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THE UNIVERSITY OF BRITISH COLUMBIA

UBC REPORTS

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THE UNIVERSITY OF BRITISH COLUMBIA
Public Affairs

Highlights of UBC media coverage in January 2012

Heather Amos

UBC RESEARCH

Mapping Dark matter

Scientists from Scotland and Canada have mapped the dark matter in the universe on the largest scale ever observed, reported ***United Press International***, ***Science News***, ***CBC's Quirks and Quarks***, the ***Calgary Herald*** and others.

The team of scientists, which included **Ludovic Van Waerbeke** of UBC, analyzed images of about 10 million galaxies in four different regions of the sky. They studied the images for distortion of the light emitted from these galaxies, which is bent as it passes massive clumps of dark matter on its way to Earth.

"It is fascinating to be able to 'see' the dark matter using space-time distortion." Van Waerbeke said. "It gives us privileged access to this mysterious mass in the Universe which cannot be observed otherwise."

1 in 10 Canadians cannot afford prescription drugs

One in 10 Canadians struggle to pay for their prescription drugs, even if they have public and/or private insurance, and one in four Canadians who do not have drug insurance cannot afford to take their drugs as directed, according to research from UBC and the University of Toronto that appeared in the ***Globe and Mail***, ***CBC's The Current***, the ***Toronto Star***, the ***Medical Daily*** and others.

"These levels of non-adherence are something to be concerned about," said **Michael Law**, an assistant professor at the Centre for Health Services and Policy Research at UBC. "When people don't take their meds, there are, potentially, higher costs in other parts of the system."

Wine: Genes, headaches and low-alcohol

Wine expert **Hennie van Vuuren**, director of the Wine Research Centre at UBC, was featured in ***Canadian Business Magazine*** for developing yeast that can make headache-free wine and in a ***Globe and Mail*** article about alcohol content and how it affects the taste of wine.

The ***Australia Life Scientist***, the ***Calgary Herald***, and the ***Vancouver Sun*** also featured van Vurren's latest research project to map the genes of 15 known clones of the Chardonnay grape vine in an effort to identify which ones are best.

UBC EXPERTS COMMENT

Keystone and Enbridge pipeline projects

With the Obama administration's decision to deny a permit for the Keystone XL oil pipeline and the start of the National Energy Board's formal hearings for Enbridge's Northern Gateway Project, UBC experts commented on energy, political, environmental and Aboriginal issues for ***CBC's The National***, ***Maclean's***, the ***Globe and Mail*** and others.

George Hoberg, a professor in the Department of Forest Resources Management at UBC, talked to ***Business News Network*** about the Harper government's support for the Enbridge pipeline project and the opposition from aboriginal groups and environmentalists.

"In order to clear legal hurdles, the government is going to have to show that they have both consulted with and accommodated the concerns of the first nations opponents," said Hoberg. "What's of concern to them is the environmental risks of a pipeline and tanker spill and the impact that would have on the salmon and other ocean resources that are so precious to their heritage."

UBC STUDENTS

Boycott SOPA app

Two UBC students created a mobile app to help derail SOPA, the *Stop Online Piracy Act Internet* censorship bill, reported ***The Guardian***, ***Forbes***, ***Mashable*** and others.

The app, called "Boycott SOPA," makes identifying and boycotting SOPA-supporting companies easy. Users scan any product's barcode to determine if it was made by a company that officially supports SOPA.

"These companies think they'll make more money with SOPA than without it," said **Chris Thompson**, who created the app with **Chris Duranti**, both third-year computer-science students at UBC. "If they realize they're costing themselves more consumers than they'll gain, they'll be less inclined to go forward with that support."

The Olympic jolt

London and Rio have a unique opportunity for social change

Heather Amos

Martin Dee Photograph

Rob VanWynsberghe stands in front of the new Musqueam cultural centre, the former Four Host Nations Olympics pavilion. UBC's Vancouver campus is located on the traditional territory of the Musqueam people.

Ask anyone in Vancouver, Sydney or Salt Lake City. When their city won the bid to host the Olympic Games, their neighbourhoods, transit and landscapes got a major facelift within a matter of years. But beyond the shiny surface, the changes can touch the social dynamics of the host city, according to UBC researcher Rob VanWynsberghe.

"Unlike any other event, sporting mega-events can be a force for change," says the assistant professor in the Department of Educational Studies at UBC. "Entire social policies can be reworked in the name of hosting. In almost no other situation are such massive resources dedicated to transforming a city."

VanWynsberghe investigates how sporting events, like the Olympics, World Cup and Pan American Games, can be leveraged to radically change how cities work.

A member of UBC's Centre for Sport and Sustainability, VanWynsberghe says these events provide cities with the unique opportunity to work on deep social issues. With the world's attention focused on them, it is a great time to try new ways of tackling problems.

VanWynsberghe is leading a study to measure the overall impact of the 2010 Games, known as the Olympic Games Impact (OGI) study. Developed by the International Olympic Committee (IOC), the OGI offers a standardized method of monitoring, measuring and reporting on the social, economics and cultural impact of hosting the Games. All Olympic organizing committees are now contractually required to undertake this study.

VanWynsberghe thinks one of the legacies of the 2010 Winter Games may turn out to be improved developments in Aboriginal relations in the province of British Columbia. The Olympics featured the inclusion of First Nations in organizing the Games, a priceless spotlight on aboriginal culture during the opening ceremonies, an attractive and prominent Aboriginal Pavilion, and economic development opportunities.

"The 2010 Games still provide a way to do things differently in the future," he says. "More generally, hosting an event like this gives you the opportunity to ask 'what is a major social issue and how can changing it now be the source of a legacy?'"

