



ALUMNI NEWSLETTER

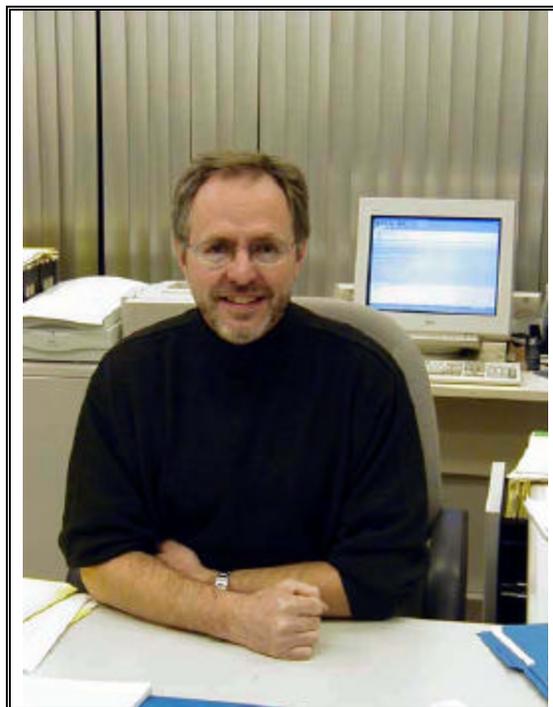
Number 4 (2001)

Message from the Head

Dear Alumni and Friends:

The year 2000 saw a change at the EOS helm when, in July, Bob Ellis retired from the headship and began a sabbatical leave in Australia. Bob saw the Department through the difficult years of the merger as we melded three former departments and the atmospheric sciences program into one of the largest units on campus. On behalf of everyone, I would like to thank him for his four years of effort and dedication. We are now poised at the start of the new millennium with a Department whose research scope encompasses core to stratosphere, a Department in which we can expect the artificial barriers that once compartmentalized the earth sciences to become more diffuse and eventually dissolve. Organizationally, EOS is redefining itself by rallying around two new banners, namely the Environmental Earth Sciences and the Solid Earth Sciences. The former deals with fluid earth processes over time scales from seconds to hundreds of thousands of years whereas solid earth processes typically operate over millions or even billions of years. We expect that our collective research will be a balanced mix of fieldwork, laboratory work and computer modelling. We will continue to value and nurture our links with industry and government. As a foundation to this new departmental structure, we are devoting more of our resources to technical support and equipment, particularly in the areas of computer systems and isotope chemistry (stable and radiogenic). For example, in this edition of the Alumni Newsletter you can read about the Pacific Centre for Isotopic and Geochemical Research, and the Geophysical Disaster Centre with its Beowulf computer cluster (p. 2).

In this edition of the Alumni Newsletter, you will also read colourful accounts of Steve Calvert and Tad Ulrych, two of our eminent scientists who retired at the end of 2000 (p. 5 and 9), and Maya Kopylova (p. 10). New blood comes in the form of three new faculty members who will be joining the Department at the end of 2001. Philippe Tortell is an ocean-going scientist who recently graduated from Princeton. Philippe has been looking at the effects of CO₂ variations on marine productivity and how it affects ecosystem functioning in past, present and future oceanic environments. Dominique Weis and James Scoates are both faculty members at the University of Brussels. Dominique is an isotope geochemist with interests in mantle plumes, oceanic basalt and environmental chemistry. James is interested in magma evolution and related ore deposits. He was just awarded the



Young Scientist of the Year award by the Mineralogical Association of Canada. This is the third year in a row that EOS-UBC has won this award (following Greg Dipple and Lee Groat), a tribute to our blossoming strength in petrology, mineralogy and economic geology.

In September of 2000 we began an extensive overhaul of the undergraduate curriculum, a process that will take several years to complete. We now have three new first year classes (The Solid Earth- a Dynamic Planet; The Fluid Earth- Atmosphere and Oceans; The Catastrophic Earth-Natural Disasters), an EOS majors program, and a suite of Co-op programs that encompasses geophysics, atmospheric sciences, geological sciences and engineering. In the future we will be looking at the feasibility of selected core classes that cut across the Department (e.g. computer applications, fluid dynamics) and new joint programs with other departments (e.g. Computer Science, Commerce).

As many of you will know, the newly merged EOS was supposed to be housed in a new building and a considerable amount of time and money has already been invested in design, architectural plans and even a model. Unfortunately, the UBC administration has not yet been persuaded to fund construction. In the current financial environment we are unlikely to get the go-ahead unless donations can be used as a catalyst for matching funds. We have established an EOS

building account and will begin actively soliciting donations in the near future. If you are able to help, please contact me or Terry Kellam, the Senior Development Officer in the Faculty of Science (822-8686). In the meantime, EOS is scattered amongst five buildings using electronic communications to deal with the difficulties that this fragmentation imposes upon research, teaching, administration and our collective identity.

If you would like to learn more about the new directions that EOS is taking or about the people who make up the Department, I encourage you to visit the EOS Web site at <http://www.eos.ubc.ca/>. You can follow the links to our 10-year vision and hiring plan, learn details of current research from personal Web pages, or click onto the Department's newsletter (Aurora) where we have a 'Spotlight On...' series giving the background and aspirations of a different EOS member every week.

Thank you all for your support and please keep in touch.

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News of the Faculty (up to January 2001)

Tim Parsons, Professor Emeritus, is one of the Laureates of the 2001 Japan Prize given by the Science and Technology Foundation of Japan. Tim is an oceanographer who conducts research on pelagic ecosystems. The Japan Prize is a highly significant award, in the same league as the Nobel Prize. In April of 2001 Tim will be formally presented the award in Japan in a ceremony attended by the Emperor and Empress.

The Royal Swedish Academy of Sciences has awarded a Pettersson medal in bronze as a "scientist working in the spirit of Hans Pettersson" to **Steve Calvert**. Pettersson (1888-1966) was a Swedish scientist whose widespread interests included nuclear physics, submarine volcanism, geochemistry of deep sea sediments, oceanic heat flow, and popularizing science.

A.J. (Al) Sinclair, Professor Emeritus (Geological Engineering), was the 2000-2001 recipient of a distinguished lecturer award from the Canadian Institute of Mining Metallurgy and Petroleum. Dr. Sinclair's lecture, entitled "Geology and data analysis: essential components of high quality resource /reserve estimation" was presented in many centres across the country in both official languages.

Raymond Andersen has been elected a Fellow of the Royal Society of Canada, as have two Adjunct Professors, **C.S. Wong** and **Ken Denman**.

At the 9th International Conference on Harmful Algal Blooms in Hobart, Tasmania, attended by 500 scientists from 47 countries, **Max Taylor** received the Yasumoto

Award for "lifetime excellence in research on harmful algal blooms".

Les Smith started a four-year term as President of the Hydrology Section of the American Geophysical Union on July 1, 2000.

Paul Smith was appointed Vice-President of the Jurassic Subcommission of the International Union of Geological Sciences, leading to the Presidency in 2004. This is the first time a non-European has been appointed to this post.

Lee Groat has been appointed Editor of 'American Mineralogist'.

Mary Lou Bevier has been elected by the Geological Society of America to serve on the "Minorities and Women in the Geosciences".

Michael Bostock is one of three principal investigators in the Portable Observatories for Lithospheric Analysis and Research Investigating Seismicity (POLARIS) project sponsored by the Canada Foundation for Innovation. The project, an investigation of the lithospheric structure and earthquake hazard of the Canadian landmass, utilizing portable seismological and magneto-telluric arrays, is a multi-institutional collaborative venture between academia (Carleton, UBC, UWO, Queen's and UManitoba), government (GSC Continental Geoscience and National Earthquake Hazards programs and Ontario Power Generation), and industry (Nanometrics, BHP, Monopros and Winspear). Matching funds for the UBC portion of the project come from the Blusson Fund and from the BC Knowledge Development Fund.

