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Neutrinos Detected in Mine

Observatory may help resolve long-standing debates about the sun

The chances of a neutrino actually hitting something as it travels through all this howling emptiness are roughly comparable to that of dropping a ball bearing at random from a cruising 747 and hitting, say, an egg sandwich.

Douglas Adams
Mostly Harmless

THEY'VE SEEN THE LIGHT. Within days of turning on a detector at the Sudbury Neutrino Observatory (SNO), scientists, including U of G physics professors John Simpson, Robin Ollerhead and Jimmy Law, are seeing faint flashes of light indicating the presence of elusive particles called neutrinos in the device, which was installed last year near the bottom of a nickel mine.

"We're excited," says Simpson, explaining that such early detection reflects the high quality of the observatory, including the contribution of the Guelph trio that designed its sophisticated instruments.

Interactions between neutrinos created in the sun or in the atmosphere on the other side of the Earth and atoms of heavy water in the detector are expected to yield clues about the nature of elementary particles and to deepen our understanding of the universe.

The observatory consists of a sphere containing about 1,000 tonnes of heavy water that was installed two kilometres down the mine to shield the detector from

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A FAMILY TRADITION

Sunny skies reigned over Johnston Green last week as U of G presented more than 1,500 degrees and diplomas during seven convocation ceremonies. Among the graduates were brothers David (seated) and Chris Morley, who became the 15th and 16th members of their family to graduate from U of G when they received BA degrees June 9. Proud parents are Jane, a 1981 M.Sc. graduate of Guelph and longtime staff member in the Counselling and Student Resource Centre, and Scott. U of G also presented honorary degrees to novelist Jane Urquhart; the late Charles Zavitz, head of field crop research at OAC for 35 years; criminologist William Chambliss; medical researcher Michel Chretien; molecular geneticist Stanley Falkow; and former Swedish prime minister Ola Ullsten. Retired professors John Leslie, Philosophy, and Ken Kasha, Plant Agriculture, were named professors emeriti. A Medal of Merit was awarded to retired physics professor Jim Hunt. The Alumni Medal of Achievement went to 1985 B.Sc. graduate Adrian Park. See stories and photos on page 5.

PHOTO BY MARTIN SCHWALBE

Metals Research Network Gets Boost

NSERC support brings funding total to \$6.4 million for studies on metals in the environment

RESearchers investigating the impact of metals on the environment have received a multi-million-dollar boost in funding.

Guelph MP Brenda Chamberlain and Tom Brzustowski, president of the Natural Sciences and Engineering Research Council (NSERC), were on campus last week to announce \$3.5 million in NSERC funding over the next five years for the Metals in the Environment (MITE) Research Network. The network is a partnership of researchers from 12 universities, including Guelph, industry and three federal government departments.

NSERC's support for the MITE Research Network will be enhanced by \$1.5 million from the Mining Association of Canada and Ontario Power Generation Inc. (formerly Ontario Hydro). With about \$1.4 million already committed from three federal departments — Environment Canada, the Department of Fisheries and Oceans (DFO), and Natural Resources Canada — the to-

tal investment to date in the MITE network is \$6.4 million. The secretariat for the network is based at Guelph.

Research within the network is structured along three interacting domains:

- sources of metals in the environment;
- processes by which metals move and transform within the environment; and
- impact of metals on ecosystems.

Launched last July, the network is managed by the Canadian Network of Toxicology Centres (CNTC), which is headquartered at U of G. Co-ordinator of the MITE network is Prof. Len Ritter, executive director of the CNTC.

Bringing together industry, government and university researchers, MITE aims to better understand how metals affect the environment, to assess the risks posed by metals and to propose management strategies to ensure that findings reach key policy-makers in government.

"This is a bold interdisciplinary research initiative that will study metals in our environment on a scale never seen in Canada," Chamberlain said at the announcement. "The information produced by this network will be very useful in the formulation of environmentally responsible policies for the federal government and its partners."

Added Ritter: "We need to ensure that the research issues being addressed are relevant and that results are communicated as quickly as possible to decision makers."

Prof. Beverley Hale, Land Resource Science, one of the network's research domain leaders, is working with the DFO to study the effects of — and the risk posed by — metals on ecosystems. Her studies will take place mostly in Sudbury and Rouyn-Noranda, areas where scientists have documented the release of environmental contaminants.

A plant physiologist, Hale has studied the uptake and accumulation of cadmium in durum wheat, as well as accumulation of trace metals

— including nickel, cadmium, copper, lead, arsenic and mercury — in the boreal forest. She said the NSERC funding will allow her and other researchers to work together in all-important partnerships intended to alleviate the environmental effects of trace metals.

Support for graduate students is a key component of the project, and Hale will use the funding for graduate student stipends, field research and data collection. Pointing to federal predictions of a pending shortage of metals scientists in Canada during the next decade, she said the new network will enable her and others to train needed professionals.

The three research domains are essential for assessing the risk metals may pose and determining how to reduce that risk, said Peter Campbell, research director and principal investigator for the MITE Research Network. Campbell, from the Institut national de la recherche scientifique at Université du Québec

Continued on page 2

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Community Input Sought on VP Positions

THE SEARCH committees for the provost and vice-president (academic) and vice-president (research) are moving forward immediately with their tasks because of the competitive recruitment environment for these positions and the need to fill them by the summer of 2000. The committees are being assisted in their work by Canada's leading post-secondary education search firm, Janet Wright and Associates, and advertisements for the positions have begun to appear.

The next focus of the search committees is to refine the position pro-

files. To aid them in this and other search tasks, the committees are seeking input and advice from U of G faculty, staff, students and other stakeholders on the qualifications, experience and personal characteristics the committees should seek in candidates. Responses may, in part, reflect individual assessments of the strategic, learning/research and internal/external needs of the University, as well as the competitive environment U of G will face in pursuing additional operating and capital resources and recruiting faculty, staff and students as it seeks to sus-

tain its commitment to quality.

The committees wish to receive input from the University community as early as possible. They also welcome suggestions of potential candidates. All comments and suggestions will be shared with the search committee members in confidence and will be used to refine the position profiles and inform the search process. Input can be submitted by letter to president Mordechai Rozanski as chair of the search committees or by e-mail to search@exec.admin.uoguelph.ca.

MITE Network 'Uniquely Canadian'

Continued from page 1



Posters describing current MITE research were displayed at the recent announcement of new NSERC funding. From left are Prof. Len Ritter, MP Brenda Chamberlain, NSERC president Tom Brzustowski, MITE research director Peter Campbell and Prof. Beverley Hale.

PHOTO BY MARTIN SCHWALBE

(UQ-INRS), is leader of a research domain looking at the environmental impact of metals.

The three research areas will involve more than 20 scientists and eventually some 30 postdoctoral fellows and graduate students, with each area co-directed by a university researcher and an industry counterpart.

Prof. Grant Edwards, Engineering, another MITE research domain leader, has measured air-surface exchange rates of volatile metals, particularly mercury, in remote natural settings. He recently received funding from the Canada Foundation for

Innovation for equipment used in tracking the movement of this volatile metal through the environment.

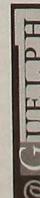
Brzustowski called the MITE network an example of a "very significant and uniquely Canadian initiative." President Mordechai Rozanski added that the network follows on Guelph's tradition of public/private partnerships.

"This is research critical to our understanding of metals and to improving the environmental quality of our ecosystems," said Rozanski. "Government, industry and university researchers are to be applauded for this multidisciplinary initiative.

U of G is proud to be home to MITE through the Canadian Network of Toxicology Centres."

The new funding will allow the network to establish research teams across Canada to strengthen its scientific investigations and ensure that a range of issues are represented. The funds will be allocated to support metals research in Canada at the 12 participating universities — UQ-INRS, Carleton, Waterloo, Toronto, McMaster, Université du Québec à Montréal, Université de Montréal, Western, Dalhousie, St. Mary's, McGill and Guelph.

BY ALEXANDER WOOLEY



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INUIT ART EXHIBITION TO VISIT ICELAND

A Macdonald Stewart Art Centre (MSAC) exhibition of Qamanittuaq drawings by Baker Lake artists, which was the inaugural exhibition at the Baker Lake Heritage Centre in June 1998 and has since toured to Nunatta Sunakkutaangit Museum in Iqaluit, will travel this August to the University of Iceland in Reykjavik, where it will be exhibited until December.

The Icelandic visit is presented in conjunction with the international multidisciplinary environmental field course organized by U of G and the University of Iceland. MSAC curator Judy Nasby will be on hand for the opening of the exhibition, will give public lectures on Inuit art and Baker Lake drawings, and will meet with contemporary artists and curators.

SENATE SECRETARY NAMED

Irene Birrell, formerly special projects assistant to the Governing Council Secretariat of the University of Toronto, joined U of G as secretary of Senate June 7. A BA graduate of U of T, she served on the Governing Council Secretariat for 10 years, eight of those as assistant secretary. During that time, she was responsible for the Academic Board of Council, the U of T body analogous to Guelph's Senate. More recently, she was assistant university ombudsperson, then acting university ombudsperson, and was appointed special projects assistant in January. In this position, she analysed policy issues and administrative structures dealing with the Governing Council Secretariat's judicial functions. Birrell can be reached at Ext. 6760.

COMMUNITY BARBECUE JULY 8

The annual Community Barbecue sponsored by the Central Student Association is July 8, beginning at 4 p.m. on Branion Plaza. The event will include games for all ages, live entertainment and a resource fair. For more information, call Josh Shook at Ext. 4407 (e-mail csala@uoguelph.ca). To volunteer at the barbecue, call Frank Le at Ext. 6748 (fle@uoguelph.ca).

RECORD-SETTING IDEAS SOUGHT FOR ORIENTATION

The Office of First-Year Studies is holding a contest to get ideas for a new record for students to set or break during Orientation Week in September. In previous years, Guelph students have won a place in the *Guinness Book of World Records* with a human centipede and a human conveyor belt. The activity must be inclusive so that all students can participate and must be something that can be completed in two hours on Johnston Green. About 2,000 frosh will participate. The deadline for entries is July 2. The winner will receive a hard-cover copy of the *Guinness Book of World Records 2000*. Send entries to Chris Lutz in Room 117 of Day Hall.

Zoology Wildlife Technician Wins CBS Teaching Award

Diligence, enthusiasm earn kudos from students and faculty



Grin and bear it. Getting wrapped up in his work is *de rigueur* for zoology wildlife technician and lab instructor Graham Nancekivell, winner of this year's CBS teaching award. PHOTO BY DEAN PALMER/SCENARIO IMAGING

SHANE DE SOLLA hadn't expected to become a moose while working with U of G research technician Graham Nancekivell several years ago near Algonquin Park. But Nancekivell was adamant that no one working on zoology professor Ron Brooks's turtle survey that year would disturb two female wood turtles nesting on an old railroad embankment that provided the only access to other nesting sites in the area.

