

GRAHAM F. SCOTT

Dylan Rae, SAC VP Student Life, holding invoices from Canada's Wonderland totalling \$240,000. The invoices turned out to be wrong, and the amount closer to \$30,000, but Rae's publicizing of their cost has drawn the ire of fellow SAC executives who say he jumped to conclusions without getting all the facts.

## SAC lost \$30,000 on frosh-week Wonderland jaunt

by ANAS MELHEM

U of T's Students' Administrative Council spent \$32,000 on a frosh week trip to Paramount Canada's Wonderland, *The Varsity* has learned, and not \$240,000, as was reported by other campus media last week.

The incident has been embarrassing for SAC, as executives squabbled publicly over the widely disputed amounts spent on the event. The amount of cash expended has declined significantly, but the expenditure of vitriol within the famously fractious organization escalated over the weekend.

During the 2004 Frosh Week festivities, SAC and radio station VIBE 91.9 jointly presented a concert for U of T students at Wonderland and provided discounted tickets to the Toronto-area theme park. According to its contract with Wonderland, SAC had initially planned on selling 7,500 tickets; the final number was actually around 3,000. When SAC received invoices from Wonderland for the cost of the tickets, the total cost appeared to be \$240,000.

These receipts were leaked to the student press by anonymous executives within SAC; VP Student Life Dylan Rae presented them at an acrimonious SAC board meeting on November 10.

In an interview with *The Varsity*, Rae, whose portfolio of Student Life

includes responsibility for running Frosh Week, said that as early as August 4 he had decided that SAC should cancel the Wonderland venture. Rae's signature, however, appears on the June 29 contract SAC signed with Wonderland, just over a month previous.

"Nobody was organized; we had no artists booked and barely any tickets sold. We had about a month to go until we had to put this show on. I told them at the meeting I thought this was going to be a disaster, but I was overruled."

Although he signed the contract with Wonderland, Rae said he had trouble tracking down the invoices that arrived later in the fall.

"I had to run around from person to person just to get information on the receipts, and I couldn't even get the information legitimately," he said. After three months of seeking answers and solid numbers Rae said that the receipts "were actually left in my mailbox anonymously. I had to repeatedly ask for them in meeting after meeting and it had to come to that to get any kind of numbers." So what exactly happened?

"The invoice getting leaked out to the press was very hurtful," said SAC President Ranjini Ghosh, "because it was a preliminary number. It led some students to believe we

See SAC on page 4

## Be not afraid

*New funding allows prof to investigate "fear" hormone*

by ZOE CORMIER  
SCIENCE EDITOR

"Oh my god, they'll be able to use this to create a race of fearless soldiers," was U of T Professor David Lovejoy's first thought after making his landmark discovery.

Three years ago Lovejoy and his colleagues discovered a family of hormones that, based on studies in rodents, seem to reduce fear. To discover a new hormone is an extremely rare feat. To discover an entirely new family of hormones is even less common.

A year ago Lovejoy created a start-up company to do further research into these new hormones, and he has recently acquired funding for his company. He is still in the process

of finalizing the contracts, so at the moment all he can say is that "the funding is coming from a group of private American investors, a lot of whom have invested because they have an interest in depression and bipolar disorder." The identities of the investors should become known to the general public within the next few weeks.

Lovejoy is hoping to use his group of hormones, called "teneurin C terminal associated peptides," or TCAPs for short, to treat human emotional problems like manic depression. But he realizes that his hormones could be used for less altruistic purposes, perhaps even by military forces.

"No matter what you discover, an

See FEAR on page 6



Make a loud noise, and you'll startle a rat. But inject it with a new hormone discovered by U of T's Dr. David Lovejoy, and it "doesn't really seem to get stressed out."

## Bob Rae's roadshow hits UTM

by JUSTIN LEUNG

Bob Rae's Post-Secondary Review travelling roadshow arrived at UTM last Monday with some fanfare courtesy of the Students' Administrative Council. Prior to the forum, the student union gave away free pizza to try and entice more students to attend. Outside the auditorium, SAC members handed out slogan t-shirts and banners to audience members as they entered.

Before taking questions from the audience, Rae was adamant in denying accusations that everything

See UTM on page 2



## SCIENCE BRIEFS



### Brains of cocaine addicts different

A new study shows that the brains of cocaine addicts are different from the brains of non-drug users. Particularly, the size of the amygdala, the area responsible for consequence judgement, is greatly reduced in heavy drug users. The amygdala was found to be between 13 and 23 per cent smaller by volume in addicts. It remains unclear whether cocaine use causes structural changes in brain structure, or if a smaller amygdala makes someone more susceptible to cocaine addiction. Researchers hope that long-term studies on individual drug addicts will clarify if this feature is a cause or an effect of cocaine use.