Looking ahead to the 2012 Summer Olympics in London, VanWynsberghe notes organizers are dedicating unprecedented efforts to promote physical activity, perhaps because London, like many other cities, is dealing with a rising tide of obesity.

But VanWynsberghe thinks the London Games could be used to address deeper problems.

"If they focus on ethnic and racial tensions in the city, London could flip things around and make their Games a celebration of multiculturalism. They could make London a destination for being the most multicultural city in the world."

In November, the UBC Centre for Sport and Sustainability hosted a conference on the impact of sporting mega-events, bringing together leading international scholars. They concur that hosting the Games in Vancouver and London is one thing. Hosting them in a developing country like Brazil–host to the 2016 Summer Olympic Games–is an entirely different matter.

"The approach to transforming a city like Rio is very different than what we saw in Vancouver or in 1996 in Atlanta," VanWynsberghe says. "The field is generally filled with case studies from North America, Europe and Australia."

"We need to compare and contrast these cases with African, South American and Asian ones to understand the full range of leveraging possibilities that may extend beyond the host city to include international goals, such as sustainability, poverty reduction, literacy, combatting racism, and stopping war."

Seeking precious minutes of focused attention

What it takes to give your science class a makeover

Brian Lin

Martin Dee Photograph

Science Teaching and Learning Fellow **Brett Gilley** (left) discusses an in-class activity with Prof. **James Scoates.**

Walking down the angular halls of the Department of Earth and Ocean Sciences (EOS), Brett Gilley stopped by Professor James Scoates' office to scan through a stack of activity sheets where fourth-year students had drawn, to the best of their recollection, cross-sections of the Earth's crust and possible locations of mineral deposits on the first day of class.

"What did students say was the hardest part of the activity?" asked Gilley, a Science Teaching and Learning Fellow (STLF) with the Carl Wieman Science Education Initiative (CWSEI).

"Scale," Scoates answered. That piece of feedback from Scoates' students will not only change how the 16-year veteran teacher begins this future classes, but is influencing the content of several other courses in the department by pointing out one of the major challenges students face, which happens to be one of the key competencies of geological scientists.

This kind of impromptu meeting has become commonplace since 2007, when 27 courses in EOS were selected to undergo transformation. They were chosen, based on reach and impact, to morph over a five-year period from the traditional "stand-and-deliver" model to something much more interactive.

"It was relentless," Scoates recalls. Over two years starting in 2009, Gilley, Scoates and Assistant Professor Ken Hickey dissected their course, identified the most important concepts in the syllabus and articulated clear goals they'd like students to achieve.

Learning activities such as the deceptively simple drawing exercise were discussed and tested against a growing literature of cognitive psychology research—a key component of Nobel laureate Carl Wieman's approach to improving teaching and learning undergraduate science through individual course transformations.

"I can't say I enjoyed all aspects of the process, but I definitely saw the value," says Scoates, who has since partnered with Gilley to revamp two more courses.

Half of the first-, second- and third-year courses in EOS have undergone transformation—and almost three quarters of the department's instructors have participated—with the help of Gilley and three other STLFs. As a result, approximately 10,000 students — a majority of them non-science majors —have learned about topics such as natural disasters and climate change in vastly different ways from their parents, or even slightly older cohorts. Nearly at the end of their five-year plan, EOS is now in the midst of a complementary curriculum reform.

"This sort of work usually takes a long time," says Gilley. "The degree to which the department has embraced this is absolutely amazing."

Halfway across campus, in Wieman's home Department of Physics and Astronomy, course transformations are moving ahead with characteristic meticulousness.

The partnership between STLF Louis Deslauriers and Assistant Professor Kirk Madison began over dinner with a visiting colleague.

"I told Kirk about the work I was doing with other courses and I could tell it was outside his comfort zone, but he was also excited by it," recalls Deslauriers, who helped Madison transform a third-year quantum mechanics course.

"The methods Louis described resonated with me because it's how I mentor my graduate students—less of a step-by-step cookbook instruction and more an open-ended exploration of ideas," says Madison. "The challenge was scaling it up to 90 undergrads."

Deslauriers and Madison focused on creating various points where students are asked, in groups of three or four, to articulate, debate and answer a question —what the two playfully call "learning events."

"The process of deliberating, communicating and discovering ideas creates a common bond that connects people," says Madison, who likens it to the spark people experience when falling in love. "Training our students to both think collectively and by themselves is a critical component of a university education because it forms the basis for the creation and acquisition of meaning and knowledge."

Giving the students time and space to think independently, however, meant relinquishing some control as *Master of the Classroom*.

"Before I tried these activities for the first time, I worried a lot about crowd control," Madison says. "Do they see I'm doing my job or would they think I'm downloading responsibility onto them? Are they going to respect me?"

What happened next was "unreal," says Madison. "When the discussion time was up and I began to offer my feedback, the room went silent. And for the next 180 seconds the students were on the edge of their seats hanging on my every word."

Madison and Deslauriers recorded such data throughout the term and found that this critical attention span lasted less than four minutes. Their findings are now submitted for publication.

"In a traditional lecture, you can do jumping jacks, cartwheels and back flips and you'd get some of the students' attention for maybe 10 seconds," says Madison. "But now I had the undivided attention of the entire class for three whole minutes—they were primed, it was my window of precious lecture time and I knew I had to make it count."

Madison's course now revolves around these 'learning events'—up to a half dozen in a 50-minute class – and his 'lecture' consists of feedback and Q&As to those activities. As a result, he has seen improvements in the students' behaviour and marks, both of which have been meticulously documented and analyzed, another key element of the CWSEI approach.

One of Deslauriers's recent studies about two other UBC physics classes made headlines worldwide after it appeared in the prestigious journal *Science*. For their part, researchers and instructors in EOS have produced more than 50 papers, presentations and workshops detailing their experience.