"He figured these animals were used to moose wandering around because it was near the water," says de Solla, a then graduate student who is still working at U of G for the Canadian Wildlife Service. "To minimize disturbance of the turtles, we put our hands on the shoulder of the person ahead and slowly walked around the nest pretending we were moose."

That characteristic diligence and attention to detail is partly what earned this year's College of Biological Science Teaching Award for Nancekivell, wildlife technician and instructor of countless laboratory sessions and field courses in the Department of Zoology during the past 22 years.

The turtle story also demonstrates the twin passions for animals and the outdoors that first brought Nancekivell to Guelph to study wildlife biology in the early 1970s. Since landing his job with the department a year after graduating, he's logged plenty of hours in the field.

In research projects with various faculty and graduate students, he's worked on everything from turtles and Canada geese to harp seals. Recalling Nancekivell's field work over the last two decades, Brooks wrote in his nominating letter that "we never failed to be impressed, even to the point of endless jokes and stories

about 'this is what Graham would do' — the ultimate perfectionist."

A longtime field course instructor, Nancekivell still teaches field ecology students at the Wildlife Research Station in Algonquin Park. Early this month, he returned from his first-ever trip with the tropical ecology field course to Australia, where he caught up with two former students now at James Cook University — Julian Caley, Australian research fellow in marine biology, and Lin Schwarzkopf, a lecturer in zoology and tropical ecology.

Writing recently on behalf of Caley and herself, Schwarzkopf says: "Since Graham taught us animal behaviour years ago and much of our work now specializes in animal behaviour, you could say he has had a major impact on our careers. Graham was also the first person to teach me how to collect field data, skills that I still use regularly."

These days, Nancekivell spends more of his time instructing students in two labs near his Axelrod Building office, where the mounted bust of a pronghorn antelope keeps glass-eyed watch. He leads students through dissections and demonstrations, writes lab teaching materials, designs and grades exams and assignments, and supervises graduate teaching assistants.

He spends most of his instruction time in the second-year course "Vertebrate Structure and Function," taught by Profs. Moira Ferguson and Fred Ramprasad, although he has worked in numerous labs from mammalogy and ornithology to field ecology and ecological methods (the latter a joint offering with the Department of Botany).

One main tool for his lab demonstrations is a vast collection of animal skeletons and skins, including 2,500 mammal specimens and about 2,300

North American birds, that make up the department's wildlife museum, of which Nancekivell is curator.

"He's just such an enthusiastic person," says zoology graduate student Kevin Judge. "When he's on the field course, it's insane how much work he puts in." He sees Nancekivell bring that same diligence to rehearsals and performances of the Guelph Chamber Choir, to which they both belong.

"I get excited about the course material," says Nancekivell. Rather than require students to simply memorize and regurgitate information, "I try to get them to think synthetically. I try to get them to think in terms of the bigger picture. How does an animal's structure affect how it functions in its environment? How does its structure relate to its evolution?"

Recalling his own undergraduate years, he says the one course "that really turned me on in fourth year was Ron Brooks's evolution course." One assignment saw the class doing a literature search about tickling, an inane-sounding topic that Nancekivell eventually realized was meant to encourage students to question the scientific literature. "He asked seemingly ridiculous questions that really made you think."

Comparing his former professor's "off-centre" teaching style with his own approach — "I'm a bit of a plodder" — Nancekivell says he prides himself on leading well-organized and thorough labs and field outings. Described in nominating letters as diligent and enthusiastic, he enjoys working closely with students. "It's amazing to see them develop," he says — mostly into biologists and ecologists, but when occasion demands, even into moose.

BY ANDREW VOWLES

PEOPLE

FACULTY ELECTED EXECUTIVES OF SCIENTIFIC SOCIETIES

Prof. Joe Gerrath, Botany, has been named president-elect of the Canadian Botanical Association. Prof. Benjamin Lu, Molecular Biology and Genetics, has been elected treasurer of the Genetics Society of Canada. Prof. Frances Sharom, Chemistry and Biochemistry, has been elected vice-president of the Canadian Society for Biochemistry and Molecular Biology. She will become president of the society in 2000.

GASKIN MEDAL AWARDED

Cheryl Tinson received the first Gaskin Medal in Marine and Freshwater Biology during last week's College of Biological Science convocation ceremony. Established by the Department of Zoology in memory of the late Prof. David Gaskin, who died last year, the medal is presented annually to a graduating student with the highest cumulative average in the marine and freshwater biology major.

LECTURE SERIES ESTABLISHED

Adjunct professor Ann Oaks, Botany, has provided an endowment fund to establish the annual Ann Oaks Lecture in Biological Science. The inaugural lecture in this first-ever CBS lecture series will take place in November with a visit by Bob Buchanan of the University of California at Berkeley.

PFEIFFER JOINS HUMAN PALEONTOLOGY ASSOCIATION

Prof. Susan Pfeiffer, Human Biology and Nutritional Sciences, has been elected one of five Canadian members of the Permanent Council of the International Association for the Study of Human Paleontology.

HISTORY STUDENT WINS GRADUATE FELLOWSHIP

Sonya Goldberg, an MA student in the Department of History, has won the prestigious Sir John A. Macdonald Graduate Fellowship in Canadian History. Her thesis adviser is Prof. Gil Stelter.

BOTANIST SPEAKS AT SWITZERLAND WORKSHOP

Prof. Wilf Rauser, Botany, attended the fourth Workshop on Sulfur Metabolism in Wengen, Switzerland, in April and gave a talk on "The Role of Thiols in Plants Under Metal Stress."

MUSIC PROF GIVES TALKS

Music professor Howard Spring presented a workshop on "Hearing and Space" at the School of Architecture at the University of Waterloo and spoke to Guelph MFA students on issues in jazz research.

IN MEMORIAM

Franco Franceschi of Hospitality Services, died suddenly June 5. He was 41. A staff member at U of G since 1992, he is survived by his wife, Neeru, a son, Damian, his mother, brother and sister.

This Doctor Makes House Calls

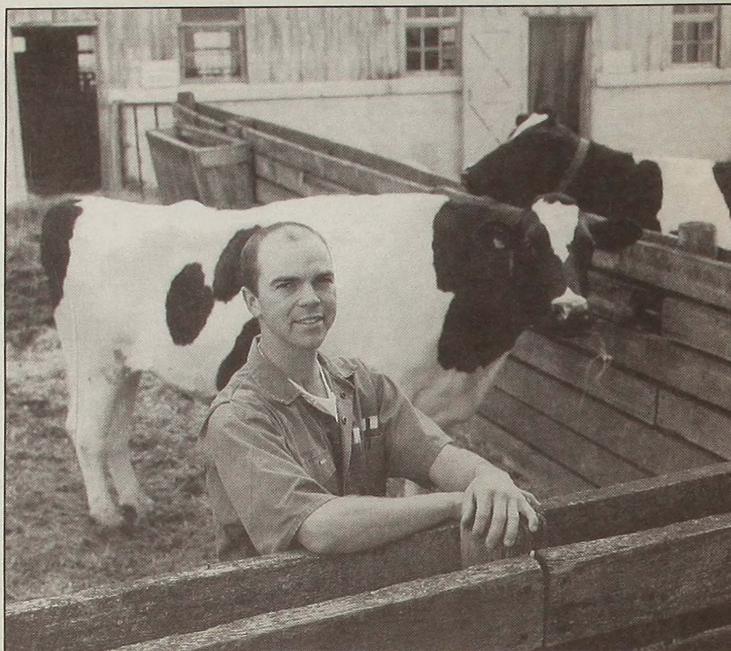
Vets in OVC's Ruminant Field Services Unit take their skills on the road

WITH A BUCKET of water at his side and only the natural light coming through the open doorway, the doctor holds the intravenous bottle above his patient. His examining room is lined with straw, and the steady sound of chewing and lowing cows provides background for the procedure. A curious baby wanders over to see what is happening to its mother. When the patient gets to its feet immediately after being treated, the doctor smiles and says: "That's as dramatic as it gets, and it's the most gratifying feeling to see her stand up right away." The diagnosis was milk fever, and the patient — a Holstein cow — made a textbook recovery.

Rob Swackhammer is one of 11 veterinarians who make up OVC's Ruminant Field Services Unit, a veterinary clinic on wheels that only makes house calls. Servicing the health-care needs of cattle, the vets spend their days travelling to farms within a 50-kilometre radius of Guelph.

The mandate of the unit, established in 1946, is to help farmers maintain their animals through health management practices and provide emergency medical care. Through site visits, the vets help monitor and analyse husbandry practices, establish breeding programs, pinpoint problems and suggest management techniques to improve herd health, in addition to treating individual sick cows.

Swackhammer says the unit's vets often play a consulting role in addition to providing medical care. Many farmers today have a great deal of knowledge about managing the health of their animals, he says, and they can do many basic treatments



OVC veterinarian Rob Swackhammer says communication and education are essential to the success of the Ruminant Field Service Unit. PHOTO BY DEAN PALMER/SCENARIO IMAGING

without the need of a veterinarian on site. This has been accomplished through the veterinary medical profession's guidance and education, he says.

"It's important for us to teach them what to do on their own in some situations, but it's also important to teach them when to call the vet," says Swackhammer. In the milk fever case described above, for example, the farmer had applied a stan-

dard treatment for his cow's condition, but recognized that when the animal didn't respond, it was time to call OVC.

More than 130 farms are registered as clients of the Ruminant Field Services Unit. Guelph-area dairy farmer Tim May says that using the unit allows him to "tap into the expertise and groundbreaking research" at U of G. He also believes that by using OVC vets, he contrib-

utes to the research and teaching that occurs at the college. Several of his cows are involved in research studies on endometriosis and mastitis, and during the school year, his barn becomes a classroom when DVM students join the field unit for a week as part of their fourth-year rotations.

Although regular herd health care is the biggest component of the unit's work, Swackhammer's main role is what he calls "fire engine

medicine," dealing with emergency calls. He may have a small roster of patients he's planned to visit in advance, but his schedule can change without warning as emergency calls such as the milk fever case come over the two-way radio in his truck. His constant communication with OVC while he's on the road sets the pace of his day, as secretarial staff in the Veterinary Teaching Hospital's large-animal clinic inform him of the nature of the calls and where he needs to go.

"The secretaries are instrumental," he says. "They are the first person the client has contact with, and they know how to prioritize the calls that come in."

Driving up the laneway of a farm, Swackhammer may know the nature of the emergency, but he doesn't always know where the visit will lead. In some cases, he may have to perform surgery on site, with a barn stall serving as his operating room.

Sometimes, more than veterinary skills are required. There are times, for example, when he has to help catch an animal and bring it in from pasture. And physical acrobatics aren't unusual — stalls and small pens can be difficult to manoeuvre in, especially when the patient is reluctant to stand still.

Swackhammer is also a communicator, discussing the day-to-day issues farmers face beyond the health of their herds, such as how their crops are growing and current affairs in the agriculture industry. Communication and education are essential to the success of the Ruminant Field Services Unit, he says. "We are medically trained, but we also provide a service."

