championship, while talking to cheering crowd. It was the first time in 12 years that UBC has won the western football championship. Coach Frank Smith takes his team to London, Ont., Saturday (Nov. 13) to play the University of Western Ontario Mustangs for the Central Bowl championship. If the 'Birds win that one they'll participate in the College Bowl on Nov. 20 in Toronto for the national college championship. Picture by Jim Banham.**

# the music box

**MONDAY, NOV. 15**

**8:00 p.m.** **UBC BAROQUE ENSEMBLE** play **Music of Vivaldi, J. S. Bach, Telemann, J. C. Bach and K. P. E. Bach.** Recital Hall, Music Building.

**WEDNESDAY, NOV. 17**

**12:30 p.m.** **NOON-HOUR CONCERT.** The Loban-Adaskin Duo play **Music of Bach, Bloch and Brahms.** Recital Hall, Music Building.

**THURSDAY, NOV. 18**

**12:30 p.m.** **FACULTY RECITAL.** Hans-Karl Piltz, viola, and Dale Reubart, piano, play **Music of Bloch, Hindemith and Marquis.** Recital Hall, Music Building.

**8:00 p.m.** **ALUMNI CONCERT SERIES.** Thirteen UBC faculty members play **Music of Brahms, Hindemith, Poulenc and Mozart.** Recital Hall, Music Building.

**FRIDAY, SATURDAY and SUNDAY, NOV. 19, 20 and 21**

**8:00 p.m.** **UBC OPERA WORKSHOP.** French Tickner directs **Music of Verdi, Mozart, Moore and Salieri.** Old Auditorium.

# NEXT WEEK AT UBC

**Notices must reach Information Services, Main Mall North Admin. Bldg., by mail, by 5 p.m. Thursday of week preceding publication of notice.**

## MONDAY, NOV. 15

**12:30 p.m.** **CANCER RESEARCH SEMINAR.** Brenda Morrison, Health Care and Epidemiology, UBC, on **Breast Cancer Screening.** Library, Cancer Research Centre, Block B, Medical Sciences Building.

**3:45 p.m.** **MECHANICAL ENGINEERING SEMINAR.** D. Bouclin, Mechanical Engineering, UBC, on **Galloping Oscillations in Water Flows.** Room 1215, Civil and Mechanical Engineering Building.

**4:00 p.m.** **ASTRONOMY AND SPACE SCIENCE SEMINAR.** Dr. J. E. Hesser, Cerro Tololo Inter-American Observatory, Chile, on **New Observational Clues about Chemical Evolutionary Processes in the Galaxy and Its Nearest Neighbour.** Room 318, Hennings Building.

**8:00 p.m.** **ARCHAEOLOGY LECTURE.** Dean Robert Johnson, Rochester Institute of Technology, N.Y., on **Master Potter in Afghanistan.** Room 102, Lasserre Building.

**IMMUNOLOGY SEMINAR.** Prof. Denis Burger, University of Oregon Medical School, Portland, on **Characterization of Transfer Factor.** Salon A, Faculty Club.

## TUESDAY, NOV. 16

**10:30 a.m.** **FINE ARTS GALLERY.** Exhibit of works by British sculptor Eduardo Paolozzi. Continues until Dec. 11. Tuesday through Saturday – 10:30 a.m. to 5:00 p.m. Basement, Main Library.

**12:30 p.m.** **BOTANY SEMINAR.** Dr. C. J. Marchant, Botanical Garden, UBC, on **The Control of Cliff Erosion by Plants.** Room 3219, Biological Sciences Building.

**3:30 p.m.** **ENGLISH COLLOQUIUM.** Dr. R. M. Jordan, English, UBC, on **Must There Be Unity?** *The Parlement of Foules.* Lounge, 5th floor, Buchanan Tower.

**OCEANOGRAPHY SEMINAR.** Dr. Nival Antia, Pacific Environment Institute, West Vancouver, on **Growth of Marine Phytoplankters on Organic Sources of Nitrogen.** Room 1465, West Wing, Biological Sciences Building.

**4:30 p.m.** **CHEMISTRY SEMINAR.** Dr. K. A. R. Mitchell, Chemistry, UBC, on Low Energy Electron Diffraction. Room 250, Chemistry Building.

**8:00 p.m.** **PHARMACEUTICAL SCIENCES LECTURE.** Dr. Ernst W. Stieb, University of Toronto, on **Pharmacy's Symbols: Past and Present.** Lecture Hall 5, Woodward Instructional Resources Centre.

## WEDNESDAY, NOV. 17

**12:30 p.m.** **PHARMACEUTICAL SCIENCES LECTURE.** Dr. Christopher A. Rodowskas, American Association of Colleges of Pharmacy, on **Pharmacy Manpower: Development and Utilization.** Lecture Hall 4, Woodward Instructional Resources Centre.

**PHARMACOLOGY SEMINAR.** Dr. Thomas L. Perry, Pharmacology, UBC, on **Further Studies of Two Dominantly Inherited Diseases: Huntington's Chorea and Cerebellar Atrophy.** Room 221, Block C, Medical Sciences Building.

