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UBC REPORTS

PHOTO: MARTIN DEE

Re-Wiring the Brain

A new Virtual Reality Therapy tool being developed at UBC may provide a non-drug alternative to stroke and Parkinson's patients. BY HILARY THOMSON

It may look like a primitive video game, but this virtual environment is a sophisticated tool to help the brain re-wire itself after damage from stroke or Parkinson's disease.

Prof. Martin McKeown, of the Pacific Parkinson's Research Centre at UBC Hospital, and colleagues are developing a virtual stimuli exercise that offers patients a non-drug-based therapy to help recover motor ability.

The therapy is the only one of its kind in North America.

"This is a whole new avenue of research," says McKeown, who is a member of the Brain Research Centre and an investigator with the Vancouver Coastal Health Research Institute. "We're looking at non-pharmacological treatments by developing optimal sensory environments to help rehabilitate patients."

The virtual reality (VR) therapy may be available to patients within five years.

A physician with a degree in engineering, McKeown has been working with Prof. Sid Fels of the Faculty of Applied Science to create the VR experiment at UBC. Before

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VR Therapy: How it Works

The therapy involves 15 electrode patches, each about five cm. in diameter, applied to the patient's arms and shoulders. The electrodes record electrical activity in the muscles, in particular, communication between groups of muscles.

The patient observes a monitor where coloured balls appear in 3-D and seem to fly toward the subject. The participant is instructed to use their weakened arm to reach out as if to catch the ball. They may be instructed to try to catch all balls or to ignore all but one designated ball. □

Dr. Martin McKeown has created a colourful, 3-D virtual environment that stimulates brain cell activity to help patients recover motor ability.

UBC Student Enlists Ugandan Girls in Education Research BY LORRAINE CHAN

Armed with two laptop computers, a digital camera and compassion, UBC education student Shelley Jones helped Ugandan girls voice their ideas on literacy, gender and education.

For a year, Jones lived in a small village without electricity or running water in the Masaka District, a rural area in south central Uganda.

Jones taught class and enlisted the help of 16–19-year-old girls at the high school. Using music, drama, video and artwork, she and the students explored such issues as barriers to paid work for women and the girls' expectations about love and marriage.

"The girls were my co-researchers," says Jones. "The important thing to me is giving these girls a voice, which has been missing from research work in developing countries. They helped me to understand the culture and context of life for women and girls in a rural Ugandan environment."

Jones adds, "Typically, NGOs parachute into developing countries and there's little or no sense of what the women experience in their daily lives, despite their key roles as caregivers, farmers and small business owners."

One of the realities girls and women face is that polygamy is still common in Uganda. Within large families, boys are seen as future breadwinners and are given priority for spending scarce education dollars. However, the girls also realize schooling is the only way out of the backbreaking toil their mothers endure.

"They know education is the most important thing in their lives," says Jones. "Some of them walk two to three hours to attend school."

Jones and the students researched how different modes of literacy — from text to visual communication — can aid education for girls in developing nations. They created a music video and documented Ugandan life through photographs. To operate her digital camera and laptops, Jones relied on the solar panels of the village library and the car battery she purchased as a power source.

One of their most successful photography projects involved a field trip to the nearby town Masaka, where the chief of police gave the group an impromptu tour and interview.

"That visit broke all sorts of barriers for the girls," says Jones. "It would never occur to them that they could enter the police station, let alone get encouragement from the chief of police to become officers."

"The important thing to me is giving these girls a voice... . They helped me to understand the culture and context of life for women and girls in a rural Ugandan environment."

PHOTO: MARTIN DEE

UBC graduate student Shelley Jones lends a helping hand to girls' education in Uganda.

Jones says most of the girls live in desperate poverty. Their families depend on subsistence-level farming supplemented by occasional labouring jobs for the men and sales of garden produce or crafts by the women.

"I was speechless at how little they had," she says. "They had no money to buy kerosene so after sunset there was no light to do their homework."

Jones says that while elementary education is free, Ugandan students have to pay school fees once they get to the equivalent of grade 8. These fees can amount to about $80 US per year, whereas a typical family in the area may earn $1 US per day or less.

Some girls were desperate enough to sell their bodies to get an education.

"I was really surprised they admitted it," says Jones, who conducted a confidential survey among 13 girls.