—WENDY GU

Source: *BBC News*



### Ape ancestor found

Paleontologists in Spain may have discovered the common ancestor of all great apes—a group that includes gorillas, orangutans, chimpanzees, and humans. Researchers found 83 bone fragments from an adult male that they say lived 13 million years ago, about the time evolutionary biologists believe that apes would have begun to split off from monkeys. *Pierolapithecus catalaunicus*, named after the Catalan village of Els Hostalets de Pierola near where the specimen was found, displays both ape and monkey characteristics. Like monkeys, it appears to have been a tree dweller. But like apes it seems to have walked upright and had a more flattened face. It is the oldest fossil found thus far that displays such characteristics.

—ZOE CORMIER

Source: *Science*

# From effluence to affluence

## How we can turn human waste into electricity

by MARY CAMPBELL

Imagine what life would be like if what you flushed down the toilet every day was turned into electricity. It is possible, according to new research from U of T Civil Engineering Professor David Bagley, which appears in the *Journal of Energy Engineering*. Bagley and the study's lead author, Ph.D. candidate Ioannis Shizas, found that there is enough energy contained in the organic—or carbon-containing—portion of our wastewater to generate enough electricity to power the very treatment plants where waste is processed.

Through several complex processes, it is possible to convert carbon-containing materials found in wastewater, like food and human waste, into methane and other natural gases, which can be burned to produce electricity.

Even if the process of converting waste to power were only 20 per cent efficient, it would provide enough electrical power to run all the wastewater treatment facilities in the City of Toronto. "Anything more than that you can use in the grid," said Bagley. "There would be enough [power] to treat the wastewater and give some back, or sell some back, to the grid."

Wastewater, in other words, could become a large-scale renewable source of electricity. But how does the potential amount of power produced by this method compare to other current renewable, and non-renewable, sources of electricity?

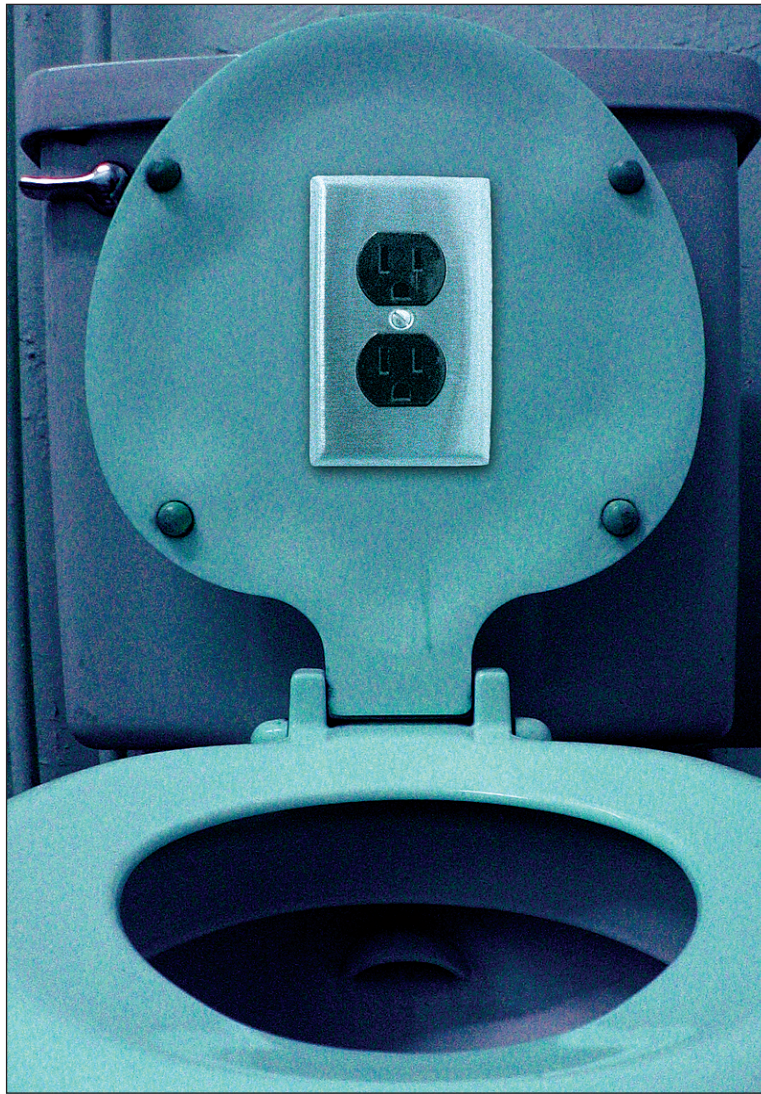


PHOTO-ILLUSTRATION: K.D. & R.B.

Consider, for instance, the Pickering A nuclear reactor, which is a major source of electrical power for the City of Toronto. It produces about 500,000 watts of power at any given time, which is enough

to power 12,500 forty-watt lightbulbs at once.