Both teams say establishing a "feedback loop" between instructors and students is key to an engaging learning experience, while mutual respect is the secret of their successful partnerships.

"The barrier has dropped between me and my students," says Scoates. "They aren't embarrassed about asking questions or saying what they might think is the wrong thing."

"I used to ask myself if I'd covered everything I wanted to in a lecture," says Madison. "Now the question I ask is 'Did they get it?' which is a much harder question. But, with constant feedback during class, I am much more certain of the answer." ●

Launched in 2007, the Carl Wieman Science Education Initiative (CWSEI) has impacted more than 10,000 undergraduate students per year with the help of 18 ScienceTeaching and Learning Fellows across UBC science departments.

Professor of Teaching: Recognizing excellence

UBC faculty members whose professional lives focus on the advancement of teaching and learning will soon have a title to match their commitment: Professor of Teaching.

Officially rolled out July 1, 2011, the new rank was introduced into the instructor tenure stream to create a complete career track that parallels the conventional professorial stream, says Anna Kindler, Vice Provost and Associate Vice President, Academic Affairs and Resources.

Working with UBC Faculty Relations and with input from the UBC 3M Fellows Council, the Provost's Office developed criteria and guidelines that ensure the title carries prestige and recognizes outstanding instructors who contribute significantly to the profession.

"We place a very strong emphasis on educational leadership and innovation in curriculum and pedagogy," says Kindler. "Professors of Teaching are not only great teachers themselves, but inspire and enable others to excel."

Kindler says the new rank and title—still a rarity at universities—will also give UBC a competitive edge in recruiting outstanding faculty with primary responsibilities focused on the educational mission of the university.

"Some scholars may realize early on that their talents—and passion—lie in teaching and educational innovation," Kindler adds. "By extending the teaching career track, we're presenting an exciting opportunity for them to contribute, grow and optimize their positive impact on the university"

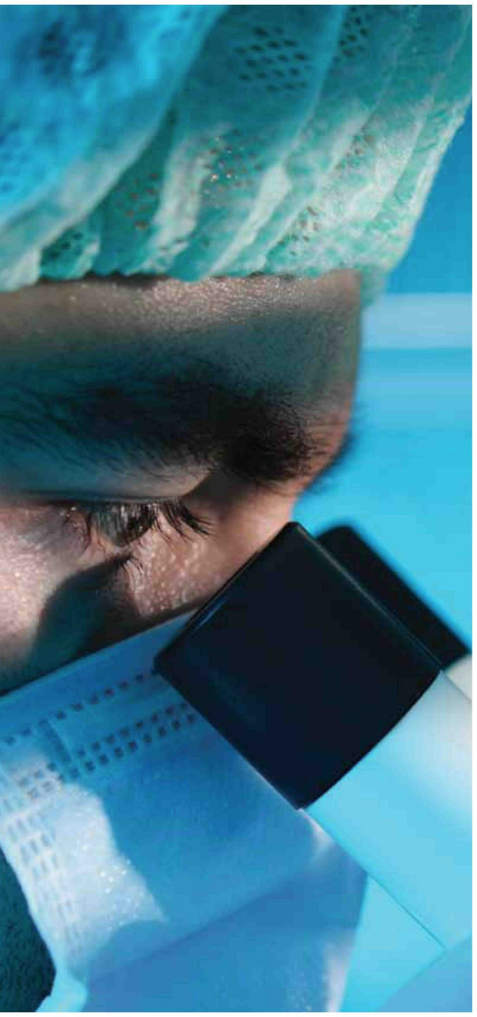
"It also gives us the opportunity to more explicitly recognize the contribution of our educational leaders and signal how much we value their expertise."

The first Professors of Teaching appointments are expected to be announced over the next year. ●

Animals in research

The UBC community examines a tough issue

IS IT NECESSARY?



Nicolas Loran Photograph

Like all leading research universities, UBC engages in animal research to investigate and address some of the more challenging issues of our time, including biodiversity loss, human disease, and the effects of climate change. And, like all research, it presents serious ethical questions that we must face as a responsible academic community.

When is animal research necessary? When is it not? How will animal research benefit both human and animal populations? How can we improve upon past research?

We asked these and other questions of each of the 982 animal research projects approved at UBC in 2010, which involved a total of 211,604 animals in the field or in laboratories. Of these, 97 per cent were rodents, fish, reptiles and amphibians. Without their participation, we could not have confidently answered a range of vital scientific questions with implications for our society and our planet.

We stand by our research, whether it is to improve medicine, cure diseases, understand basic zoology, or ensure better treatment of animals in society. And others stand by it, too: the patients who benefit from our medicines, the agencies that fund our research, and the regulators who monitor and enforce the strict codes of ethics and behaviour we adhere to.

A university campus allows us to respectfully debate the more contentious issues of our time. As part of an ongoing academic dialogue to evolve our thinking and practices on the issue of animal research, four scholars share their reflections with *UBC Reports*.

John Hepburn
Vice President Research and International

Let the conversation continue.

UBC Animal Research website
www.animalresearch.ubc.ca/index.html

UBC Green College Dialogues
www.greencollege.ubc.ca/whats_on/index/main3/events/category99.php

Making wise decisions about animals

Since zoology is the branch of biology that studies animal life in its dazzling diversity and richness, zoologists like myself are involved in animal research of one form or another, in sub-disciplines ranging from cell and molecular biology through anatomy and physiology, to behaviour, ecology and evolutionary biology.

As a zoologist, I need to know how animals "work" before I can understand the potential consequences of climate change and the ways to mitigate its effects; understand the causes and consequences of such outbreaks as avian flu, white nose syndrome in bats and facial tumour disease in Tasmanian devils; or provide medical aid to household pets and injured wildlife.

