Academic Matters

THE JOURNAL OF HIGHER EDUCATION
LA REVUE D'ENSEIGNEMENT SUPÉRIEUR

An OCUFA Publication April-May | Avril-Mai 2008

The Green University

David Suzuki
Environmentalism and the responsibility of academia

William Rees
Science, cognition and public policy

Ross McKitrick
The environmental crisis: the devil is in the generalities

Brian Wakelin and Kathy Wardle
Universities in a climate of change

Freedom to focus on getting well -
Critical Illness Insurance from OTIP

Being diagnosed with an illness like cancer, multiple sclerosis or a heart attack can make life seem very dark.

Working during this time can be overwhelming but options are sometimes limited when there are bills to pay.

Worrying about finances shouldn't come first.

With critical illness insurance there is a bright side. Gain freedom and financial flexibility while you are trying to heal.

Having this protection in place provides choice - letting you determine your recovery strategy.

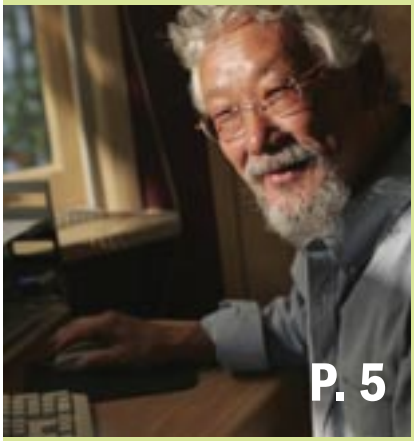
Focusing on your health should come first.

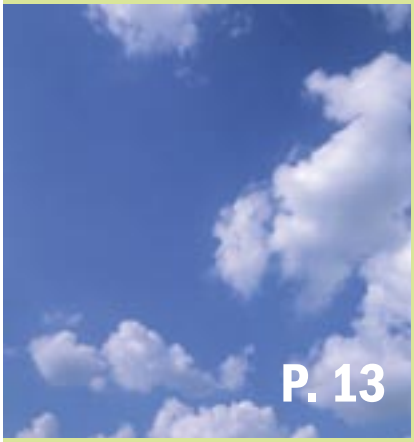
OTIP RAEO®

1.800.267.6847 | www.otip.com

Critical Illness insurance from OTIP (Ontario Teachers Insurance Plan) puts you in control. Eligibility is not based on "family history". Coverage is available to education employees under the age of 65.

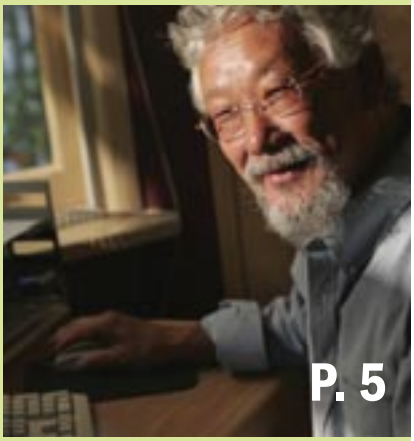
Call an OTIP representative today at 1-800-267-6847.

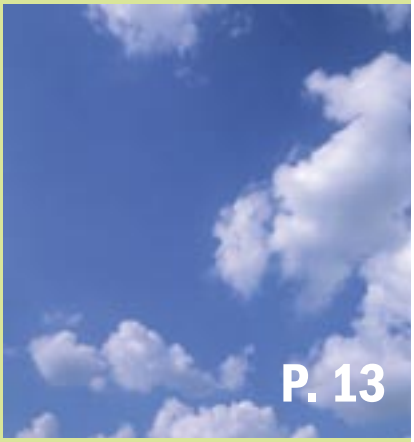




OCUFA
Ontario Confederation of University Faculty Associations
Union des Associations des Professeurs des Universités de l'Ontario

Cover illustration: Marie-Claude Carignan





OCUFA
Ontario Confederation of University Faculty Associations
Union des Associations des Professeurs des Universités de l'Ontario

A NEW REASON TO CELEBRATE

Looking for insurance coverage that fits every stage of your life? Then turn to North America's largest teacher-owned and operated, not-for-profit fraternal insurer.

Now available: Health & Dental Coverage

We're celebrating our new Teachers Life Health & Dental Insurance plans, broadening our District offerings. When you are negotiating a new collective agreement, you need to know that Teachers Life is ready with very competitive, comprehensive solutions backed by our renowned commitment to member service excellence.

Discover more at **teacherslife.com** or 1.866.620.LIFE.

Optimum Insurance Protection at Affordable Prices

District Plans: **Life • Disability • Health & Dental**

Individual Plans: **Life • Critical Illness**

TEACHERS LIFE
Ready For Life

Academic Matters

THE JOURNAL OF HIGHER EDUCATION
LA REVUE D'ENSEIGNEMENT SUPÉRIEUR

Academic Matters is published four times a year by OCUFA, and is received by 24,000 professors, academic librarians and others interested in higher education issues across Canada. The journal explores issues of relevance to higher education in Ontario, other provinces in Canada, and globally. It is intended to be a forum for thoughtful and thought-provoking, original and engaging discussion of current trends in post secondary education and consideration of academe's future direction.

Readers are encouraged to contribute their views, ideas and talents. Letters to the editor (maximum 250 words) are welcome and may be edited for length. To provide an article or artwork for Academic Matters, please send your query to Editor-in-Chief Mark Rosenfeld at mrosenfeld@ocufa.on.ca.

Academic Matters accepte volontiers des articles écrits en angalis ou en français.

Publisher:
OCUFA; Hentry Mandelbaum, Executive Director

Editor-in-Chief:
Mark Rosenfeld, Associate Executive Director

Associate Editor:
Lauren Starr

Art Direction:
Eva Kiss, Neglia Design Inc., www.NegliaDesign.com

National Advertising Sales:
DOVETAIL COMMUNICATIONS
30 East Beaver Creek Road, Ste. 202
Richmond Hill, ON L4B 1J2

Sales Manager:
Beth Kukkonen, bkukkonen@dvtail.com
Phone (905) 886-6640 ext. 306

ISSN 1719-010X

For subscription information, please contact:
OCUFA@ocufa.on.ca

Return undeliverable Canadian addresses to:
Ontario Confederation of University Faculty Associations
83 Yonge Street, Suite 300, Toronto, ON M5C 1S8
Phone (416) 979-2117 Fax (416) 593-5607
www.ocufa.on.ca

union logo here

Letters to the Editor

Dear Editor:

There is much to comment on in your provocatively titled issue, "God on Campus." Especially disappointing is the absence of contributions reflecting the skeptical world-view of those who doubt the very existence of any such god, on campus or elsewhere. Setting that aside, however, let me focus on the article by C.T. McIntire, who is intent on abandoning the "scientific template" in religious studies.

If science is the application of logic and reason to the natural world, then McIntire certainly leads by example. McIntire is critical of religious studies that "... either reduce religions to something like merely societal, cultural, economic, psychological, social controlling or power driven phenomena — or [force] the removal of religions to the stratosphere as other-worldly phenomena concerned with transcendent spirits, gods and heroes." But this is no false dichotomy: Religious divinities are either "other-worldly", or they are not. If such other-worldly deities do not actually exist, then religions are indeed phenomena of the natural world, and a product of the human animal. To use the word "merely" is to diminish the complexities and rich possibilities of the naturalist explanation. As part of his abandonment of the scientific template, C.T. McIntire spurns formerly accepted goals such as secularity, rationality, objectivity and neutrality by turning these into "isms." How long will it be before the anti-science model rejects his own goals of "understanding religion, appropriately, fairly, and critically"? Perhaps the post-post-modernists will caricature such goals as appropriatist, fairist, and cricitalist.

GERHARD PRATT, PROFESSOR, DEPARTMENT OF GEOLOGICAL SCIENCES AND GEOLOGICAL ENGINEERING, QUEEN'S UNIVERSITY

Dear Editor:

I would like to congratulate Academic Matters for publishing the series of articles in the February 2008 issue, including an excellent editorial on the problems and prospects of quality teaching at the university level. It has been a great pleasure on my part to go through the vividly illustrated article series on varied aspects of teaching and the philosophy of teaching. I appreciate the student centric course curriculum approach and the student centric teaching concept. I encourage the editorial board to continue publishing more articles like these as a source of guidelines and encouragement for new faculties and graduate students. The suggestions and directions provided in these well researched articles will surely strengthen the teaching abilities of many new academics and enthusiastic graduate students with teaching assistantship responsibilities.

SAIKAT KUMAR BASU, PH.D CANDIDATE, DEPARTMENT OF BIOLOGICAL SCIENCES, UNIVERSITY OF LETHBRIDGE

Dear Editor:

The December 2007 issue of Academic Matters, devoted to religion, did not include a single skeptical voice. Instead, we got a lot of religion-friendly blather. Tariq Ramadan laughs at the idea that Islamic authorities should denounce terrorism, which is particularly ironic since he himself has, on occasion, refused to do just that. C. T. McIntire claims we need to replace the "disintegrating, modernist scientific template," but offers no evidence that the "template" is disintegrating, and offers no coherent alternative. He scoffs that those studying religion have tried to be impartial, "keep[ing] their religious, political, and moral identity... out of the classroom and out of their scholarship." It used to be that impartiality was valued, because it led to results that could be assented to by those of all faiths. McIntire, it seems, would replace this hard-won academic value with religious cheerleading. Tom Sherwood is not content with the already-extensive resources devoted to chaplaincies and religious constituencies. He wants even more, because "Faith... is part of the landscape of the university."

All of your writers seem to think that religious belief is something we should support and coddle. Not a single writer took issue with the facile credence of believers, the nonsense of religious dogma, the readiness of religion to support attacks on science and rationalism. Society and the university's problems cannot be solved by resorting to prayer. Society—and your editorial board—needs more rational and skeptical inquiry, not blind adherence to dogma.

JEFFREY SHALLIT, PROFESSOR, SCHOOL OF COMPUTER SCIENCE, UNIVERSITY OF WATERLOO

Internationally-acclaimed scientist and environmentalist David Suzuki discusses the obligations of academics in promoting global sustainability and the need for a holistic approach in protecting the planet

Environmentalism and the Responsibility of Academia

by David Suzuki

Scientists, especially those in academia, have played an enormous role in the modern environmental movement. From Rachel Carson, Paul Ehrlich and Margaret Mead, to Barry Commoner, Ursula Franklin, David Schindler, Ransom Myers and E.O. Wilson, reputable scientists have sounded the warnings and become public figures in the quest for a cleaner, healthier planet. Much of the momentum began in 1962 with the publication of Ms. Carson's seminal book, *Silent Spring*. Remember, when her book was published, no government on the planet had a department or ministry of the environment. This tide of science-driven, environmental advocacy continues today, albeit in small pockets, on campuses across North America and the rest of the world.

Never has there been a more important moment for academics to speak out. U.S. President George Bush's perversion of science to political ends is outrageous and ought to be openly challenged at every opportunity. The fact that Mr. Bush, as well as some other politicians, continued to deny the seriousness or even reality of global warming until 2007 is an affront to the scientific community. Every leading scientific body from the National Academy of Sciences (US), Royal Society of Canada, Royal Society of London (UK) to those in China, Japan, Germany, Russia, and more, has declared the threat of human-induced global warming to be real and has called for immediate and deep cuts in greenhouse gas emissions. If we do not use the best science available to help us formulate policy and strategy to confront the most serious issues facing society, we are in a perilous state.

Meanwhile, the Canadian government's stance on global warming has not gone unnoticed. This year, the internationally respected British science journal, Nature, published a strongly worded editorial that criticized the federal government's skepticism on the science of global warming and its retreat from Canada's Kyoto commitment.

The role of the academic in promoting environmental sustainability is pivotal. On the one hand, the general public trusts scientists. On the other hand, the academic has a reciprocal responsibility to engage the populace; after all, they are bilingual, speaking the arcane language of science as well as the vernacular of society. Just as Ms. Carson did in 1962, scientists have to go beyond their narrow role as experts to become leaders who inform the public with what they know. It is the only way to ensure that the public can make informed interventions and force those with the authority to carry out conservation plans and be accountable for their actions.

Equally, with this responsibility comes a great privilege: the open access to new ideas in an arena that encourages thought and debate. When it comes to the environment, students, scholars and academics, like any other group, have a lot at stake in these issues. It should go without saying then, that the very place they congregate should be as green as possible.

However, the most important factor enabling such academic environmental activism has been tenure. Certainly speaking from very personal experience, tenure liberated me from concern about the political and economic consequences of speaking out on issues that involved a clash with corporate or government interests. Tenure was never meant as a sinecure. Instead, tenure is a great privilege wisely conferred to relieve academics of possible consequences of thinking beyond the boundaries of conventional wisdom. Academics have a distinguished history in the role they played in the environmental movement. Sadly, there has been a serious erosion of that seminal role. As universities have sought to supplement their budgets with new sources of revenue, they have entered into an unhealthy partnership with the private sector.

I remember taping a program for *The Nature of Things* on the Alberta tar sands in 1974. A year earlier, the Arab oil embargo led to spectacular and terrifying rises in oil prices. The instability prompted the Science Council of Canada to assign the task of responding to the challenge to Dr. Ursula Franklin. Her committee's 1974 report, *Canada as a Conserver Society,* laid out the framework for what could have led to a fundamental shift to a more efficient, less polluting, sustainable future. In Alberta, then Premier Peter Lougheed proposed rapidly increasing both the number and size of plants in the tar sands. At that time, there was one plant that produced approximately 50 tonnes of sulfur dioxide a year—a lot of acid precipitation. We tried unsuccessfully to interview biologists about the ecological consequences of ramping up tar sands development. The refusal of academics to be interviewed on camera reflected a fear of reprisal or jeopardy of their grants from the oil sector. As biotechnology companies blossomed in universities, serious discussion about the possible hazards or negative consequences was muted as faculty became much more secretive because new insights might be patented. The very reason for tenure was being undermined by the potential for revenue and profit.