The UBC Pacific Centre for Isotopic and Geochemical Research (**Jim Mortensen**, principal investigator) has received funds from the Canada Foundation for Innovation, which will be matched by funds from the Blusson Fund and from the BC Knowledge Development Fund. The proposal was co-signed by 13 colleagues from UBC, SFU, and the Universities of Victoria and Alberta. The Centre will comprise new laboratories and five new mass spectrometers, including an additional thermal ionization mass spectrometer, a laser-fusion Ar-Ar mass spectrometer, a laser-ablation light-stable-isotope mass spectrometer, a multi-collector ICP-MS, and a high resolution ICP-MS. The Centre will facilitate research in paleo-oceanography, global tectonics, mineral deposits, global change and environmental geochemistry.

Roland Stull (Principal Investigator) received funds for the Geophysical Disaster Computational Fluid Dynamics Centre. Collaborating colleagues come from EOS and other UBC units (Geography, Forest Sciences, Agricultural Sciences and Mechanical Engineering) and from federal institutions (Institute of Ocean Sciences and Environment Canada). Funds will provide and support a 288-processor Beowulf-cluster computer with three workstations. The goals are to develop methods to improve numerical weather

predictability over mountainous and coastal regions. To achieve this, investigators will study fluid-dynamical processes that govern weather-related disasters and apply results as real-time forecasts at high resolution to predict forest fire storms, cyclones, avalanches, floods, and other hazards affecting the economy of Western Canada.

NSERC strategic grants were received by **Phil Austin** (Modelling of clouds and climate); **Marc Bustin** (Acid gas sorption by coal - implications for permanent disposal of acid gas in deep coals and possible co-production of methane) and **Curtis Suttle** (Viral-mediated mortality of the toxic bloom-forming alga, *Heterosigma akashiwo*)

Recently published books include "Topical Studies in Oceanography" edited by P.W. Boyd and **Paul J. Harrison**, published by Pergamon; "Fisheries Oceanography: An Integrative Approach to Fisheries Ecology and Management" edited by **Paul J. Harrison** and **Timothy R. Parsons**, published by Blackwell; "Advances in Jurassic Research" edited by R. Hall and **Paul L. Smith**, published by TransTech Switzerland.

The second edition of **Roland Stull's** "Meteorology for Scientists and Engineers" has been published by Brooks/Cole Thomson Learning. This 500-page book is a quantitative introduction to meteorology for first- and second-year students.

Professor Emeritus **Ken McTaggart** has written and published "Golden Fleece" a mystery involving mining and exploration skullduggery in the backwoods of B.C.

Mineral Deposits Research Unit

Dick Tosdal, Director)

Research projects in Alaska, Yukon, British Columbia, Nevada, Mexico, Perú, and Argentina are in progress. A new project in central Perú on ore formation in magmatic and volcanic environments will provide new opportunities for graduate students. The Sheahan Library should be operational shortly. Opportunities for collaborative research with the mining industry continue to present themselves, despite downturn in the metal prices, diminished exploration budgets, and mergers. Individual projects are summarized below.

Intrusive Gold (**Shane Ebert**, Coordinator): At the close of 2000, a three-year study of gold deposits and regional geology of Yukon-Alaskais is halfway completed. **Kathi Dilworth** (MSc candidate) will be working on the auriferous quartz veins in the Pogo area. *Carlin Reconstruction* (**Ken Hickey**, Coordinator): The primary aim is to reconstruct the late Middle Eocene paleogeography of the Carlin-Elko area in NE Nevada. **Simon Haynes** (M.Sc candidate) is undertaking research on Eocene sedimentary sequences and basin development in the Carlin-Elko area. **Dick Tosdal** presented an overview of Carlin-type gold deposits to the Sociedad Geológica del Perú in November. *Andean Metallogeny* (**Dick Tosdal**, Coordinator): **Diego Charchaflí** (MSc candidate) will establish the

volcanogenic framework for Veladero, Argentina, to upgrade the geologic knowledge of the eastern part of the El Indio belt. **Cari Deyell** (Ph.D. candidate) working on geochemical data from the El Indio belt, presented some results at the Geological Society of America national meeting in November 2000. *Evaluation of Metal Mobility from Concealed Deposits*: A pilot study, directed by **W.K. Fletcher**, used lead isotopes to evaluate efficiency of selective extractions in glaciated permafrost terrain at the Pb-Zn Swim deposit, in conjunction with Jeff Bond of the Yukon Geology Program. Results were shown at the recent Annual Yukon Geoscience Forum and at the Cordilleran Exploration Roundup. *Global Volcanic Massive Sulfide Deposits*: Members attended the conference on Volcanic Environments and Massive Sulfide Deposits in Tasmania in November: **Tina Roth** (PhD candidate) presented a paper on sulfur isotope zoning around the Eskay Creek deposit, British Columbia; **Lawrence Winter** and **Steve Piercey** examined Tasmanian deposits on a field trip. **Tom Danielson** completed his MSc research on San Nicolas, Mexico. A study of a range of *polymetallic deposits in carbonate rocks of the high Andes of Central Perú* should be in operation with a research associate and two graduate students by mid-year. *Sheahan Diamond Library*: Through much effort by everybody at UBC and by Patricia Sheahan, we have transferred the library of Konsult International to MDRU. The library, when fully operational at UBC, will enable members to have access to the best information available for an exploration geologist. Members will be able to query the database, examine the literature, make lists of references on a specific subject and secure copies of the references. MDRU will continue to add to the collection and provide a service to the diamond industry using the successful template established by Patricia Sheahan.

Awards to Graduate Students

Tom Danielson (M.Sc. candidate) won first prize for the best student poster at the Cordilleran Roundup for his poster entitled: "San Nicolas VMS Deposit, Southeastern Zacatecas, Mexico: Age and Paleotectonic Setting".

Michelle Hawke (Ph.D. candidate) received an award for the best paper at the Society of Organic Petrology meeting in Indiana. The paper is entitled "The use of peatlands in monitoring contaminant heavy metals in the environs of point sources - methods, advantages and future approaches."

Tara Ivanochko won an Outstanding Student Paper Award for her presentation at the American Geophysical Union 1999 Fall Meeting entitled "Controls on late Quaternary variations in the oxygen content of Santa Barbara Basin bottom waters: Implications from trace metal analysis" with **Tom Pedersen** as co-author.

Stuart Knoop won the Best M.Sc. Thesis award of the Canadian Tectonics Group. His thesis "A stable isotropic analysis of syntectonic fluid regimes in the Dogtooth,

Western and Main Ranges of Southeastern British Columbia."

Peir Pufahl won the Best Student Paper award for his presentation "Economic Phosphorites in Jordan: implications for the formation of an Upper Cretaceous (Maastrichtian) Phosphorite Giant." at the GSA Cordilleran Section Meeting in Vancouver in April, 2000.

EOS Student Enrollments, 2000-2001 (1999-2000 numbers in brackets)

Degree	ATSC	GEOL	GEOP	OCGY	Totals
*Bachelors	20(10)	# 78/77 (137/82)	14(30)	27(6)	216(265)
M.Sc.	7 (5)	25 (25)	10 (11)	13(9)	55 (50)
M.A.Sc. & M.Eng.		16 (14)			16 (14)
Ph.D.	10 (9)	15 (19)	19 (20)	15 (19)	59 (67)
Total Grads	17 (14)	56(58)	29 (31)	28 (28)	130 (131)

* 3rd and 4th year only # Science/Engineering
Undergraduate gender: male 126, female 90

Student Clubs and Activities

Dawson Club: report by **Wes Hodson**, President

At the UBC Science Week in January, we promoted our Department to the rest of UBC through a display in the Student Union Building. In the same week, at the Cordilleran Round-Up in Vancouver, members volunteered their time to help the conference run smoothly. The highlight of the year was our trip during spring break to the big island of Hawaii. Twenty students and three professors saw the active lava flows of Kilauea and enjoyed beautiful beaches. Through the year, we organized weekend field trips and social events, including the EOS Talent Night where all and sundry showcased their "talents" and monthly beer gardens where students relieved the stress of school. The latter included the Back from the Bush Bash, Import Beer Night, and a home-brew contest. In October a field trip to Candy Rock Mine near Grand Forks was a huge success.