BY GAYLE ANDERSON

Four Dying Maples to Be Felled

Consultant recommends that 10 other aging trees along Gordon Street receive maintenance treatment

FOUR OF THE 14 "sentinel" sugar maple trees lining the western edge of Johnston Green have been found to pose a safety hazard and will be felled early in 2000 during their dormant period. The remaining 10 maples will receive maintenance treatment as recommended in a recent consultant's report on the trees.

The four trees to be removed are the most southerly of the 14 maples standing guard along Gordon Street between College Avenue and Reynolds Walk at the southern edge of Johnston Green. John Reinhart, manager of landscape maintenance, says assessments last fall by U of G Grounds arborist Dennis Lamont and an independent consultant showed irreversible structural deterioration in all four trees. "There's not enough sound wood of large enough diameter for cabling or bracing," he says.

"No tree lasts forever," says Prof. Doug Larson, Botany, who joined U

of G's Landscape Advisory Committee last fall. Pointing to their exposed location, he says the trees "have come to the end of what you can expect of life for a sugar maple, and now they're at the point where they could become quite dangerous. Large parts of their crowns are dead or dying. The University is worried that, if they are not removed, someone could be hit by a falling branch."

The trees were planted 100 to 125 years ago as part of the entrance to what was then the Ontario School of Agriculture and Experimental Farm, the forerunner of OAC and U of G.

Recognizing that the trees were entering their golden years, the University planted a replacement row of maples 10 years ago directly east of what Larson calls the "sentinels" lining Gordon Street. "Those trees are the first things you see when you approach the campus. They're the visual cue to the existence of Johnston Green, and I'm glad that second row is there."

The Grounds Department will erect information signs in the area, then fell the trees next January or February. At the same time, workers will carry out the recommended maintenance on the remaining maples, including pruning and reinforcing of their branches and trunks.

Following a routine assessment by Grounds last year, Lamont had recommended that the four trees be felled. Mindful of their prominent location and long history, Reinhart hired a consulting arborist to check all 14 trees.

The resulting evaluation included an assessment of the trees' health as well as a hazard rating based on the potential danger posed to pedestrians and cyclists. Although some of the trees are in moderate vigour and health, all 14 specimens contain cracks or cavities in trunks or branches, as well as decay and deadwood, according to the report. The four to be removed received a "severe" hazard rating. The remain-

ing 10 received a "medium" hazard rating, along with recommendations to prune branches or to install supporting cables in the canopy or braces in the trunk to prevent cracks from widening.

"By performing continuing inspection and tree care procedures on a regular basis, a magnificent row of sugar maples can be preserved as well as made safe from potential danger," wrote arborist Arthur Marlow, head of TRACE Arboriculture Services Inc.

The recommendation to remove the trees was approved last fall by the Landscape Advisory Committee. Chaired by Garry Round, executive director of Facilities and Hospitality Services, this group began meeting more regularly last fall and added several members to include faculty from the departments of Botany and Plant Agriculture and the School of Landscape Architecture; staff from Student Housing Services, Planning, Facility Support Services and the Ar-

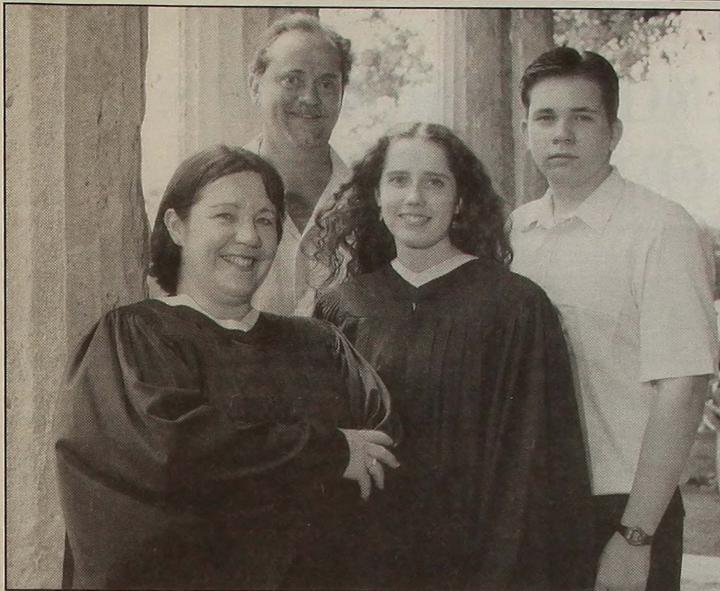
boretum; and a representative of the Central Student Association.

The group is reviewing and updating the University's landscape advisory plan, which was developed in the 1960s, says Larson.

"There's going to be a new campus-wide landscape plan. The decision was made to make the Landscape Advisory Committee more active and more proactive, not just in cutting down and planting trees but in letting people know what is happening. The grounds and the land that we walk on every day didn't just grow — they've been actively managed."

The most recent felling along Gordon Street saw a single tree removed from the row three years ago. Reinhart anticipates that another two or three will have to be removed in the next decade. "They're all showing their age," he says. "But with cabling and bolting and some good luck, they could last another 50 years."

BY ANDREW VOWLES



From left are Nancy, Rick, Melissa and Lucas Renaud.

PHOTOS BY MARTIN SCHWALBE

Mother-Daughter Act

AFTER MORE THAN six years of part-time studies, Nancy Renaud graduated June 8 at the same ceremony as her daughter, Melissa.

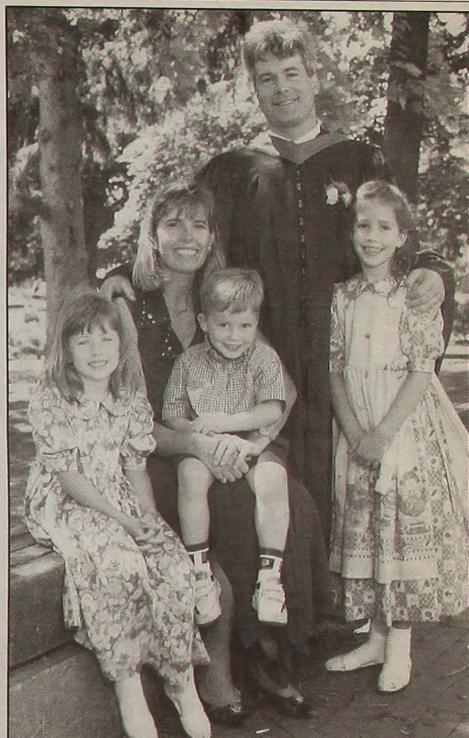
Nancy, who teaches Grade 1 at St. François School in Guelph,

earned a general BA; Melissa completed an honours BA in history and drama. Like Mom, Melissa wants to be a teacher and will enrol in the University of Toronto education program this fall.

Nancy's husband, Rick, is also a

Guelph graduate. He earned a B.Sc. in genetics in 1972 and is a technician in the Department of Biomedical Sciences.

Son Lucas, currently in high school, may make it a foursome by applying to U of G.



Dr. Adrian Park, a 1985 B.Sc. graduate who received the Alumni Medal of Achievement at convocation June 10, shares the moment with his wife, Jennifer, a 1984 BA graduate of Guelph, and their children. The award recognizes the professional achievements of a recent graduate. Park is a specialist in minimally invasive surgery at the University of Kentucky. From left are Meredith, Jennifer, Evan, Adrian and Hilary Park.

A Brotherly Tradition

THREE BROTHERS started a Guelph family legacy in the 1920s, and two brothers are continuing the tradition in 1999. When they were awarded bachelor of arts degrees June 9, David and Chris Morley brought the total of Guelph graduates in their family to 16.

David and Chris are the sons of Scott and Jane Morley, a 1981 M.Sc. graduate of Guelph who is a co-op co-ordinator in Co-operative Education Services. Jane's father, Sidney Henry, earned a BSA from OAC in 1932. Sid's brothers also graduated

from OAC — Nelson from the diploma program in 1924 and Gordon from the degree program in 1934.

All three brothers are deceased, but their names are still familiar to many people in the University community. Sid Henry was an elite athlete and the inaugural winner of the Ted Wildman Memorial Trophy. He was inducted into the Gryphon Club Hall of Fame in 1992. Gordon Henry was named U of G's Alumnus of Honour in 1994 in recognition of professional contributions to the dairy industry in Ontario, his service as mayor of Ingersoll and his in-

volvement in alumni activities. Nelson Henry was also a major contributor to Canadian agriculture, spending most of his career at the experimental farms operated by Agriculture and Agri-Food Canada in Ottawa.

The second generation includes Jane Morley, her brother, Don Henry, a 1964 graduate of OAC, and his wife, Mary, who earned her B.A.Sc. in 1966. Don and Mary Henry operate Maitland Manor Nursery, a recent donor of nursery stock to U of G's conservatory and garden project. Nelson's son Jim, a

1955 graduate of OVC, was director of Veterinary Laboratory Services for the Ontario Ministry of Agriculture, Food and Rural Affairs before retirement.

The third generation includes Don and Mary's children, Andrew, ADA '86, and Lisa, B.Sc. '92, and cousin Andrew, B.Sc.(H.K.) '95. Jim's daughter, Judy, B.Sc. '98, continued the family tradition last year. She is now on leave from OVC's Department of Pathobiology to complete a master's degree in the United States.

In addition to the Henry connec-

tion, David and Chris Morley have other aunts, uncles and cousins who are Guelph graduates, but 1999 was their year to be recognized. David completed two overseas semesters while earning his degree in international development and will be leaving for Ghana this fall to work for a telecommunications company. Chris majored in Canadian studies and was chosen as one of eight graduates from Ontario universities to do an internship in the Ontario legislature. Both worked as residence assistants and were active in student government and other campus activities.

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PERFORMANCE INDICATORS: BOGYES OR OPPORTUNITIES?

"The creation of real performance indicators can help us discharge our teaching and research responsibilities."

BY SID GILBERT

Editor's note: This article by Prof. Sid Gilbert, Sociology and Anthropology, director of the Centre for Educational Research and Assessment, originally appeared in the spring 1999 issue of the *Ontario Confederation of University Faculty Associations Forum*. It is reprinted here with permission.

UNIVERSITY PERFORMANCE INDICATORS are strongly advocated by governments, administrations and boards of governors to demonstrate public accountability. There is great interest in ensuring that universities are accountable for the effective and efficient expenditure of scarce public funds.

On the other hand, faculty, faculty unions and advocacy associations usually regard the interest in performance indicators as only one aspect of a general attack on universities. The attack encompasses:

- moving universities from publicly funded to publicly supported, i.e., deliberate withdrawal of government funding and forced reliance on tuition fees and other non-government sources of revenue;
- more closely connecting universities to labour-market requirements;
- introducing elements of private education to ensure relevance and competitiveness;
- elimination of tenure; and
- the aforementioned emphasis on performance indicators.