Foresight, prescription, and the management of our future

The unique ability of the human brain to conceive of an abstract concept like the future was critical to humans becoming the dominant mammal on the planet. This enabled us to recognize that we could influence that future by what we do in the present. By looking ahead, we could anticipate

When it comes to the environment, students, scholars and academics have a lot at stake. It should go without saying that the very place they congregate should be as green as possible.

dangers and opportunities and deliberately choose a path that would avoid the dangers while exploiting the opportunities. Foresight, coupled with a vast memory, curiosity and inventiveness enabled us to assume an unprecedented position of dominance. Today, human numbers, technological prowess and a huge appetite for consumer goods delivered by a global economy, have made our species a new kind of force capable of altering the biological, chemical and physical features of the planet on a geological scale. And in that position, we have never needed the gift of foresight more. The great descriptive power of science must be a primary element to manage our impact on Earth and navigate the uncertain waters of the future. The major credible source of scientific information is academia without a vested interest in the issues being discussed.

We have to raise public awareness about the nature of science itself. The great strength of science is in its description of the features and state of the world around us. The power of description cannot be overstated. Darwin's observations and inference about evolution have had repercussions throughout society even as we continue to debate the mechanisms underlying the process. Pure description of changing carbon dioxide levels, melting glaciers, migrating animals and plants, has been a powerful indicator that our climate is in fact changing.

But that state of description is in its infancy and we too often mistake our incremental observations with "breakthroughs" in our understanding and ability to control the forces of nature. Take, for example, those who claim to manage fisheries, forests, air, or water. In order to manage anything, whether it is a population of wild animals or a candy store, at a minimum, we need an inventory of everything involved and a blueprint illustrating how the components are interconnected. Well, if we think about Earth, how many species are there? Scientists don't know. There are estimates, anywhere from two million to a hundred million. Most biologists seem comfortable with the estimate of ten to thirty million. To date, we have identified about 1.5 million species which thus suggests we know between five and fifteen per cent of all biological complexity on the planet. And all "identification" means is that a scientist has given it a taxonomic name. It does not mean we know population size, geographic habitat or interaction with other species. We know detailed information on far less than one per cent of all species that have been identified. How could we possibly manage anything with such a primitive level of knowledge? The global ecocrisis demands action but, in view of our ignorance, we should stay away from such geomanipulations such as pouring iron in oceans to stimulate algal growth or spreading sulfur dioxide to mimic the shading of volcanic eruptions. Human beings are at the centre of the problems and we are the only part of the system that can be managed.

An example of the folly of assuming sufficient knowledge to manage nature is the way we treat Pacific salmon. For thousands of years on the west coast of North America, billions of salmon have made their final dash to spawn in thousands of rivers and streams. We have known for years that the five species of Pacific salmon need the forest because whenever the trees surrounding a watershed are cleared, salmon populations in that watershed plummet and even disappear. The fish need the trees to cling to soil and prevent erosion that clogs spawning reddes, to shade the streams to keep temperatures lower and to provide feed to the baby salmon before they reach the ocean. Biologists have discovered the need is reciprocal, that the forest needs the fish.

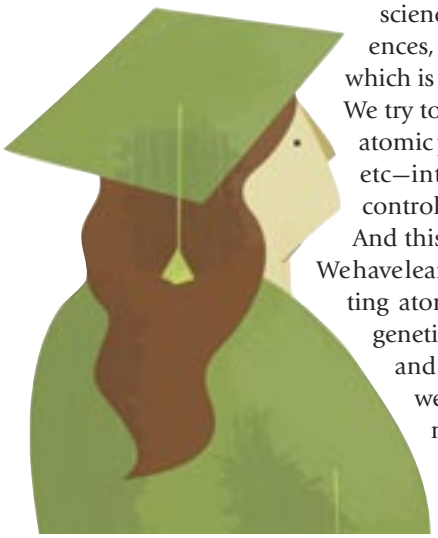
It rains a lot along the Pacific coast and that water supports the temperate rainforest that has the highest biomass of any ecosystem on the planet. Trees there are huge. But that heavy rainfall washes matter out of the soil and along the coast, nitrogen is in scarce supply and is the limiting growth factor. Scientists have long wondered how such big trees could grow in such poor soil. The answer turns out to be the salmon. On land, most nitrogen is found in the form of ^{14}N while in the oceans; the heavier isotope of ^{15}N is more abundant and is a useful 'marker' for a marine origin. When the salmon go to sea, their growth incorporates a lot of ^{15}N into their bodies. Using the isotopic markers, scientists have demonstrated that when salmon return to their natal streams,

they represent by far, the single largest pulse of nitrogen fertilizer the forest receives in a year.

Through vectors like bears, wolves, eagles and insects, ^{15}N from the ocean is spread through the forest. Annual growth rings have been shown to correlate with both the size of salmon runs and amount of ^{15}N present in rings. Carcasses of salmon that sink to the river bottom are soon covered in thick coats of fungus and bacteria that provide feed for the baby salmon when they emerge from the gravel to begin moving. Salmon carried by bears into the forest are soon devoured by fly maggots that then drop to the forest litter and emerge the following spring by the trillions just at the time birds migrating from South America pass through on the way to Arctic nesting grounds.

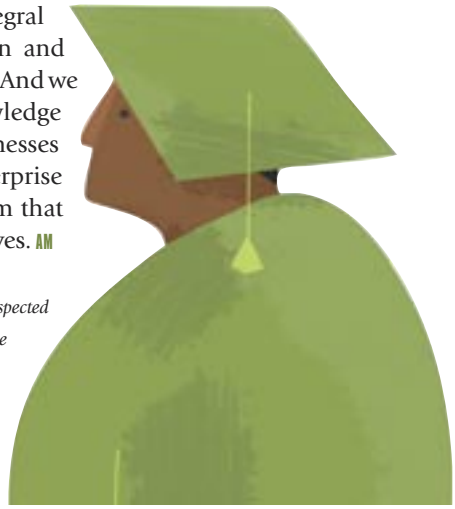
Ocean and land, northern and southern hemispheres, fish, trees, birds and mammals are all a part of a single integrated entity. Modern society attempts to manage these various components by distributing them to different ministries: fish to Fisheries and Oceans (commercial), Indian Affairs (native food) and Tourism (sports); trees to Forestry; eagles, bears and wolves to Environment; rivers and lakes to Agriculture (irrigation) and Energy; boulders and mountains to Mining. This approach shatters what is a single entity into limited governable pieces thereby ensuring they will never be managed sustainably.

Our great weakness in science is in prescription, which is providing profound solutions to problems. Right now a large part of the problem is that we know so little. But there is another even deeper difficulty. Most of modern science, especially in the life sciences, is based on reductionism, which is focusing on a part of nature. We try to bring that fragment—a subatomic particle, atom, molecule, cell, etc—into the lab where we can control, manipulate and measure it. And this provides powerful insights. We have learned to release energy by splitting atoms, read and synthesize the genetic code, clone molecules, cells and organisms. The hope is that if we can acquire enough information about the pieces, then like a gigantic jigsaw puzzle, it can all be put together to provide a coherent whole. But in the process of focusing on a part, we remove it from the context within which it exists and interacts and so we are blind to the rhythms, patterns and cycles that impinge on it. While we learn a great deal through reductionism, no amount of experimentation can provide the important insights into how it all works in the real world.



As an example, we need look no further than DDT, a complex ring molecule that was first synthesized in the 1800s. When Peter Mueller, working for Geigy in Switzerland, discovered that DDT kills insects, it was hailed as a miracle cure for pestilence that had plagued humankind for millennia. Mueller was awarded the Nobel Prize in 1948. I vividly remember in the mid 1940s on a farm in southern Ontario, my mother would set out food for dinner then spray DDT above it, a mist then slowly sinking onto our plates. We believed the press, that here was a miracle chemical, killing pests but harmless to people. But by the 1950s, massive use of DDT was found to correlate with declines in bird populations and in tracking down the cause biologists discovered a hitherto unknown phenomenon of biomagnification. No amount of testing in growth chambers or control plots could ever have revealed the concentration of molecules up the food chain, ultimately accumulating in the shell glands of birds and affecting the viability of eggs.

Here is the crux of what I believe is the great challenge for academics. We have to educate people about the reality of the biosphere within which we live and derive a living. We have to show them that we remain animals, as dependent on the quality of air, water, soil and energy and on biodiversity, as any other species. We have to make science an integral part of the way we plan and strategize into the future. And we have to openly acknowledge the strengths and weaknesses of both the scientific enterprise and the economic system that shapes so much of our lives. AM



David Suzuki is an internationally respected geneticist, professor emeritus with the University of British Columbia's Sustainable Development Research Institute, co-founder of the David Suzuki Foundation and an award-winning broadcaster.

University of British Columbia's William Rees examines the use (and abuse) of academic research in the development of environmental public policy

Science, Cognition and Public Policy

by William Rees

We are not a science-based society

The western world, at least, thinks of itself as a post-Enlightenment world, a world freed from superstition and empowered by reason. People generally believe that modern nations are no longer the slaves and dupes of myth—humanity has long moved beyond the groundless fears, falsehoods and unscientific beliefs that distorted reality and shaped the lives of earlier cultures.

Nowhere has this belief been more strongly entrenched than in our universities. Higher education is nominally all about the development of intellect, reason and our capacity for critical thinking. Academic research, particularly in the biophysical sciences, is among the most formal expressions of the organized rational mind. And there is no scarcity of evidence that sheer reason, critical analysis and formal experimental methods have produced spectacular results across the academic spectrum. Modern societies have made enormous progress against racism and gender bias and for universal human rights; medical science has improved the quality of life and prolonged the lives of billions; techno-industrial society, with its prodigious output of consumer goods is both product and proof of humanity's scientific mastery of the material world. But for all the achievements of modernity, it is time that we acknowledged an increasingly evident paradox. This may well be the age of science, but this fact has not prevented us from being as myth-bound as any preceding culture.

This paradox is understandable if one appreciates the adaptive advantage that might accrue to myth-making. Consider Colin Grant's enlightened perception of *Myths We Live By* not as superstitious lore or fairy tales for the childishly gullible, but rather as socially constructed comprehensive visions "that give shape and direction to life." Indeed, myth-making in various forms—think 'political ideology,' 'disciplinary paradigm,' 'religious doctrine'—is a universal property of human societies and plays a vital role in every culture including our own. The assertion that ours is a myth-free culture may actually be one of our most important cultural myths!

Myth and the policy process

> "Not truth, but error has always been the chief factor in the evolution of nations... The masses have never thirsted after truth. They turn aside from evidence that is not to their taste, preferring to deify error, if error seduce them. Whoever can supply them with illusions is easily their master; whoever attempts to destroy their illusions is always their victim." Gustave Le Bon

Academic researchers are trained to believe that better data and analyses lead to better environmental decision-making. Most grant applications in any area of public policy relevance are at least partially justified on grounds that the results of the proposed study will improve policy development. This seems a reasonable assumption and one that the public can readily appreciate. How often have we heard that the government cannot act yet on some critical ecological problem (biodiversity loss, fisheries collapse, climate change, etc.) because of insufficient data and the need for more research?

Unfortunately, politics is among those domains of human activity least beholden to sound academic research. First, politics—indeed, social relations of all kinds—is about power, ambition, social status, and personal prestige. Thus, while politicians will readily adopt research that supports their beliefs, many show little affinity for results that challenge their political survival. Indeed, they will readily abandon science that speaks to the long-term public interest, giving way to powerful special interests if to do so helps ensure re-election. Being the best-studied fishery on the planet was not sufficient to save the North Atlantic cod from economically-driven collapse; Alberta's money machine in the oil-sands and the power of the oil and gas industry have so far made the province invincible to policies to reduce greenhouse gases or protect the land and waters of the boreal region.

Second, politics is ideological and, like other mythic constructs, a political ideology can be a rather ungainly concoction of fact and values, assumptions and illusions. It often gains credence only after frequent repetition and ritualistic affirmation. But while people may come to believe profoundly in a particular political position, ardent belief alone cannot true that position with reality. In these circumstances, we would do well to recall Henry Kissinger's dictum that "It is not a matter of what is true that counts, but a matter of what is perceived to be true." In other words, policy action is often propelled more by myth than science.

Contemporary history provides evidence enough for this assertion. [1] U.S. President George W. Bush is a neoconservative—environmental sceptic, champion of the corporate sector and devotee of economic growth (and also Christian fundamentalist). After less than two months in office, the new President Bush announced that he would abandon a campaign promise to regulate carbon dioxide from coal-burning power plants, the US's largest source of carbon dioxide. He subsequently pulled out of the Kyoto Protocol, the first binding international agreement to limit greenhouse gas emissions. Indeed, the Bush administration has waged a virtual war on the environment by reversing ecologically progressive legislation and enabling industries to log national forests, divert water, and pollute the atmosphere, soils and waterways, even in national parks. He would permit drilling for petroleum in the Alaska National Wildlife Refuge; at one point, his administration joined the automobile industry in a lawsuit against California, challenging the state's authority to set emission standards tougher than those of the federal government.

No one should be surprised that President Bush's environmental policies have reflected his political philosophy, favouring so-called free enterprise and the economy at the expense of all other values. We should all be disturbed, however, that U.S. science itself is being forced to conform to the same ideological mould. On 14 September 2004, a New York Times editorial charged that "The Bush administration has from time to time found it convenient to distort science to serve political ends. The result is a purposeful confusion of scientific protocols in which 'sound science' becomes whatever the administration says it is... this is a tactic to override basic environmental protections in favor of industry."

Governments often take policy decisions that are against their own long-term interest or the interests of their constituents, even though viable alternatives are available and known to the decision-makers.

Perhaps the most egregious and best-known example was revealed by Dr. James E. Hansen, head of NASA's Goddard Institute for Space Studies and among the world's leading researchers on climate change. In 2005 and 2006, Hansen asserted in the *New York Times* and the *Washington Post* that, following orders from the Bush administration, NASA administrators were trying to influence his public statements about the causes of climate change. He claimed that the government was restricting whom he could talk to and editing what he could say. According to Hansen, politicians were rewriting the science: "In my more than three decades in the government, I've never witnessed such restrictions on the ability of scientists to communicate with the public."