GEOROX Club: report by **Shiloh Jorgensen**, President

Highlights of 2000 included a successful Back from the Bush Halloween Beer Garden, where the creativeness that lives in students was evident from the entertaining costumes, and the Annual GEOROX Christmas party. The upcoming Engineers' Ball will be a night to remember: as with every year, the Ball requires a Ball model. This year we have chosen to model groundwater contamination and the prevention of the contaminants entering a river system and have incorporated geophysics. In athletics, we made it to the semi finals in two softball tournaments and strong teams were fielded in volleyball, ice hockey and storm-the-wall.

The grad class will be donating a mural to the Clubroom in the EOS building with a geomorphologic theme.

Society of Economic Geologists (UBC Student Chapter): report by **Scott Heffernan**, President

We had an active and successful year. Dick Tosdal (Director, MDRU) helped us to continue the sponsored lecture series. Talks were given by Noel White (BHP; Convergent Evolution and Ore Deposits), Christoph Heinrich (ETH Zurich; Magmatic-hydrothermal Ore Formation: New Insights from Fluid-Inclusion Micro-Analysis) Barry Smee (Smee and Associates Consulting; The Use and Abuse of Weak Extraction Geochemistry in Mineral Exploration) Michael Michaud (SRK Consulting; The Geology, Petrology, Geochemistry, and PGE-Au-Cu-Ni Ore Assemblage of the Roby Zone, Lac des Iles, Northwestern Ontario) Bill Wengzynowski (Expatriate) and Lee Groat (UBC) (Recent Emerald Discoveries of the Goal Net Property, Yukon Territory) and John Thompson (Teck; Research and Mineral Exploration).

We have initiated an annual field trip, to bring together professionals, academics and students to study mineral deposits and their regional settings both locally and abroad. In May 2000 the first trip, 'Great Basin Gold', run in conjunction with the Geological Society of Nevada 2000 conference, was a huge success. Currently, we are planning a field trip to Central Mexico for May 2001. The trip has generated a lot of interest and we expect it to be well attended. Please contact us if you wish to participate or to share insights and ideas.

Environmental and Engineering Geophysical Society (UBC Chapter): report by **Pam Skinner**, President

The UBC Chapter of EEGS aims to bring together UBC geophysics students. Our goal is to encourage and facilitate communication. During the past year we had a speaker come in from industry and give a technical presentation on microseismic monitoring to a large turnout of undergraduate and graduate students. We have also composed an email list of all streams geophysics students (Engineering, Science, Undergraduate and Graduate) so we can spread information rapidly. Next year we hope to raise funds for students to travel to SAGEEP, and have further technical geophysics presentations at UBC. Everyone is encouraged to look up our website at www.eos.ubc.ca/~eegs or contact us at our email eegs@eos.ubc.ca

Intramural Hockey

Intramural hockey teams (men's and women's) including faculty, staff, graduates and undergraduates were coached by **Steve Israel** and **Scott Heffernan**.

Graduate Theses completed in 2000 supervised by EOS Faculty (name of supervisor in brackets)

Ph.D.

Alt-Epping, Peter: Insights into the Evolution of an Oceanic Hydrothermal System and a Method for Constraining Estimates of the Vigor of Hydrothermal Convection (L. Smith)

Cagnoli, Bruno: Lateral Facies Variation of Base Surge Deposits in the Ubehebe Hydrovolcanic Field Investigated by Ground Penetrating Radar (T. Ulrych)

Fielding, Anthony: The Relationship Between Carbon Isotope Fractionation and Carbon Concentrating Mechanism Activity in Marine Phytoplankton (P. Harrison)

Flowers, Gwenn: A Multicomponent Coupled Model of Glacier Hydrology (G. Clarke)

Frederiksen, Andrew: Seismic Imaging of the Canadian Upper Mantle (M. Bostock)

Gaganis, Petros: On the Quantification of the Effect of Model Error on Groundwater Model Predictions and Risk Assessments (L. Smith)

Gorman, Andrew: Deep Probe: Investigating the Lithosphere of western North America with Refraction Seismology (R. Clowes)

Kavanaugh, Jeffery: Hydromechanical Behaviour of a Surge-type Glacier: Trapridge Glacier, Yukon Territory, Canada (G. Clarke)

Monahan, Adam: Nonlinear Principal-component Analysis of Climate Data (W. Hsieh)

Rondenay, Stephane: Teleseismic Imaging of the Southeastern Canadian Shield and Cascadia Subduction Zone (M. Bostock and R. Ellis)

M.A.Sc.

Burns, Sean: Contaminant Transport Through Abandoned Boreholes in Fractured Rock (L. Smith)

Fletcher, Lara: Failure Behaviour of Two Landslides in Silt and Clay (O. Hungr)

M.Sc.

Bornhold, Elizabeth: Interannual and Interdecadal Patterns in Timing and Abundance of Phytoplankton and Zooplankton in the Central Strait of Georgia, BC with Special Reference to *Neocalanus Plumchrus* (P. Harrison)

Danielson, Thomas J.: Age, Paleotectonic Setting, and Common Pb Isotope Signature of the San Nicolas Volcanogenic Massive Sulfide Deposit, Southeastern Zacatecas State, Central Mexico (J. Mortensen)

Harris, Richard: Triassic Doig Formation Sand Bodies in the Peace River Area of Western Canada: Depositional and Structural Models, and the Impact of Diagenesis on Reservoir Properties (R.M. Bustin)

Howard, Patrick: Mississippian Sedimentology, Depositional and Diagenetic Control on the Kisbey Sandstone Petroleum Reservoir Development, Williston Basin (R.M. Bustin)

Hilton, Elizabeth: Composition and Structure of Titanian Andradite from Magmatic and Hydrothermal Environments (J.K. Russell)

Irving, James: Estimation and Correction of Wavelet Dispersion in Ground Penetrating Radar Data (R. Knight)

Knoop, Stuart: A Stable Isotopic Analysis of Syntectonic Fluid Regimes in the Dogtooth, Western, and Main Ranges of Southeastern British Columbia (L. Kennedy)

Lundgren, Jeff: Elevated Ozone Layers and Vertical Mixing in the Lower Fraser Valley, British Columbia (I. McKendry)

Meyn, Stephanie: Heat Fluxes Through Roofs and Their Relevance to Estimates of Urban Heat Storage (T. Oke)

Nassichuk, Brent: Sedimentology, Diagenesis and Reservoir Development of the Lower Triassic Montney Formation, Northeastern British Columbia (R.M. Bustin)

***Quinn, Declan:** Atmospheric Wave-Mean Flow Interactions (L. Pandolfo)

* **Rodriguez-Maynez, Liliana:** Institutional Arrangements for Shrimp Fishery in the Upper Gulf of California: A Case Study (M. Healey)

Zhang, Changjun (Albert): Absorption Compensation in Seismic Data Processing (T. Ulrych)

* Candidate registered in department other than EOS

Faculty Retirements

Steve Calvert

Steve Calvert arrived at UBC in 1979 as first Head of the new Department of Oceanography. The Department succeeded the graduate Institute of Oceanography, founded thirty years previously. Steve was Head until 1987, when he metamorphosed into an ordinary departmental citizen.

Born in 1935 in Greenwich, on the south bank of the Thames in eastern London, Steve lived there for the next 18 years, including most of the wartime blitz, going then to Reading University (40 miles west of London to study chemistry and geology. The Geology Department had a total of four faculty members, with Percival Allen as its Head. In Steve's four years at Reading, sedimentology. Steve graduated in 1958, with a specialization in sedimentology, a rapidly developing field that was gaining support from the petroleum industry. At Allen's urging, he applied to graduate school at the Scripps Institution of Oceanography in La Jolla, California where the American Petroleum Institute was supporting research in the Gulf of Mexico. Attention turned to the Gulf of California as an example of a very different basin of sedimentation, and Steve jumped at the chance to do his doctoral work in this project. Working in Mexico was a real delight: on a six-week research cruise in 1960-61, Steve persuaded the Captain to stop briefly at

many small ports along both coastlines, including Loreto, the capital of California during Spanish rule.