Bill Bruneau states: "The great danger of performance indicators is that they will be used to attack departments, faculties and individuals" (*CAUT Bulletin*, November 1997). Bill Graham adds that the new design of higher education has students as "clients" and the bottom line as the ultimate objective. To enhance profitability, universities are forced to use performance indicators and benchmarking and be attentive to the marketplace (*The Toronto Star*, May 17, 1998).

Is there any room for compromise? Can or should academics attempt to mediate, negotiate or assist in resolving the conflict, or is this the most slippery of slopes?

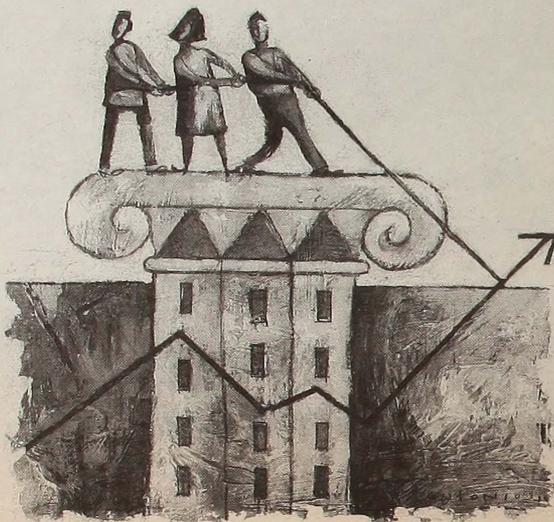
First, we need to clearly understand what performance indicators are and are not. Second, we need to make a distinction between what they are in principle and how they are used and misused in practice.

I think the development and dissemination of real, meaningful performance indicators has great benefit for us individually and collectively, but we need to avoid some dangerous gross misuses. The great benefit of performance indicators is that they can be used to inform and assess instructional effectiveness and ultimately to improve education.

As an instructor, I am highly interested in the extent to which my courses are meeting the student learning objectives and outcomes that I strive for. My department is highly interested in knowing the extent to which our program leads to "the ideal graduate" in terms of the knowledge, skills, values, attitudes and behaviours that students acquire as a consequence of taking the required courses. This university has identified learner-centredness and research-intensiveness as two fundamental strategic directions; it is then actively trying to assess the extent to which we are meeting those two key objectives.

In short, the creation of real performance indicators can help us discharge our teaching and research responsibilities, increase student confidence and public trust, possibly even increase faculty/administration solidarity, and last, but certainly not least, remove the threat of externally imposed and often meaningless statistical comparisons masquerading as performance indicators.

What are performance indicators in principle and how are



they used/misused in practice? A performance indicator is a statistic, number or qualitative description that "indicates" the extent to which the university system, an individual institution or some internal structure/process is performing as it ought to. Quite often, an explicit statement of university goals, purposes, missions or objectives is the reference point. Other reference points or points of comparison that permit a judgment or assessment of the functioning of the institution or system are an absolute standard, a past value (comparison over time) or a comparison across universities, regions, countries.

Performance indicator development often uses an input-process-outcome framework. Inputs represent what universities start with — programs and instructional processes such as curricula, workload, organization of teaching, faculty/student contact and class sizes. Outcomes are the cognitive and non-cognitive effects of the university experience on students — their knowledge, skills, values, attitudes and behaviours, including subsequent employment and incomes.

The interaction of input characteristics and university structures and processes to create value-added outcomes all takes place within an external environment or context (demographic, economic, social, cultural, historical, regional or political factors) that affects institutions but is beyond their control or influence.

So there could be — and actually are — many educational indicators, descriptors or management statistics concerning university inputs, process and outcomes. Most of these are not performance indicators. One of the major criticisms of the *Maclaren's* university rankings is that the measures are either input characteristics (grades of entering students, number of books in the library) or dubious process measures (class sizes, which are not strongly associated with student achievement and learning outcomes.)

Meaningful performance indicators link university structures and processes to student learning and development outcomes (basic university objectives or missions), independent of input characteristics. They demonstrate that the student outcomes are truly the result of university activities and structures (program effects) rather than the results of inputs (selection effects) or exogenous influences such as economic conditions.

What they are not? Performance indicators are not measures of inputs, process alone or even outcomes per se. They are not measures of anything and everything that can be counted, regardless of whether or not it really counts or matters. Performance indicators are not simply management statistics that

describe various aspects of the university or the university system. For example, although it is possible to compare universities on the employment, attrition and loan default rates of their graduates, these do not really represent program effects or matters that are totally within the control of universities. Graduates' employment rates are a function of the economic conditions, a contextual factor. Attrition and loan default rates are closely related to a combination of input or selection factors (the kinds of students admitted) and prevailing economic conditions.

Another misapplication of performance indicators is treating an academic's grants as the measure of research productivity or indication of her/his value to the university. This confuses grant-getting activity and contribution to the financial health of the institution with knowledge creation or generation. Some grants do not produce any new knowledge, some large grants do not produce large amounts of new knowledge, and some new knowledge is produced outside the grant structure.

The *Broadhurst Report* and most critics — Bruneau and Graham, for example — stress the importance of beginning the development of performance indicators with a university's most fundamental goals or mission. "Each university should be held accountable primarily by reference to how it fulfills the mission it has determined for itself within the broad objectives of public policy" (*Report of the Task Force on University Accountability*). If an essential aspect of a university's mission is to be accessible to students from a variety of income groups, then the university should monitor the social class composition of its students and address any radical departures from a broad representation of the socioeconomic status of the general Ontario population. This is particularly important when family incomes are not rising but student tuition and debt loads are, and employment and income expectations are uncertain or modest.

Similarly, if a fundamental aspect of a university's mission is to develop graduates with advanced communication, creative thinking and problem-solving skills and an enthusiasm for learning, then the university should examine, document and produce evidence that this is, in fact, occurring and that it is the result of the university experience. It should not simply be taken for granted.

Dissemination of meaningful performance indicator information would go a long way toward demonstrating real public accountability. Many times, charges are levied against universities and there is no research to indicate otherwise. If universities made their missions explicit, measured the extent to which they were achieving their goals, shared data on successes and problems, including what is being done to remedy deficiencies (a strong demonstration of accountability), public trust and confidence would be enhanced. Most important, education would be improved.

Instead of leaving the development of performance indicators to others, we should actively determine their purpose, approach, measurement and use. If faculty members do not assume responsibility for the agenda, someone else will and university education will be worse off for it. It will be worse off not just for faculty, but also for students, employers, parents, taxpayers and Canadian society generally. Universities develop highly skilled talent and citizens who function in an increasingly competitive global economy. Who is in a better position to formulate the citizenship characteristics and the advanced creative thinking, reasoning and learning skills that will be necessary? Who is in a better position to articulate our fundamental teaching and research objectives, to determine the extent to which we achieve these and to suggest improvements? Performance indicators need to be objective, quantifiable and measurable, but above all, they need to be measures that matter.

FOUR WITH A FUTURE

School of Languages and Literatures is poised for growth

By MARY DICKIESON

WITH THE ARRIVAL of four (soon to be five) new faculty members, the School of Languages and Literatures is both balanced and poised for growth, says director Prof. Daniel Chouinard.

Created in 1997 as the result of restructuring in the College of Arts, the school accepted a mandate to increase collaboration among language programs and strengthen the European studies program. Chouinard says it was "a bold, but very wise move" by University administrators to ensure that faculty retirements that preceded the restructuring were not left without successors.

"We have award-winning faculty with international reputations — one-third who have been here 20 years or more and another third who are in mid-career," says Chouinard. "With five new faculty filling in the roster, we are seeing a change of generation that validates the efforts of more experienced faculty."

Members of the new generation include French professor Stéphanie Nutting, who was hired into a full-time position in 1997, after completing a one-year contract. Frédérique Arroyas joined the French program in 1998. Dorothy Odartay-Wellington came to teach Spanish and Spanish literature in 1997 and was joined by Stephen Henighan in January 1999. In August, the school will welcome Paola Mayer, who will contribute to the German and European studies programs.

The school's transition period is now complete, says Chouinard. "We can view the future with optimism." That future will include a proposal for the establishment of a graduate program that takes advantage of the wide range of expertise available in the school, more support for University exchange programs and continued growth in European studies, already one of the school's largest programs with more than 60 students enrolled.

Meet the new generation of faculty who will contribute to the future of the School of Languages and Literatures.

LANGUAGE BEYOND THE CLASSROOM

Prof. Stéphanie Nutting says she has always been fascinated by language, and even remembers a French immersion kindergarten experience when she first discovered that an ugly face in a pointy hat can be both a witch and a *sorcière*.

From kindergarten to the University of Toronto and graduate degrees at Queen's University, the fascination continued. Now a specialist in Quebec theatre and French-Canadian prose fiction, Nutting shares her interest in French language and culture with U of G students. She has been active in organizing departmental colloquia and student trips to Quebec, as well as helping to co-ordinate exchange programs. With colleague Prof. François Paré, she is managing a Canada Council project that brings francophone writers to U of G, the University of Western Ontario and McMaster.

All these extracurricular activities are important, says Nutting. "Part of the University's mandate is to broaden cultural horizons. Many of our efforts are designed to give students an opportunity to speak French and see that the language and culture extend well beyond the classroom."

Nutting teaches French-language courses, a course on Quebec literature and society, and courses on Quebec poetry and theatre. She says the breadth of subjects keeps her sharp and builds her excitement about research. Later this year, she hopes to publish a book that deals with the evolution and esthetics of tragedy in Quebec and French-Canadian theatre. In future, she plans to write a collaborative book on female playwrights in Quebec and French Canada.

LANGUAGE EXPLORES CULTURE

It was the four-hour improvisation session held at the Macdonald Stewart Art Centre last fall that made Prof. Frédérique Arroyas pick up the phone and volunteer to work with organizers of the Guelph Jazz Festival. Now she's a member of the board and says she's more impressed than ever by the large arts



From left are Profs. Frédérique Arroyas, Dorothy Odartay-Wellington, Stephen Henighan and Stéphanie Nutting.

community in Guelph. "The community is very involved here, people are interested in the arts, and we have wonderful events like the Jazz Festival."

She feels the same kind of involvement among her colleagues in the School of Languages and Literatures. "There's a comfortable atmosphere here where everyone seems ready to help you."

That familial atmosphere is important to Arroyas, who left a teaching post at the University of Victoria in British Columbia to come to Guelph. She is pleased that her two children can now grow up closer to her family in London. Her parents emigrated from Algeria to France to Ontario before she was eight, and she grew up in London, where she attended the University of Western Ontario and completed undergraduate and graduate degrees in French studies.

Arroyas teaches both language and literature courses at U of G and mixes her cultural interests with her academic pursuits, devoting her research efforts to the interaction between artistic disciplines, usually music and literature. She studies the presence of music in literature, plays piano and can actually get caught up in a book about music theory.