U.S. scientists are beginning to fight back. In mid-February 2008, the Union of Concerned Scientists (UCS) convened a panel in Boston to issue a statement asking Congress to protect scientific integrity. The UCS called on Congress to ensure that the next president does not censor,

suppress and falsify important environmental and health research as it claims the Bush Administration has done. Spokesperson Susan Wood, a former director of women's research at the U.S. Food and Drug Administration insisted that "The next president and Congress must cultivate an environment where reliable scientific advice flows freely."

Canadians can hardly feel smug about the freedom of government scientists on this side of the border. Indeed, Ottawa seems to be reading from the same manual on environmental governance as the Bush administration. Certainly it asserts notoriously tight central control over information flow and the policy process to ensure minimal interference with corporate interests and the economy. In early February 2008, the national media reported that Environment Canada had for some weeks been formally "muzzling" its scientists. Apparently, all media inquiries must now be routed through Ottawa, where media relations personnel work with scientific staff to ensure that that responses conform to "approved lines." The reports claim that the policy is blocking effective communication and infuriating the scientists. Gregory Jack, acting Director of Environment Canada's ministerial and executive services, explains that "there is no change in access in terms of scientists being able to talk." It's just that they have to respond in a "quick accurate way that is consistent across Canada." One is left to assume that "accuracy" and "consistency" in this context are determined by conformity with the pre-approved party lines. It is hardly reassuring when Jack asserts that the policy is designed to bring his department in line with other federal departments. Does Harper's conservative ideology now prevail over solid research and other alternative perspectives right across government in Canada?

Politicians' defence of ideology and the status quo against the harsh barbs of reality can have tragic consequences. In The *March of Folly,* U.S. historian Barbara Tuchman documents how governments, as long as there have been governments, often take policy decisions that are against their own long-term interest or the interests of their constituents, even though viable alternatives are available and known to the decision-makers. Millions have died and whole societies have collapsed as a result. Tuchman argues that sheer "wooden-headedness, the source of self deception... plays a remarkably large role in government. It consists in assessing a situation in terms of preconceived fixed notions [i.e., ideology] while ignoring any contrary signs. It is acting according to wish while not allowing oneself to be deflected by the facts." To paraphrase the *New York Times,* in such circumstances sound science becomes whatever the ruling faction says it is. What constitutes 'sound science' is further complicated at the global level by the clashing ideologies of various national governments and the rising influence of self-interested corporate lobbying efforts over governments of all stripes. The result ranges from profound policy error by many countries in such domains as bio-fuels, to quasi-paralysis in others including climate change. In this light, consider the closing words of Sweden's Tällberg Forum 2007, a hard-nosed assessment of the international situation respecting climate change and the global policy transition necessary to achieve sustainability: "Do we know what to do? Probably yes. Will we do it? Probably not."

The human nature of cognition

Contemporary research in neuroscience and human cognition provides important insights into the power of ideology and, coincidentally, society's limited progress on the ecological sustainability file. It seems that neurological development is a highly integrated process that is partly genetic (nature) and partly social (nurture). The human brain and all its macro-potentials are genetically fixed but individual experience determines much of the micro-structure.

A fundamental finding of cognitive science is that during early life and maturation, sensory, social and cultural experiences contribute to shaping the individual's brain structures and synaptic circuitry. Effective socio-environmental influences range from physical contact, through observed social behaviour, to elements of abstract political ideology. The critical point is that, once entrenched, an individual's neural structures alter his/her subsequent experiences and perceptions. As Yale psychiatry professor Bruce Wexler explains in *Brain and Culture,* people tend to seek and create experiences that reinforce their pre-established circuitry and to select information from their environment that most closely matches these structures. Conversely, when faced with information that does not agree with their internal structures, they deny, discredit, reinterpret or forget that information.

The new science also suggests that human neural plasticity diminishes with age. (Actually, folk wisdom got there first: "You can't teach an old dog new tricks.") There is no penalty for this in a stable environment; indeed, in relatively unvarying circumstances behavioural conservatism may even be rewarded. However, once an individual's neural structures are well-engrained, significant changes in either the socio-cultural or biophysical environment pose a major adaptive challenge. To re-establish psychological consonance between programmed perceptions and new environmental realities requires that people engage wilfully in the restructuring of their own neural pathways and psychological states. Even when one accepts that such 'reprogramming' is necessary, the process can be lengthy, difficult and unpredictable.

This emerging understanding of cognitive development provides an explanation for ideological intransigence even as the ecological crisis unfolds. Human reasoning power is compromised when new data conflict with critical elements of an individual's established personality, identity, social status or paradigmatic expectations. This helps explain why both politicians and ordinary people may readily accept science that reinforces existing policy and life-styles but reject data and analysis that requires altering course (think 'climate change'). The latter tendency will be compounded if the leader must remain loyal to vested interests and political allies

to ensure his/her own political survival. In short, ignoring or misusing science in environmental policy is all but inevitable—short-term limbic and brain-stem defences are not easily swayed by long-term logic, rational assessments, or moral and ethical arguments. Little wonder that forty years on, most symptoms of the gathering global ecological crisis are steadily worsening.

Epilogue—sustainability and higher education

> "...[the depletion and pollution of the planet] is not the work of ignorant people. Rather it is largely the result of work by people with BAs, BSs, LLBs, MBAs and PhDs" (David Orr).

Environmental educator David Orr asserts that higher education presently contributes to the destruction of the planet because it both embodies the growth-oriented techno-social paradigm and helps to reproduce it. Certainly the modern curriculum, particularly in the applied and social sciences still mainly reflects a set of (often unstated) core values that serve to set humanity against nature and ultimately against itself. Consider the following suspects: anthropocentrism, humans-as-masters-of-nature (or the feminists' extension, the dominance of white males over women, children, other races, and nature) atomism, reductionism, mechanism, materialism and utilitarianism. These are the values that underpin contemporary techno-industrial society with its emphasis on material wealth and economic growth through competitive market mechanics and techno-efficiency. Society's emphasis on monetary value ensures that the majority of research funds goes to those disciplines that produce patentable goods and licensable services privileged by the marketplace. Disciplines and knowledge that have less commodity value—but possibly higher contemporary survival value—struggle to stay afloat. Some universities even seem to see their role more in terms of producing employable 'products' for the increasingly competitive global economy than in creating better, more intellectually aware world citizens. Perhaps Orr has a point that higher education currently impedes sustainable development.

The lesson for education is obvious. Schools, colleges and universities should be engaged in a deliberate process of reinventing themselves and, in the process, helping to reinvent society. If our prevailing cultural myth has become maladaptive, we should be engaged in constructing another, one whose derivative political philosophies will better map to biophysical reality. Physiologist Jared Diamond's *Collapse* shows that societies that avoid the environmental abyss are culturally nimble societies, those that discard failing core values and radically transform themselves for survival. The outstanding question is: In today's strife-torn world, will cooperative intelligence and enlightened self-interest be able to create the behavioural templates necessary for sustainability and override the darker shades in the spectrum of human behaviour that would frustrate the effort?

We'll never know unless we let the paradigmatic revolution begin. AM

---

[1] The Bush regime's fabrication of a grand mythic narrative to rally the US 'tribe' in favour of its invasion of Iraq may be the most dramatic contemporary example.

William Rees is a professor in the School of Community and Regional Planning at the University of British Columbia, a member of the Royal Society of Canada, and an internationally recognized scholar of human ecology and ecological economics

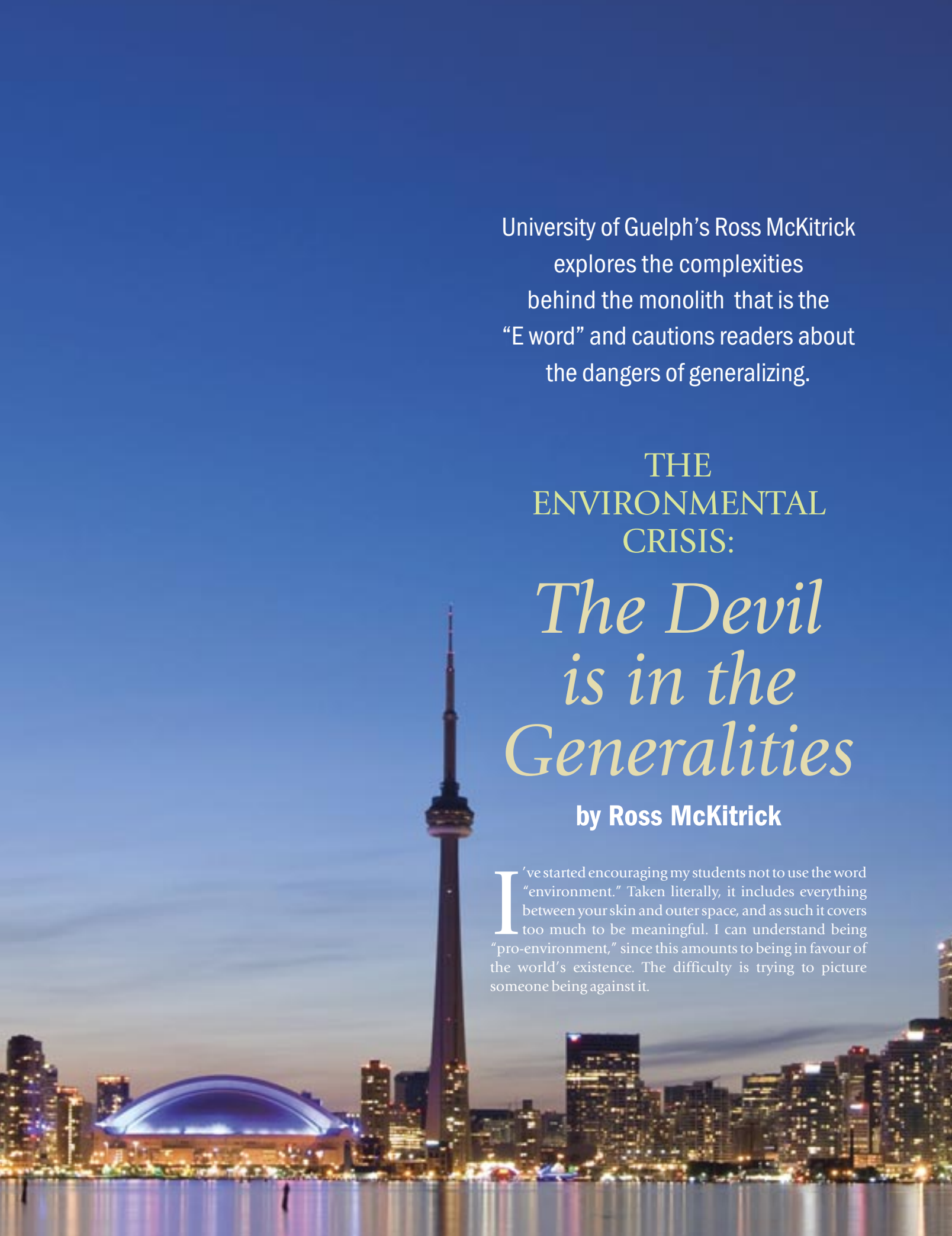
University of Guelph's Ross McKitrick explores the complexities behind the monolith that is the "E word" and cautions readers about the dangers of generalizing.

THE ENVIRONMENTAL CRISIS:

The Devil is in the Generalities

by Ross McKitrick

I've started encouraging my students not to use the word "environment." Taken literally, it includes everything between your skin and outer space, and as such it covers too much to be meaningful. I can understand being "pro-environment," since this amounts to being in favour of the world's existence. The difficulty is trying to picture someone being against it.



If the conversation treats the environment as a single, abstract whole, we lose the ability to guide our thinking with the tools of measurement, experimentation, modeling and hypothesis testing.

But these days when people say they are "pro-environment" they typically have something more specific in mind. With so much anxiety on the subject, and so many public policy decisions influenced by that anxiety, it is important to try to clarify those specifics. In this respect, common usage of the term "environment" seems to me to create two problems.

First, using the general word "environment," instead of more specific terms, tends to detach any ensuing discussion from the prospect of measurement with real data. We can measure specific types of pollution, biological conditions, resource scarcity, etc. But there is no way to measure the "environment" as a whole.

At a minimum, we ought to distinguish between air, water and land-related issues. But even within these categories the sub-distinctions are large and important. Consider air pollution, for example. If we start with the question of whether air quality in your region is getting better or worse, we soon run into the complexity that it is not one thing, but many different things. There are hundreds of air pollutants addressed by contemporary regulation. Some are gases, some are particles, some are aerosols. Some are emitted, some are formed by chemical reactions involving ambient levels of precursor compounds. Some are toxic, some are not. Some are more prevalent in cities, some in rural areas. Some are affected by meteorological conditions, some are not. All these distinctions matter when trying to characterize the issue.

Each year, my students' first assignment is to get long term air pollution data from Environment Canada for the city (or, if available, the neighbourhood) in which they grew up, and write a report on how air quality, as represented by the major contaminant species, has changed since they were born. Most are surprised to see how much it has improved (and if I had asked them to go back to 1970s data they would have seen even larger improvements). In the mid-1960s, sulphur dioxide levels in downtown Toronto averaged over 100 parts per billion. Today they average less than five parts per billion. The effective disappearance of sulphur from urban air is a common pattern in Canadian data. But not all contaminants have gone down. Compared to the early 1980s, ground-level ozone has risen, though the number and intensity of summertime peaks has tended to diminish in some places.

If we ask whether air pollution has gotten worse, the answer is "it depends." Many air pollutants have been reduced. If we focus on ozone and ask how it should be reduced further, the distinction between emitted and precursor-based pollutants comes into play. Ground-level ozone is not emitted, it is the result of complex chemical reactions between nitrogen oxides and volatile organic compounds, each of which comes from both human and natural sources. Depending on meteorological conditions and the current concentrations of these precursor gases, a decrease in, say, nitrogen dioxide, might lower the ambient ozone level, but it might also raise it. Or it might lower it locally but cause it to increase in a downwind region.