The early 1960s saw extraordinary growth in ocean sciences, with copious funding from the U.S. Office of Naval Research, arguably the first national research funding agency. Shiptime was abundant: even lowly graduate students programmed entire research cruises for their own projects. This largesse enabled Steve to spend six months on Scripps cruises to the Pacific, the Atlantic and the Mediterranean. So many scientists visited Scripps that a research seminar by a well-known oceanographer was almost a daily event.

For his doctoral research, completed in 1964, Steve studied formation of diatomaceous sediments of the Gulf of California, under the joint direction of Tjeerd van Andel and Ed Goldberg. The gulf has high growth rates of diatoms, the most abundant phytoplankton in coastal upwelling regimes, and a very intense oxygen minimum at intermediate water depths. These circumstances cause the formation of annually laminated (varved) diatom oozes around the margins of the central gulf basins, making the gulf a splendid modern analogue for the environment in which the famous Monterey Formation of California, with its organic-rich, laminated diatomaceous shales, probably accumulated. In 1963, Steve married Helene Flanders, a Research Assistant of Doug Inman of Scripps, the renowned nearshore sediment physics guy.

In Steve's first job, as an Assistant Professor at UCLA, he took over the teaching of sedimentology from Jerry Winterer who had just left for a faculty slot at Scripps. This swap enabled Steve to learn more about the Monterey rocks and the origin of bedded cherts, which were being recovered by the Deep-Sea Drilling Project at many sites in the deep ocean. Working on the diagenesis of silica from its amorphous state (opal-A) through intermediate crystalline forms (opal-CT) the final recrystallization as quartz in the cherts, Steve saw a direct path from the way sediments probably form in the modern ocean to the rocks appear in the geological record.

Gordon Craig, the first holder of the James Hutton Chair at Edinburgh University, spent a sabbatical year at UCLA in 1964-65, and this chance association led to discussions about how to develop oceanography programs in departments of geology. Steve accepted a position as Lecturer at Edinburgh, and moved there in 1966 with Helene and their new daughter. The Department of Geology at Edinburgh, whose Head was Fred Stewart, well known for his work on evaporites, had twelve full-time faculty, and was growing rapidly. The young and very active group was engaged in expanding teaching and research. Mike O'Hara set up a major research group in experimental petrology, Keith Cox and Brian Upton were unravelling the intricacies of basalt geochemistry, Ben Harte and Mike Johnson were delving into the metamorphic rocks and structure of the Scottish Highlands and Ken Walton was working on turbidite sedimentation in the Palaeozoic basins of Europe. Samples of the first moon rocks arrived by a bank security courier, to

be cooked and recrystallized in the new experimental facility. A long collaboration began between Steve and Brian Price, an expert in X-ray fluorescence spectrometry who had worked on the geochemistry of the Palaeozoic manganiferous rocks of North Wales. Working on geochemistry of modern sediment in the Scottish lochs and the Norwegian fjords, they focused on the formation of manganese nodules, the diagenetic cycling of iron and manganese, the composition of settling particulate material in the water column and the contrasts between oxic and anoxic sediments. This led naturally to work on the enigmatic ferromanganese nodules of the deep ocean, and together they produced the first comprehensive compositional data on these deposits using the XRF facilities in the department. Several large research programs on deep ocean nodules as metal resources were beginning in the United States, and their origin remained obscure. Steve and Brian extended the work of Frank Manheim to suggest that some of the processes of iron and manganese diagenesis in shallow and coastal sediments that have distinctive compositional signatures also operate in the deep ocean, thereby explaining a good deal of the spatial variability of the composition of these deposits. On a Scripps expedition to the South Atlantic, they studied the chemistry of the highly organic-rich diatom oozes that accumulate on the shelf off Namibia.

In 1972, with Helene and an additional three Scottish bairns, Steve moved to the National Institute of Oceanography in Wormley, Surrey. The new Director, Henry Charnock, an ocean physicist, wanted to expand the work of the institute into sediment geochemistry. Steve wanted to be able to work more easily at sea than he could at Edinburgh. Steve set about developing deep-ocean coring devices and building labs for X-ray analysis. Voyages on Britain's premier research vessel *Discovery* took him to the Mediterranean and the North and South Atlantic. Research springing from curiosity as to the possibility of disposing of high-level radioactive waste in the deep ocean later caused the work of Steve's section in the institute to become strongly focused. Steve spent a brief leave-of-absence at the University of Washington in Seattle in 1975, enabling the family to vacation in B.C., an enjoyable experience during a very dry summer.

The loss of support for basic research at IOS and the lack of everyday contact with grad students and young researchers caused Steve to think about academia once again. The search for Director of the Institute of Oceanography at UBC in 1978 resulted in Steve visiting the campus, presenting a talk, and being offered the position. He arrived in Vancouver on July 4, 1979. The Faculty of Graduate Studies had meanwhile decided that the Institute should become an academic department, so Steve never became Director, but instead was the first Head of the new Department of Oceanography in the Faculty of Science. Although the institute had been active in both undergraduate and graduate teaching, the first few years involved Steve in working with the faculty to formulate and introduce new undergraduate and graduate programs in oceanography and a joint program

with Geography in Atmospheric Sciences. Steve stepped down as Head in 1987 and took on more teaching.

At UBC, Steve's research took a new turn, focusing on carbon accumulation in marine sediments, processes of carbon cycling in anoxic basins and the historical record of changing ocean production as stored in marine sediment cores. In collaboration with Tom Pedersen, he developed a research group in marine geochemistry, and established labs for the wide range of analytical work that is needed for these studies. On west coast research vessels he concentrated on the coastal inlets of BC. With other groups he participated in voyages to the Black Sea and the South China Sea. Post-docs in his group also worked on vessels in the North Atlantic and the Arabian Sea. The sediment geochemistry work naturally led to the development of the strong emphasis on palaeoceanography, led by Tom Pedersen, which flourishes today.

Despite the university's severe funding problems in the 1980s, Steve has not regretted moving to UBC. During this period, the oceanography group, young and active, enjoyed the largest per capita research support in the Faculty of Science. Although small by international ocean science standards, the group was tightly knit and collaborated well. They essentially ran the department, knowing what was necessary and pushing the discipline and the academic programs ahead. They were fortunate in being able to attract graduate students who acquired broad education in multi-disciplinary oceanography and went on to excellent careers in ocean and environmental sciences.

Steve's retirement has enabled him to get on with research; he sees a lot still to do, including new lab work and writing. It will be a lot of fun.

Tad Ulrych:

The old couple trudged on and on. They were lost in the blizzard, cold, hungry and so distant from the comforts of their palace. Suddenly an acoustic signal - hope, hope at last. The old man, suddenly transformed into a yak, bounded with precision towards the faint source. And there it was, the little bundle, dressed in sheep's clothing to confuse the wolves. "Tadeusz", said the old woman, "my little isotope". "Maximize your entropy", murmured the little one. "A geophysicist he shall be", pronounced the old man.

Educated in the best schools and universities of Lower Slabotnia (presently seven independent countries), he soon graduated. Unable to find the intellectual stimulation that he so desperately required and preoccupied with the lack of Tesla coils needed for his vacuum experiments, he decided to seek his fortunes in the Western world. His university mentor called him aside one day and said, "Tadeusz, why don't you invent a method for the synthesis of lead tetramethyl for analysis in a gas source mass spectrometer using di-tertiary-butyl peroxide?" Of course, he thought, how obvious is truth. There was only one place to go, only one man to work with - Doncaster Russell, Dr. Pb as he was lovingly known, then at the University of Toronto. "Lead me

to lead", Tadeusz begged. And he was. Tadeusz followed the renowned one to UBC, where he soon became deeply involved in the manufacture of one of the most lethal poisons known to man. It was a great time. He had the whole floor to himself and recognized his colleagues only by the mask they wore. With the demise of gaseous lead analysis, his patented method became obsolete immediately upon graduation.