"Over 40 per cent said they would consider prostitution in order

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IN THE NEWS

Highlights of UBC Media Coverage in November 2005. **COMPILED BY BASIL WAUGH**

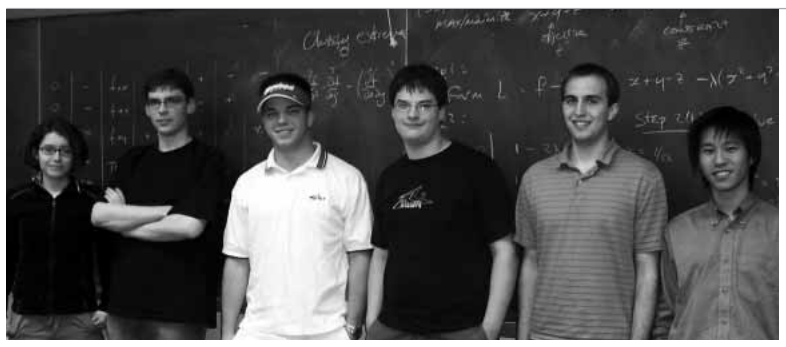

PHOTO: COURTESY OF UBC SNOWSTAR

UBC's Team Snowstar (Left to right: Ashley Cook, Andrew Morrison, Damir Hot, Simon Hastings, Steve Jones, and Eric Ma)

COW-TIPPING: NO LEG TO STAND ON

Several international and national dailies, including the *Times of London* and the *Globe and Mail*, reported on a study by UBC scientists that debunks cow-tipping as an urban, or perhaps rural, myth.

According to **Margo Lillie** and student **Tracy Boechler** of the UBC Department of Zoology, physics would require five people to exert enough force to push over a cow standing with its legs straight. Fewer people could exert the required amount of force to tip a static cow, but this is only theoretical as cows do not sleep on their feet and are easily disturbed.

"I suspect that even if a dynamic physics model suggests cow-tipping is possible, the biology ultimately gets in the way. A cow is simply not a rigid, unresponding body," Dr. Lillie told the *Times*.

UBC STUDENTS DESIGN SPACE ELEVATOR FOR NASA COMPETITION

NASA recently challenged space engineers across North America to design a "space elevator," a system that delivers cargo from Earth to space along miles of super-strong tether, using only light as a power source and at a fraction of the cost of a traditional space launch.

Of the many university and corporate teams that entered NASA's recent competition, Team Snowstar, a student team from UBC, was voted most likely to succeed in 2006. The team was profiled in major U.S. media outlets including *CNN*, *USA Today* and *MSNBC*.

"Having always seen space travel as the next step in human development, I jumped on the opportunity to get involved," said Team SnowStar's **Simon Hastings** to *National Graphic* magazine. "It wasn't about the money, but about the feeling of being part of something bigger than myself and accomplishing something meaningful."

TECHNOLOGY COULD TRANSFORM URBAN LANDSCAPE FOR DISABLED

UBC undergrads have discovered a way to enable people living with disabilities to control crosswalk signals and household electronics using everyday cellular phones.

The findings focus on Bluetooth technology, which is now standard in cell phones and laptops. By fitting public facilities with Bluetooth-enabled transmitters, the student team effectively turned cell phones into universal remote controls.

In an interview with the *Ithaca Journal* in New York, UBC electrical and computer engineering prof. **Dave Michelson** said that Bluetooth-enabled transmitters already exist, so installing them into public facilities wouldn't require a lot of money or time — all that is required is industry and government support. □

DEAR EDITOR

The following letter was received in response to the call for comments about Policy #130 (Management of Wireless Network), printed in the November edition of UBC Reports.

Dear editor:

I write to express my dissapointment in the Review Committee of Policy 130. Clearly listed in "Who Should Read This Policy" section of the policy are "Students in UBC housing," but there are no student representatives on the review committee. UBC should make greater efforts to consult students on issues that UBC thinks effect students.

Kim Lam
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Still Time to Donate!

As the 2005 UBC United Way Campaign draws to a close this month, donors and volunteers are continuing their support.

"With over $400,000 raised we have achieved 76% of our fundraising goal to support social programs and services in the Lower Mainland," notes Eilis Courtney, Senior Coordinator for this year's campaign.