The academic structure that brings all languages together in the School of Languages and Literatures makes the school rich and accessible, she says. And it opens the door to new programs in comparative literature that "would bring our expertise together to present the great master works of literature. We have already started to exploit this potential with the European studies program, which allows students to explore the language, culture, economy and history of different countries."

LANGUAGE IS INTERDISCIPLINARY

Prof. Dorothy Odartay-Wellington finds much to interest her in contemporary Spanish literature. She completed a PhD thesis in 1997 that analysed the way Western norms and values reflected in fairy tales are reworked and tested in modern narratives. She delivered a paper earlier this month at the Social Sciences and Humanities Congress in Lennoxville, Que., on the role of female novelists as intellectuals in Spain in the 20th century. And she is now settling into the bustling literary circles of Madrid for a three-month project in which she will study and interview writers whose current fiction reflects the political and social changes in that city over the past decade.

Supported by a research grant from the Spanish government, Odartay-Wellington hopes her work will contribute to the development of a history of the Spanish novel. Contemporary writers, like all citizens of Spain, are enjoying the liberalization and freedom that came with the end of the Franco

dictatorship and censorship in 1975. Now they are also facing social and cultural challenges as they find their place in the European Union. It's an exciting time to study the literature of Spain, she says.

Odartay-Wellington shares her enthusiasm for peninsula literature with Guelph students and is redeveloping some of the courses she teaches to make them more accessible to students outside the School of Languages and Literatures. "I hope we can become more interdisciplinary," she says. "The study of literature benefits from students who bring different backgrounds and different ideas."

She developed her love of literature as a student in her native Ghana. She did her first degree at the University of Ghana, then came to Canada to do graduate work at McGill University and made her first trip to Guelph for the 1997 interview that won her a faculty position here. "Of course, I knew about Guelph because of its exchange programs with the University of Ghana," she says.

LANGUAGE FOR LITERATURE

Prof. Stephen Henighan will spend his first summer in Guelph promoting a new book — his fourth work of fiction. *North of Tourism* is a collection of short stories about "people who go to other countries and stay there too long," he says. They are no longer tourists, but are not yet accepted as natives.

The book received complimentary reviews in the May 22 *National Post* and in the June 7 *Globe and Mail*, where reviewer Nigel Hunt wrote: "This is beautiful, fresh writing, which insightfully explores its territory: the disparate struggles of being an outsider in our so-called global village."

Henighan's fiction draws heavily on personal experiences. "I've always been an 'intimate outsider,'" he says. The description dates back to childhood when his immigrant parents settled near Ottawa. He grew up comparing his parents' British English to the Ottawa Valley dialect of his schoolmates and the Québécois French spoken just across the Ottawa River. "I learned to love language and to appreciate language as a factor in life and culture."

A love of language, a compulsion for travelling and a talent for writing have led Henighan around the world. He trekked through South America before completing a BA in political science at Swarthmore College in Philadelphia, then earned an MA in creative writing at Concordia University in Montreal. After six years of freelance writing and travelling, he launched into a doctoral program in modern languages at Oxford University. He was on faculty at the University of London before coming to Guelph.

Henighan's travels have fuelled his love of languages — he speaks five — as well as his interest in literature. "If you really want to understand how another culture works, there is no substitute for experiencing its literature in the original language," he says. That is a fundamental belief that attracted him to Guelph's School of Languages and Literatures, where students pursue language studies to lead them into deeper cultural exploration through literature.

Henighan teaches Hispanic literature in a language he first taught himself in high school. He is also working with other faculty in the school to develop new courses that will build the foundation students need for advanced literary studies in Spanish.

LANGUAGE LEADS TO COLLABORATION

The fifth position to be filled in the School of Languages and Literatures creates a dual role for Prof. Paola Mayer in European studies with a specialization in German studies. She will join the faculty Aug. 1 from the University of Calgary. Mayer has a PhD from Princeton University in German literature and completed a Killam Postdoctoral Fellowship. She has several refereed articles, reviews and papers to her credit, and her thesis is about to be published by McGill-Queen's University Press.

Chouinard says Mayer's dual appointment supports growing interest in U of G's European studies program and confirms the University's desire to expand its international profile.

PHOTO BY MARTIN SCHWABE

U of G Opens 'Front Door' for Alumni Weekend

Alumni will cut ribbon to open newly restored greenhouse conservatory and gardens and will honour three fellow graduates

THE OFFICIAL OPENING of U of G's newly restored conservatory greenhouse and gardens June 19 will follow the recognition of three distinguished alumni at the President's Luncheon on Johnston Green. A signal event of Alumni Weekend, the noon-hour luncheon is expected to draw more than 400 guests.

The U of G Alumni Association (UGAA) will present its 1999 Alumnus of Honour award to former OAC dean Rick Richards, a 1938 graduate of OAC. The Alumni Volunteer Award will go to David Adams, a 1949 graduate of OAC and a former member of Senate and Board of Governors. In addition, the OVC Alumni Association will honour 1958 graduate Duncan Sinclair as OVC Distinguished Alumnus.

The conservatory and gardens opening will take place at 3:30 p.m., culminating a restoration and gardens development project that was spearheaded by alumni, faculty and staff and funded in part by cash gifts and gifts-in-kind from alumni and the private sector. The 1931 conservatory greenhouse will be named in honour of 1951 OAC graduate Don Rutherford and his family, whose leadership gift enabled the project to be completed in time for Alumni Weekend '99. Built by Lord and Burnham of St. Catharines, the greenhouse is one of the few remaining pagoda-like glass and cypress wood structures in North America.

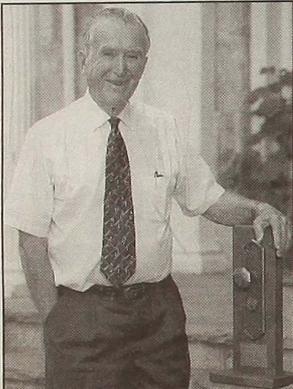
When it was first built, the greenhouse was a working showpiece, designed for the study of floriculture. It was surrounded by ornamental gardens and a lily pond that senior alumni remember as a popular spot for couples to meet.

Now restored to its former glory and surrounded by six thematic gardens, the conservatory will serve as the University's "front door." The spring, summer, fall, winter, water and woodland gardens are named in honour of their chief supporters — the OAC classes of 1949, 1951, 1953, 1955 and 1965 — and in memory of the late Doug Robinson, a 1953 graduate of OAC and former staff member at U of G.

Other Alumni Weekend events include an opening-day barbecue Friday at 5:30 p.m. and a reunion dinner Saturday at 6:30 p.m., featuring a talk by 1971 Guelph graduate Ron Bremner, president and CEO of the Calgary Flames Hockey Club, who will share his insights on the future of the NHL in Canada. Tickets for both events are available by calling Alumni House at Ext. 6544. Call the same

number to claim one of the few remaining tickets for the President's Luncheon and awards presentation.

Richards will be recognized for his lifelong commitment to excellence in administration, teaching, research and extension. He pioneered the process of soil classification and mapping for the Province of Ontario. As head of the University's Land Resource Science Department, he spearheaded the construction of new facilities, provided leadership in the development of broader, more scientific programs and the expansion of faculty, and obtained more land areas for departmental research. He



Rick Richards

for the Royal Agricultural Winter Fair and the Canadian National Exhibition FARM.

Adams has also demonstrated a devotion to volunteer excellence through his commitment to the University, OAC and his alumni class, OAC '49. He was UGAA president in 1968/69, president of the OAC Alumni Association in 1965/66 and a member of the University Senate and Board of Governors from 1970 to 1973. In addition, he has made multiple contributions to OAC '49 activities. He has been instrumental in organizing 50th-anniversary class celebrations for Alumni Weekend, which include the dedication of the Year '49 OAC pond

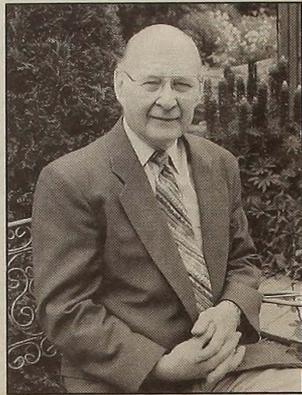


David Adams

of dean of medicine. He retired from the university in 1996 and currently chairs Ontario's Health Services Restructuring Commission, an independent body of health experts and professionals appointed by the province to redesign the health system. He was also the 1983 recipient of OVC's Schofield Medal.

The UGAA Medal of Achievement was awarded during convocation to Dr. Adrian Park of the University of Kentucky, a 1985 B.Sc. graduate who has earned international recognition as a pioneering surgeon and educator in the area of minimally invasive surgery.

Also part of Alumni Weekend are numer-



Duncan Sinclair

was appointed the first dean of OAC in 1962 and was one of the four principal academic leaders who shared in establishing U of G. After completing two terms as dean, he returned to teaching and retired in 1981.

As a professional agrologist, Richards implemented plans for the Canadian Agricultural Research Council as its first president and was president of the Canadian Society of Soil Science, the Ontario Institute of Agrologists and the Agricultural Institute of Canada. He was also the Canadian representative to the United Nations Food and Agriculture Organization.

Adams has also had a distinguished career in the agri-food industry and was general manager of the Canadian Meat Council when he retired in 1993. He continues to share his expertise with the council and as a volunteer

garden at the Arboretum Centre and the upcoming restoration of the Johnston Hall portico.

Sinclair's contributions to career and society have proven his leadership and expertise in health sciences. He graduated from OVC in 1958 and earned a master of science from OAC in 1960, specializing in nutrition. He then earned a PhD in physiology at Queen's University in 1963 and began a career focused primarily on human health.

He was a consultant to the Ontario Ministry of Agriculture, Food and Rural Affairs on the Animals for Research Act and began his academic career at Queen's as dean of arts and science in 1974. He went on to serve as vice-principal, institutional relations, services and health sciences, before assuming the role

of dean of medicine. He retired from the university in 1996 and currently chairs Ontario's Health Services Restructuring Commission, an independent body of health experts and professionals appointed by the province to redesign the health system. He was also the 1983 recipient of OVC's Schofield Medal. The UGAA Medal of Achievement was awarded during convocation to Dr. Adrian Park of the University of Kentucky, a 1985 B.Sc. graduate who has earned international recognition as a pioneering surgeon and educator in the area of minimally invasive surgery. Also part of Alumni Weekend are numerous class reunions, the UGAA annual meeting on Saturday afternoon at 2:30 p.m. in Room 103 of the University Centre and the traditional Golden Anniversary Dinner on Saturday night in Peter Clark Hall. A highlight of that event is the presentation of the Gordon Nixon Leadership Awards, which provide financial support to selected extracurricular student activities. The 1999 awards will be presented to the Student Senate Caucus to support the International Freedom Forum; the U of G Women's Choir, Siren, for its CD project; the Nutrition and Nutraceutical Science Students' Association for a cookbook project; and the International Veterinary Students' Association field study program. Alumni Weekend concludes with an ecumenical service and farewell breakfast on Sunday morning.