Undaunted, Tadeusz obtained a position at the University of Western Ontario. It was the closest to his alma mater that he could find - after all, he was to live in London in the Oxford apartments with a view of the 'river' Thames. Still weighed down by lead, he embarked on studies of one of its safer isotopes. With safety came ennui, however, and the only solution was to find a suitable place where ennui could be cultivated into a marketable commodity. South Africa, where the plains of Serengeti offered unlimited potential, came to mind. While in that ancient terrain, Tadeusz decided on a last leaden fling and embarked on a hunt for the oldest leads in the world. He found them, often bounding with precision, a lesson learned from his father (who turned into a yak, remember?), to escape the ever present black mambas. The paper was published months after considerably older leads were discovered by some lucky Brit somewhere else and that just about did the lead bit.

Fortuitously, Tadeusz's pater, a prominent figure in Lower Slabotnia (presently, following a recount, eight independent countries) was on intimate terms with The Three Princes of Serendip and Jack Jacobs. The latter, probably feeling no pain at the time, called Tadeusz in South Africa with a question, "Would you join the faculty at UBC?" "Give me a moment to reflect", he said, while packing. The position was the dream, the salary started at a local minimum (and has progressed to a global one). Temporary relief came by way of an offer to teach potential fields in Brazil, a transformational adventure. Goodbye lead isotopes - hello lead exploration. Long hours with Grignard reagents and free radicals were transformed into long hours with algorithms and Toeplitz forms (Tadeusz is now on the quest for a radically free Toeplitz form). Brazil, Brazil. A new life on many levels. Thank you Jackie.

And from the gurgle in the tundra to now, just a Delta(t). Tadeusz is 432 years old. They finally caught up with him and suggested early retirement. Inspired by the American elections, he accepted without troubling the supreme beings. He will be here for a few more Delta(t)'s. Recently he received the following letter that exemplifies his career and contributions.

Dear Dr. T.J Ulrych

I belong to a Letter Writing Club and I chose you to write to from noteworthy people. I hope that I receive a letter and a picture which I will add to my album. I am 9 years old. Congratulations for studying heart attacks. Sincerely

Jose Marando III

Spotlights: New Faculty

Maya Kopylova:

I grew up in a small town near Moscow (USSR) built around the International Joint Institute for Nuclear Research. The town was full of physicists, mathematicians and programmers of all nationalities, and my decision to go into geology seemed bizarre to my classmates, 25 of whom became physicists and electrical engineers. However, my fascination with rocks started when I was a child. In daycare we hid pretend "gemstones" in sand and then dug them out, imitating geological exploration.

During my student summers I worked in stables training young horses for races, but half-way through university, I got married and the arrival of a family quickly made raising a child the only hobby available to me! I graduated from the School of Petrology at the Lomonosov Moscow State University in 1986. Our Geological Faculty was big, even by Soviet standards, and boasted 350 new graduates annually, all of whom were "distributed" by a university commission to work in their specialized fields. I won a Ph.D. scholarship to the Schmidt Institute of Physics of the Earth (Moscow) and defended my Thesis in 1991.

My first petrological love was tectites - glasses of unknown (lunar?) origin distributed on ancient erosion surfaces. I studied tectites and other natural glasses with complete fascination. We were actually able to calculate the pressure in the lightning channel by the anomalous optical properties of dynamically stressed quartz in fulgurites! (fulgurite is a glassy rock fused by a strike of a lightning). I was able to go on field trips to buried and modern meteorite craters and the most exciting expedition was to Zhamanshin, an astrobleme in Kazakhstan (Middle Asia)! This crater is known for solving the problem of the origin of tectite. It is in this place that tectite-like glasses were first found in association with a meteorite crater and were therefore proven to be Earth's impactites.

At the Schmidt Institute of Physics of the Earth I started to study mantle xenoliths - spinel-garnet peridotites in alkali basalts and kimberlites. And then, one day, I had a phone call from Sydney, Australia, inviting me to work at Macquarie University in a research group headed by Prof. O'Reilly. He had begun an ambitious project of mapping the mantle from Siberia to Australia, and my research on Mongolian xenoliths fit right in! From Australia I moved to South Africa where I won a National Research Foundation post-doctoral award to study mineral inclusions in Zimbabwean diamonds. I worked at the University of Cape Town with Prof. Gurney, famous for his discovery of the principal diamond indicator mineral, a harzburgitic garnet. After a year of a very tedious work extracting 30-micron mineral inclusions from diamonds, we learned that the Limpopo mobile belt is not rooted in the mantle and that the cold mantle of the Kaapvaal and Zimbabwean cratons is continuous at depth.

In 1995 I moved to Vancouver and took up a postdoctoral position with Kelly Russell. Canamera Ltd., a junior exploration company, funded the petrological research of its Jericho kimberlite and xenoliths. I then worked part-time as a Research Associate with Kelly and in 2000 won a University Faculty Award for Women in Science. This award allows me to teach only one course a year and devote most of my time to the organization of the Diamond Exploration Lab.

I am very grateful for two things in my life. The first is my family - my three children (17, 2 and 7 months old) take up all my time when I am at home. The second has been seeing the world at someone else's expense! I am very glad I was a research geologist in the Soviet Union. Our scientific work was generously funded and full of interesting expeditions. It took me all over former Soviet Union: beyond the Polar Circle in Siberia and in Northern Spitsbergen (82° N!), to the mountains of the Ural, the Pamir, the Caucasus and the Tien-Shan (Middle Asia), to the deserts of Kazakhstan. Cape Town, Cape Peninsula and Zimbabwe, which I crossed twice, remain the highlights of my travels, and I still miss that beautiful land.

Awful Weather Forecasts by Roland Stull

Professor Roland Stull, one of three atmospheric scientists who recently transferred to Earth and Ocean Sciences from Geography, has a PhD from the University of Washington and is a keen aviator. Here he talks about one aspect of his current research.

We've all heard weather forecasts that turned out to be wrong. Such bad forecasts are more common in British Columbia (BC) than elsewhere in Canada. We in EOS are working to improve BC weather-forecast quality.

How do we measure the "goodness" of a forecast? "Accuracy" is not a good enough measure. For example, we could create a card deck with 197 red cards (representing rain days each year) and 168 black cards (representing non-rain days) based on the historical climatology of Vancouver. But because it rains so often in Vancouver, we could shuffle the deck and draw cards at random, and still have an average "accuracy" of about 54%, just based on climatology.

However, meteorologists consider forecasts "skillful" only when they are more accurate than climatology and deviate from climatology in the same direction as the actual weather. Due to the chaotic (dynamically nonlinear & complex) nature of the atmosphere, even the theoretical "best" possible forecast deteriorates from 100% to 25% as we project further into the future (from 1 s to 10 days). Although there is no strict definition, most users consider a forecast to be "good enough" when this skill-measure is better than about 60%.

Over most of Canada, actual forecasts are "good enough" out to about 3 days in the future during winter when the weather

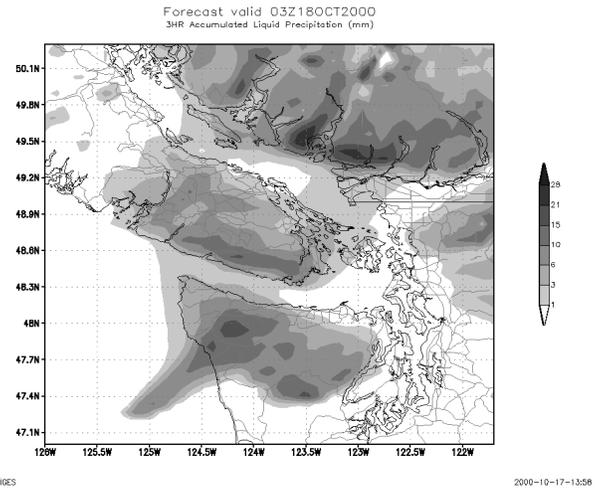
is most changeable, and out to 5 or 6 days during summer. However, in western BC, winter forecasts are good only out to about one day. Such poor forecasts costs industry and governments millions of dollars each year. My goal is to improve 2-day weather forecast quality in BC. Working with me is a team of six graduate students and additional computer-science co-op students from around the world.