With almost 60 presentations under his belt, Loaned Representative Don Erhardt has been busy spreading awareness about United Way and its contribution to the community.

"For 75 years United Way have been shepherds in our community, understanding the social needs and helping to address them via fundraising, and supporting over 400 agencies in the Lower Mainland" says Erhardt. "Eighty-nine cents of every dollar raised goes toward these programs, and all undesignated funds raised in the Lower Mainland stay here and go directly toward supporting our community."

Donations will be accepted until the end of the tax year, December 31st. Those still interested in supporting this year's campaign are encouraged to donate before December 5th—the deadline for final prize draws, which includes a grand prize draw for two flight tickets on Air Canada. For more information on the campaign, how to donate, news or event photos, visit www.unitedway.ubc.ca or phone 604-822-8929. □

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A Renaissance of Aboriginal Literature

Prof sees more fearless voices emerging

BY LORRAINE CHAN
(*with files from Alexandra Chu*)

Aboriginal literature is undergoing a renaissance in Canada, says UBC creative writing instructor Richard Van Camp.

The published Dogrib author says early trailblazers like Thomson Highway, Jeannette Armstrong and Lee Maracle are only getting better while younger writers swelling their ranks are infusing healing, humour and sensuality into Aboriginal narratives.

"I'm seeing more fearless voices," says Van Camp, "people who aren't scared to take on their leadership, to question the teachings of their elders or the customs of their people. At the same time, I'm reading new voices out there who are really researching their cultures and trying to find their way to celebrate their traditions in two worlds."

Van Camp is in a unique position to steward new talent. Since 2001, he has been leading weekly workshops at UBC's First Nations House of Learning for Aboriginal second-and third-year students. He also teaches a storytelling and writing workshop for 15-to 29-year-olds on the Musqueam Indian Reserve in south Vancouver.

Van Camp is supporting his students through a journey he himself took at the age of 19. As a member of the Dogrib Nation growing up in the Northwest Territories, Van Camp felt compelled to write a book he wanted to read and one that showed his life and the life of his peers.

Five years later in 1996, Douglas and McIntyre published Van Camp's first novel, *The Lesser Blessed*. The powerful coming-of-age story follows a Dogrib Indian growing up in the small northern town of Fort Simmer. Van Camp captures the tragedy and hope facing youth and families in northern Native communities.

In the year following the novel's publication, Van Camp was awarded the Canadian Authors Association Air Canada Award, which recognized a Canadian author under 30 deemed to show most promise in literary fiction. *The Lesser Blessed* was also translated into French and then into German, which garnered the 2001 Jugendliteraturpreis, the country's highest award for a translation.

"When my novel came out, I didn't know that I was going to be the first published Dogrib author," says Van Camp. "Since then — and for the first time — we're able to publish our novels, our way. Our poetry, our way. Our graphic novels, our way, and we have Aboriginal publishers now who will gladly publish us."

He says there are about six Aboriginal publishers, which include Pemmican Press, Theytis Books and Kegedonce Press. "They can publish what speaks to them. Before, we only had mainstream publishers who would say there's no market for this."

At present, there are about 30 established Aboriginal writers in Canada, among them Ruby Slipperjack, Alootook Ippelie, Joseph Dandurand, Drew Hayden Taylor, Garry Gottfriedson, Eden Robinson and Chris Bose.