Object Is to Prove Whether Neutrinos Have Mass

Continued from page 1

background interference. SNO is designed to detect neutrinos passing through the Earth, particularly from the sun, which bombards each square centimetre of the Earth's surface with billions of neutrinos a second.

Along with Simpson's PhD student Nathaniel Tagg and research associate Pillalammarri Jagam, the U of G professors built instruments used to ensure an acceptable level of background radioactivity in the heavy water and to calculate the amount of energy packed by arriving neutrinos.

"That's why there's a lot of noise about the first measurements," says Simpson, referring to an announcement made by the observatory last week. "Some other detectors have to work harder to get the background

radioactivity down. We've shown that we constructed a very clean detector."

Neutrinos are among the most common particles in the universe, but many of their basic properties, including whether or not they have mass, remain unknown. Studying neutrinos is a challenge because they rarely interact with other matter and are thus difficult to see.

Simpson says the SNO may help resolve long-standing debates about the workings of the sun and about the eventual fate of the universe.

Referring to earlier experiments that detected fewer solar neutrinos than expected, he says most scientists believe that "neutrinos have mass and they change type as they leave the sun, and that's why we have

never seen enough of them."

Proving that neutrinos have mass might enable researchers to determine conclusively that the particles' collective gravitational pull will eventually cause the universe to collapse.

"Our object is to find the smoking gun that proves or disproves that theory," says Simpson. "That's what SNO is designed to do."

He's been studying neutrinos for almost two decades, beginning with experiments in a Windsor-area salt mine. "It's the last unknown low-energy area left. Neutrinos are still the least-understood elementary particle of all."

His graduate student is also studying cosmic ray particles called muons detected as a byproduct in

the observatory. Explains Tagg: "When you build a detector, you get a lot of things for free. Muons are considered background to most of the collaboration, but there are some interesting physics you can do with them."

Unlike neutrinos, muons come from cosmic rays, or ionized nuclei, that begin life far beyond the solar system, perhaps generated by stars exploding into supernovas or by shock waves from collapsing black holes.

When these cosmic rays hit the Earth's atmosphere, they create extremely high-energy muons that can be detected by the SNO, some alone or in pairs like bullets, others in a shower like shotgun pellets. Comparing the ratio of single bullets to

shotgun blasts may tell Tagg something about how the particles originated.

Several of Simpson and Law's former students wrote the computer program used by all SNO scientists in predicting muon events. "The study of muons has been a Guelph project," says Simpson.

The world's only heavy water-based detector, SNO was built by a collaboration of almost 100 scientists from 11 universities and laboratories in Canada, the United States and the United Kingdom. Canadian participants include university researchers from Queen's, Carleton, Laurentian, British Columbia and Guelph.

BY ANDREW VOWLES

Come into My Garden

Macdonald Stewart Art Centre tour features gardens of OAC and CBS profs

TWO U OF G FACULTY whose gardens are on the Macdonald Stewart Art Centre's Gardenscapes '99 tour don't mind bringing home their work — nor even bringing something of their home to the University. Profs. Richard Reader, Botany, and Glen Lumis, Plant Agriculture — both first-timers this year on the art centre's annual garden tour fund-raiser — trace connections between their home gardens and their research and teaching.

"I bring specimens from here for students to identify in plant material quizzes," says Lumis, referring to numerous trees and shrubs dotting the front and rear gardens that he and his wife, Peggy, have cultivated since moving to their Bishop Court property six years ago. "Almost every woody plant here I use in some way in my teaching."

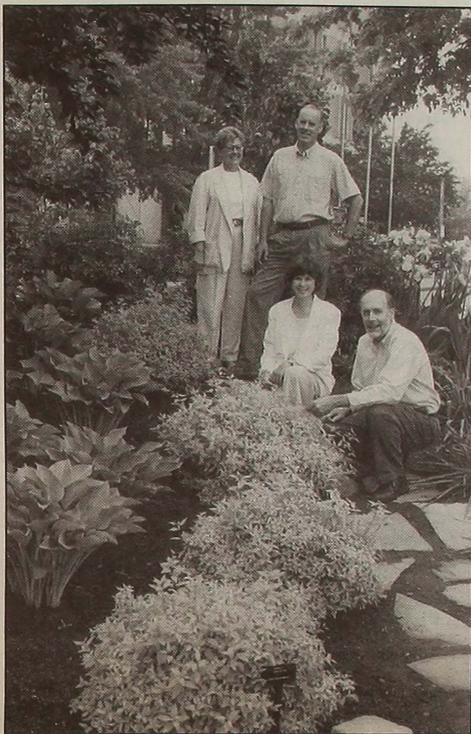
An expert in nursery production of woody plants, Glen Lumis enjoys growing less common species, including yellowhorn, Persian parrotia, moosewood, inkberry holly and his piece de résistance, a dwarf birch, which is an arctic species recognized by few people. "I enjoy having one of everything," he says of this collector's garden.

Complementing his interest, Peggy Lumis tends the roughly 300 different perennials and ornamental grasses packed into numerous beds constructed on a backyard hillside that drops about 25 feet. Looking up the slope to the patio, she laughs as she explains that each year she dutifully hauls out lawn furniture, which then sits unoccupied for the entire growing season.

"Ten of everything" might be the theme for the perennial garden that Reader and his gardening partner, Jennifer Minogue, hazardous waste materials safety officer in Environmental Health and Safety, began cultivating 12 years ago when they bought their 100-acre pine woodland in Puslinch.

But as with the Lumis showpiece, what Reader learns in his garden about cultural requirements of particular plants finds its way back into the classroom and the lab. "I'm using it more or less as a test garden," he says.

Hemmed in by the original pines and deciduous trees, the grounds around Reader and Minogue's cream-coloured stucco home con-



Visitors to this year's Gardenscapes tour can view six local gardens, including two cultivated by U of G faculty and staff, as well as the University's newly restored conservatory and gardens. Posing in the campus gardens are, clockwise from top left, Peggy Lumis, Prof. Glen Lumis, Prof. Richard Reader and Jennifer Minogue.

PHOTO BY MARTIN SCHWALBE

tain two ponds, huge perennial and shrub beds whose dominant tones are set by irises, peonies and day lilies, and curving perennial-lined paths that radiate from the back garden to lose themselves in the woods.

Citing his interest in plant distribution, Reader says he often experiments with less-familiar cultivars encountered through his studies. "I go to the garden centre, pop it in and get a better understanding of why some species perform better than others." One lesson learned in his woodland Eden: planting hydrangeas and euonymus is like setting out dessert for the many neighbourhood rabbits.

He began gardening at his parents' home in Windsor, where he eventually completed his undergraduate degree. "My great-grandfather was head gardener at

Bookham Estate south of London, so I think it's in the blood."

Visitors can view these and four other Guelph gardens during Gardenscapes '99, which runs June 27 from noon to 5 p.m. This year's tour includes the restored conservatory and gardens adjacent to the University Centre. Visitors can also take in current exhibits at the Macdonald Stewart Art Centre, including "Sowing the Seeds," which commemorates the 125th anniversary of the Ontario Agricultural College, and tour the adjoining Donald Forster Sculpture Park.

Tickets are \$8 and \$3 and are available at the art centre, the Framing & Art Centre, Royal City Nursery and Coach House Florists. For more information, call 837-0010 (days) or 837-8082 (evenings).

BY ANDREW VOWLES

Bioinformatic Tools Available for Researchers on Web

UOF G researchers are invited to participate in a test site for BioNavigator, a new global bioinformatic service provider that uses a Web-based delivery system.

BioNavigator gives biological researchers access to a powerful and comprehensive range of integrated bioinformatic tools to conduct such

functions as DNA and protein sequence analysis and sequence database searching. BioNavigator employs a user-friendly and intuitive graphical user interface, designed by experienced bioinformaticians and programmers. It is driven by bioscientists' needs for a one-stop shop for bioinformatics so-

lutions and comprehensive support mechanisms.

For more information about participating in BioNavigator's test site, call Connie Hearty, director of the Business Development Office in the Office of Research, at Ext. 6471 or send e-mail to chearty@uoguelph.ca.

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We are looking for families in Guelph who would like to host these participants. Families must speak English at home and be able to provide a safe, clean and caring environment for the participants. Host families are remunerated for their services at \$600 per month per student.

G.A.T.E.'s greatest priority lies in the well-being and happiness of each participant. If you would like the opportunity to welcome an international student into your home and show them Canadian hospitality, please contact us at 766-1157.

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A S@GE Experience

New science program introduces senior elementary students to university studies

HOLDING UP two unopened cans of cola, food science graduate student Mark Yoshimasu asks which will float in water: regular or diet? Waving hands fill the Department of Food Science lecture theatre faster than foam rising in a glass. "Regular," calls out one student. "Diet," says another. "Let's do an experiment," says Yoshimasu. With a practised touch worthy of a magician, he releases the cans into two large, clear beakers of water. The can of regular pop heads for the bottom while the can of diet pop floats. Half the class groans; the other half cheers.

Learning about the basics — and the surprises — of food science is just part of the agenda for the students in this Grade 7/8 class from Thornhill, who are visiting U of G as part of the University's inaugural series of residential spring camps called S@GE (Science at Guelph Experience).

Since early May, groups of about 150 senior elementary students from throughout southwestern Ontario have been spending three-day stints at Guelph to learn about aspects of science and technology and career opportunities in food science, biotechnology, nutrition and health, physics and engineering and zoology. The project is run jointly by the Office of Open Learning (OOL), Conference Services and Student Housing Services.

Dave Castle, program development co-ordinator for OOL, says Guelph has registered about 1,600 students, roughly 400 more than organizers had anticipated last year when they began pitching the program to 17 school boards and more than 1,900 individual schools.

"The great response has led to the development of new modules for 2000," says OOL director Virginia Gray.

OOL, the College of Biological Science, the College of Physical and Engineering Science, the Ontario Agricultural College and the Health and Performance Centre developed academic modules to help young campers learn about aspects of science and technology and related careers. Graduate and undergraduate students were recruited to deliver the modules on engineering design, transgenic plants and organisms, Great Lakes biodiversity, health and nutrition, food properties and uses, and owl habitat (an evening "owl prow" in the Arboretum).

S@GE was designed to reflect recent changes to the province's secondary school science curriculum, says Castle. "The new curriculum emphasizes problem-solving abilities and knowledge of science and its technical aspects."

Running weekdays until mid-June, the camps are attended by

entire classes, along with teachers and parent chaperones. Most groups are coming from outside Wellington County, bunking up in Johnston Hall and eating at Centre Six.

Castle says S@GE is an excellent way to introduce the notion of university studies — and Guelph specifically — to young people. Noting that various science liaison officers from across campus have been invited to attend at least one session, he says: "Teachers and parents have sought out these camps because they want to increase students' awareness of science and technology in a university context."

