THE SCIENCE CREATIVE QUARTERLY ISSUE TWO PART ONE OF SIX JULY 11TH 2005 TA DA!

Our masthead, we think, will be forever evolving, although at present we have two Daves, a Bethany, a Caitlin, a Stephen, a Claire, and a Russell.

Tom, Moebius and Richard continue to be happy to help.

Maybe Justin and Willow?

We did follow up on Chris and his friends, and for now, we know that Chris is on board.

Isn't Jen really good at drawing pictures?

Our exotic sounding Azar is sort of still with us, but involved with a different project that will likely have an affiliation with the SCQ later this summer.

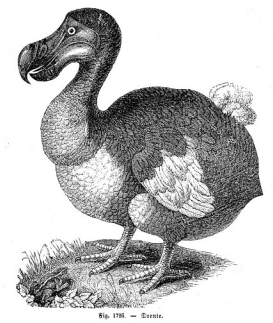
Email us at **tscq@interchange.ubc.ca**

IT'S ALL ABOUT PROMOTION BABY.

From The Science Creative Quarterly

Dear Reader,

We are pleased to say that we feel we are now in a comfort zone. Not fuzzy by any means, but let us call it a place of safety - a luxury given to us with the successful launch of our first issue. Now that we essentially know this experiment might work afterall, we are in spin mode. This is not in reference to physical forces, quantum considerations or even subtle drosophila mutants. No, we're talking about spreading the word, we're talking about maybe giving you a chance to win an iPod, and yes, we're talking about spending a little more effort in playing the field that is the web. Wanna play?



DOLPHINS SHOW SOME CULTURE.

By David Secko

See a dolphin swimming through the water and you're not just looking at a sleek and playful marine creature, you're also seeing an animal with culture.

Indeed, dolphin culture has recently been spotted off the coast of Australia, says new research from a group of international marine biologists studying bottlenose dolphins.

However, this dolphin culture isn't fancy cocktail parties, visits to art galleries, or listening to contemporary jazz. It's wearing sea sponges.

This use of sea sponges is first description of potential culture—a skill or tradition that is passed down without the involvement of genetics—in a marine mammal and places dolphins in a select group of animals (basically human and primates) that do the same.

"Over the last five or seven years there has been quite a debate over whether it [dolphin culture] exists," says Lars Bejder, from Dalhousie University and one of the authors of the research. "This is probably now the best documented case in a wild cetacean… which is comparable to chimpanzees and non-human primates that also use tools," he says.

The behavior originally puzzled people. Back in 1960s, fisherman noticed some dolphins in Shark Bay, Western Australia, had taken to wearing sea sponges on their beaks (rostrum), says Bejder. When biologists heard about it they had to go investigate, unsure what the reports meant. Over the

years, it's become apparent that the dolphins seem to use sponges during foraging in the coral for fish.

"It's very peculiar," says Bejder, "and the theory is that they use it as a protective shield to scare fish and not get cut up by rocks."

Sponging, as the researchers call the behavior, is passed on from mother to daughter. About 15 mothers and 7 offspring have been seen sponging in Shark Bay over the years. However, the behavior is largely seen only in females and appears to have recently passed down from a single mother, which the researchers have dubbed "Sponging Eve."

Bejder, lead author Michael Krützen, and their colleagues, think sponging is a form of culture and not just the simple use of a tool (other animals, like birds, use tools but this behavior is passed through genes). They came to this conclusion by excluding other possibilities, namely that sponging is due to the environment or genetics.

An environmental explanation didn't pan out because numerous other dolphins in the area don't use sponges, suggesting that nothing is unique to the Shark Bay environment, says Bejder, who participated in the project as part of his Ph.D.

To examine if sponging is genetic and potentially passes on through instinct, the researchers also took mitochondrial DNA from 185 dolphins, of which 13 were adult spongers. They then set about comparing patterns in this DNA, or haplotypes, against 10 different explanations for how a sponging gene might be inherited.

For example, if a sponging gene was on the X chromosome and expressed dominantly only in females, you'd expected only to see female spongers. But, at least one male sponger has been observed by the group, negating this pattern of inheritance. The nine other genetic explanations also don't appear to fit, the results of which are published in PNAS on June 21, 2005.

"We took the three different scenarios [environment, genetics, or culture] and could tick everything off except culture," says Bejder, "it's a very exciting result."