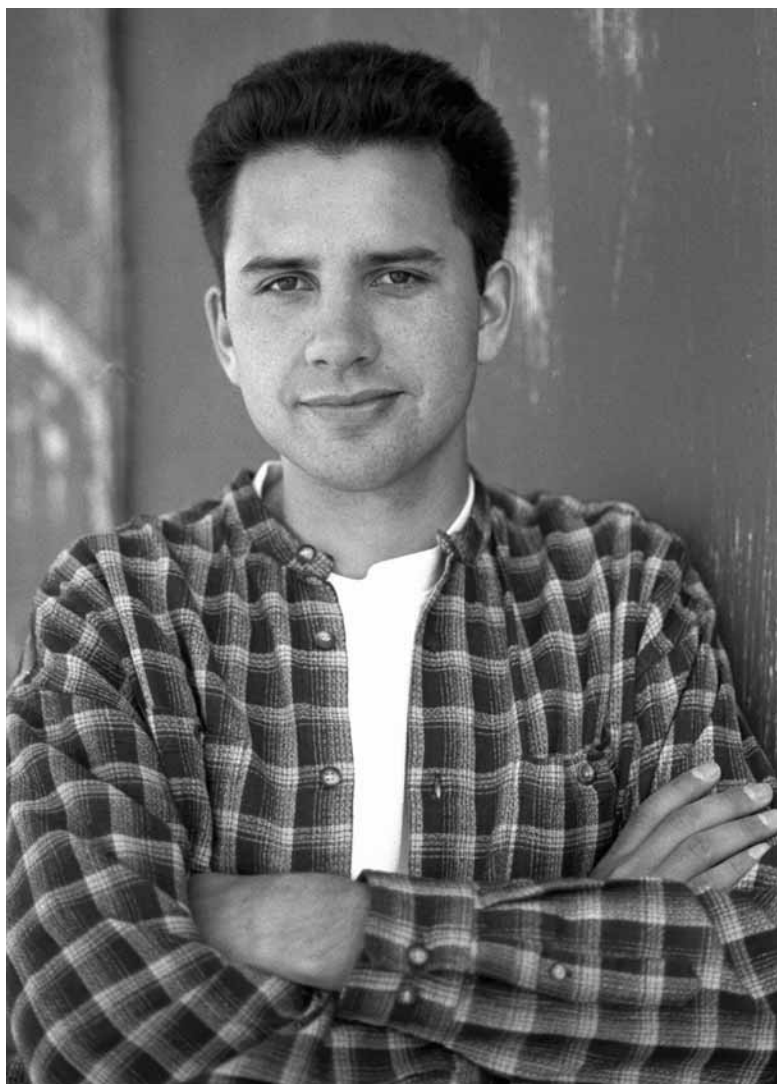

PHOTO: COURTESY OF RICHARD VAN CAMP

Dogrib author Richard Van Camp wrote his first book at age 19.

Van Camp points to several factors why Aboriginal literature is thriving. "We're the second generation writing in English. We're also the second generation free from residential schools."

"Technology has helped as well." Van Camp says with the Internet and booksellers like Amazon or Goodminds.com, Aboriginal writers have been able to access domestic and international audiences.

In 2002, Van Camp published a collection of short stories, *Angel Wing Splash Pattern*, with Kegedonce Press. Recently translated into German, *Angel Wing Splash Pattern* explores Northern Indian life with themes of redemption, family, hope, and devotion.

Van Camp has also written two children's books, both illustrated by Cree artist George Littlechild. With Children's Book Press, he published *A Man Called Raven* in 1997 and *What's the Most Beautiful Thing You Know About Horses?* in 1998. □

Van Camp Creates Storytelling Community Among Students

Van Camp's former student Nicola Campbell has just published her first children's book, *Shi-shi-etko*. Her free-verse picture book tells the story of a little girl preparing to leave her family and community to attend Indian residential school.

Campbell praises Van Camp as "a great storyteller" with "an awesome sense of humour."

"He knows how to create a community atmosphere in the classroom."

Campbell says the course allows Aboriginal students to discuss and write about matters close to the bone and trust that others know where they're coming from.

"The advantage of working within an Aboriginal creative writing class was the familiarity with the sense of humour, communication styles and cultural context."

Her classmates were not all creative writing majors, and in fact, came from numerous faculties. Campbell says a cornerstone of Van Camp's class is to honour each person's voice.

"He's incredibly inspiring. He makes sure that everyone of the students knows that their writing is important and is worth publishing." □

Artisanal Miners Risk Mercury Poisoning

Student works for healthier mining technologies. **BY BRIAN LIN**

When Cody Hopkins witnessed four Indonesian artisanal gold miners narrowly escape a landslide last summer, it hit home what a big difference he could make with a degree in mining engineering.

Hopkins, a fourth-year student in UBC's Dept. of Mining Engineering, spent three weeks in Indonesia with the Global Mercury Project (GMP), a UN-funded project aimed at providing gold miners in developing countries with healthier, more efficient mining technologies.

"We are currently witnessing the biggest gold rush the world has ever seen," says UBC Mining Engineering Assoc. Prof. Marcello Veiga, the world's leading researcher in mercury contamination from artisanal mining, and Chief Technical Advisor of the GMP. "In more than 50 countries, there are 15 million people working as artisanal gold miners, including four million women and two million children."