Always at the back of my mind when I do research in the field or the lab— with methodologies ranging from unobtrusive observation to more invasive procedures—is the code of ethics that guides my work and my absolute commitment to the humane treatment of the animals in my care.

It has always been extremely important to make wise decisions when conducting animal research because research procedures can result in animal deaths.

I know many of us struggle with this responsibility for the life of sentient beings. After all, we become zoologists because we care deeply about animals. So how can we live with the implications of our work?

For me, it is this deep concern for the health, wellbeing and future of all animals— non-human and human— that anchors my conviction in responsible research involving animals. Perhaps one day we won't need to use invasive methods for this essential work—but we're not there yet. ●

Bill Milsom
Head, Department of Zoology,
Past Chair of UBC's Animal Care Committee, and former member of the Canadian Council on Animal Care

Racism, sexism, species-ism?

Mahatma Gandhi said "The greatness of a nation and its moral progress can be judged by the way its animals are treated." Our perception and use of nonhuman animals is the focus of interdisciplinary scholars in the emerging and widely diversified field of critical animal studies where Gandhi's words have particular resonance in the critique of the treatment of non-human animals in factory farming, rodeos, zoos, the aquarium and in scientific research.

Scholars in my field question the arbitrary distinctions used to separate the "human" subject from the "animal," critiquing what some have labeled "speciesism," and calling attention to the disregard for the suffering of nonhuman animals.

As a theorist and scholar, I am often challenged because I extend ethical considerations to non-human animals—a premise some call "irrational."

Feminism faced similar disavowals in the academy—less than 100 years ago women were not designated as persons. I find students are more willing than some colleagues to ask hard questions about the use of animals in research.

I've been told I'm "anti-science" and that courses such as the one I recently taught on our Okanagan campus, *Posthumanism and Critical Animal Studies*, are akin to teaching"creationism." Yet emerging discoveries on animal sentience, behaviour and self-awareness underscore the need to analyze thoughtfully the treatment of non-human animals.

In fact, I am pro-inquiry, as should be all members of the academic community. Science is a social phenomenon and a human practice; it cannot be isolated from social morality.

The Green College dialogue series in which I participated aims to foster "meaningful, interdisciplinary, scholarly deliberation about the use of nonhuman animals in university teaching and research" and brings together, at long last, "scholars from the humanities, social sciences and science who otherwise have scant occasion to interact." It just might have us all reflecting seriously about Gandhi's words. ●

Jodey Castricano
Associate Professor, Critical Studies,
UBC's Okanagan campus

Do no harm

In the UBC Animal Welfare Program, the approach we use for animal-based research is akin to that of medical researchers to their patients: we work to improve the lives of those we study, and we follow the principle of 'do no harm.'

What does this mean? Most of our research tries to improve the health and comfort of animals in shelters, farms and laboratories. In some cases, where animals are subjected to painful treatments by others, we test ways of reducing the animals' pain and distress. But we do not inflict negative treatments for the sake of science.

If our research animals don't suffer, neither does our research. Our group is extremely productive. It is well integrated with the animal-care professions, and we have hundreds of enquiries each year from would-be graduate students from around the world. We feel that our decision to 'do no harm' has not harmed our ability to do good science.

That philosophy may work for us, but what would the health sciences be like were our approach to catch on?

Certainly, invasive animal-based research in fields like physiology, organ function and drug kinetics has allowed astounding advances in drugs, surgery, and other means of treating disease.

But suppose the vast resources and ingenuity that go into this research were to be redirected? What different advances might we have? Would the medical profession be less focused on treating disease, and more focused on how nutrition, life-style, community engagement—even the arts and spirituality—help prevent disease and promote wellbeing?

If this meant foregoing some of our more spectacular (and expensive) disease interventions, might the ultimate result still be a healthier, happier population? Might such an approach do *us* no harm? ●

David Fraser
Animal Welfare Program,
Faculty of Land and Food Systems

Clear and present purpose

Imagine being imprisoned in a body that no longer responds to your control. Like an evening shadow that creeps across the landscape, Parkinson's disease insidiously shuts down areas of the brain and body.

Parkinson's disease afflicts 7-10 million people worldwide and burdens the families who care for them. Without medication, the body rapidly loses motor control—yet the mind remains aware. The best available medications only treat the symptoms, they do not slow the rate of decline, and they produce side effects such as the jerky, involuntary movements we see most famously in Michael J. Fox.

The world's half-billion baby boomers are moving into the prime stage of life for Parkinson's. In the coming decades, this disease will become a global epidemic unless solutions are found. For researchers like me, this involves an ethical choice: do we use animal models to develop a cure now, or wait for a technology that will replace the need for animals in research? While I want to minimize suffering in all species, I cannot ignore this human catastrophe.

Before we can test a potential Parkinson's cure in humans, we are required by law to demonstrate its safety and tolerability in at least two species, and no new drug gets to this stage without a clear demonstration of efficacy in animals.

I do involve mice and rats in my research, but I limit their use by learning from clinical, genetic and pathologic studies in patients and their families. Our drug development effort is informed by gene mutations that trigger late-onset Parkinson's disease, and is based on molecular genetic design. Drugs targeted to a specific molecular cause for given patient groups are the most promising.

It's true that animals, unlike people, cannot choose to participate in research. But victims of Parkinson's disease do not choose their fate either—Parkinson's chooses us. I've spent my career weighing the ethical ramifications of my work and I say unequivocally: animal research is a price that must be paid to prevent Parkinson's disease. ●

Matthew Farrer
Professor of Medical Genetics and Canada Excellence Research Chair in Neurogenetics and Translational Neuroscience

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UBC WELCOMES THE WORLD'S SCIENTISTS AND MEDIA TO VANCOUVER

More then 30 UBC researchers are participating in the American Association for the Advancement of Science (AAAS) annual meeting, the world's largest general science conference, Februrary 16–20 2012.