I saw a vivid example of the disconnect between perception and measurement last year, when I heard a well-known Canadian newspaper columnist give a keynote address to a conference of economists. He expressed his hope that the federal government would soon move to regulate air pollution. He grew up in rural Ontario, he said, in a place where there never used to be smog warnings. But in recent years, air quality in Ontario had become intolerable. There have been smog warnings even in his home town, he said, and there was even one in winter a few years ago. He was dismayed that governments had allowed air pollution to be unregulated for so long, and he called on the federal government to take action.

I introduced myself to him after his talk. I explained that he did not recall any so-called "smog warnings" (actually Air Quality Advisories) from his youth because the system did not exist back then, but smog certainly did. The Air Quality

Index was only introduced in 1992, and in late 2002 the formula was revised so that it is triggered under broader conditions. That is why we recently had our "first ever" winter smog warning. But actual air pollution levels have gone down across Ontario, even in Toronto. If the current smog warning system had existed in the 1960s, there would have been alerts all year round; they would seem remarkably infrequent today, by comparison. I also explained that air pollution has been subject to provincial regulation for decades, and is not under federal jurisdiction.

He was taken aback by all this, and said he would like to write a column about it. Later I emailed some information sources to him, but by then he had moved to a new assignment and wasn't able to write further on this issue. What struck me at the time was that this was a well-educated national journalist, whose job requires him to be informed about major policy issues, who was giving a prepared speech on a topic of obvious personal concern to him, before a conference of professionals, and yet when he stood up to speak, what he had to say was completely wrong on points that are easy, with minimal effort, to look up.

That is, in a nutshell, my first concern about the word "environment." Academics tell their students to "look it up." But this requires a habit of thinking about specifics. You can't "look up" the state of the environment. You can look up specific aspects of it: air pollution, water pollution, forest cover, land use patterns, resource stocks, species populations, and so forth. But if the conversation treats the environment as a single, abstract whole, we lose the ability to guide our thinking with the tools of measurement, experimentation, modeling and hypothesis testing.

My second concern about the E-word follows from the first. In the absence of specific measurement, or even agreement on what we ought to be measuring, the discussion too readily seems to get framed in the language of crisis. I grew up hearing about the environmental crisis. Twenty years ago I decided to specialize in environmental economics after hearing more and more about the environmental crisis. But in the intervening years I have found that the perception of crisis is often inversely proportional to the specificity of the discussion.

The intellectual pilgrimage of Danish academic and author Bjorn Lomborg is well known in this respect. Lomborg was annoyed upon hearing an American economist (Julian Simon) claim that the state of the world was improving. To debunk the claim, he waded into detailed examination of specific data, and ended up conceding the argument by way of his bestseller, *The Skeptical Environmentalist.* My own pilgrimage has similar elements. In 1999, as part of a research project I was starting, I contacted the Ontario Ministry of the Environment to obtain some historical air and water pollution data. I got the data, graphed it, and my assumptions about pollution trends promptly fell to pieces. It forced me to wonder why I carried those assumptions for so many years without ever looking up the underlying information.

Back then I taught a second-year course called "Economic Growth and Environmental Quality," a popular elective with environmental science majors. Rather than begin with a load of economic theory, I would start by showing my collection of data on air and water pollution, with many of the series plotted against measures of local real income. In most cases (though by no means all), greater wealth and income seems to accompany lower pollution levels. This would immediately raise questions about how economic growth could accompany environmental improvement, thereby motivating interest in the main content of the course.

One year an environmental science student challenged me over the data I was showing. He was convinced that I was cherry-picking. So I invited him to go to the library and find all the data he could, and I promised to show anything he wanted to the class. He arrived in my office the next day convinced that he had found data refuting the general pattern that wealthy countries were cleaner. When he showed me the graph, I pointed out that the axis measured water *quality,* not pollution, and the implication was the opposite of what he thought.

At this point he slumped in the chair with a mystified look. He said that on his first day of class four years earlier, the professor had told them "The environment is in worse shape now than it was ten minutes ago, and ten minutes from now

it will be even worse. It is up to you to stop this." Since then he had been filled with a great sense of purpose and excitement, but somehow he hadn't actually looked at much data. Now that he was, for the first time, seeing measurements of the things he had been talking about for years, the picture was not what he expected it to be.

It has become a commonplace to refer to the "environmental crisis." But I find the crisis rather hard to locate. On specific issues there is a continuum, ranging from non-issues, situations of concern, problems, and onward up to actual crises. Not everything is a crisis, just as not everything is a non-issue. Things mostly fall in between. But to see this requires leaving aside the concept of the environment as a single abstract whole, and going into specifics.

Let me take the highly contentious topic of global warming as an example. Al Gore referred to it as a "planetary emergency" in his testimony before Congress last year. Similar language in the media and among politicians is now ubiquitous. A couple of years ago, knowing that I was involved in debates about this, a colleague expressed to me his exasperation at the seemingly intractable disputes. Surely, he reasoned, there must be agreement by now about what the issue is, and how to measure it, and at that point we should be able to look at the data and decide.

This is the right way to approach the issue. Here is my suggestion about measurement. A little-noticed message from last year's report of the UN Intergovernmental Panel on Climate Change (IPCC), echoing Report 1.1 from the United States Climate Change Science Program (CCSP) in April 2006, is that if greenhouse gases are driving climate change, there will be a specific pattern to it. The warming will be at a maximum in the tropical troposphere, which is the region of the atmosphere from one kilometer up to about 16 km above the surface, between thirty degrees North and South of the equator. Model "back-casts," or simulations of the 20th century evolution of the atmosphere, indicate that this warming pattern should be running at about double the surface warming rate, it only arises from greenhouse gases, and it ought to be observable already (I am referring here to Figure 9.1 of Volume 1 of the IPCC Report, and Figure 1.3 of the CCSP report.) Model projections of 21st century greenhouse warming all show that it will reach a maximum in the tropical troposphere, and that the effect occurs rapidly in response to greenhouse gas accumulation (IPCC Volume 1 Figure 10.7, discussed on pages 763—764).

Since the tropics accounts for half the world's atmosphere, and since the model consensus points to a rapid response to greenhouse gases in the tropical troposphere, and furthermore that this is where the maximum greenhouse warming is expected, the data for this region seems to me to be a good candidate for measuring an upper bound on human-induced global warming. There are two teams (one at the University of Alabama-Huntsville and one at Remote Sensing Systems in California) that use weather satellite data to produce measures of the average temperature for the tropical troposphere. Both teams report a small upward trend for this region (0.18 degrees C per decade) since 1979, just below the low end of the forecast range in the recent IPCC report.

To my mind, this trend is not indicative of a crisis. Indeed, the CCSP report drew attention to the tropical data, pointing out that "the models that show best agreement with the observations are those that have the lowest (and probably unrealistic) amounts of warming" (p. 11). Leaving aside the bracketed gloss—though it is interesting to ask how models showing the best fit to the data but the least fit to modelers' prior beliefs are deemed unrealistic—I take this to mean that the current data does not validate the mid-range or upper-range of the warming projections, and at the moment our attention should be on the low end of the forecast range.

But things might change. As a policy idea, I have proposed that governments ought to consider implementing a tax on carbon dioxide emissions, with the growth of the tax tied to the trend in the temperature data from the tropical troposphere. At the upper end of the IPCC projections the tax would go up fast enough to bring about aggressive emission reductions, while at the low end the tax would only slowly curtail some emitting activity. In other words, the atmosphere's revealed sensitivity to carbon dioxide emissions would determine how aggressive the policy would be, and all parties to the debate would thereby expect to get their

APRIL 2008

ONTARIO University Report

THE ONTARIO CONFEDERATION OF UNIVERSITY FACULTY ASSOCIATIONS

OCUFA

Budget Fails to Address Quality Crisis in Post Secondary Education in Ontario

On March 25, 2008, the provincial government released its budget with funding for students, universities and research. As welcome as this funding is, it falls well short of the resources required to improve the quality of university education to a level comparable to that received by students in other jurisdictions. The budget did not include any additional funding to hire the thousands of new faculty that are required to protect the quality of higher education.

In response to the government's budget, OCUFA delivered the message that investing in buildings will not remedy the problems facing Ontario universities. For students to receive the quality education they deserve, sufficient academic staff need to be hired. The only way to reduce class sizes and improve student-faculty ratios is to hire more faculty now.

Just as in 2003, Ontario ranks last in Canada in funding of universities, per capita. Student-faculty ratios in Ontario continue to be the worst in the country at 26 students for every faculty member, compared with 22 students in the rest of Canada and 16 students in American peer institutions. Class sizes continue to increase. Concequently, Ontario students reported 28 percent lower levels of interaction with faculty than students at peer institutions in the United States.

OCUFA has also repeatedly called on government to ensure that students have access to the same quality of education as their parents did. Ontario is not committing the resources to the children of baby boomers it did for their parents 30 years ago — even though, it is estimated, 70 per cent of jobs will require a university education. Today's inflation adjusted funding per student falls woefully short that of the 1970s: an average $4,271 per student today versus $6,568 in the 1970s, a gap of $2,297, or 35 per cent less.

The Reaching Higher plan was a good beginning, but the government has not followed through. At the very least this budget should have contained $440 million to hire the 5,500 new tenure stream faculty that are required to bring Ontario's 2009-10 student-faculty ratios to the Canadian average and ensure that students receive the high standard of educational experience they deserve.

The year 2008-09 is an opportune time to take advantage of increased federal funds for post-secondary education (PSE) and to make headway on addressing ongoing shortfalls in operating funding.

Without this funding, university students across the province will see their class sizes grow even larger, they will have even less interaction with their increasingly transient faculty and their education will suffer.

Further analysis of this budget can be found on OCUFA's webpage.

Professor Brian E. Brown, OCUFA President

Ontario University Report is your best way to keep up with Ontario faculty news!

Ontario University Report is OCUFA's electronic publication. It will keep you informed about developments, trends and ideas that affect faculty association members in Ontario. It is published 10 times a year. Subscribe to the Ontario University Report! It's free to all members of OCUFA affiliated faculty associations.

Go to OCUFA's website: www.ocufa.on.ca and follow the link to the Ontario University Report.

Upcoming OCUFA Biennial Conference
Accounting or Accountability in Higher Education?
January 23-24, 2009

The Ontario Confederation of University Faculty Associations (OCUFA) will be holding a 1½ day academic conference entitled "Accounting or Accountability in Higher Education?" on Friday, January 23 and Saturday, January 24, 2009 at the Sutton Place Hotel, Toronto, Ontario.

The conference will bring together speakers from universities and research institutes in Canada, the United States and Europe. It is designed to reflect on both the theory and practice of accountability in higher education and consider what a truly accountable system could look like.

There will be three keynote addresses and four panel sessions. Topics include: accountability initiatives in higher education, current approaches to accountability, student surveys and university rankings. Confirmed speakers to date are:

- Bjorn Stensaker, Head of higher education research, NIFU STEP Studies in Innovation, Research and Education, Oslo, Norway.
- Tony Keller, Managing Editor, Special Projects, Maclean's
- Tony Chambers, Associate Vice-Provost Students, OISE, University of Toronto

> **The fee for registering on or before December 12, 2008 is $275.00, which includes continental breakfasts, lunch, refreshments and all materials. The student rate is $150.00.**
>
> **For more information, please contact Mark Rosenfeld at: mrosenfeld@ocufa.on.ca or 416-979-2117 x233**
>
> **To register please contact Lisa Alexis at: ocufa@ocufa.on.ca or 416-979-2117 x228**

Call For Nominations

Member of OCUFA Executive

OCUFA invites applications for a position on the OCUFA Executive for Fall 2008. This position is open to any person who at the time of their election will have served at least one year as a member of a local association Executive Committee or an OCUFA Standing Committee.

This position requires a committed individual, with knowledge of faculty and librarian concerns and who can speak on behalf of faculty. Preference will be given to members with previous OCUFA experience.

The person being nominated should provide an information statement outlining his/her background and experience, as well as a statement that he/she agrees to be nominated and agrees to serve if elected. Please send written nominations, from the Member association or from the OCUFA Director, to the Chair of the OCUFA Board:

> **Dr. Glenna Knutson**
> **C/O OCUFA**
> **83 Yonge Street, Suite 300**
> **Toronto, Ontario M5C 1S8**

Member of OCUFA Status of Women Committee

OCUFA invites applications for a position on the OCUFA Status of Women Committee for Fall 2008. This position is open to any person who at the time of their election will have served at least one year as a member of a local association.

This position requires a committed individual, with knowledge of faculty and librarian concerns and equity or women's issues. Preference will be given to members with previous OCUFA experience.

The person being nominated should provide an information statement outlining his/her background and experience, as well as a statement that he/she agrees to be nominated and agrees to serve if elected, to the Chair of the OCUFA Board:

> **Dr. Glenna Knutson**
> **C/O OCUFA**
> **83 Yonge Street, Suite 300**
> **Toronto, Ontario M5C 1S8**

AVRIL 2008

Rapport sur les universités ONTARIENNES

UNION DES ASSOCIATIONS DES PROFESSEURS DES UNIVERSITÉS DE L'ONTARIO

OCUFA

Le budget n'aborde pas la crise de la qualité de l'éducation postsecondaire en Ontario

Le 25 mars 2008, le gouvernement provincial a publié son budget comprenant le financement pour les étudiants, les universités et la recherche. Même si nous accueillons ce financement avec enthousiasme, il est loin d'affecter les ressources requises pour rehausser la qualité de l'éducation universitaire à un niveau comparable à celui que reçoivent les étudiants d'autres juridictions. Le budget n'incluait pas de financement additionnel pour l'embauche des milliers de nouveaux professeurs nécessaires à la protection de la qualité de l'enseignement supérieur.