PHOTO: CODY HOPKINS

Artisanal miners in Indonesia panning mercury in open water.

As a result of artisanal miners using mercury to extract minute quantities of gold — too little to make economic sense for large-scale mining companies, but enough to put food on the table for poverty-stricken rural communities — more than 1,000 tonnes of mercury are released back into the environment each year.

The powerful poison damages the brain and kidneys when inhaled or ingested through the food chain. It is especially dangerous for developing babies and small children, many of whom work side-by-side with women artisanal miners.

Both stages of the extraction process bring miners into direct contact with mercury. The first involves miners wringing out excess mercury with their bare hands — usually into a pond or river. The small amounts of gold-mercury amalgam produced in the first stage is then burned — in open air or a closed room, often with children present — to vapourize the mercury and further purify the amalgam.

Ironically, most mercury used by artisanal miners is recycled mercury imported from the developed world.

Inspired by Prof. Veiga's work — Hopkins took a third-year course with Veiga — he applied to join the team last summer to collect data to help build a case for the severity of the situation.

"A big part of my work there was administering a breathing test to miners and measuring mercury contamination in their respiratory system," says Hopkins. "Depending on the method they use to extract gold from the mercury-gold amalgam, miners could measure anywhere from 5,000 to 20,000 nanograms per cubic metre of air, compared to 20 nanograms, which is normal in urban North America."

While visiting one of the mines, Hopkins witnessed another practice that poses a more immediate danger.

"In some of the alluvial mining sites, miners would spray water jets at the face of an ore-containing soil slope to loosen the structure. They then pump the slurry, or ore-containing mud through a sluice — long, inclined troughs with a straining mechanism to collect gold particles," says Hopkins.

"I was talking to some miners and all of a sudden there was this loud thump and I saw the entire top section of the slope tumble to the bottom, almost falling on one of the miners. That was when it really hit me that what we're doing here could really make a difference."

Since returning to UBC, Hopkins has been helping design simple retorts, or devices made of common kitchen items and cheap plumbing tools readily accessible to miners that prevent mercury vapour from being released into the air.

Attacking the problem simultaneously from another angle, he's also working with other engineering students to find ways that help miners increase their yield by investigating the feasibility of a magnetic sluice for areas rich in magnetic minerals, or magnetite.

"Most sluices in the area are lined with carpets or other cheap fibres," says Hopkins. "As slurry flows through, gold particles, which are heavier, sink and get trapped among the fibres. By attaching magnets underneath the sluice, magnetite that is already present in the slurry would create a temporary, fine-toothed strainer that would catch more gold."

Ironically, most mercury used by artisanal miners is recycled mercury imported from the developed world.

Hopkins, who has always been interested in the environmental aspect of mining engineering, says his experience with the GMP helped solidify his career aspirations.

"Now I know there are things I can do with what I learned in school that will make a difference in people's lives." □

PHOTO: MARTIN DEE

" I couldn't imagine my life without her," says UBC education student Shelley Jones of her adopted Ugandan daughter, Shakira, now almost three.

A Year of Living Profoundly

BY LORRAINE CHAN

When UBC graduate student Shelley Jones, 43, traveled to south central Uganda last August to research her education thesis, she had no idea she'd be returning a mom.

But early into her first term of teaching high school in Masaka District, Jones began taking care of an 18-month-old girl who was extremely ill.

"I had gone to visit a nearby home and saw this little baby," says Jones. "She was obviously very sick and no one was able to afford to take her for medical treatment or give her the care she desperately needed."

The child, Shakira, had been orphaned and was left in the care of a grandfather and other relatives. "They were already quite burdened with other children to look after. They had very little."

Soon, Jones began to look in on Shakira twice a day. Before going to work and on the way home, she would take the baby back to her house to feed and bathe her.

"After a couple of weeks, I began taking her to school with me and keeping her with me all day," says Jones. "And then it just made sense for her to come live with me."

Because Shakira had not been breastfed, the doctors told Jones that she showed all the classic symptoms of extreme malnutrition. As well, the girl suffered from malaria and other signs of ill health.