However, critics caution that whether the dolphins are using sponges as tools is still not clear, since its only been inferred by sound recordings and surface behavior so far. More work therefore waits before sponging is labeled a genuine form of culture by all.

Nevertheless, these curious dolphins remind us that culture is not merely a human trait, highlighting our often forgotten connection to the animal kingdom.

HOLLYWOOD VS. SCIENCE: HOW FAR ARE WE FROM INTERSTELLAR TRAVEL?

By James Weldon

Virtually all Hollywood science fiction - from Star Trek to Total Recall to the Alien franchise - agrees on one basic point: sometime in the near future, humanity will soup up its spaceships, stock them with silver jumpsuits, and get itself beyond the confines of our solar system.

So, in no time at all, humanity will reach other worlds, says Hollywood. We may meet new species, and someday, God willing, we'll all get the chance to have aliens hatch out of us at breakfast.

To many of us, this vision is just a matter of time.

After all, it's been about 40 years since the first manned space flight. Since then, we've put 12 men on the moon, built two space stations and sent probes to every planet but one. Indeed, with the advent of Virgin Galactic, Richard Branson's company dedicated to space tourism, William Shatner himself is planning a space flight (for real this time).

With the captain of the Enterprise headed into orbit, can interstellar travel really be so far behind? Yes, say experts, it can.

Despite what the movies may say, travel to the stars remains far beyond our grasp. We have no idea how we are going to overcome the obstacles that stand in our way. Nothing we've tried so far comes close.

Scientists are faced with three basic problems. Put simply, our engines are far too slow, our ships are far too heavy, and long term exposure to space tends to kill us.

The Voyager space probes offer a good illustration of just how daunting the distances are. Sent skyward in the final days of disco, Voyagers I and II hurtled past the outer planets in the early 1990's at a whopping 59,000 km per hour. At that speed, the probes will reach the nearest star in about 60,000 years -- hardly the stuff of compelling cinema.

To speed the trip up would require a huge increase in fuel weight, which itself would create problems. The amount of fuel required to shorten the trip to the nearest star would be enormous. Even a nuclear fusion engine, one of the most powerful conceivable, would require (and this image is pilfered shamelessly from NASA's Jet Propulsion Laboratories website) close to a billion super tankers full of fuel to make the journey in a reasonable time. That's assuming you don't want to do anything fancy like come back. Or do it in less than nine centuries. Or see something other than the nearest star.

Apart from all this, another major problem is keeping the occupants alive.

Living in space isn't a problem close to Earth. But when you step out from the shelter of the planet's magnetic field -- about a fifth of the way to the moon -- things start to get ugly. The level of radiation increases dramatically, with severe consequences for the health of astronauts.

So far, we don't know how to shield vessels

either. Metal itself becomes radioactive in the presence of this kind of radiation. More effective blockers, such as liquid hydrogen, would have to be about two metres thick to provide protection – hardly a practical solution.

The technology to solve the problems of speed and weight are even further away.

However, over the years a number of solutions to this problem have been proposed. These range from the sensational but environmentally unfriendly Project Orion -- which called for detonating nuclear bombs behind a spacecraft during launch -- to my personal favourite, Robert Forward's interstellar laser sails.

Forward's plan was simple: build a laser that would use 10,000 times the energy produced on Earth and fire it at a reflective space sail 1,000 km across. Although not lacking in pizzazz, the plan was ultimately cast aside when critics became convinced it might be impractical.

These have been more or less our best ideas to date.

In recent years, NASA has looked seriously at some wild ideas for making the movies come true. In 1996, NASA founded the Breakthrough Propulsion Physics Project (BPPP), whose stated purpose was to explore science's most radical theories until they came up with something that worked.

The BPPP looked at everything from making wormholes to warping space-time to creating "negative mass." Their progress was limited, though, and in 2002 the project was cancelled.

Without a giant leap in technology, humanity will be restricted to unglamorous exploits of sending probes to explore / crash into / lose power near our various next door neighbours.

For now, at least, Hollywood's spaceships will have to remain in the movies.

SEXY UNIVERSE.