En réponse au budget du gouvernement, l'OCUFA a transmis le message que l'investissement dans les immeubles ne remédiera pas aux problèmes auxquels font face les universités de l'Ontario. Pour que les étudiants reçoivent l'éducation de qualité qu'ils méritent, un nombre suffisant de membres du personnel universitaire doit être embauché. La seule façon de réduire le nombre d'étudiants par classe et d'améliorer les ratios étudiants-professeur est d'embaucher plus de professeurs dès maintenant.

Tout comme en 2003, l'Ontario se classe au dernier rang du financement universitaire par habitant au Canada. Les ratios étudiants-professeur en Ontario continuent d'être les pires au pays, soit 26 étudiants par membre du corps professoral, par rapport à 22 étudiants pour le reste du Canada et 16 étudiants dans les établissements homologues étasuniens. Le nombre d'étudiants par classe continue d'augmenter. Les étudiants de l'Ontario ont signalé des niveaux d'interaction avec les professeurs de 28 pour cent in férieurs à ceux des étudiants aux établissements homologues des États-Unis.

De plus, l'OCUFA n'a cessé de demander au gouvernement de s'assurer que les étudiants ont accès à la même qualité d'éducation que leurs parents. L'Ontario n'engage pas les mêmes ressources pour les enfants de la génération du baby-boom que pour leurs parents il y a 30 ans — même si l'on estime que 70 pour cent des emplois exigeront une éducation universitaire. Le financement actuel par étudiant en valeur constante est déplorablement inférieur à celui des années 1970 : une moyenne de 4271 $ par étudiant aujourd'hui par rapport à 6568 $ dans les années 1970, un écart de 2297 $, soit 35 pour cent de moins.

Le plan Vers des résultats supérieurs était un bon départ, mais le gouvernement n'a pas mené son projet à terme. Ce budget aurait dû compter au moins 440 millions de dollars pour la création de 5500 nouveaux postes menant à la titularisation, requis pour ramener les ratios étudiants-professeurs de l'Ontario de 2009-2010 à la moyenne canadienne et pour s'assurer que les étudiants reçoivent l'expérience éducative de la norme élevée qu'ils méritent.

L'année 2008-2009 est le moment opportun de tirer parti de l'augmentation des fonds fédéraux pour l'éducation postsecondaire (EPS) et de réaliser des progrès concernant les lacunes de financement continues pour les budgets de fonctionnement.

Sans ces fonds, l'éducation des étudiants d'université de la province souffrira car le nombre d'étudiants en classe ne cesse d'augmenter et l'interaction avec les professeurs se fait de plus en plus rare.

Pour une analyse plus approfondie de ce budget consultez la page Web de l'OCUFA.

Le président de l'OCUFA, Brian E. Brown, Professeur

Rapport sur les universités Ontariennes est le meilleur moyen de vous tenir au courant des nouvelles concernant les professeurs de l'Ontario!

Rapport sur les universités Ontariennes est la publication électronique de l'OCUFA. Il vous tiendra au courant des développements, des tendances et des idées qui touchent les membres des associations de professeurs en Ontario. Il est publié 10 fois l'an. Abonnez-vous à Rapport sur les universités Ontariennes! C'est gratuit pour tous les membres des associations de professeurs associés à l'OCUFA.

Rendez-vous dans le site Web de l'OCUFA, www.ocufa.on.ca, et suivez le lien vers Rapport sur les universités Ontariennes.

Prochaine conférence biennale de l'OCUFA
Comptabilité ou responsabilité au sein des études supérieures?
23-24 janvier 2009

L'Union des Associations des Professeurs des Universités de l'Ontario (OCUFA) tiendra une conférence universitaire d'une journée et demie intitulée « Comptabilité ou responsabilité au sein des études supérieures? » (Accounting or Accountability in Higher Education?) le vendredi 23 janvier et le samedi 24 janvier 2009 à l'Hôtel Sutton Place, à Toronto (Ontario).

La conférence regroupera des conférenciers d'universités et d'instituts de recherche du Canada, des États-Unis et de l'Europe. Elle a pour but de se pencher sur la théorie et la pratique de la responsabilisation en matière d'études supérieures et d'envisager la structure éventuelle d'un système réellement responsable.

Il y aura trois discours-programmes et quatre réunions d'experts. Les sujets traités seront, entre autres, les initiatives de responsabilisation au sein de l'éducation, les approches actuelles de la responsabilisation, les sondages auprès des étudiants et le classement des universités. Voici les conférenciers qui sont confirmés jusqu'à maintenant :

- Bjorn Stensaker, chef de la recherche en éducation supérieure, NIFU STEP Studies in Innovation, Research and Education, Oslo (Norvège).
- Tony Keller, président-éditeur, Projets spéciaux, Maclean's.
- Tony Chambers, vice-recteur associé, OISE, Université de Toronto.

> **Les frais d'inscription, jusqu'au 12 décembre 2008, sont de 275 $ et ils comprennent les déjeuners continentaux, le dîner, les rafraîchissements et tout le matériel. Le taux étudiant est de 150 $.**
>
> **Pour plus d'information, acheminez un courriel à Mark Rosenfeld à mrosenfeld@ocufa.on.ca ou composez le 416-979-2117, poste 233**
>
> **Pour vous inscrire, acheminez un courriel à Lisa Alexis à ocufa@ocufa.on.ca ou composez le 416-979-2117, poste 228**

Appel de candidatures

Membre à l'Exécutif de l'OCUFA et

L'OCUFA invite la soumission de candidature à de poste de membre à l'Exécutif de l'OCUFA à l'automne 2008. Cette poste sont ouverts à toute personne qui, au moment de l'élection, aura servi au moins un an en qualité de membre de comité exécutif d'une association locale ou d'un comité permanent de l'OCUFA.

Ce poste requiert une personne engagée, ayant une bonne connaissance des préoccupations des professeurs et bibliothécaires et pouvant parler au nom des professeurs. Nous privilégierons les membres qui ont déjà acquis de l'expérience auprès de l'OCUFA.

Le candidat devrait soumettre une déclaration soulignant ses antécédents et son expérience, ainsi qu'une déclaration à l'effet qu'il accepte la mise en candidature et de servir s'il est élu. Veuillez acheminer vos mises en candidature par écrit, de l'association membre ou du directeur de l'OCUFA, à la présidente du conseil de l'OCUFA :

> **Glenna Knutson**
> **A/S OCUFA**
> **83, rue Yonge, bureau 300**
> **Toronto (Ontario) M5C 1S8**

Membre du Comité de l'OCUFA sur la condition féminine

L'OCUFA invite la soumission de candidature à de poste de membre au Comité de l'OCUFA sur la condition féminine. Cette poste sont ouverts à toute personne qui, au moment de l'élection, aura servi au moins un an en qualité de membre de leur association locale.

Ce poste requiert une personne engagée, ayant une bonne connaissance des préoccupations des professeurs et bibliothécaires et équité ou inquiétudes féministes. Nous privilégierons les membres qui ont déjà acquis de l'expérience auprès de l'OCUFA.

Le candidat devrait soumettre une déclaration soulignant ses antécédents et son expérience, ainsi qu'une déclaration à l'effet qu'il accepte la mise en candidature et de servir s'il est élu, à la présidente du conseil de l'OCUFA :

> **Glenna Knutson**
> **A/S OCUFA**
> **83, rue Yonge, bureau 300**
> **Toronto (Ontario) M5C 1S8**

Not everything is a crisis... [B]ut to see this requires leaving aside the concept of the environment as a single abstract whole, and going into specifics.

preferred outcome. Since markets are forward-looking, investors would start building expectations of future climate change into current investment plans, and this would put a market premium on the best climate forecasting techniques.

I have spoken to numerous audiences about this idea over the past year, and I am often struck how people who would consider themselves to be deeply interested in global warming are unaware of the specific issues surrounding the tropical troposphere. As a generalized concept, global warming evokes great fascination and anxiety. Crisis language has become so cliché that politicians have to reach for ever more lurid analogies to prove their concern, such as Al Gore likening it to a baby in a crib that has caught fire. But go into the specifics, and the hyperbole seems to become more and more misplaced. This is not to say that the whole thing is a non-issue, but that proper assessment of the nature of the problem can only begin when the discussion departs from vague generalities and gets into specific phenomena that can be measured with good quality data and rigorous empirical analysis.

At many Canadian universities, not to mention in society as a whole, the "environment" has now become one of the top organizing themes for new policies and directions. Perhaps much good will come of this. But the intellectual duties we face at this moment would become clearer if use of the term "environment" gave way to a new habit of referring to specific topics, beginning with agreement about what we are actually trying to measure, and leaving aside any prior assumption that the whole thing is in crisis. AM

Ross McKitrick is an associate professor and director of graduate studies in the Department of Economics at the University of Guelph

Architect **Brian Wakelin** and environmental scientist **Kathy Wardle** survey the record, examine the challenges and note the urgency of creating green university campuses in Canada

Universities in a *Climate of Change*

Although we are not experiencing intense hurricanes or brush fires, as a northern country, Canada is more sensitive to climate change than its southern neighbours. The 2.5 degree Celsius increase in Canada's average temperature over the last 50 years has had major impacts: from diminishing ice caps to shrinking lakes to a forestry industry decimated by pine beetle infestation. According to climate scientist, James Hansen of NASA's Goddard Institute for Space Studies in New York City, we only have 10 years or approximately 3,000 days before our ability to affect climate change becomes irreversible. In this context, urgent action is critical and everyone must contribute, especially universities.

Universities can affect climate change in two important ways. First, day to day campus operations directly impact the environment because campuses are run like small cities. They provide water, collect garbage, collect recycling, manage fleets of vehicles, build roads and buildings, and set patterns of land use. Second, and most importantly, our universities train tomorrow's leaders.

To understand what action Canadian universities are currently taking to reduce climate change, our firm, Busby Perkins+Will, surveyed twenty institutions of various sizes, locations and operating endowments about their operations and curriculum. The results reveal consistent strengths and weaknesses in all schools.

Canadian universities are educating themselves on sustainability issues. Most universities are members of green organizations such as the Canada Green Building Council (CaGBC) and the Association for the Advancement of Sustainability in Higher Education (ASSHE). Furthermore, most universities have also made public written commitments to sustainability. For example, Canadian universities are among the 350 signatories of the Talloires declaration established in 1990. It was the first official statement made by university administrators of a commitment to environmental sustainability in higher education and incorporates sustainability and environmental literacy in teaching, research, operations and outreach.

The results of Talloires were largely symbolic and

resulted in little change.
A decade and a half later, science has
reached a consensus that global warming is real.
The American College & University Presidents Climate Commitment (PCC) was created in 2006 calling on university presidents to commit to addressing climate neutrality by minimizing greenhouse gas (GHG) emissions. The PCC mandates universities to set their own timeline for becoming climate neutral—the point where their operations will have no adverse impacts on the climate. For example, Ohio's Oberlin College's plan is particularly progressive and strives for Climate Neutrality by 2020—without carbon offsets—which would nearly meet the 3,000 day action plan. PCC support has surpassed Talloires virtually over night. The 500th signatory has just been recorded.

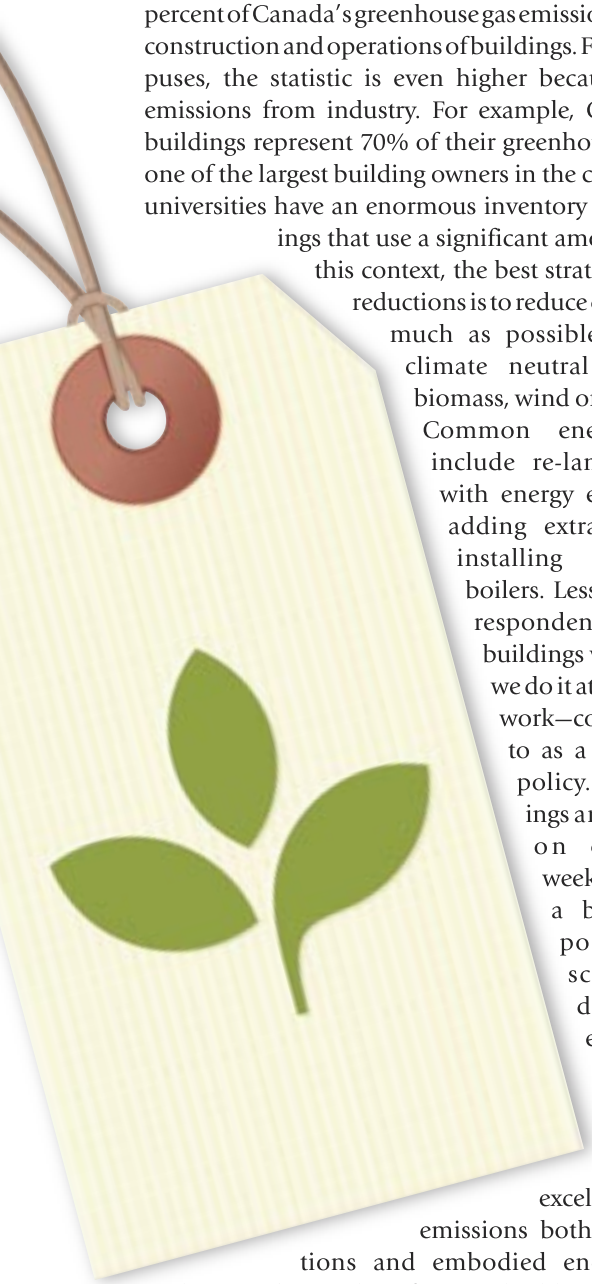
In contrast to Talloires, the PCC is all about action. The steps outlined in the commitment are worth reviewing: 1. initiate a plan to achieve climate neutrality as soon as possible; 2. initiate tangible actions to reduce greenhouse gases while the comprehensive plan is being developed; and 3. make the action plan and progress report publicly available.