Jones carefully fed her easy foods such as scrambled eggs, milk, fruit, vegetables, and Shakira's favourite, pasta, along with a cocktail of vitamin serums and prescription medication.

"She had this fiery determination to live," says Jones, "That's what really helped her to make a full recovery."

After nine months, Jones made the adoption official. And when she returned to Vancouver this August, Shakira — now almost three — was her irrepressible seatmate on the flight home.

Jones has found an apartment through UBC Family Housing. And Shakira is enrolled in daycare, while Jones focuses on keeping all the balls up in the air as a single mother, working part-time and shaping a year of profound experiences into a PhD thesis.

Despite the challenges, Jones says she has no regrets. "Shakira is this totally joyous and amazing child. I couldn't imagine my life without her." □

Voice About Education

continued from page 1

to raise school fees," says Jones.

And of the girls who completed the questionnaire, 100 per cent admitted they knew of girls who had engaged in sex with their teachers. Jones says this is a recognized and widespread problem in Uganda. Girls slept with teachers out of fear that they could be punished for refusing, or in hope they could earn tuition money.

Jones returned to Vancouver this August, but remains close to the students and villagers.

"I don't go a week without a phone call to find out how they're all doing," says Jones.

"I'm committed to those girls. They're at a critical juncture; 17, 18, 19-years-old is when they'll be making lots of decisions that will affect them for the rest of their lives."

Jones has been paying out of her own pocket the school fees for several girls. She has also has launched a Ugandan girls' education fundraising campaign through YouLead, a development and youth global citizenship organization at UBC. Their campaign will kick off with a Dec. 15 fundraiser event. To be held at UBC International House, the 5 p.m. to 7 p.m. event will feature African music, drummers, a silent auction and door prizes.

As well, YouLead is working with a Ugandan village to build a facility by next spring that will house visiting researchers and community projects such as the one underway to foster women and small business ownership.

Jones' study has won funding from the Social Sciences and Humanities Research Council (SSHRC) and the International Development Research Council (IDRC).

For details about YouLead and the December 15 YouLead fundraiser, visit: http://www.youlead.org

For more information about Jones' research: http:www.interchange.ubc.ca/skjones □

UBC Faculty and Students Have Established Strong Research Links with Uganda

Shelley Jones' study is but one of three UBC Faculty of Education research projects in that country.

- Her supervisors, UBC Education Profs. Maureen Kendrick and Bonny Norton, are leading studies on adult and family literacy. With Harriet Mutonyi, a UBC education student from Uganda, they're also exploring HIV/AIDS education for adolescents.

- Faculty of Medicine's Shafique Pirani, clinical professor of orthopaedics, is training Ugandan doctors to use non-surgical treatment to correct clubfoot deformity.

- The Liu Institute for Global Issues is co-ordinating multi-agency research that will advance human security issues, which include on-the-ground mechanisms to protect civilians from violence and abuse.

- To promote global oral health, UBC Dentistry Assistant Prof. Shafik Dharamsi has focused on delivering health promotion and early-childhood development initiatives in several African countries, including Uganda. □

Science Co-op Launches Student on Global Journey

BY BRIAN LIN

PHOTO: COURTESY OF LARS JUNGCLAUS

(Above) Canadian and Indonesian youth worked together to build public washrooms in a small village on the island of Borneo. (Below) Lars Jungclaus (lower right) and his host family in Indonesia.

When UBC biophysics student Lars Jungclaus signed up for the Science Co-op Program, he never expected it to contribute to a better understanding of his family heritage, Islam and Korean culture.

What began as an eight-month stint in the Microstructure Laboratory at the University of Würzburg in Germany, however, turned into a series of transformative experiences that the 24-year-old honours student says is by far worth the time and efforts.

"I'm half German, so the opportunity to brush up on the language and spend time with relatives was a big draw," says Jungclaus, who studied the performance of semiconductor lasers being developed at the world-renowned lab for potential applications in data transmission.

"I also got to travel around much of Europe on the weekends, and once I caught the travel bug, it was kind of hard to stop."

With his appetite for globetrotting whetted at Würzburg, Jungclaus took a year off school and joined Canada World Youth, an organization founded by former senator Jacques Hébert. "The program pairs Canadian youth with peers from a developing country — in our case, Indonesia — and we spend seven months volunteering in a rural area of each country," says Jungclaus.