Although, to judge by the Thornhill campers' answers to Yoshimasu's questions about artificial sweeteners, acidity and fluid flow, these youngsters already know a thing or two about the science of soft drinks.

BY ANDREW VOWLES

HAFAs Prof Shares Expertise in Russia

Modern hospitality and hospitality management focus of lectures, seminars, workshops

BEFORE LEAVING for Russia this April, Prof. Jeff Stewart, HAFAs, promised to stay in touch with colleagues at the school. Then HAFAs director Prof. John Walsh heard nothing.

Days passed, and like the arrival of the telegram of old, news arrived by e-mail that Stewart was fine. Thus began a pattern: every few days and from a different e-mail address, Walsh received a message incorporating a few Cyrillic characters, alerting him that Stewart was well, mixing opera, ice fishing and lectures at university campuses on the ice-bound steppes of provincial towns along the Ural Mountains.

Now back at U of G, Stewart says his experience showed him that the notion of "globalization" is the accepted path to future prosperity, but

for many of the world's citizens, horizons are expanding faster than their ability to pay for it.

"The students I was teaching have difficulty getting in touch with the rest of the world because of a lack of computers," he says. "E-mail is rare, and phones and airfare are nearly prohibitive, especially when wages average only \$50 Canadian per month."

Stewart was in Russia as an overseas volunteer with the Canadian Executive Service Organization (CESO). Touring the Modern University of the Humanities at four of its satellite campuses at Ufa, Sterlitamak, Oktabrskiy and Asha, he gave lectures, seminars and workshops in his area of expertise, the modern hospitality and hospitality management industry.

Everywhere he went, Stewart was accorded a warm reception. "The people I met were keen to establish their own hospitality industries," he says. "They tend to be knowledgeable in economics and business generally, but not as specialized as we are in North America in specific areas of service management."

In the evenings, he was taken to the ballet, jazz concerts and art galleries and on the occasional ice-fishing expedition. "They were wonderful hosts; they really rolled out the red carpet."

CESO is a non-profit organization made up of 4,000 employees with technical and managerial expertise. Volunteers get a week or two of their time to help businesses and organizations in developing nations, in countries of the former So-

viet Union and in aboriginal communities. CESO is funded by the Canadian International Development Agency, as well as corporations, foundations and individual Canadians. Stewart's interest in volunteering for CESO was sparked by Gunter Otto, retired president of Cara Operations, who served as HAFAs' executive-in-residence during the winter semester and is also a CESO volunteer.

Stewart left Russia with warm feelings. "There are a large number of very smart, motivated people who are very curious about the global business environment. Despite their difficult history, I'm optimistic about their chances because they are so resourceful and resilient."

BY ALEXANDER WOOLEY

Winegard Lectures Form Basis of Book

Essays address effects of restructuring processes in Canada, New Zealand

AS SOCIAL SCIENCE lecture series sponsored by U of G's Winegard visiting professor program in 1996/97 forms the basis of a recently released book, *Restructuring Societies*.

Co-edited by Profs. David Knight

and Alun Joseph, Geography, the book is a collection of essays addressing the effects of restructuring processes in Canada and New Zealand.

"There is a lot written about restructuring societies, but very little about their impact," says Knight.

Restructuring Societies presents the diverse views of nine scholars representing a broad range of social scientific perspectives — anthropology, geography, history, indigenous studies, politics, psychology and sociology. Four of the essays were lectures given by participants in the 1996/97 Winegard visiting professor program in the then College of Social Science. The visiting scholars spoke on a common theme — social sci-

ences and public policy in a restructuring society.

The Winegard visitors whose work is featured in the book are former Ontario premier Bob Rae; Olive Dickason, professor emerita of history at the University of Alberta; University of Auckland geographer Warren Moran; and Julian Barling, a professor of organizational behaviour and psychology at Queen's University. Other essays in the book were written by U of G faculty — Knight and Joseph, Profs. Belinda Leach and Tony Winson, Sociology and Anthropology, and Prof. Jackie Wolfe-Keddie, Rural Planning and Development.

Knight says the essays were writ-

ten and edited to ensure that social science jargon didn't creep into the literature, making it accessible to the average person with an interest in social sciences.

Restructuring Societies was launched in April and is dedicated to former U of G president Bill Winegard, who went on to serve as Guelph MP and federal minister for science. The Winegard visiting professor program was named in his honour to recognize his service to the University and Canada. Supported by gifts from alumni and friends of the University, the Winegard professorships are being held this year in OAC. *Restructuring Societies* is available at the University Bookstore.

LETTERS

PERMISSION NOT GIVEN

Thank you for printing my letter in the June 2 issue of *@Guelph*. In the editor's note, it was stated that my letter was shared, with my permission, with Nancy Sullivan, vice-president (finance and administration). I am really surprised by this assertion because I never gave permission to anyone to share my letter with the vice-president. I am therefore writing to correct this misperception.

In her letter, published in the same issue, Nancy Sullivan graciously thanked me for allowing her the opportunity to comment on my letter. Once again, I would like to clarify that I never discussed my letter or its contents with anyone in the university administration. It was simply a letter to the editor, expressing my views on the faculty salary settlement. It appears now that my letter was passed on to the vice-president for comments without my knowledge or consent, and I find this deplorable.

Prof. Dilip Banerji
Computing and
Information Science

WOULD THE REAL EDITOR PLEASE COME FORWARD?

In the June 2 issue of *@Guelph*, two letters appeared that commented on the recent salary settlement for faculty and professional librarians. The first was written by Prof. Dilip Banerji; the second, an immediate rebuttal to his letter, was submitted by Nancy Sullivan, vice-president (finance and administration).

On reading the letters, I contacted Prof. Banerji and *@Guelph*. After several probing questions were asked of the various parties, it became evident that *@Guelph* did not, in fact, obtain Prof. Banerji's permission to share his letter with Nancy Sullivan. Nor did Prof. Banerji give his permission to have the vice-president respond directly to his letter in the same issue. It is indeed unfortunate for the University that the circumstances surrounding the publication of these letters betray normal journalistic practice and knowingly or unknowingly convey the message: "Big Brother is watching."

Prof. Bruce Koenig
Literatures and Performance
Studies in English

Note: I spoke with Prof. Dilip Banerji about his recent letter to the editor prior to its publication in *@Guelph*, to seek his permission to publish a response. It was my understanding that he was aware his letter would be shared with Nancy Sullivan, vice-president (finance and administration), and that her response would be published in the same issue. I regret the misunderstanding.

Darlene Frampton, Director,
Communications and
Public Affairs

@Guelph Publishing Schedule Summer 1999

Publishing date	Deadline
July 7	June 30
Aug. 11	Aug. 4
Sept. 15	Sept. 8

C L A S S I F I E D S

FOR RENT

Three-bedroom bungalow, June Avenue area, two baths, rec room, treed yard, gas heat, central air, available Sept. 1, \$1,150 a month; two-bedroom spacious penthouse apartment in stone house near Exhibition Park, library, perfect for professional couple, available Aug. 1, \$899 a month, 824-1773.

One-bedroom apartment on Victoria Road North, parking, laundry, controlled entrance, available July 1, 827-1533.

Bachelor apartment, laundry, parking, close to bus stop, available immediately, \$480 a month inclusive, 823-8914.

Upper floor of bungalow in old University area, references required, non-smokers, \$1,100 a month inclusive, 823-5014.

Bachelor apartment on Cork Street, controlled entrance, available immediately, \$425 a month, 821-2067.

Spacious one-bedroom apartment available for summer, separate entrance, quiet neighbourhood, laundry, parking, on bus route, non-smoker, no pets, \$400 a month inclusive, call May, 763-2235.

One-bedroom basement apartment in private home, four-piece bath, close to bus stop, Woodlawn/Victoria area, available July 1, \$500 a month plus cable, Judy, Ext. 4365 or 824-0903 evenings.

Furnished five-bedroom house, minutes to downtown, family room with fireplace, on large treed lot with deck, possible exchange for similar rental in Montreal from September 1999 for academic year, 837-1900 or send e-mail to dfischli@uoguelph.ca.

One-bedroom garage apartment overlooking 3/4 acre of gardens, Kortright/Gordon area, private kitchen and bath, 10-minute walk to campus, available July 1, \$600 a month inclusive, Frances, leave message at 822-8466.

Furnished four-bedroom home on 3/4 acre in old University area, open concept, private house and gardens, 10-minute walk to campus, ideal for visiting faculty, available Aug. 15 to July 15, 2000, Maurice or Lisa, 763-0449 or send e-mail to mnelisch@la.uoguelph.ca.

One-bedroom apartment on 11th floor, laundry room, near river and downtown, available July or August, rent negotiable, leave message at 826-6918.

Furnished upscale apartment, fully equipped kitchen, private entrance, parking, air, central vac, no lease required for short-term rental or lease for longer term, available Aug. 1, \$795 a month inclusive, Carol, 823-1857.

1992 Dodge Shadow Sport hatchback, white, AM/FM cassette, sunroof, tinted windows, air, mint condition, bra on hood, remote starter, one owner, 62,000 km, Viviane or Jerry, 824-0628.

1984 Kawasaki GPZ900 (Ninja), 55,000 km, liquid-cooled, all original, blue and silver, tank bag included, 822-5724 or send e-mail to tkanerva@uoguelph.ca.

Child's Norco micro-mountaineer, excellent condition, 821-2646.

Kitchen table with five cane-backed chairs; sofa bed; pantry, 16 by 30 by 58 inches; small adjustable bookshelf; floor lamp; TV stand, 823-9423 or send e-mail to cstunden@uoguelph.ca.

WANTED

Two- or three-bedroom house with fenced yard for prof with mature dog and small caged pet in Guelph/Elora/Fergus area for Aug. 1, Scott, 250-472-4303 or send e-mail to sbm1@uvic.ca.

Room or apartment for Sept. 1, within walking or cycling distance of the University or on bus route, willing to share, Angela, 905-828-4137 or send e-mail to awlin@hotmail.com.

One-bedroom furnished apartment for 50-plus single male, walk to downtown and/or campus, Aug. 1 to Jan. 15, 2000, up to \$700 a month, send e-mail to graeme.wells@anu.edu.au.

Two-bedroom accommodation for prof and family from Aug. 1 to May 1, 2000, prefer downtown/University location, close to bus route, price range \$800 plus utilities, Robert, Ext. 2176.

Furnished three-bedroom accommodation for professional couple, Aug. 1 to Oct. 30, Stephen or Janet, 822-2424 after 8 p.m. or send e-mail to sgawron@uoguelph.ca.

Five-bedroom house for responsible university students, four females and one male, walking distance to campus, appliances, parking, required for Sept. 1, send e-mail to kat346@hotmail.com.

One- or two-bedroom furnished accommodation for mature exchange student and child, walking distance to campus, on bus route, September to April 2000, send e-mail to jag07@students.stir.ac.uk.