**ENGLISH EDUCATION LECTURE.** Bob Steele, Education, UBC, on **The Development of Imagery in the Expressive Arts.** Room 111, Ponderosa Annex E.

**3:30 p.m.** **CHEMICAL ENGINEERING SEMINAR.** A. K. Mitra, Kharagpur, India, on **Heat Transfer in Single- and Two-Phase Flow with Jet Mixing.** Room 206, Chemical Engineering Building.

**STATISTICS WORKSHOP.** Prof. Ross Prentice, University of Washington, on **Statistical Models for Failure-Time Data.** Room 321, Angus Building.

**4:30 p.m.** **HISTORY COLLOQUIUM.** Dr. Edgar Wickberg, History, UBC, on **Immigration and Community Organization in Vancouver's Chinatown: 1900 to the Present.** Penthouse, Buchanan Building.

**ANIMAL RESOURCE ECOLOGY SEMINAR.** Dr. L. Dill, Simon Fraser University, on **Refraction Ballistics in the Archer Fish.** Room 2449, Biological Sciences Building.

**8:00 p.m.** **SENATE MEETING.** Free tickets for interested members of the University community are available from Frances Medley, 228-2951. Board and Senate Room, Old Administration Building.

## THURSDAY, NOV. 18

**12 noon** **WORKSHOP ON RESEARCH, SCIENCE AND TECHNOLOGY.** Dr. Steven Globerman, York University, on **Methods for Studying the Rate of Diffusion Technology and Comparison of Diffusion Rates in Canada.** Fee, $25, includes luncheon and papers. E. D. MacPhee Executive Conference Centre, Angus Building.

**12:30 p.m.** **CHINESE STUDENTS' ASSOCIATION** and **ASIAN STUDIES DEPARTMENT LECTURE.** Dr. Graham Johnson, Sociology, UBC, on **Impressions of China During My Recent Visit.** Room 106, Buchanan Building.

**CELL BIOLOGY GROUP SEMINAR.** Dr. J. W. Berger, Zoology, UBC, on **Regulation of DNA Content in *Paramecium*: Some Implications for the Cell Cycle.** Room 2321, Biological Sciences Building.

**CENTRE FOR HUMAN SETTLEMENTS.** Habitat film preview. Three films from the Middle East. Room B79, Woodward Instructional Resources Centre.

**ARTS LECTURE.** Prof. S. Andreski, University of Reading, England, on **Over-Development and Mental Pollution.** Room 204, Buchanan Building.

**FINE ARTS LECTURE.** Dean Ellis, artist, on **My Past and Recent Art Works.** Room 102, Lasserre Building.

**OMICRON KAPPA UPSILON HONORARY DENTAL SOCIETY LECTURE.** Prof. Charles L. Bolender, University of Washington School of Dentistry, on **Trends That Will Affect Prosthodontics.** Anatomy Lecture Theatre, Block B, Medical Sciences Building.

**3:30 p.m.** **MANAGEMENT SCIENCE SEMINAR.** Prof. F. Granot, Commerce and Business Administration, UBC, on **A Parametric Primal Algorithm for Discrete Chebyshev Linear Approximation.** Room 321, Angus Building.

**CHEMISTRY SEMINAR.** Dr. Robert B. Morin, Merck Sharp & Dohme Research Laboratories, on **Recent Studies in the Cephalosporin, Penicillin and Related Areas.** Room 225, Chemistry Building.

**GEOLOGICAL SCIENCES LECTURE.** Dr. Roger G. Walker, McMaster University, on **Facies Models for Sandy Fluvial Systems.** Room 330A, Geological Sciences Building.

**3:45 p.m.** **APPLIED MATH AND STATISTICS COLLOQUIUM.** Prof. Michael P. Mortrell, University College, Cork, Ireland, on **A Stroboscopic Procedure for Nonlinear Waves.** Room 2449, Biological Sciences Building.

**4:00 p.m.** **PHYSICS COLLOQUIUM.** A. W. Overhauser, Purdue University, on **Fundamental Experiments with a Neutron Interferometer.** Room 201, Hennings Building.

**8:00 p.m.** **ZOOLOGY SEMINAR.** Dr. Herman Rahn, State University of New York at Buffalo, on **Strategies of Birds' Eggs; Water Regulation, Metabolism, and Altitude.** Room 2000, Biological Sciences Building.

## FRIDAY, NOV. 19

**9:00 a.m.** **PEDIATRICS GRAND ROUNDS.** Dr. Ross Parks, University of Illinois, on **Re-evaluation of the Father's Role in Infancy.** Lecture Room B, Heather Pavilion, Vancouver General Hospital.

**3:30 p.m.** **FINANCE WORKSHOP.** Prof. Oldrich Vasicek, University of California, on **An Equilibrium Characterization of the Term Structure.** Room 325, Angus Building.

## SATURDAY, NOV. 20

**8:15 p.m.** **VANCOUVER INSTITUTE LECTURE.** Dr. Kaye Lamb, former Dominion Archivist, on **Mackenzie King and History: Use and Abuse of His Diaries.** Lecture Hall 2, Woodward Instructional Resources Centre.