Despite finding some striking similarities to Canadian youth including a passion for Western television and music, Junglcaus was moved by the devotion to Islam shown by their Indonesian counterparts, especially against the backdrop of small-town B.C., where the two dozen Canadian and Indonesian youth spent the first half of the program.

"Part of the time we spent in Fernie, B.C., happened to be Ramadan," says Jungclaus. "Some of the Canadian participants, including myself, decided to observe the fast in support of our Muslim partners. It was the first time many of us had direct exposure to Islam."

It was Jungclaus's turn to stand out when the group arrived in a small village on the island of Borneo, population 100. At six-foot, five-inches tall, Jungclaus says he felt like a tourist attraction for locals as he hovered above most of the villagers, helping plant trees and build public toilets.

"Most of them are quite poor and make a living from selling fruit from their plantations," says Junglcaus. "But they seem very content with life and derive happiness from simply putting food on the table — things we take for granted."

Rounding up the globetrotting, Jungclaus completed one more Science Co-op work term in Korea, designing and testing a solar lighting system in a joint project with the Korea Institute of Energy Research.

"I was impressed with the strong work ethics of my Korean colleagues," says Jungclaus. "They work long hours, then they go out after work and have a good time. The team bonding was probably the strongest I've seen anywhere."

Jungclaus credits his co-op experience for exposing him to a wide range of professional and academic environments, and allowing him to see first-hand how he could apply knowledge to real life problems. "I definitely come away with a sense that I know what's waiting for me beyond university — whether it's graduate school or an industry career." □

UBC Science Co-op Program

Established in 1980, the UBC Science Co-op program places approximately 1,000 students in co-op jobs each year with industry employers and research institutions across Canada and in more than 15 countries around the world.

Billy Lau, a fifth-year Engineering Physics student who spent two co-op terms at the University of Würzburg, says the experience helped him develop technical skills while reinforcing knowledge obtained from coursework. "You can definitely notice the difference in fifth-year lab courses. You just 'get it' more," says Lau.

Ninety-one per cent of co-op graduates are employed within two months of graduation, versus 60 per cent for non co-op graduates.

Seventy per cent of co-op graduates are in jobs which meet their salary expectations, compared to 46 per cent for non co-op graduates.

For more information, visit www.sciencecoop.ubc.ca □

Re-Wiring the Brain

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PHOTO: MARTIN DEE

Dr. McKeown and colleagues (l-r) Joyce Chiang, Dr. Yuqing Wei, Graeme McCaig and Lisette Eigenraam.

McKeown arrived on campus in 2003, he worked on the therapy at Duke University in North Carolina.

The therapy builds on previous research that showed synthetic stimulants, such as amphetamines, helped patients to re-learn movement, even years after they had suffered a stroke. Stimulants release a naturally occurring chemical in the brain called norepinephrine, which acts as a neurotransmitter to relay electrical signals between brain cells, including those brain cells that ultimately control muscles necessary for movement.

The only problem was that giving stimulants to stroke patients carried a risk of heart attack, making proper dosage hard to determine.

"We started looking for ways to stimulate release of norepinephrine without the use of drugs," says McKeown. "A virtual solution seemed perfect — patients could react to stimuli in a safe environment and we could monitor precisely the electrical activity of muscles."

The intensity of the stimuli causes the brain to spike production of norepinephrine. These chemical bursts allow the brain to reprogram damaged nerve-signaling pathways. Motor ability improvement is measured by the degree of electrical signaling between muscles.

"The beauty of the VR environment is that we can match stimuli to the electrical activity from muscle groups to learn precisely how stimuli are affecting movement," says McKeown. In collaboration with Prof. Jane Wang of UBC's Dept. of Electrical and Computer Engineering, McKeown is also using the experiment to develop an accurate measure of motor performance in brain-injured patients, a long-standing challenge of rehabilitation science.

McKeown, his colleagues from Duke University, and Dr. Yuqing Wei, a visiting neurologist from China, have shown the immediate positive effects of the stimuli in 20 stroke patients and 20 control sub-

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Health Researchers Explore Communication Technologies to Deliver Care

Dr. Kendall Ho is working with WHO to bring e-health to underserved areas.