Two- or three-bedroom house or apartment with yard for family with one child and two mature dogs for July 1, \$700 to \$900 a month, Steve, Ext. 4706, 837-0867 or e-mail srbrown@online.net.

Accommodation for July 1 for female student with dog, 822-6855 or send e-mail to pteal@uoguelph.ca.

Loving home for small six-year-old dog, Barb, Ext. 2043 or 821-7069.

House in Fergus/Elora or surrounding area for professional couple with children for Aug. 1, minimum 12

months, 787-0996 or e-mail pmenzies@ovc.uoguelph.ca.

Temporary accommodation in Guelph area for mature alumni, willing to house-sit for sabbatical or extended vacation, 905-631-0974.

Clean room with laundry facilities for single female, fourth-year student, close to campus, needed for fall and winter semesters, Annie, send e-mail to annie@uoguelph.ca.

Two-bedroom country home in Guelph-Acton-Georgetown area for August 1999 for one year, Ann, Ext. 2508 or send e-mail to aclark@plant.uoguelph.ca.

Recreational vehicle to sleep four, preferably for two to three weeks in August but July is suitable, e-mail laidlawm@uoguelph.ca.

FOUND

Academic hood, black with three-inch brown border, cream lining with three unequal diagonal red/rust stripes, about 5/8, one and 1.5 inches, maker's tag reads Paul A. Willise, Detroit, Omaha, Keith, Ext. 8258.

Classifieds is a free service available to staff, faculty, students, alumni and retirees of the University. Submit items by Wednesday at noon to Linda Graham on Level 4 of the University Centre, fax to 824-7962 or e-mail to lgraham@exec.admin.uoguelph.ca. For external and commercial advertising, call Brian Downey at Ext. 6665 or e-mail to bdowney@exec.admin.uoguelph.ca.

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- Always stay a good distance from the vehicle in front of you so that you will be able to stop your vehicle quickly and safely;
- Always keep the windshield, headlights, tail-lights and windows clean and adjust the rear-view mirrors to reduce blind spots;
- Slow down for yellow lights, come to a complete stop at stop signs and respect speed limits;



Finally, don't drive when weather conditions are bad and when you are tired.

It goes without saying that you should never drive when you have been drinking. The severity of the penalty should be enough to convince you of this. To avoid ending up in a hospital or jail, it's better to be prudent, public-spirited and sober when you get behind the wheel.

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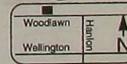


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ARBORETUM

Botanist Allan Anderson will lead a workshop on fern identification and propagation July 8 from 9 a.m. to 4 p.m. Much of the workshop will be held in the forest. Cost is \$35. Registration and payment are required by June 24. Call Ext. 4110 to register.

CONCERTS

The Diocesan Chorale will perform on campus and downtown June 29 to celebrate 25 years of choral music from the Bahamas. At noon beside Day Hall, the singers will offer a tribute to Canada highlighting folk music indigenous to the Bahamas (rain venue: University Centre courtyard). At 7 p.m., the group performs at Chalmers United Church, where admission is a free will offering. The concerts are sponsored by the Commonwealth of the Bahamas and the College of Arts.

NOTICES

The Mexican Association of Canadian Studies invites papers and panels for its Sixth International Congress Sept. 21 to 23 at the National Autonomous University of Mexico. The theme is "Canada: A Salute to the Millennium." Papers should address social, political, cultural and economic challenges to Canada in the next century. Abstracts and proposals are due June 30. More information is available at the Centre for International Programs or from

Maria Cristina Rosas at mcrosas@dfl.telmex.net.mx.

The International Development Research Centre (IDRC) and Association of Universities and Colleges of Canada offer sabbatical grants of up to \$36,000 to encourage academic co-operation between Canadian and African researchers and institutions. Application deadline is July 30. Details are available at the Centre for International Programs InfoCentre and on the Web site www.aucc.ca.

Students are needed to work at new student registration Sept. 7 from 7:45 a.m. to 4 p.m. Applications are available at the academic records section of the Office of Registrarial Services on Level 3 of the University Centre. Early application is advised.

SEMINARS

The Department of Human Biology and Nutritional Sciences seminar series continues June 21 with Robert Reichert of the National Research Council exploring "Vegetable Oil Byproducts (Minor Components) and Functional Foods: A Canadian Opportunity" at 3 p.m. in OVC 1715. On June 28, "N-3 and N-6 Fatty Acid Stimulation of Restitution in a Cell Culture Model of Intestinal Wound Healing" is the topic of graduate student Derek Ruthig at 3 p.m. in Animal Science and Nutrition 141.

The Guelph Food Technology Centre offers two public seminars in July—"HACCP for the Food-Service Sector" July 6 and 7 and "HACCP Train the Trainer for the Food-Service Sector" July 9. For registration information, call Marlene Inglis at 821-1246, send e-mail to minglis@uoguelph.ca or visit the Web site www.gftc.ca.

THESIS DEFENCES

The final examination of MLA candidate Susan Chow, Landscape Architecture, is June 18 at 11 a.m. in Landscape Architecture 125. The thesis is "Analysing Visual Character in the Urban Landscape." The adviser is Prof. Nate Perkins.

The final examination of MA candidate Casey Batchelor, Psychology, is June 22 at 10 a.m. in MacKinnon 311. The thesis is "Correlates of Adaptation in Families of Children With Pervasive Developmental Disorder." The adviser is Prof. Mary Konstantareas.

The final examination of M.Sc. candidate Istvan Imre, Zoology, is June 25 at 9:30 a.m. in Axelrod 265A. The thesis is "Developmental Response of Young-of-the-Year Brook Charr (*Salvelinus fontinalis*) to Water Velocity." The adviser is Prof. David Noakes.

The final examination of Michelle Smith, an M.Sc. candidate in the

Department of Family Relations and Applied Nutrition, is June 25 at 10 a.m. in HAF 243. The thesis is "Examining the Transmission of Values Between Generations." The adviser is Prof. Joan Norris.

The final examination of Natalie Hotrum, an M.Sc. candidate in the Department of Food Science, is June 25 at 1:30 p.m. in Food Science 241. The thesis is "Interactions Between Kappa-Carrageenan and Beta-Lactoglobulin in Gelling and Non-Gelling Aqueous Systems." The adviser is Prof. Doug Goff.

The final examination of Dave Goorahoo, a PhD candidate in the Department of Land Resource Science, is June 28 at 9 a.m. in Richards 038. The thesis is "Spatial Variability of Hydraulic and Transport Properties for Coarse Porous Media." The adviser is Prof. Gary Kachanoski.

The final examination of M.Sc. candidate Nikos Hontzeas, Zoology, is June 29 at 9 a.m. in Axelrod 265A. The thesis is "Strategies Against Cryptobiosis: The Production of a Recombinant Protein for Therapeutic Purposes." The adviser is Prof. Patrick Woo.

The final examination of PhD candidate David Barney, Animal and Poultry Science, is July 5 at 9 a.m. in Animal Science and Nutrition 141. The thesis is "The Effect of High- or Low-Fibre Diet Within Two Con-

finement Housing Systems on the Production, Health and Behaviour of Primiparous Dairy Cows." The adviser is Prof. Frank Hurnik.

COMMUNITY EVENTS

Guelph Museums will celebrate Canada's birthday July 1 from noon to 4 p.m. at McCrae House. The free event will include displays, demonstrations, music and activities for the entire family. For more information, call 836-1221.

The Guelph Arts Council offers guided walking tours of historical Guelph on selected Sundays until October. Tours last two hours; cost is \$2. Upcoming tours will focus on the Speed River June 20 (leaving from the Guelph Public Library), Victorian Guelph June 27 (Guelph Civic Museum) and Brooklyn and College Hill July 4 (McCrae House).

The Guelph Youth Orchestra is holding auditions for the upcoming season for instrumentalists aged 12 to 20. Brass and wind players are particularly needed. For audition dates and times, call Mary-Jo Gordon at 836-5788. For more information, call Judy Greenhill at 763-2494.

The Guelph Arts Council will present its 1999 Heritage Awards June 21 at 4:30 p.m. at the GAC office, 147 Wyndham St. N., Suite 404. For more information, call 836-3280.

The Soy of Life

Researchers hope to find that isoflavones in soybeans can help reduce blood cholesterol

UNHEALTHY blood cholesterol levels could be lowered by increasing soybean consumption, if researchers at U of G and the University of Toronto are right.

A recent three-phase four-week clinical trial involving U of G's Laboratory Services is investigating blood cholesterol levels in participants receiving soy-based food products such as soy burgers, puddings, milk and desserts.

"We're hoping to find that the isoflavones in soybeans have a positive effect on cholesterol levels," says Chung-Ja Jackson, a researcher at the Guelph Centre for Functional Foods in Lab Services, who is collaborating with University of Toronto nutrition researcher David Jenkins. "If they do, we may be able to make dietary recommendations for people who are trying to lower their cholesterol levels," she says.

Some of the group's findings were presented at the recent annual meeting of the Canadian Federation of Biological Societies.

The potential ability of isoflavones to reduce blood cholesterol is a new addition to the growing list of health benefits provided by this



Chung-Ja Jackson is investigating the potential of soybeans in lowering blood cholesterol. PHOTO BY MARTIN SCHWALBE

group of compounds. They have already been shown to help prevent other health problems such as cancer of the colon, breast and prostate, as well as menopausal symptoms and osteoporosis.

Soybeans have been an important part of Asian diets for centuries. They are known to help reduce the incidence of women's health problems in particular. This is because isoflavones are weak phytoestrogens, compounds that can mimic human estrogen. Although other lifestyle factors play a role in the decreased rates of these health problems among Asian women, diets high in soybean products are believed to be a significant factor.

Jackson's role is to measure levels of isoflavones in soy foods consumed by the volunteers as well as levels of isoflavone metabolic break-down products in the participants' urine. Soybeans and soy food products contain 12 different forms of isoflavones she is able to isolate, identify and quantify. Changes in blood cholesterol levels are measured at the University of Toronto.

Cholesterol is a soft, waxy substance that is carried around the

bloodstream by one of two carrier molecules—low-density lipoprotein (LDL) or high-density lipoprotein (HDL). High levels of LDL, or "bad cholesterol," can cause cholesterol buildup in blood vessels. HDL, or "good cholesterol," removes cholesterol from the bloodstream and helps prevent accumulation.

Jackson's previous research shows that some soybean varieties produce higher levels of isoflavones than others do. The location and the year in which the soybeans are grown can also affect isoflavone levels. Future studies may look at how cholesterol levels are affected by different varieties of soybeans or by different growing conditions. The researchers were recently awarded new funding by the Natural Sciences and Engineering Research Council to continue their work in this area.

This research is sponsored by the Ontario Ministry of Agriculture, Food and Rural Affairs and is being done in collaboration with industrial partners Loblaw's, Yves Veggie Cuisine, So Good, Soy City Foods and La Soyaine.

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