Learn about UBC's involvement in the "Olympics of Science" at

www.ubc.ca/news

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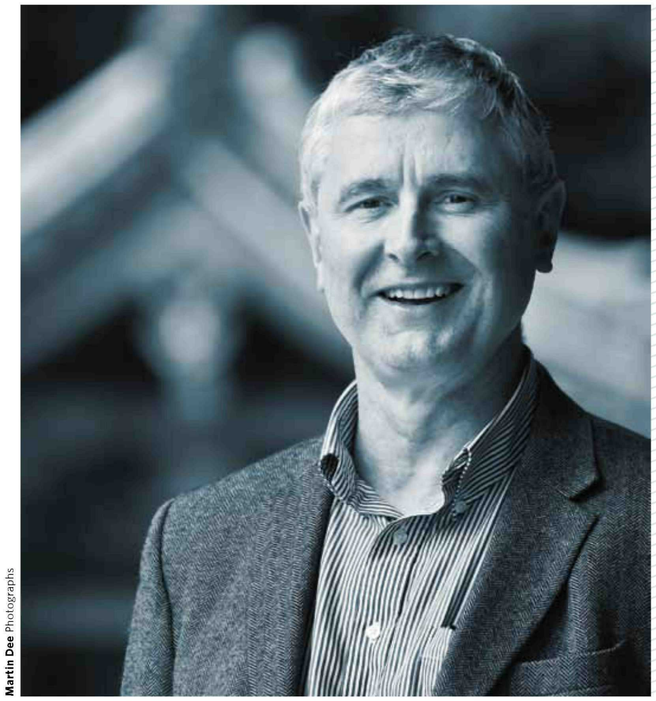
China 2012 The year of living dangerously

Even before the death of North Korea's Kim Jong-Il, the Year of The Dragon was to be one of potentially massive change, with the US, China, Russia, and South Korea all selecting new leaders.

Basil Waugh



Martin Dee Photographs

Paul Evans (above) and **Timothy Cheek** (below) say China's new leaders will face growing social unrest, widespread disparity and a cooling economy.

With tensions rising between the U.S. and China and the world economy sputtering, UBC Institute of Asian Research experts Paul Evans and Timothy Cheek outline major issues and potential conflicts in 2012, with a focus on China.

China's 'princelings' grab the brass ring

If all goes according to script this October, Xi Jinping and Li Keqiang will become China's new general secretary and prime minister, respectively. This will likely be the fourth peaceful succession since Mao's death, which is remarkable in a communist system.

Chinese power rotates between three groups and their relative tendencies are instructive. The outgoing leaders, from the party's more ideological "youth league," took a characteristic hard line on dissent. Before them, the "Shanghai group," characteristically focused on the economy. It is now a third group's turn, the "princelings," from which Xi and Li emerged.

The "princelings," comprised of elites and former leaders' families, have an interest in preserving class privileges. Xi and Li will understand intuitively that confrontation with the U.S., social unrest and disparity are not in their class interests. Both are smart, proven administrators who have worked closely and effectively with the party's Shanghai and youth league factions. **Tim Cheek**

Disparity grows as China's economy slows down

China's economic growth has been extraordinary for 30 years. The number of people that have been pulled out of poverty is astonishing. But it's very apparent that huge inequalities have emerged. Even China's current premier has stated the country's economic model is unsustainable and unfair.

The new leadership faces difficult choices in rebalancing China's role in the global economy in a period that its growth rate is declining and social disaffection is growing. The leadership is exploring social safety nets, health and welfare systems which have almost completely collapsed in the era of reform and openness. The question is: how do you preserve growth, while distributing its benefits more equally? The challenge is not unique to China, but nowhere is the disparity or risk of unrest greater. **Paul Evans**

Rising unrest as citizens find their voice

By the government's own count, there were more than 180,000 "social incidents" in China in 2010, a staggering figure. These are public demonstrations, sometimes riots, against corruption, working conditions, pollution and land expropriation. They are usually led by poor farmers or workers, but China's middle class is now starting to protest infringements on their lives.

China's government realizes this unrest is inherently tied to their model of development. Lack of democracy, regulations, protections and standards is precisely why China outperforms the West. The people, unable to vote, must express dissatisfaction in other ways. A burgeoning "rights movement" is gathering steam, fuelled by social media.

China's challenge is to find a mechanism to absorb feedback, address citizen's issues and clean its bureaucracy of corruption. If they fail – and they mostly likely will, because the new leaders resemble the current ones – the unrest will worsen. **Tim Cheek**

Social media + unrest = Chinese Spring?

Blogs, SMS texts, and QQ, a Chinese Twitter, are helping to fuel the unrest in China, but the government is too competent and way too tough for a "Chinese Spring" to occur. While many Chinese hate their local officials—who they view as corrupt and incompetent—they still hold China's central government in extremely high regard, and don't see a viable alternative. They are nowhere near the levels of alienation we saw in North Africa. **Tim Cheek**

Potential flashpoints: South China Sea and cyberspace

China began asserting its claims on the South China Sea more assertively in 2010. This rang alarm bells in Southeast Asia and opened a door for the United States to play a more active role on the issue. In December, Obama committed 2,500 marines to nearby Australia and stated that democracy is the only legitimate form of government. While the US-China relationship is complex and mutually important, Obama was signaling a policy shift in the direction of military containment even as the strategy of economic engagement remains in place. The South China Sea has always seen incidents, but the chances of these escalating are now more significant.