In the first step, within two months of signing the commitment the institution is required to create a framework to guide and implement the climate neutral plan. Most Canadian universities surveyed already have sustainability managers in place. In fact, Canadian universities are sustainability coordinator pioneers. For example, Freda Pagani founded Car da's first Campus Sustainability Office at the University o ritish Columbia (UBC) and successfully led university programs to reduce energy, water, paper and greenhouse gas emissions. The Sustainability Office is widely recognized as a leader and has consulted with many North American organizations.

The second step establishes a baseline. Within one year of signing, the signatory must complete an inventory of greenhouse gases including emissions from electricity, heating, commuting and air travel. Despite most universities having central heating and cooling plants and central electricity generation or purchasing, surprisingly few Canadian universities have greenhouse gas inventories in place. Furthermore, our experience working with Canadian universities has shown that many buildings on central plants are not adequately metered. What is remarkable about this is that baseline information is easy to obtain. The University of Toronto, for example, established its greenhouse gas inventory in 2001 with a combination of building monitoring data and a survey of fleet vehicles and commuter patterns.

Once the baseline is in place, the third step is to establish a target date for climate neutrality with interim targets and goals. Less than a quarter of the universities surveyed have any greenhouse gas reduction plans in place. As part of step three, universities must also adopt tangible actions to reduce greenhouse gas emissions in the short term while the comprehensive plan is being developed. More than 30

percent of Canada's greenhouse gas emissions come from the construction and operations of buildings. For university campuses, the statistic is even higher because there are no emissions from industry. For example, Oberlin College's buildings represent 70% of their greenhouse emissions. As one of the largest building owners in the country, Canadian universities have an enormous inventory of existing buildings that use a significant amount of energy. In this context, the best strategy for emissions reductions is to reduce energy demand as much as possible and switch to climate neutral fuels such as biomass, wind or hydro electricity. Common energy reductions include re-lamping buildings with energy efficient lighting, adding extra insulation, or installing high efficiency boilers. Less than half of the respondents turn off their buildings when not in use—we do it at home, why not at work—commonly referred to as a building setback policy. Campus buildings are largely vacant on evenings and weekends. As a result, a building setback policy can save a school a tremendous amount of energy and operating expenses.



Renovating existing buildings is also an excellent way to reduce emissions both from an operations and embodied energy perspective because the number of existing buildings vastly outweighs the number of new ones being built. For example, UBC's Renew program is a $300 million initiative that restores aging buildings. Rather than spending money on maintenance every year, the university spends in one lump sum to renew the buildings for a fraction of the cost of building a new one. With this program, short life cycle building systems such as heating, ventilation, power and lighting are replaced at the end of their life span with energy efficient systems. Building envelopes are also upgraded and classrooms and social spaces are reconfigured to suit current learning methods. The result is a renewed stock of energy efficient buildings for a fraction of the amount of embodied energy required for a new building.

With the introduction of the Leadership in Energy and Environmental Design (LEED®) rating system into the North American market place, more universities have started looking at their design standards for new and retrofit buildings. New campus buildings should be built to LEED standards. About half of the universities we surveyed have some LEED compliant new and retrofit buildings. Across Canada, fifteen percent of LEED registered projects are higher education buildings (compared to less than 5% in the US). Given the small number of campus projects undertaken, this demonstrates that schools are committing to green building. But in most cases this appears to be for demonstration purposes only. Very few schools surveyed have a mandatory policy that all campus buildings must pursue LEED certification. Canadian cities on the other hand are more proactive according to our research. For example, the Town of Canmore (population: 11,599—less than many universities surveyed) mandates LEED Silver for all new municipal buildings. Our research has shown that cities across Canada are mandating minimum LEED performance for their own buildings—universities have not followed suit.

As one of the largest building owners in the country, Canadian universities have an enormous inventory of existing buildings that use a significant amount of energy.

While there is much to be done to improve our existing and new buildings, the biggest contributor to greenhouse gas emissions in Canadian universities is the central plant. Central plant heating and cooling systems are common across Canadian universities. Central plants and the network of tunnels that go with them are a huge investment and significant opportunity to reduce GHG emissions. Through our work with the University of Calgary, we have learned that there is enormous potential for heat exchange between different buildings. Conventional laboratories, for example, contain scientific equipment that emit large amounts of heat. Dormitories, on the other hand, are buildings containing people that require heat during winter. One building is a heat generator while the other requires heat and they are both networked via a system of warm water pipes. These buildings could transfer heat back and forth without requiring any input from the central plant—heating for free.

If all buildings are on a single loop system, switching to a climate neutral fuel such as biomass or fuel cell can convert all buildings to climate neutrality. Conventional stand alone buildings are not networked in this way so switching fuel sources is very expensive. Biomass central plant systems are currently in use at the University of Iowa and the University of Idaho, among others. The business case for alternative fuels is improving every day as the price of petroleum based fuels increases. However, universities that are not able to finance a central plant fuel conversion in the short term should consider purchasing green power such as hydro or wind where

available. Our survey response shows the uptake on renewable energy is slow.

Part of the Presidents Climate Commitment (PCC) tangible actions also include making sustainability part of the curriculum and student learning experience. Within the past 10 to 20 years, universities have begun to realize that global warming can no longer be considered an independent issue to be discussed by climate scientists. Its subject matter is now the purvey of architects, economists, ecologists, and engineers. Interdisciplinary study now has biologists sitting together with building designers. Business and environmental students have even begun taking courses together. The cross pollination and fluidity from one discipline to the other will likely be the cornerstone of most university's curricula in coming years. For example, the Centre for Interactive Research on Sustainability (CIRS) proposed for UBC brings together academia, industry and government to provide solutions for sustainability. The building will be a true living laboratory. Its building monitoring and assessment lab will be a space where building materials and systems can be monitored and tested on an ongoing basis for sustainable performance criteria.

Furthermore, universities are becoming think tanks for climate research. Higher education research on climate change has informed the public's awareness. Canadian universities have been leaders on such subjects as restoration ecology, rising sea levels, effects on agriculture due to rising temperatures, climate change adaptation, and loss of species diversity. For example, Laurentian University's Living with Lakes project will go beyond the LEED Platinum rating. For the first time, an academic facility is being designed for a 2050 climate with heating and cooling systems intended specifically to adapt to warmer winters and summers.

The final stage of the Presidents Climate Commitment (PCC)—that signatory universities make their action plan, emissions inventory, and progress reports publicly available by providing them to AASHE for posting and dissemination—is of utmost importance so that others can follow their example. While no Canadian institutions have signed on to the PCC, a similar made-in-Canada version has recently been announced. In March 2008, six British Columbia university presidents led the charge and have signed on to the Climate Change Statement of Action for Canada. In order for real change to occur, however, others must quickly follow suit. Only then can Canada show the world how to make climate neutral universities a reality. AM

Brian Wakelin is Associate Principal and Kathy Wardle is the Director of Research and a Senior Associate at Busby Perkins+Will, a Vancouver-based firm which is a leader in "green design" architecture.

The University of Guelph's Robert Corry takes a critical look at the green initiatives, challenges and possibilities on campus.

From Grey to Green

Environmental Sustainability at the University of Guelph

by Robert Corry

My campus is not green. It has a greenish hue.

The University of Guelph, like many campuses I've experienced, gives an impression of green. But is the green a veneer? Is it like the tidy mown lawns of newly-developed residential neighbourhoods that belie the ecological re-structuring that recently occurred?

Campuses are hotbeds for concern, thought, protest, and action. University of Guelph students are no exception. Guelph Students for Environmental Change—and in particular their Student Renewable Energy Group—recently put words into actions and their dollars behind both. In a campus referendum University of Guelph students agreed to commit more than four million dollars over twelve years to energy conservation on campus. The funds, matched one-to-one by the university, will be directed to retrofitting campus buildings by introducing more efficient lighting, heating, and water systems. The badly-needed changes are anticipated to reduce energy use by about ten percent. The university is likewise engaged in a five-year plan to increase energy efficiency across campus. A pilot project in 2004 to retrofit the Crop Science building for lighting, water fixtures, and heating-ventilating-air conditioning (HVAC) sprouted the move.

A substantial challenge that is not unique to the University of Guelph is aging buildings and infrastructure. Projects such as retrofits are overdue: most buildings are still furnished as original equipment. In what could be compared to the twenty-year-old beer-fridge problem that electrical utilities battle, the lighting, plumbing, and HVAC systems of most buildings are beyond the age of majority—their efficiency is circa a building's age. The deferred maintenance of buildings on Ontario campuses cuts both ways: while care has been trimmed and a lack of upgrades and enhancements have not allowed for improvements in efficiency, campuses

While institutions of higher education move minds forward, mine and most universities are not leading in innovative action for conservation and electricity generation. We don't walk our talk.

have been required to steward the embodied energy of previous eras for as long as possible. The lack of maintenance—and more importantly, improvement—in campus buildings results in a legacy of energy-inefficient structures. At the same time we are wringing every functional bit of life from the infrastructure and keeping the de-constructed bits from the landfill.

In scheming ideas for energy efficiency, a colleague and I co-operatively purchased solar panels, a storage battery, and inverter. After measuring the energy use in his laptop we set to taking his office off the electricity grid and runing it on solar power. Two things worked substantially against the project: the solar panels could not be mounted outside without work orders and more money (for the self-funded project), so the panels remained inside the windows. But the windows eliminate some of the sun's energy, made worse by their dusty outside film (deferred maintenance). My colleague might have been able to wash the windows himself, but the windows are stuck shut (again, deferred maintenance). Ultimately he gave up and the panels are in my office window waiting for me to figure out a plan B for mounting them on the outside wall. I face the same logistical hurdles. To my knowledge there is no office or lab on campus that uses an independent renewable energy supply.

The university is behind. Elementary and high schools across Ontario are increasingly experimenting with alternative energy. So far the University of Guelph is entirely grid-powered. At the same time that students become more environmentally-literate, their nearly-standard equipment includes laptop computers, MP3 players, digital cameras, and cell phones. Unlike a decade earlier, individual students use a lot of electrical energy to get through a class, assignment, or late-night study session—and all of this energy requirement is provided by the grid and the coal and nuclear power that make the wires hum. While institutions of higher education move minds forward, mine and most universities are not leading in innovative action for conservation and electricity generation. We don't walk our talk.

My building is home to the only green roof on campus—a small overhang over the front door that was created bravely and somewhat surreptitiously by the department head and some inspired students. New University of Guelph buildings have been erected since green roofs became part of the North American architectural lexicon, but the innovation is absent from campus. While the university has rightfully earned some boasting rights for the green living wall at the University of Guelph-Humber campus in Toronto, the Guelph campus does not demonstrate the novel alternative to lifeless walls. In fact, roof retrofits continue on the many flat roofs on campus, along with the indicative odour of the environmentally-unfriendly materials used.

Notable momentum exists at the University of Guelph to improve our walk. Physical Resources has been proactive in attending to greening issues. The university has a sustainability co-ordinator who administers programs for car pooling, waste reduction, recycling, and energy conservation. In the 2007 "Commuter Challenge" the University of Guelph received two of three City of Guelph awards for reducing emissions and traveling more efficiently than any other Guelph workplace. The university is now on GO Transit routes and co-operation with the City has decreased City bus pass costs so students and faculty can affordably use public transit. Bicycle use on campus is encouraged by dedicated bike lanes, parking racks, and a student-run bike repair centre stocked with tools and tips for two-wheeled commuters to care for their bikes at minimal cost.

The university's current level of spending—$15 million a year—to electrify, illuminate, heat, cool, and run water through the university is a substantial part of the university's carbon footprint. Physical Resources has implemented lighting retrofits, changed to more efficient building equipment, installed low-flow shower heads in campus dorms, and enhanced computer control of mechanical systems. The sustainability co-ordinator has worked on campus campaigns that provided free or low-cost "action kits" to the campus community with compact fluorescent light bulbs, low-flow shower heads and faucet aerators, and other water management tools and energy-saving tips.

Waste management by Physical Resources aims to divert 60 percent of its landfill-bound waste by 2010. The university has already enhanced recycling, including drop-off locations for the surprising number of alkaline batteries and cell phones that come from across campus. Within Physical Resources is a compost co-ordinator who oversees composting depots around campus and readily provides answers and solutions for compost management questions. Livestock bedding and manure are part of the compost stream generated by the university (and in this case used on a local farm). Some buildings (like mine) have compost bins in student and staff lounges and composters outside—with compost used on our immediate grounds.

Some future solutions seem relatively obvious. Office paper use has soared with computers and laser printers and the many drafts required to gain approval from a committee, peer-reviewer, or editor. The office paper that typically stocks the University of Guelph is 30 percent recycled; that's 70 percent virgin ingredients! It's branded an "environmental choice," but is it? One hundred percent post-consumer recy-

cled paper is available. The office printer capably prints on both sides of the page, a no-cost, no-emission way to cut paper use by up to half. In what I compare to the assumed donation of human organs referred to as "compassionate consent", our computer printers should default to double-sided printing: "compassionate conservation"...opt-outs available.

The University of Guelph boasts some impressive open space. The heart of the "College on the Hill" is Johnston Green. Beyond it are 90 more hectares of open space and over 6,000 trees. However this open space has diminished as the campus has expanded its student population in recent years. The greenness has declined. The university retains an impressive 165 hectare arboretum as part of the campus where gardens, forests, and myriad wildlife offer nearby nature for restorative as well as research purposes. The campus grounds—except for sports fields and high-profile gardens—receive relatively few pesticides or chemical fertilizers and in fact some areas (like parking islands) escape all manner of care including mowing. The deferred maintenance leads to frugal management that might mitigate some detrimental alternatives. In 2008 the campus is planned to be pesticide-free.

This winter the university announced its participation in a Zerofootprint program, launched by our President, Dr. Alastair Summerlee. University of Guelph community members can join the program and use a web-based calculator to measure the size of their carbon footprint—including emissions from their home, travel, and food choices. The program reports an individual's footprint relative to Ontario and Toronto averages and provides suggestions for how to reduce your carbon footprint based on your answers to behaviour questions.