Our approach is numerical weather prediction (NWP). Weather involves many quantities (temperature, winds, humidity, etc) at an infinite number of locations in the atmosphere interacting in a way that is described by the equations of fluid mechanics. Because these zillions of variables and their nonlinear interactions are too much for the human brain, computers are ideal for finding approximate solutions.

In fact, computer forecast skill exceeded human forecast skill about two decades ago. These days, human forecasters use the NWP forecasts produced by government computer centers such as the Canadian Meteorological Center as their primary tool. Compared to their other tools such as satellite and radar observations that show only the current weather, NWP is the only tool that gives a forecast. For this reason, improvements to NWP forecasts are highly desired by meteorologists and their customers.

The biggest roadblocks to better forecasts in BC are the complex mountainous topography, and the paucity of weather data upstream of us over the NE Pacific Ocean. To address the complex topography, we run our NWP computer codes (called "models") to solve the equations of fluid mechanics at a large number of very closely-spaced grid points. We use a suite of dedicated, multi-processor computers, including two Silicon Graphics computers with 4 and 8 processors, and a 24-processor "Beowulf cluster" (a generic name for many PCs wired together to act like a big multiprocessor computer). We make new numerical forecasts every day on a tight schedule, starting from the weather observations taken at 00 UTC (= 4 pm PST), and projecting 48 hours into the future.

Even with this dedicated computer power, we are unable to cover all of western Canada with the fine grid resolution (granularity) that we desire. So we compromise with a nested-grid approach. Namely, we use coarser grid spacing (90 km) covering all of western North America and the NE Pacific, and use that to drive an imbedded smaller-domain nest having finer resolution. We currently have 4 levels of nest, with the finest at 3.3 km grid spacing covering the SW corner of BC. An example of a resulting precipitation forecast is shown in the figure.



GRADS: OOLA/IGES

2000-10-17-13:58

But no single computer model is best, because much of the atmospheric physics (such as zillions of cloud and rain drops and ice-crystals, or billions of wavelength bands of solar and infrared radiation, or millions of turbulent eddies) must be approximated. Different research groups make different approximations, resulting in different NWP models. We have found that no single model is best, but by using multiple models, we can average the results to get a better overall forecast.

We currently use 3 models. One model, called MC2, was developed in Montreal by the Numerical Prediction Research Division of Environment Canada. Another, called NMS, was developed by Greg Tripoli at the University of Wisconsin. The third, called MM5, was refined by the National Center for Atmospheric Research in Colorado. We hope to add two additional models to our suite. While all this makes lots of sense, each model requires significant computer resources, so we run a very tight daily schedule that consumes every available cycle of our computers.

We feed the output from these number-cruncher computers into smaller workstations, to analyse the output and draw over 3000 new weather map images each day. Some of these weather maps cover different areas and show different weather elements, while others are point forecasts tailored to the industry and government clients who help fund our research. You can view a subset of our forecasts on our web page (<http://www.eos.ubc.ca/wxfst/>), although we keep the really-good stuff on password-protected web pages for our clients. Current and past clients include BC Hydro, Environment Canada, BC Rail, BC Ministry of Transportation and Highways, Whistler/Blackcomb, BC Ministry of Forests, Canadian Avalanche Association, CKWX Radio, and various agricultural operations including vineyards.

We were excited to learn in July that we won a \$1.3 million grant from the Canadian Foundation for Innovation (CFI). With a team of 14 collaborators, we will use this money to buy a really big computer, to serve as the foundation infrastructure to a new "Geophysical Disaster Computational Fluid Dynamics Centre". This will allow us to buy a 288

processor Beowulf cluster computer or equivalent, which will enable my team to make numerical forecasts at 1 km horizontal grid spacing over all of BC. These forecasts will be used, in turn, by my collaborators in EOS, Geography, and elsewhere to study avalanches, floods, forest fires, wind storms, cyclones, and many other weather-related disasters that affect western Canada.

With all these computers solving the resolution/mountain problem, we find that the biggest remaining roadblock to better forecasts in BC is the Pacific data void. Observations in this region are crucial, because the atmospheric equations of fluid mechanics are equations of change. Namely, they require initial conditions as a starting point to make the forecasts. But the initial conditions are just the observations of the current weather. Over the NE Pacific, there are woefully insufficient observations, and unfortunately, this data-void region is upstream of us, where all the nasty storms evolve that later hit the west coast.

To try to solve this problem, we are taking two approaches. One is to try to estimate the variety of possible errors in the observations in the NE Pacific, and then devise an artificial set of initial "observations" to use as slightly different starting points for the forecasts. We make a separate numerical forecast from each plausible starting point, and group the results into an "ensemble". The average of these ensemble forecasts usually gives better skill than any single forecast, and the spread of the ensemble members tells us about forecast confidence and probabilities. Some of our more meteorologically- sophisticated clients can use this probability information in their daily tactical planning to make better operational decisions that save them money.

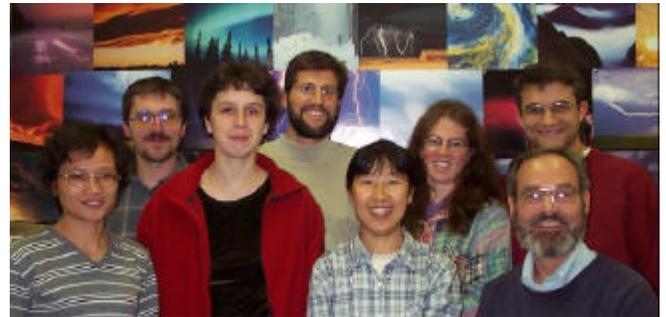
The other approach is to make more observations in the Pacific. Already satellites and commercial aircraft observe the top of the active part of the atmosphere, and weather buoys and ships-of-opportunity provide surface reports. This "observation sandwich" of data at the top and bottom leaves a gap in the middle of the atmosphere (a layer spanning roughly 1 to 9 km above sea level). This middle layer, however, is crucial for determining how the weather evolves.

It is very difficult to make measurements at these altitudes. Over land it is easier -- a network of radiosonde stations covering North America launch balloons that carry weather instrument aloft, twice daily. Over the ocean, there is no such network. We are proposing to develop a buoy holding 800 rocketsonde launch tubes, each loaded with a small rocket and weather sensor package. From a network of such buoys evenly spaced on the NE Pacific Ocean, two rocketsondes would be launched daily from every buoy, to effectively fill the Pacific data void. This project, just starting, will take at least 5 years to reach fruition, assuming our proposals are funded.

We recently won a contract from Emergency Preparedness Canada, to tie together the over 600 weather stations on land in BC into a single unified "Emergency Weather Net". These

stations have been previously deployed by various industries and provincial agencies to address their own specific problems. Our effort to tie these stations together into a unified data base will allow a synergy where each the collaborating agencies can benefit from the total pool of weather data.

We at UBC will use this observation data over land to validate and improve our weather forecasts. The incorporation of weather data into a numerical weather forecast is called "data assimilation". Doing such assimilation in mountainous terrain is extremely tricky, and is one of the many focus areas of our research.