BY HILARY THOMSON

When a child has a brain hemorrhage, a city doctor consults with a neurosurgeon — and fast. But what if the child lives in an isolated South Asian village and the closest neurosurgeon is hundreds of kilometres away?

Telemedicine, or e-health, could be the answer, says Dr. Kendall Ho, who is working with an international group of health-care practitioners interested in spreading health information through technology.

Associate dean of continuing professional development and knowledge translation in UBC's Faculty of Medicine, Ho chairs an e-health steering committee within Universitas 21 (U21), an international consortium of research-intensive universities. Committee members are focused on the enormous challenge of delivering health care to underserved populations in both developing and industrialized countries.

"Telemedicine will completely change health care," says Ho. "It gives us undreamt of opportunities to spread medical knowledge to the world."

Members of the committee include health sciences representatives from Hong Kong University and University of Queensland in Australia. For the past three years, they have been looking at how telemedicine — health-related activities across distance that use computers and videoconferencing — can improve global health. They envision technology can play a substantial role to enable and facilitate improved access of care in remote areas that lack facilities and health-care personnel. The emerging field is commonly known as e-health.

Ho says about 10 per cent of the world's population has access to 90 per cent of the world's health-care resources, according to World Health Organization (WHO) data. In addition, approximately seven million children under the age of five die each year, most in developing countries, from conditions that could have been prevented if there was sufficient knowledge and access to existing, cheap methods of treatment.

"With the aid of e-health, we can be instrumental in preventing unnecessary deaths among children," says Ho, who along with other committee members, works in collaboration with WHO to use information and communication technology in clinical work, health training and administration.

In July, a UBC medical student, along with two students from the University of Hong Kong, went to a Sri Lankan hospital to explore telemedicine opportunities. Working with local health-care professionals, the students identified clinical cases that might benefit from online consultation with health-care practitioners in U21 member countries. They used digital cameras and the Internet to document and communicate details of patients' conditions.

"Computers were non-existent in the hospital," says Anne Huang, currently a third-year UBC med student. "Electronic reports of lab results — things we consider standard practice here — just weren't available. The whole experience cemented my belief that to provide the best care, physicians must be part of a bigger structure that requires systemic approaches, such as IT resources."

The U-21 committee is now planning an e-health project in Papua New Guinea.

"Our goal is to build health-care capacity among a country's own citizens," says Ho. "E-health is intended as a support, not replacement, for local resources."

E-health would be especially useful in providing distance specialist services, says Ho. Neurosurgical consultations and mental health assessments are possible via videoconference, specialists can confer with local practitioners by e-mail, and personal digital assistants offer improved access to specialized information to help doctors with their clinical decisions.

Health professionals in underserved and isolated locations could be electronically linked, and practitioners using e-health technology could provide effective global health surveillance of widely communicable diseases like SARS.

But there are significant challenges to implementing e-health innovations.

An immediate problem is access to technology and user skill levels. In addition, rapid evolution of technology may hinder long-term use of today's hardware and software, which often become obsolete soon after introduction. Also, there is currently little research-based evidence to support telemedicine's cost effectiveness and return on investment relative to traditional services.

"What we're trying to do now is to conduct thoughtful evaluation to generate evidence about the sustainability of telemedicine," says Ho. "The time is right to do this work. The technology is there, public awareness of global health issues is there and synergy between U21 institutions and WHO can kick start initiatives and investment in communication technologies."

Health science students and faculty members interested in becoming involved in e-health projects can contact Ho at kho@cpdkt.ubc.ca or at www.cpdkt.ubc.ca. □

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jects. The next step in the research is to determine if the VR therapy improves motor performance in the long term.

McKeown believes that the VR method will also be useful in Parkinson's disease — a progressive neurodegenerative disease that involves loss of the brain cells that ultimately influence movement control. It is estimated that approximately 100,000 Canadians have Parkinson's disease.

Stroke is a sudden loss of brain function caused by the interruption of blood flow to the brain or rupture of blood vessels in the brain. The fourth leading cause of death in Canada, about 16,000 people die from stroke each year and about 300,000 Canadians live with the effects of stroke.

Co-investigators include medical student Lissette Eigenraam, from Holland; Prof. Wang's master's student Joyce Chiang; and research assistant Graeme McCaig. Lab space has been provided by UBC's Media and Graphics Interdisciplinary Centre (MAGIC). □