Faculty research and teaching demonstrates environmental leadership to improve not only our campus but also the communities we serve. Assistant Professor in the School of Engineering, Dr. Khosrow Farahbakhsh has been engaged in research to make rainwater harvesting part of innovative building and site design. His work with LEED-certified homes (Leadership in Energy and Environmental Design) in Guelph illustrates how practical solutions are within the grasp of thoughtful students. The Guelph Institute for the Environment, (GIE) led by former federal environment minister David Anderson, is a connector of environmental research and teaching on campus and a clearing house for environmental research projects involving university researchers and scholars. With the many disparate disciplines engaged in environmental research and teaching across campus, facilitators like the GIE and the Environmental Sciences Research Initiative encourage information flows. The Environmental Sciences Research Initiative provides seed money for collaborative projects on community energy planning, biodiversity mapping, corporate social responsibility, and designs for the world's first pollinator park on a former landfill site in Guelph.

Student initiatives include the mundane. The Bullring, a distinctive campus building that originally served as a livestock pavilion, now serves as a popular student-run coffee shop. In its seamless way, The Bullring decidedly operates partly on wind power purchased from a local utility on a per-student levy. It is the only location known on campus to purchase alternative power.

Universities ought to be places for innovation, leading-edge thought, field experimentation, observation, and reporting. I currently advise a student who is critically exploring the contribution of green rooftops to the amount of impervious surfaces and urban stream quality. My campus includes no places for him to observe the relationship in practice, but an outdoors store in Toronto does. The possibilities for university campuses are myriad. The campus landscape is typically open—it could capably capture wind and sun energy to offset energy requirements. The roofs of campus buildings are dramatically flat—and non-green—when they could be green, alive, cool, and highly-insulating. Their rainwater runoff could be captured to run through toilets. Oberlin College in Ohio has an environmental studies building that is measured, monitored, reported (in real time, online) and made with the life-cycle of the building, its equipment, and its occupants in mind. The eight-year old building is con-

In its composition the university has every potential to be greener—it has the structure, the people, and many of the furnishings to achieve energy and material efficiency in everyday ways.

nected to the landscape and is part of the teaching environment—not a value-neutral carcass. My alma mater, the University of Michigan, retrofitted its School of Natural Resources & Environment building and received a gold LEED rating in 2005. The building features recycled building materials, composting toilets, and super-insulated walls. The University of Guelph's Science Complex, opened in 2007, earned no LEED rating.

There is a definite verdant tint to the University of Guelph. The gray world is the reality upon which I and others increasingly seek a green heart. In its composition the university has every potential to be greener—it has the structure, the people, and many of the furnishings to achieve energy and material efficiency in everyday ways. Students, the driving forces and frequent inspirers of change have the drive and tenacity to make the changes happen.

Challenges, of course, remain. The immediate response might be citing the usual refrain of limited campus funding—we need government support to make change happen. Yet the most accessible and responsible may be behavioural changes like printing less and double-sided, shutting down the power bar, and using a desk lamp instead of overhead lights. Each small change incrementally increases the intensity of the tint, and eventually the veneer that can obscure the truth will have a truly green core. AM

Robert Corry is an associate professor of landscape architecture in the School of Environmental Design & Rural Development, University of Guelph where he received the 2007 CMHC Award for Excellence in Education. Like the university, he too has a greenish hue, at least some of which is veneer. Dr. Corry commutes 70 kilometres to campus and drives a car that uses 4.5 litres per 100 km driven (62 miles per gallon). He lives in a self-built, 968 square-foot highly-insulated strawbale home made with straw grown on his farm. He harvests rainwater for watering livestock, flushing toilets, and laundering clothes. The off-grid house is powered by solar and wind, and uses propane (for hot water and cooking) and a diesel generator for winter back-up electricity. Dr. Corry's farm includes riparian buffer strips and an acre of planted tallgrass prairie habitat. He raises grass-fed beef.

Academia Abroad

by Thomas R. Klassen

A Canadian professor discovers that scholars are the new royalty in Korea

The global scope of scientific discovery suggests that academic life is the same the world over. In an age when university faculty regularly communicate and collaborate with colleagues in other countries, publish in the same journals and might teach exchange students from any number of continents, it is easy to believe that universities are uniform in all developed nations.

However, a year spent on research leave at Yonsei University in Seoul, South Korea, shattered this notion. Immediately noticeable upon arrival in the country was that education in this East Asian 'tiger' is a unique blend of formality and competition. Without natural resources and a land mass only one percent of Canada's, Korea spends a greater proportion of its gross domestic product on education than any other country.

Historically under Confucian tradition, scholars ranked only after the now-abolished royalty in social status. Today, university professors continue to be viewed as role models for citizenship and ethical behaviour. They have little trouble moving between the academy and positions in government, often as elected officials, or the private sector.

In the classroom professors are accorded a level of deference unknown in North American or even European institutions. Students often bring small gifts to faculty members during the national teachers' day or just when visiting for office hours. It is not uncommon for faculty members to be invited to weddings and other personal functions of students. In a country were bowing is the standard form of greeting, university faculty receive particularly deep and formal bows both on and off campus.

The respect accorded to teachers means that they are permitted to work until age 65. Nearly all workers in the country—including in white collar jobs—are forced to retire by their early or mid-fifties. Retired at such a young age, usually with little savings and in a yet underdeveloped welfare state, they envy university faculty who invariably continue to

work until age 65.

Most notable is the quantitative ranking that imbues education in Korea. The selection of students to university is based on a standardized nation-wide exam, along with supplementary university administered entry tests. Examinations are widespread during studies, with compulsory mid-term and final exams in most courses.

For students, exams continue post graduation with nearly all employers utilizing tests as part of the employment interview and hiring process. Jobs applicants for government positions must undergo highly competitive multi-stage week-long national exams.

The ranking inherent in standardized exams extends to other realms of social life. One of the most common questions that colleagues in my host department asked was my age. In formal situations, as well as some informal ones, age determines speaking order, the form of address one might use and how deep one bows. Age also determines who pays for lunch (the oldest person pays).

Also publicly discussed is one's publication record. Korean faculty members are little interested in authoring book chapters or even books, but rather focus on journal articles because these are easily quantified and ranked. As such, it is not uncommon for a colleague to be introduced as "the most published member of the department according to the Social Science Citation Index."

Not only are students and faculty members ranked, but also universities. Although there are no formally published studies, there is general societal consensus as to the top universities and their order. As I was to learn, my host university was 'number two.'

That one can travel to Seoul, the capital where the top universities are located, from any other locale in the country in a few hours, heightens competition on the part of students to attend the premier schools. Unlike Canada, there is little friction of distance in deciding what university to attend. It is not uncommon for families to move to new neighbourhoods and cities to be nearer to the best secondary and post-secondary schools for their children.

Slightly over 40% of the 50 million Koreans live in Seoul, making it one of the most densely urban areas in the world. Combined with nearly universal car ownership, traffic and parking are often nightmarish, even with an efficient 300 station subway system (which opens one new station per month). Among the best, and most closely guarded, fringe benefits of professors in Seoul is highly subsidized on-campus parking. Obtaining my university parking permit involved producing, along with other documents, my marriage certificate and my wife's birth certificate!

Competition is fierce, both on the part of faculty and students, to join the more elite universities. Parents invest heavily in tutors and supplementary programs for high school and university students. Individuals planning to be become professors invest in obtaining a graduate education at universities in the United States. A doctorate from an English language university, preferably from the United States, is a requirement to be hired into a tenure track position at the top universities.

In a country in which the role of women and men is changing dramatically, there is considerable debate about the future of gender segregated post-secondary institutions

Once hired, new faculty members join academic departments that are far more homogeneous than in Canada, in part because of the homogeneity of the society. In my host department, the dozen faculty members—all of whom were male—had attended the two top Korean universities, and all but one had completed doctoral studies in the United States (the exception studied in England).

Learning English language skills—particularly from native English speakers—permeates high school and university education. Korean students and teachers, at all levels of the educational system, realize that as individuals they must compete in a world where English is the common language of science and business. When I arrived in Korea I expected that my very limited Korean language skills would be a detriment to my research, teaching and related work. However, my English language skills were valued to an extent I would never have imagined, while my lack of Korean was dismissed as an insignificant matter.

A final remarkable feature of academic life in Korea is the existence of women's universities. Such institutions are restricted to a few small undergraduate colleges in Canada and the United States. However, in Korea, the female only universities (which hire male faculty) can be large, with graduate and professional programs, such as medical and law schools. As one might imagine, in a country in which the role of women is changing dramatically, there is considerable debate about the future of gender segregated post-secondary institutions.

For the supporters of such institutions, they provide a place where the strongly patriarchal system of values that historically dominated the country matters less. For instance, women's universities have a glass ceiling for male faculty who will never attain senior administrative positions.

As I returned to Canada at the end of my research leave, what remained with me most vividly is the extraordinary degree of passion for education I experienced in Korea. I hope that I might impart a strain of this 'education fever' to my new cohort of Canadian students. AM

Thomas R. Klassen is associate professor in the Department of Political Science, and the School of Public Policy and Administration, at York University. During 2006-07 he was Visiting Professor in the Department of Public Administration at Yonsei University, Seoul, South Korea.

Kathy Cawsey reveals why new technology combined with the traditional encouragement of collaborative study at university may explain the increasing tendency of students to cheat

Blame Facebook

by Kathy Cawsey

By October of my first year of teaching, I'd had five plagiarism cases. Three more surfaced by Christmas, and a couple more in the second term. My response was typical, I suppose—shock, surprise, anger, exasperation. Mostly disbelief.

I shouldn't have been surprised, though. If recent studies are accurate, half of all undergraduates admit to having engaged in "serious cheating in written work," which includes copying from a written source or the internet without footnoting[1] —the kind of plagiarism I encountered. At five cases in a class of over fifty students, I was at the low end of the scale in terms of cheating—barely 10 %.

Cheating and plagiarism are increasingly becoming 'hot topics' both on campus and in the media. Perhaps most notorious, was last year's Maclean's article which lambasted universities for their ignorance of, and indifference to, the rampant cheating and plagiarism going on in Canada's universities. Since Christiansen-Hughes and McCabe's study of cheating at Canadian universities was published in 2006, *University Affairs, The National Post, The Teaching Professor, The Chronicle of Higher Education* and others have all published articles on the "scandal" (*Maclean's* terminology).[2] Universities across Canada have revamped their academic misconduct prevention strategies and instituted new programs, from Wilfrid Laurier University's mandatory orientation-week seminars to the University of Manitoba's 'honour code' forms which students sign and hand in with every assignment.

In other words, if the extent of academic misconduct among undergraduates wasn't obvious in 2005, it should be by now.

Most professors are now aware of the strategies we should be using to prevent cheating. Change assignments and tests from year to year. Develop unusual or particularly specific essay questions and assignments that are unlikely to match essays available for sale on the Internet. Break down the assignment into proposals and drafts, so students are forced to learn time-management skills, since many students

My students always look shocked when they are told they should never cut and paste into their essays, and that even cutting and pasting from the net into an open 'research file' is dangerous.

cheat when they panic before a due date. Give a lecture on plagiarism in each and every course—and then give it again. Insist that the administration have workable systems of discipline for academic misconduct, and that it track repeat offenders. Use turnitin.com.

Because these studies and articles are readily available, and because most of us have read at least one or two, it is not necessary to go into the details or the common solutions proposed. There are a few dimensions to this phenomenon of cheating and plagiarism, however, that many articles and discussions miss. Many professors are frustrated by the fact that even after implementing most or all of the measures advised by the articles on plagiarism, we still find ourselves dealing with several cases a year.

It seems that there are some broader, underlying factors at work, both within the culture of incoming undergraduates and within the culture of our universities, that have not yet been addressed.

Since my five cases in 2005, I have been involved in plagiarism discussions, education and policy decision-making at both Wilfrid Laurier and Dalhousie. I have also put a great deal of thought and effort into my own teaching strategies, and have involved my students in conversations about their assumptions, beliefs, attitudes and previous education with regards to plagiarism and referencing. From these discussions, three main broader issues have become clear; these have been touched on in some of the debate about academic misconduct, but most studies do not address them fully enough.

The Cut-and-Paste Generation

My roommate this year is twenty-seven. I am thirty-three. Between us, I am discovering, there is a cultural and generational gap far greater than one would expect from five years. I can remember not owning a computer and was in the first year of university students to automatically get an email account.

My roommate barely uses email. If I want to ask him to buy milk on the way home I change my 'status' on my Facebook page—he gets instant updates of all his friends' statuses on his cellphone. To him, a cellphone is an unquestioned necessity—like heat or water for me—and it never occurs to him to cancel his cellphone if he's short on cash. He works on two computers at once—a downloaded movie plays on his desktop while he does his homework on his laptop. He can no more imagine living without an iPod than I can imagine living without a car radio. He doesn't own a watch: his alarm clock is his cell-phone.

Generational and technological gaps have always existed, of course, and maybe this one is no different. But there has been a major shift in the attitude towards technology in the past five or so years, and universities—and faculty—are only just starting to catch up. The break comes somewhere among the people in their late twenties: for the most part, those older than twenty-six or twenty-seven have a different attitude to technology than their younger peers.

Teens and twenty-year-olds are surrounded by technology and information nearly every waking moment. We know this; but we don't always think through the ramifications. One consequence is that information is pervasive, persistent, and—as far as the end-users are concerned—relatively sourceless. Music is made by sampling, news reports are made by cribbing from competitors, scrapbooking is the craft of the day . . . and essays are made by cutting-and-pasting. Most students truly do not see a problem with this approach: information is information, so why does it matter where it comes from?

Cutting and pasting seems to be the standard research modus operandi of most high school and undergraduate students. My students always look shocked when they are told that they should never ever cut and paste into their essays, and that even cutting and pasting from the net into an open 'research file' is dangerous. Some have even responded that this is how they were taught to research in high school; and in some schools, this is what they were actually taught. Admittedly, I don't remember footnoting all that much in my high school years. I didn't copy large chunks of information out of books when writing high school essays because paraphrasing was easier, not because I thought copying directly was particularly *wrong*.