The figure shows the Weather Prediction team. Henryk Modzelewski runs the NMS model, serves as our computer system administrator (quite a big job with all our computers), and is finishing his PhD on a better description of turbulence for NWP models. Josh Hacker runs the MC2 model, provides high-resolution weather-forecast products such as precipitation and air pollution transport for many of our industry and provincial clients, is developing better algorithms for solving the NWP equations, and is finishing his PhD on ensemble prediction and data assimilation. Xingxiu Deng will continue running MC2 after Josh graduates, provides forecast verification statistics for clients, runs a model-output correction method called Kalman filtering, and is implementing a assimilation code called "LAPS" as part of her PhD research. Yongmei Zhou is running the MM5 model, and is starting her PhD on data assimilation in complex terrain. Larry Berg is finishing his PhD on better cloud parameterization methods for NWP and climate models. Claudia Roeger is finishing her M.Sc. on applications of high-resolution NWP forecasts of precipitation to improved avalanche forecasts. Co-op computer science student Trina Cannon is creating the database and web page for the Emergency Weather Net of observation stations in BC. As director of this NWP research, I consider myself lucky to have such bright and dedicated students and employees.

While my focus is on short-term weather prediction, my atmospheric-science colleagues in EOS are studying a wide variety of other subjects, which they will describe in future newsletters. In closing, let me say that this has been an exciting and rewarding time for us. We have been warmly welcomed into EOS, and we are keen contribute to the excellence of UBC earth science research in the EOS department.

Obituaries

As this newsletter was going to press, we heard the sad news that **Ray Best** had died. An obituary will appear in the next edition.

A revision of the obituary for Dr Robert Delavault published in the Alumni Newsletter for 1999 is given below.

Associate Professor Emeritus **Robert Edmund Delavault** passed away in summer 1999. Born December 3, 1907, in Edmonds, Alberta, Bob was educated in France, obtaining the Diplome (Geologie) from the Ecole Nationale Superieure (Paris) and the PhD from the Sorbonne (1936). Bob was wounded while serving in the French Army in the Second World War. He worked with the Musée d'Histoire Naturelle in France until his return to Canada. From 1949, with Harry Warren, he pioneered research in exploration geochemistry in Canada, particularly in biogeochemistry. Dr. Delavault was a Research Fellow in the Department of Geology and Geography in 1949-50, a Research Associate in Geochemistry (1954-65) and an Associate Professor (1965-72) in the Department of Geology. He retired from UBC in 1972, and taught in Brazil until he returned to Vancouver in 1982.

Freleigh Fitz Osborne (1903-2000) B.A.Sc. (UBC, Mining Engineering) 1924, M.A.Sc. (UBC, Geological Engineering) 1925, PhD (Yale, Geology) 1928.

Born of Canadian (UEL) parents in Nogales, Arizona Territory in 1903, Freleigh grew up in Vancouver. In 1928 he joined the State University of Iowa as an associate, and in the same year married Agnes Jardine (BA, UBC, 1924).

In 1930 he became Assistant Professor, and in 1939 Associate Professor of Geology at McGill. During WWII, in addition to his regular courses, he instructed military personnel in Map Reading, Radio Mechanics, and Navigation. At McGill, he was chairman of the Time-Table Committee in the hurried post-war period of expansion and the startup of Dawson College. He served as the McGill appointee on the Montreal City council, 1945-47.

In 1947 he became Professeur Titulaire de Petrologie at the Université Laval, teaching graduate and undergraduate courses and exploring his new hobby, palaeontology, until his retirement in 1971. Complementing teaching with field geology was a big part of Freleigh's life. He served with the GSC (1922-25) the ODM (1928-29) and Quebec Department of Mines (1932-1971). He was elected Fellow of the Royal Society of Canada, in 1937 and served as President of Section IV 1959-60.

Freleigh published many papers, particularly on the Grenville area and the region around Quebec City. He was a member of the executive of the Office de Recherche Scientifique de Québec 1934-48, and Associate Editor, Canadian Journal Earth Sciences (1967-71). Freleigh passed away suddenly in Montreal March 13, 2000. He is survived

by his son Freleigh J.F., grandson Don and two great-grandchildren, all of Beaconsfield, Quebec.

New Endowments

Awards totaling \$1500 annually for students pursuing graduate research in Geological Engineering have been endowed by Lisle T. and Sheila Jory. Lisle graduated with BAsC in Geological Engineering in 1950, went on to gain a PhD, and was a principal at Dolmage Campbell until his retirement. Sheila, through the Engineers' Wives' Association, has been a contributor to bursaries for undergraduate engineers at UBC for the past 25 years.

Alumni News

Geological Engineering Class of 1950 - Reunion

The Geological Engineering class of 1950 celebrated the 50th anniversary of their graduation September 29th, 2000 at Malahat, Vancouver Island. Ken and Madeleine Harris were gracious hosts. Thanks to Ken's efforts, attendance was the largest ever for our class: out of a class of 27, 12 attended (all male as we had graduated in the dark ages when few females were enrolled in engineering). Attendees numbered 26 with spouses and four guests, including one of our former professors, Dr. Ken North.

Food and drink were spiced with the joy of visiting with friends of long ago. Between some of us, 50 years of catching up on career and family to be achieved in a few hours. Neighbours were unaware that a party for engineers was in progress: voices were not raised in the raucous engineering songs of our youth, the flight of the latter being emphasized by remarks such as "No thanks, I'll stick with tea or coffee: my medication, you know".

Most of our class were in the unprecedentedly large enrollment of returning veterans in 1946. We were older, mature (we thought) students anxious to get on with learning and career. Dr. Norman MacKenzie had recently settled in as President, and "temporary" huts hastily erected under the direction of Dr. Shrum became our home. Are there any of those huts still in use after more than 50 years? (*A few soldier on: ed.*).

After graduation, we pursued diverse careers including mineral exploration, mine development, mining, petroleum exploration, geotechnical consulting, geological surveys (federal and provincial), teaching (university and high school) and management in industry. Two members of the class who were air force pilots during the war returned to their wartime occupation with commercial companies: unfortunately, both were killed in aircraft accidents. Several of us went on to obtain advanced degrees. The class has contributed widely to the geological engineering profession.

Attending the reunion were Jim Aitken, Bobo Baragar, Oscar Friesen, Ken Harris, Lisle Jory, Chester Millar, Hugh

Nasmith, Stan Pedley, Cliff Rennie, Ken Smith, Roy Stuart, and John Taft. Unable to attend for reasons of health or prior commitment were Ray Best, Bill Plumb, Lloyd Fenske, Ed Livingston, Stan Kanik, Bob James, and Atholl Sutherland-Brown.

* Ray Best and Hugh Nasmith passed away after the reunion took place.

Contributed by Lisle Jory

Alumni Feedback

Syd Lumbers (MSc 1960) Retired in 1996 after 23 years at the Dept. of Earth Sciences, Royal Ontario Museum, as Curator-in-charge and Curator of Geology. Moved to New Mexico in October of 1996. Do consulting, but mainly enjoying hiking the beautiful Southwest U.S. mountains.

John Eckersley (BSc GEOL 1965) Having retired as Placer Dome Inc.'s secretary and General Counsel in 1995 (after 22 years of service), I am now on the Board of Directors of Meridian Gold Inc., a mid-sized gold producer.

Bob Handfield (BSc GEOL 1965) My wife Margaret and I have just returned from 7 years in Australia where I was in charge of the Cyprus Amax exploration program for the Australia-SE Asia region. We had a great time living in Sydney and we ran into a number of other UBC geology grads now living "down under". I've now retired from the exploration business and we have moved to Penticton where we now own and operate Butternut Ridge Bed and Breakfast. We have 7 acres amongst the orchards and vineyards of the Okanagan with our own small heritage apple orchard (about 85 varieties of apples). We invite all UBC geology grads to come up and enjoy the wines and hospitality of the Okanagan. Our e-mail is butternut@img.net and our website is www.bbcanada.com/butternutridge

Iain Blown (BSc 1966) Iain is alive and well spending summers in Revelstoke working at his new consulting business, IB Geotechnical Ltd. The company has four to five employees. Iain is newly married to Darcy.