The cyber realm is another potential flashpoint, with China's increasingly sophisticated capabilities. President Obama said in May that a cyber attack on US military infrastructure would be considered equivalent to a military attack. With opposing views of "freedom" on the internet, and China's failure to regulate in its own cyber backyard, there is growing potential for major international conflict. Not military conflict, but a trigger to rising tension and a greater deterioration of diplomatic relationships. **Paul Evans**

What does China want?

In the G20 and other international institutions, Asian countries so far have a poor record of working together. China and India are active players in these institutions, but rarely leaders. It is difficult to imagine progress on key issues like climate change and financial regulation until they play a bigger and more constructive role in setting rules that transcend their immediate interests. Asia is increasingly at the centre of global economic power, accounting for nearly 75 per cent of global growth. But it is not yet at the centre of institutional and normative power. 2012 promises to be a pivotal year in testing how far an American-centred world order can be maintained and whether Asia's rising powers will live within that order or begin to establish an alternative. **Paul Evans**

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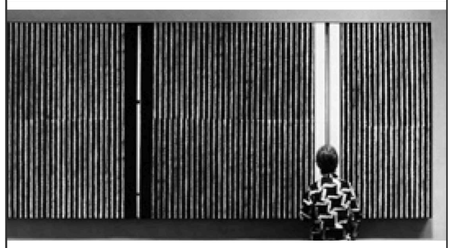

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Installation view: *Survey '69*, exhibition at The Montreal Museum of Fine Arts in May-June 1969. Michael Morris, *New York Letter*, c. 1968. The Montreal Museum of Fine Arts, Purchase, Saidye and Samuel Bronfman Collection of Canadian Art. Photo: Henry Koro.

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Six things science tells us about happiness

UBC economist on a bold UN mission

Basil Waugh

Darin Dueck Photograph

Social connections bring more happiness than money, says UBC economist **John Helliwell.**

Struggling to find happiness? Consider the plight of John Helliwell, a University of British Columbia economist who was recently asked to help the United Nations measure and improve global happiness levels.

Helliwell, a leading happiness researcher, is working with colleagues on a "World Happiness Report," that will support a special UN meeting on April 2 in New York City. The meeting, the result of a unanimous UN resolution introduced by Bhutan, will document the current state of happiness around the world, and is part of a UN effort to improve life satisfaction with strategies grounded in science.

Universal happiness may sound like a stretch, but science offers some clear direction, says Helliwell, who began exploring social capital and well-being issues as a visiting professor at Harvard in the 1990s. "Time and time again, we find that people systematically overestimate the impact of material things and underestimate the positive impacts of social connections," he says.

UBC Reports asked Helliwell to list some of the most important discoveries to date in the field of happiness research.

"When people ask where to start, I say transform your elevator ride from a prison sentence to a social event waiting to happen."

1. Money ≠ happiness

Does money bring happiness? Studies find that income does support life satisfaction, but mostly at low income levels, and not as much as people expect, says Helliwell, who first ranked the happiness of Canada's cities in 2007. Positive social interactions have a much greater impact on well-being, he says.

2. Trust is a must

Helliwell's research shows that working in an organization where trust in management is one point higher (on a 10-point scale) has the same impact on life satisfaction as getting a 30 per cent pay raise. But the importance of trust extends far beyond the workplace; trust in police and neighbours counts too. "When trust is high, people have the confidence to reach out and engage with the community," he says.

3. Longing to belong

Like trust, a sense of belonging is another key indicator of happiness, Helliwell says, noting that your immediate surroundings are especially important. "Studies show that feelings of belonging at the local community level have twice the impact of those at the national or provincial," he says. As for social media, a Canadian survey found that it is the size of your network of real-time friends, and not the online version, that supports life satisfaction.

4. Generosity pays off

If you are going to spend money on happiness, studies suggest spending on charitable donations or activities designed to serve a larger purpose. Donors and volunteers often receive greater personal satisfaction from their philanthropy than recipients, says Helliwell, a professor emeritus in UBC's Dept. of Economics. In a recent study, cancer patients who counseled their peers received even larger benefits than those they were counseling.

5. Freedom brings happiness

While good health is important, the perceived freedom to make important life choices is also crucial, says Helliwell, a co-director of the Canadian Institute for Advanced Research's social interactions, identity and well-being program. It should come as no surprise that Denmark, which has the world's highest self-assessed levels of freedom, also has the highest life satisfaction levels, he says.

6. Reach out

Small towns tend to outperform the big cities on happiness because it is easier to get to know neighbors, build trust and create a sense of belonging. "When people ask where to start, I say transform your elevator ride from a prison sentence to a social event," he says. "Chat with neighbours and help carry their groceries. It's easier to reach outside your comfort zone when you realize that you and the whole community are likely to benefit." ●