If the waste recovery process could operate with 30 per cent efficiency, it would be possible to produce enough "juice" to power

all the waste treatment plants in the City of Toronto with enough remaining to power the equivalent of almost 300 forty watt lightbulbs. In short, wastewater technology is more efficient than other renewables, like wind, but significantly less effective than non-renewables nuclear power.

Will we ever see this technology in use in Ontario? The initial cost of installing the proper machinery, about \$1.2 million for each generator, coupled with the relatively low cost of electricity in the province, will probably see this technology shelved for the immediate future.

According to Bagley, "Right now, in Ontario, it isn't cost effective, because energy is so cheap." However, because of the reduction in greenhouse gas emissions that this technology could provide, this technology may present itself as an attractive source of renewable energy in the future.

Bagley and Shizas measured the energy content of raw wastewater at four Toronto treatment facilities through a technique known as bomb calorimetry. In this technique the organic material extracted from the wastewater is burned inside a sealed steel chamber, known as the "bomb." The bomb is surrounded by water, the temperature of which changes when the burning solids inside heat up the cylinder's walls. This temperature change in the water is measured and can be used to mathematically determine the energy content of the sample.

FEAR>> Continued from page 1

evil mind can turn it to something bad," he said. "This is the problem with discovery."

But this concern will not deter him from investigating further TCAPs, he says. "Say I build a car to get from point A to point B; somebody could put armour and guns on it and make a tank out of it. If I create a hammer to build a house, somebody could use it to kill somebody. So when you come up with something like this, do you focus on the bad things, or do you focus on the good things?"

The general effect of Lovejoy's hormones seems to be to "reduce anxiety." In a world where "anxiety disorders" are attracting more and more attention from health professionals, Lovejoy's discovery may be very significant indeed.

His colleague Dr. Denise Belsham, also of U of T, is also hoping that TCAPs will help people who suffer from anxiety problems. But she does not think we should worry about the hormones

being hijacked by the military. "I'm not too concerned because there are other bioterrorist things out there that could be used long before therapeutics for anxiety could be used," she said. "I think it really will result in only good things"

Lovejoy and his colleagues, however, have a long way to go before they will be able to create any sort of anxiety-reducing drug. They have only just scratched the surface of these hormones, and they still have a lot to figure out.

For example, the way TCAPs work is not yet fully understood. Inject these hormones into the brains of rats and you can dramatically reduce what lab techs would call their "fear response." They won't jump anywhere near as much if you try and startle them with a loud noise—they literally become less jumpy. If you put them on a suspended plank of wood, they are much more comfortable exploring around the edge.

"If you inject TCAPs into a high-emotionality rat, it will reduce its emotional

levels," said Lovejoy. He also found that if you give TCAPs to hamsters, which normally run up to eight kilometres a night in search of food, they stop running altogether. In the lab "they get on the wheel, kind of look at it, and decide they don't feel like running."

"But here is the really interesting thing," Lovejoy continued. "If you inject TCAPs into the brains of low-emotionality rats, it will make them *more* active. It basically normalizes behaviour."

Almost every hormone that we know of has a number of different, complicated effects on how you feel and act, and so it is very difficult to accurately summarize how any chemical will affect you. At its simplest level, TCAP reduces anxiety.

But despite the novelty of Lovejoy's discovery and the potential he feels these hormones hold for treating human emotional problems, he has had a great deal of difficulty getting his work recognized by mainstream science.

"[Our work] was rejected [by journals] time and time again; we spent three years trying to publish our work.

It was a novel family of hormones—well, most scientists think that families aren't discovered, and they certainly aren't discovered by little labs at U of T—they're discovered by big Nobel Prize-winning labs."

Lovejoy had the same problem trying to get funding for his company after creating it a year ago. "We got rejected three times from grant agencies, including the Canadian Institutes of Health Research. They usually said 'wow, this is great science, come back to us when you're ready to do clinical trials.'"

But it takes a long time to go from lab rat studies to actually experimenting on humans, and they needed funding to do the preliminary research. Finally they received it, from US sources. Lovejoy is ecstatic. "It turns out that we are the first company in the history of the U of T to get American funding," said Lovejoy.

Lovejoy's work on TCAPs was first published in June 2004 in the journal *General and Comparative Endocrinology*.



## Truth is Stranger Than Fiction

Modern science has shown that the idea of a "third eye" may not be so outlandish. The ancestor of all vertebrates, a sort of eel-like primitive fish, had a patch of light sensitive tissue on the top of its forehead, in between its eyes. This patch took various forms as backboneed creatures evolved and split into different groups. In lizards this patch became more

and more like an actual eye, developing a proper lens and cornea, and is often referred to as the "third eye." In mammals this organ retreated inside the brain, and forms what is now called the pineal gland. The true significance of this organ is still a mystery, but we do know that it produces melatonin and regulates our sleep-wake cycles.