We need to go beyond telling students not to plagiarize. We need to be explicit and clear about what plagiarism is, and why it is objectionable. Most students understand when you explain that you don't want to see someone else's internet words in their paper, you want to see—and mark—their own words. When you point out that cutting-and-pasting is not that hard, and requires very little thought, they may not only stop plagiarizing, but begin to understand the components of an academic essay. When they begin to re-envision essays not as repositories of data or information, but as contributions to an ongoing conversation and debate, they will also come to understand why it is important that the reader know who said what in the debate—in other words, they will begin to see the importance of referencing.

The second problem that comes with the pervasiveness of information and technology, in addition to the cut-and-paste

University culture is fundamentally schizophrenic on a number of levels—and many of the levels have a subtle impact on the plagiarism debate.

impulse, is the disassociation of information from its source. Movies are on computers, language lessons come through iPods, email comes via phones. Phones are cameras, cameras are clocks, and clocks are—well, almost obsolete. Every December and again in April I am baffled when students are shocked that they cannot use cell-phones in the examination hall. They do not understand that this means they also cannot use their cell-phones as a clock. They gape at me in astonishment when I confiscate their phone; it simply does not occur to them that someone can tell the time without a phone.

In terms of essays, many students enter university with a complete inability to discriminate among sources. When I read a journal article in JStor or ProQuest, in my mind I am still reading a paper journal from a library shelf; it just happens to be stored in a computer. When my students find a journal article on JStor, however, they are finding it on "the Internet," and they don't understand how this source of information is any different from anything else one finds on the internet (read: Wikipedia).

Universities are catching up with this technological/generational gap; but there is about a five-year time lag. Last year it was my fourth-year students plagiarizing, and not my first-years—largely because the first-years were getting lectures on plagiarism in all their classes. The fourth-years, on the other hand, did not know that it was possible to plagiarize in an oral presentation (cut-and-pasting Wikipedia), or that assembling unattributed quotations to make an essay was not acceptable even if the sources were in the bibliography. (One student said he had received straight As through three years of university using precisely this technique).

Cultural Schizophrenia

It's easy to blame the students; and people have commented on the technology problem before. However, there is a more pervasive cultural disjunction at work, not in our students, but in our universities. It is part of the way the system works, and change doesn't seem likely. However, we need to be explicit about it to students, and make it clear where the lines and boundaries are.

University culture is fundamentally schizophrenic on a number of levels—and many of these levels have a subtle impact on the plagiarism debate. We pride ourselves on being institutions where cooperation and collaboration are encouraged. Funding bodies such as SSHRC increasingly look favourably upon collaborations and inter-disciplinary or inter-institutional projects. Few papers in the sciences are published without a list of individuals involved in the project; and while articles in the arts or humanities are less likely to be the product of collaboration, humanities professors still often work together on edited books, large projects, and inter-disciplinary research. We review each other's work, edit each other's articles, and borrow each other's syllabi and teaching notes. At conferences, we exchange ideas, critique papers, and form joint sessions with overlapping topics. In our classrooms, we encourage a similar kind of collaboration, through in-class discussion, out-of-class BLS/WebCT discussion boards, and group work. We suggest to our students that they form study groups, go to the Writing Centre, or consult a Teaching Assistant or peer for help.

At the same time, all promotional and tenure decisions in universities are made on a strictly individual basis. Research is rewarded, for the most part, at an individual level. Graduates of interdisciplinary PhDs find it difficult to get jobs within the traditional disciplinary structure of departments. Even team-taught courses cause administrative and financial nightmares. Most importantly, we insist on marking and assessing our students on an individual basis. The individual transcript is the bedrock of our system, and it is starkly at odds with the collaborative values we ostensibly espouse. Because it is so important, we react strongly to issues of plagiarism, cheating, and academic misconduct.

Our university culture has a clear idea of where the lines fall between collaboration and cheating, helping and plagiarizing. From the point of view of a student, however, it can be confusing. How is my asking a colleague to edit an article different from a student asking a parent to re-write a paper? Where is the line between 'studying together' and 'cheating'? If we crib from textbooks, other profs, the internet, and various other sources for our lectures, why can a student not do the same for an essay? Writing Centres especially are hampered by this schizophrenia, since they often have strict policies not to 'edit' or 'proof-read' students' papers, but merely to 'teach' or 'suggest'. Too often the student emerges simply confused.

Many programs, as well, emphasize the importance of group work and team projects—and then expect the students to forget everything they have been modelling and practising all term when it comes to the exam or the final paper. It is no coincidence that programs with the highest level of group-work—business, law, etc.—also report the highest levels of cheating, although most studies attribute it to the 'mercantile' attitudes of those students. If we don't want our students to work together, why do we put so much emphasis on their working together?

It does bear repeating that most of us do have clear ideas of where the line rests between collaboration and cheating. We must make that line equally apparent to our students. We need to explain explicitly why some projects are group projects, but the end-of-term paper is not. We need to clearly outline the difference between 'editing' and 're-writing,' between 'helping' and 'cheating,' between 'getting inspiration' and 'plagiarizing.'

And we need to be explicit and conscious about our own practices too: showing students where academics footnote their colleagues in journal articles, for example, demonstrates how one can collaborate without cheating. We need to start referencing our own lectures, whether through footnotes on slides, references on the chalkboard, or a cumulative bibliography for the course. The collaborative enterprise is one of the greatest strengths of a university; we need to show our students how to do it properly.

Honour Talk

Most of these observations have referred to the 'unintentional' plagiarizers—the students who don't quite get that their actions constitute academic misconduct. But no amount of education about plagiarism will stop the students who cheat knowingly. We cannot fully depend on technologies like turnitin either, for these students will always find ways to get around them. A sharp-eyed Teaching Assistant of mine caught one student who had uploaded a different essay to turnitin from the hard copy he handed in—the turnitin version had the plagiarized sections cut out!

There is only one way we will significantly decrease this kind of cheating: change the culture in our schools. We cannot hope to have much effect on the broader culture at large, but we need to develop a culture in our universities where values such as honour and integrity are not only officially upheld but adhered to and talked about.

How do we do this? One way is to use the subjects we teach as vehicles for discussions about these ethical issues. In my Arthurian Literature class, this approach is easy—students who scoff when I start using words such as honour laugh less when I describe cheaters in terms of the most despicable characters in the works we study. Other classes can do the same: a politics class can compare the ethics of politicians to the ethics we espouse in universities; a business class can study the consequences of unethical behaviour in cases such as Enron; an anthropology class can consider the ways in which honourable behaviour is crucial to the functioning of communities and groups.

We can also turn the mercantile, practical, so-called 'real world' discourse that is so often used against us, to our favour. Honour is important in institutions beyond universities, and we need to emphasize this to our students. Students going on to medical school, law school, engineering, psychology, or teaching professions can be asked to look at the honour codes upheld by their respective professions, and at the consequences of dishonourable behaviour. Students in university sports can consider their cheating within the context of the athletic code of conduct.

We can even reach those who see their degrees in purely commercial terms, as a piece of paper or a service bought and paid for. (These are the worst offenders in cheating, according to Christiansen-Hughes and McCabe.) We need to make it clear to our students that cheating in university is like buying a gym membership and then paying someone else to sit on the exercise bike for you. The gym membership might let you sign up for the marathon, but it's not going to help you win the race; a degree might get you a job, but it's not going to help you do the work.

Even honour can be quantified, in a sense. I tell my students that their honour is worth more than an essay for my course. If they're going to sell their souls, the starting bids should be set far higher.

Last term, my fifth teaching full-time, was the first time I didn't have any plagiarism cases. The plagiarism lecture for my first-years is ready; we'll see how next term goes. AM

---

[1] Julia M. Christensen Hughes and Donald L. McCabe, "Academic Misconduct within Higher Education in Canada" *Canadian Journal of Higher Education/Revue canadienne d'enseignement supérieur* 36.2 (2006): 1—21.

[2] C. Gulli, N. Kohler, and M. Patriquin, "The Great University Cheating Scandal" *Maclean's*, February 2007; Alex Gillis, "Cheating Themselves" *University Affairs* April 2007; Alex Gillis, "Cheaters testing patience of professors" *National Post*, Friday, April 27, 2007; S. F Hard, et al., "Preventing Cheating: Do Faculty Beliefs Make a Difference?" *The Teaching Professor* March 2007; Jonathan Malesic, "How Dumb Do They Think We Are?" *The Chronicle of Higher Education.* 53.17, Dec 15, 2006.

Kathy Cawsey is an assistant professor in the Department of English at Dalhousie University

Editorial Matters

Mark Rosenfeld

The Greening of Academia

IN 1970, CHARLES A. REICH published his bestseller *The Greening of America*. The book argued that a fundamental shift was taking place in American consciousness, reflecting the 1960s counterculture which emphasized egalitarianism, personal liberty, and respect for nature. This emerging new worldview was predicated on a firm rejection of the "military-industrial complex" and the values which underpinned it.

Reich's analysis was caught up in the enthusiasms of the 1960s, and much of what he took as the beginning of a permanent transformation of American society did not come to pass. But not everything in Reich's celebrated new worldview evaporated with the aging of the Baby Boom generation.

A concern about the health and integrity of the planet, and the metaphor of "greening," have undergone a resurgence. Academia has played a critical role in that resurgence, on campus and far beyond. As the internationally-respected geneticist David Suzuki writes in this issue, scientists, especially those in our universities, have had an enormous influence in the contemporary environmental movement. Their research has highlighted and raised concerns about climate change, its causes and consequences. They have alerted governments and the public about the need to adopt solutions which recognize the complex interconnections of the biosphere.

Suzuki challenges academics to educate the public about their research and the interdependence of our world while acknowledging the strengths and limitations of the scientific enterprise. He also worries that as universities become increasingly entwined in funding partnerships with the private sector, a willingness to criticize corporate behaviour has been compromised.

Another concern is the use of scientific research, particularly in the development of environmental public policy. To what degree do ideology, politics, and self-interest shape how academic research is incorporated into policy development? William Rees, well-know for his work on human ecology, provides a rather sobering account of this dynamic. He writes that while U.S. science is being forced to conform to the political philosophy of the Bush administration, there are disturbing trends in Canada as well. In both countries, policy decisions are being made which are not only contrary to the findings of sound academic research but are also not in the long-term public interest.

Scientific research in areas such as climate change and global warming, however, are not without their controversies, as noted in the provocative article by environmental economist Ross McKitrick. He argues that we need to move away from broad general terms, such as "the environment" and categorizations such as "crisis" and instead focus on the specific and measurable.

The findings of research on greenhouse gases, alternative energy sources and ecologically-friendly building materials, among other areas, are now being directly applied to university campuses. Theory has been put into practice, but how green are universities in Canada? In a new survey of twenty institutions, architect Brian Wakelin and environmental scientist Kathy Wardle reveal that important initiatives have been taken to promote environmental sustainability. But, the record is mixed. They find that most Canadian universities have sustainability managers in place and have been pioneers in this initiative. Few have greenhouse gas inventories or reduction plans, however. While the design standards for new and retrofitted buildings show some commitment to environmental sustainability, it is not as extensive as it should be. The same applies to the use of renewal energy.

Wakelin and Wardle paint a broad canvas of sustainability initiatives on Canadian universities. Rob Corry, who teaches landscape architecture at the University of Guelph, provides a more detailed appraisal of the record on his campus. He writes that the transition from "verdant hue" to full-fledged green has yet to be made. Outlining the logistical hurdles that need to be overcome to create energy efficiency on campus, Corry observes that elementary and high schools have outpaced universities in creating an energy-efficient infrastructure. "While institutions of higher education move minds forward," he writes, "mine and most universities are not leading in innovative action for conservation and electricity generation. We don't walk our talk."

The renewal of concerns about global sustainability is taking place at a time of intellectual, economic and political ferment. It holds out the promise of significant change. Whether that change represents a shift that is more enduring than the transformation envisioned by Reich almost forty years ago, however, remains to be seen. AM

Mark Rosenfeld is editor-in-chief of Academic Matters and associate executive director of OCUFA

LET'S GO THE DISTANCE so our food doesn't have to.

WHEN YOU CHOOSE LFP CERTIFIED FOOD, YOU…

- ✓ Enjoy fresh food from Ontario.
- ✓ Support environmentally responsible farming.
- ✓ Conserve energy and cut greenhouse gases.
- ✓ Ensure fair conditions for farm workers.
- ✓ Provide humane care for livestock.
- ✓ Preserve farmland and wildlife habitat.
- ✓ Foster a strong local economy.

LocalFoodPlus.ca
in Ontario
en
LFP
CERTIFIED
CERTIFIÉ
AlimentsLocauxPlus.ca

Available at the University of Toronto

Offering LFP certified food is one important way to show existing and prospective students and faculty that your institution is innovative and progressive.

If you're interested in making local sustainable food one of the key differentiators at your institution, please contact us for more information today.

www.LocalFoodPlus.ca

GREEN BELT
Our living countryside

AN EDUCATOR SEES A SPONGE

A PHILOSOPHER SEES DESCARTES

A NEUROLOGIST SEES A SYNAPTIC MISFIRE

QUESTION EVERY ANGLE.
STUDY EVERY ANGLE.
RESEARCH EVERY ANGLE.

WELCOME TO THE INTERDISCIPLINARY UNIVERSITY. At York, we tackle real-world issues by bringing together researchers, graduate students and partners from different disciplines. Currently, neuroscientists, psychologists and psychiatrists at York's Milton & Ethel Harris Research Initiative are pioneering research into the clinical technique of Individual-Difference Relationship-Based Therapy. This could help countless children, including those with autism, get a better start. It is this collaborative approach to creating new knowledge that makes York a leading research innovator. To learn more about the interdisciplinary university, visit **YORKU.CA**

YORK
UNIVERSITÉ
UNIVERSITY
redefine THE POSSIBLE.