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Toxic gold rush

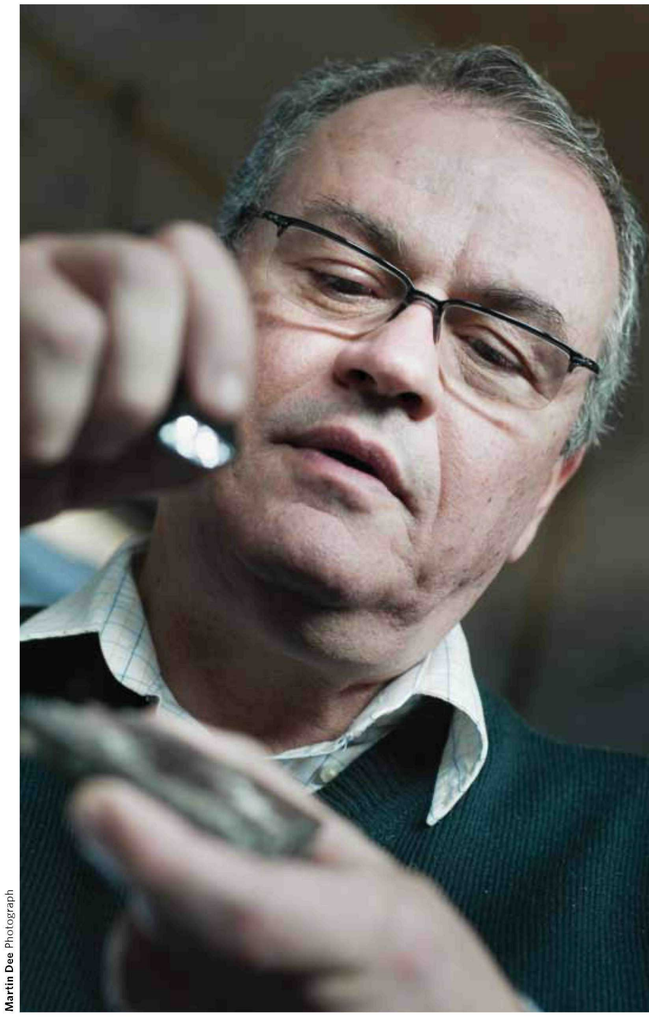
Helping artisan miners stay clear of mercury

Lorraine Chan

"This is a poverty-driven activity. These miners aren't villains. They're victims."

Photograph courtesy of **Marcello Veiga**

Women and children work with small ball mills filled with mercury and gold ore.



Martin Dee Photograph

Mining Engineering **Prof. Marcello Veiga.**

Residents of Colombia's mining towns are breathing in dangerous levels of mercury as a result of artisanal gold mining, says UBC Mining Engineering Prof. Marcello Veiga.

And mercury contamination may be reaching consumers in far away markets through Columbian food exports, making this little-known environmental problem a global issue.

"This is a poverty-driven activity. These miners aren't villains. They're victims," explains Veiga, the world's leading researcher on mercury contamination and UN advisor on the global effects of artisanal gold mining which involves small scale, rudimentary and often unsafe mineral extraction.

A powerful toxin that damages the brain and kidneys, mercury is used by artisanal miners to extract gold from ore. Over the past three decades, Veiga has travelled to roughly half of the 80 countries where 15 million men women and children are involved in artisanal gold mining. His mission: bring them vital information on practical, safer alternatives that are good for their health, and better for the environment.

Last year, Veiga and a research team investigated gold production methods and mercury release pathways in five municipalities of Antiquoia, a northeastern province of Colombia. In this remote and mountainous region, there are 17 mining towns and about 30,000 artisanal miners who typically bring back the ore to urban centres for processing.

"The miners feel safer in the towns than staying out in the rural areas where the gold rush has attracted armed guerillas and paramilitary activities," explains Veiga.

Also involved in this research are Colombia's central and regional governments and the United Nations Industrial Development Organization's Colombia Mercury Project. One of the goals is to demonstrate mercury free and also cleaner production technologies, including heavy metal condensing and filtering systems. Led by UBC PhD mining engineering student Paul Cordy, the study appeared in a recent issue of the journal Science of the Total Environment.

The paper details how the miners grind the ore with mercury in small ball mills called "cocos." During this process, up to 80 per cent of the mercury is lost with the waste, which is then drenched with cyanide to recover any residual gold—often minute quantities.

"In this process, a very toxic compound is formed: mercury-cyanide which is dumped into the local creeks," say Veiga, adding that this is happening as well in countries such as Peru and Ecuador.

As yet, there have been no studies on the impact of mercury-cyanide on the environment or food chain. However, Veiga says that downstream effects are likely given the number of South American banana plantations and shrimp farms that export to global markets.

However, the most immediate and extreme danger is borne by people who live and breathe in Antiquoia's towns. Shops where the miners' gold-ore amalgam is refined simply burn off the mercury without containing or filtering the emissions.

Measuring the air quality in the five towns, the researchers found mercury levels that commonly exceeded 10,000 nanograms per cubic metre—ten times the 1,000 nanograms per cubic metre limit set by the World Health Organization for mercury vapour exposure.

Veiga says, "We found these levels and higher to be common in busy main streets with stores and schools, and with residential neighbourhoods nearby."

Colombia is the world's highest per capita mercury polluter due to artisanal gold mining, releasing 130 tonnes of mercury annually into the environment, notes Veiga. Globally, artisanal gold miners are responsible for contaminating air, land and water systems with 1,000 tonnes of mercury each year.

"Ironically, most of the mercury used by artisanal miners is recycled mercury imported from the developed world," he adds. ●

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Do advertising bans work?

Quebec legislation reduces fast food consumption

Lorraine Chan

Martin Dee Photograph

Sauder marketing expert **Tirtha Dhar.**

"That regulation effectively reduced fast food consumption in households by as much as 13 per cent each week."

Could it really be as simple as cutting out the ads and watching the kids slim down and get healthy?

A UBC study of Quebec's 32-year ban on fast food advertising found that people in that province bought less junk food and their children tend to weigh less than their North American counterparts.

"That regulation effectively reduced fast food consumption in households by as much as 13 per cent each week," says Asst. Prof. Tirtha Dhar, a marketing expert at UBC's Sauder School of Business.

In the first study of its kind, Dhar investigated the impact of the world's first and oldest advertising ban on fastfood. Enacted in 1980, Quebec legislation prohibits advertising of products such as toys and fast food which target children in print and electronic media. In the past decade, other countries have followed suit with similar bans, among them Norway, Sweden, Greece and the U.K.