David F. Classen (MSc GEOP 1970) For nearly 25 years, I participated with various geophysical, applied physics, and exploration-computing project teams in the oil & gas and mining industries as well as government and academic research organizations. Periods of residence in Sweden, Canada, the U.S., and Indonesia have given an international flavor to my experiences. An oil industry contraction during the 1991-2 recession redirected me to the University of Texas at Dallas where I completed an MBA in Finance and International Management Studies in 1994. Since then, I have metamorphosed into a full-fledged capitalist, managing my private investment portfolio.

In response to Barry Devlin's query, "Who's been the highest?" (January 2000 Alumni Newsletter) – I can also claim to have climbed to the 18,000 ft. level (Like the Florida vote, however, no one will ever know the true winner of the contest. Inaccuracies of the maps in that area preclude a more exact elevation determination.) I did this while on a 250-mile, 27-day trek in Eastern Nepal near the Bhutan border en route to the Yalung Glacier. The base

camp for climbing Kanchenjunga, third highest peak, is located at the Yalung Glacier terminus.

I continue to enjoy the outdoors and travel periodically to the Big Bend region of Texas, to the San Juan Mountains of Colorado, and to various other Colorado Plateau areas on 4WD and hiking trips.

Yale R. Simpson (BSc 1970) Currently President of Canaust Resource Consultants Ltd. and Executive Chairman of Argosy Minerals Inc.

Ian Paterson (PhD GEOL 1973) Still with Cominco Ltd based in Vancouver, but have changed my focus from exploration in Latin America to Eurasia.

Dr. Ed Medley (BSc 1978) Was promoted to Principal Engineer with Exponent Failure Analysis Associates. Geo3 (Geotechnical, Geological, and Geo-environmental Group) is now 15 people, including a smattering of Canadian Geological Engineers. Can always find time to talk to any interested Georox (sunny Silicon Valley has many charms besides incredibly expensive housing....)

Greg Kary (BSc GEOL 1980) Bumped into Matt Ball in late 1998 at OK Tedi Mine in Papua New Guinea.

Don Grant (BSc 1981) Don and Beth Grant had a second child last year (1999) in June (Kate), Jake (4). Currently Senior Mining Engineer at the MIM Copper Mine looking after the mine planning. Early winter here this year, temps 5 to 22 degrees. All for now, cheers from the Isa.

Steve Kirstiuk (BSc GEOL 1981) I have worked with Irving Oil for the last 15 years and I am currently responsible for New Business Development. This has involved work relating to Natural Gas originating from the Sable Offshore Energy Producers (east coast Nova Scotia), power development, e-Business opportunities and petrochemicals. Life is going well in Atlantic Canada!

Darrell Podowski (BSc GEOP 1983) After working as an exploration geophysicist for Dome Petroleum and Amoco in Calgary from 1983 to 1989, I returned to UBC to obtain my law degree, which I received in 1992. I practiced as a corporate and securities lawyer for 6 years in Vancouver, and then took a job as Corporate Counsel with Teck Corporation in Vancouver. Teck is a diversified mining company with operations worldwide, and is listed on the Toronto Stock Exchange.

H. Warren Newcomen (BSc 1985) Warren Newcomen and his wife Nancy Stevens moved to Kamloops from Vancouver in January 2000 where Warren started a new job as Highland Valley Copper's Senior Geotechnical Engineer. He is enjoying the departure from fifteen years of consulting, and taking advantage of the additional free time and good weather to fly fish, mountain bike and ski! Last year Warren and Nancy trekked to Everest Base Camp, and spent several days above 5500m. This year they are travelling to the Middle East and the Caribbean to satisfy their travel urges. Old friends are invited to look them up if they are passing through Kamloops.

Peter Guyan (BSc GEOL 1985) New job as Vice President, Exploration with Arrival Energy Ltd. (public company, trades on the Venture Exchange) as of Sept 1, 1999.

David Bromley (BSc GEOP 1985) Married with 3 sons. Wife Brenda (Dyck) Bromley BCom 1986. Worked for

Geological Survey of Canada as summer student in 1983/84. Took 4 year contract after graduation doing seismic work throughout Canada. Back to school in 1988-MBA in 1990 from SFU. Change of career – now work for RBC Dominion Securities as an investment advisor.

Jason Boshier (BSc GEOL 1985) I will be marrying Tracy Williams in August. We have bought a house in Langley. I am currently building set, props and masks for next seasons Vancouver Opera in The Schools Program. Life is good.

Peter Fischl (BSc GEOL 1986) I've been with the Hunter-Dickinson Group since 1993, exploring copper and gold deposits from the Yukon to Mexico. I'm currently involved in the search for high-grade gold in Nevada's Carlin Trend.

Gary Sutton (BSc GEOL 1987) I spend 4 years in mineral exploration in Western Canada before arriving at Leaf Rapids, Manitoba. I spent 3 years as a mine geologist there and significantly improved the use of computers in everyday geology and engineering tasks. Seeking much warmer weather I moved to Arizona where I spent 5 years at the San Manuel Mine until it closed. Going from geology to more project management work I obtained an MBA at the University of Phoenix in 1999. Currently I am attending the University of Arizona in the Computer Science program and I am still trying to figure out what to really do with my life when I grow up.

Tiro Clarke (BSc GEOL 1988) Now practicing law in Calgary. Kathleen Dixon (BSc 1989) and I had a little girl – Micaela – on July 21, 1999. Have enjoyed meeting up lately with UBC geo-friends, including Dave Mercel, Lee Deibert, Andrew Arthur, Paul Lepper, etc.

Connie Cudrak (MSc GEOP 1988) Since leaving UBC, I worked at Shell Canada and Shell International as a seismic processing geophysicist for seven years. In 1995, I went back to university and obtained another BSc, this time in Ecology. Since finishing this degree in 1997, I have been a stay-at-home mother. My husband Dale and I have two adorable daughters: Laura, who is now four, and Julia, who was born at the end of 1999 (just missed the pseudo-millennium). Although taking care of children is much different from both academic and business life, I have found patience I never knew I had and my multi-tasking has improved!

Mark Leir (BSc 1990, MSc 1995) Mark has moved away from geological engineering consulting and is now president of GroundControl Geo Technologies Inc., a small high tech company in Vancouver riding the information/GIS technology wave. He is enjoying the challenges of management but does miss the outdoors of geology. He keeps in touch with fellow GeoRox Bill Burton (BSc 1991), Brent Gilmore (BSc 1991) and Steve Hedberg (BSc 1990).

Sheryl Mawdsley (nee Tewnion) (BSc ATSC 1990) I worked for a private consulting firm in Vancouver for 4 years after graduating, performing computer modeling and completing air quality impact assessments for industry. We have two children now, a 6 year old daughter and a 3 year old son. I stayed home with our children for a few years and am now employed in a different career field that has allowed me to work closer to home and spend more time with our children.

Acknowledgments

We wish to thank Dick Chase for compiling this Newsletter and Tracy McLean for organizing the layout.

KEEP IN TOUCH

Enjoy keeping up with friends and classmates in the Alumni News section? Why not return the favour - drop us a line. Please fill in your current address below even if the Newsletter was correctly addressed - it helps us maintain our records, or email us at alumni-contact@eos.ubc.ca. Also visit the Earth & Ocean Sciences website at www.eos.ubc.ca. Please do not provide any information that you would not want published in the next Alumni Newsletter.

Name: _____

UBC Degree: _____ Graduation Date: _____

Address: _____

Telephone: _____ Fax: _____

Email Address: _____

Has the above changed since last year? Yes No

What's new with you?

- | | | |
|------------------------------------|---------------------------------|--|
| <input type="radio"/> Married? | <input type="radio"/> New job? | <input type="radio"/> Back in school? |
| <input type="radio"/> Take a trip? | <input type="radio"/> Promoted? | <input type="radio"/> See a classmate? |
| <input type="radio"/> Retired? | <input type="radio"/> New Baby? | <input type="radio"/> Other? |

Thanks for your response

UBC Dept. of Earth & Ocean Sciences Alumni Contact 6339 Stores Rd. Vancouver BC Canada V6T 1Z4