Dhar says the annual drop in household fast food purchases represents the equivalent of US $88 million in 2010 dollars. "In terms of meals, that reduction represents 13 and 18 billion fewer fast food calories a year."

Co-authored with Asst. Prof. Kathy Baylis at the University of Illinois, the study appeared in a recent issue of the Journal of Marketing Research.

Using Statistics Canada data for 1984-1992 household expenditures on fast food among francophone families with children in Quebec, Dhar and Baylis compared the consumption behaviour of representative households in Quebec to that of Ontario, using determinants such as French-language, economic and socio-demographic characteristics. Data wasn't available after 1996 when the surveys stopped recording mother tongue—a key variable of the study.

Dhar points out that Quebec has one of the lowest childhood obesity rates in Canada, though its children have one of the most sedentary lifestyles according to 2005 Statistics Canada data.

More importantly, he says, the 2004 Canadian Community Health Survey shows that the combined overweight and obesity rate among two-to 17-year-olds in Quebec is significantly below the national level.

In North America, where two out of every 10 children are overweight or obese, the debate over advertising legislation is a heated one. What sets their work apart from previous studies, says Dhar, is that it draws from field-level data and is the first study to explore "the real world impact of advertising regulation."

"The existing research on advertising bans drew from lab experiments or data from small cross-sectional surveys that give you a snapshot of a point in time. The situation in Quebec is unique because we're able to see the real impact of regulation over a longer period."

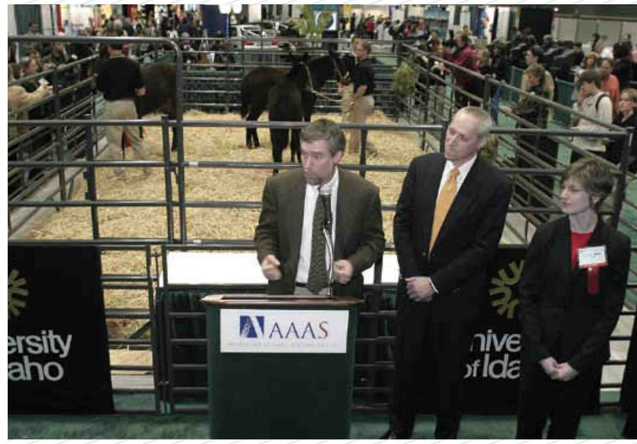
However, Dhar cautions against adopting legislation as the magic bullet to vanquish problems like childhood obesity. "It's getting tougher to regulate advertising since children can be reached through the Internet, social media, smartphones and other mobile devices.

"Legislation should just be one of the tools in a larger, comprehensive plan that includes education about healthy eating and parental care," says Dhar. "The key issue is how you manage the environment for your children, from which TV programs they watch to the kinds of food they eat." ●

outtakes

The AAAS comes to Vancouver

Ginger Pinholster, Director, Office of Public Programs, American Association for the Advancement of Science



Three cloned mules were stars of a 2004 **AAAS** press event on cancer research.

Since coming on board in 2000, I've collected some prize memories from the annual meetings of the American Association for the Advancement of Science (AAAS). And they're not what you might expect:

In 2003, BBC reporters suddenly noticed that a robotic head looked exactly like the engineer's girlfriend, who was standing in a corner of the press room.
Three cloned mules—Idaho Gem, Idaho Star and Utah Pioneer—were on hand for a 2004 press event on cancer research.
A cadaver-sniffing dog, brought in to demonstrate search-and-rescue techniques in 2005, kept "finding" a staff member.
Former U.S. Vice President Al Gore's lecture in 2009 required all hands on deck, from Meetings Director Barb Rice to computer specialists, to help direct traffic.

We've had stars and luminaries grace our gathering over the years—U.S. presidents Harry Truman, George H.W. Bush and Bill Clinton; Bill Gates, Stephen Jay Gould, and UBC's own William Rees, originator of the "ecological footprint" concept.

The unexpected and often intimate moments of connection are what make the AAAS conference so unique. This is where you'll see a high-school student sitting with the director of the U.S. National Science Foundation, or a scientist from a developing country talking with the head of the Human Genome Project. The breadth of the conference, encompassing every discipline from astronomy to zoology, and the diversity of the program make it appealing to an unusually large, global audience.

The meeting is, in fact, not one but three (we prefer not to call it a three-ring circus.) The scientific program, featuring 170 symposia for 2012, drew nearly 5,000 general attendees last year in Washington, D.C. The newsroom operation served more than 1,000 newsroom registrants in 2011. Two free Family Science Days lure thousands of public visitors each year and fufill AAAS's mandate to engage the public in open dialogue on science-society issues.

For the Vancouver conference, our program committee reviewed 355 symposium in 24 disciplines. By the way, hosting the event in Vancouver recognizes the international scope of the organization, representing 10 million individual scientists worldwide through its membership as well as 262 affiliated societies.

At the 2012 meeting, look for plenaries by Mike Lazaridis of Research in Motion, Ismail Serageldin of the New Library of Alexandria, Egypt, and Frans B.M. deWaal of the Yerkes Primate Center at Emory University. Topical lecturers will include Carl Wieman of the U.S. Office of Science and Technology Policy, who has a joint appointment at UBC.

Science headlines will likely encompass hydraulic fracturing or "gas fracking," archaeoacoustics, climate change impacts to marine life, particle physics, endangered languages, spinal cord injury research, and much more. The Family Science Days lineup features UBC astrophysicist Jaymie Matthews, Simon Fraser nanotech expert Nancy Forde, the aquarium's killer whales guru Lance Barrett-Lennard and Chris Hadfield of the Canadian Space Agency.

The late Carl Sagan once said, "Somewhere, something incredible is waiting to be known." At AAAS, we believe it's waiting to be communicated, too. ●

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