By Ronnie Cordova

You are fine, what did you say your name is again? Mm. You got a way aboutcha, no lie. I like the way you cuuuuuuuurve so seductively around massive objects, baby, and I am dying to see how much you curve around this. You give me different looks, I like that, always something new to discover about you. I feel I can dig pretty deep into your mysteries and oh lordy do you have mysteries. You're charming but you've also got depth, underneath the surface there's something so consistent about you. Dependable. You're not a flake is what I'm saying, you've got character. How old did you say you are? Baby you don't look it, no joke. I wouldn't put you a day over 5 billion years, tops. Hell no I'm not kidding! Expanding? I don't know about that, baby, all I know is you look damn good from where I'm sitting. It's cute how you blush. You're so modest and so real sweetie, I love how you're finite but unbounded. I love that about you. Where the hell did you come from anyway? No wait, don't answer that. I kinda like not knowing.

Oh honey, I could spend my whole life exploring you. I wanna send my unmanned probe into your darkest reaches, sugar. Where you been all my life, hot thing? What? Ohhhhh honey, don't tell me that, not now when I'm all worked up. You don't need to collapse, we can make another big bang right here. Damn, and you're still shaking a little from the last one too. No no, leave the lights on.

INTRODUCING: BABY TALK.

By Russell Bradbury-Carlin

Most parents are anxious to know the meaning of the various cries, groans, and sounds their child makes. Recently a Spanish electronic engineer named Pedro Monagas created a battery-powered device called "Why Cry". This instrument about the size of a calculator is reportedly able to tell a parent whether their baby's cry is indicating hunger, sleepiness or tiredness. Mr. Monagas states that his "Why Cry" is 98% accurate.

Well I, myself, am considered a kind of "tinkerer". And, as a new parent I often wonder what all the sounds that my baby makes might mean, not just his crying. So, I gathered together some random things lying around my basement: a bike frame, a tube of caulking, some bits of string that I keep in a metal tub, the metal heads from golf clubs I found, amongst other things and started to put together my own device.

"Baby Talk" is a small instrument about the size of a 70's Volkswagen. It will listen to any sound that a baby makes and translate it into its true meaning. On a good day, it boasts 61.3% accuracy. I intend to place it on the market in the next year. I intend to sell it for a reasonable price. I intend to make a lot of money.

But does it work, you ask. Well, I can tell you that the communication between my 11 month old son and I has greatly improved since I've been strapping this device to him. Let me give you a sample of translations.

Mmma-maaa: Why don't you give me some Cheerios…in fact give me the whole box.

Blaa-Blaa-Blaa: Dad, you've put the diaper on backwards again.

Tthhhpttt: I've recently come to realize that my tongue is capable of spraying some kind of liquid from my mouth all over everything, making a nice glistening sheen.

Gaa-gaa-grrmm: I quite like to look in the mirror as it seems to contain the twins of my parents and an amazingly handsome young child.

Bbb-bb-bbb: Excuse me, but you are invading my personal space.

Huhhhh!: Actually, these Cheerios are quite bland, I'd much prefer a case of Cocoa-Puffs.

Tweeemm: If you ask me to give "kisses" again, I'll give you a big kiss, all right, buster.

Rrrrrrrrr: It would be awesome if you would let me sit in the car alone, start it up, and roll down the hill.

Ddd-ddd-ddd: Where is that really cute girl-baby that came by yesterday? I'd really like to see her again, let her yank toys out of my hand, and make me cry. Rowr!

Whaaap: The "Baby Talk" machine is amazing. It has changed my life! By the way, where are those Cocoa-Puffs I asked for?

My "Baby-Talk" machine has been a bit of a miracle in our house-hold. Now, instead of waiting for our son to communicate clearly to us, or having to go through the long anguishing work of teaching simple sign language, I just plug the "Baby-Talk" machine

into its gasoline-powered generator, attach it to my son and we're "talking".

I am also currently working on another device. But this one works the other way - translating parent's words into baby-sounds so the child can understand us. Does anyone have a bucket full of used staples or the frame to '68 Cadillac?

MICROBIAL FUEL CELLS FROM RHODOPHERAX FERRIREDUCENS.

By Mario Jardon, images by Jen Philpot

Novel microbial fuel cells.

A recently isolated microorganism has been reported to have a remarkable potential for electricity generation in microbial fuel cells. Rhodoferax ferrireducens, an iron-reducing microorganism, was isolated from subsurface sediments in Oyster Bay, Virginia, USA. Microbial fuel cells composed of this microorganism exceed the performance of previously described microbial fuel cells and even show some clear advantages over existing transition metal-catalyzed fuel cells.

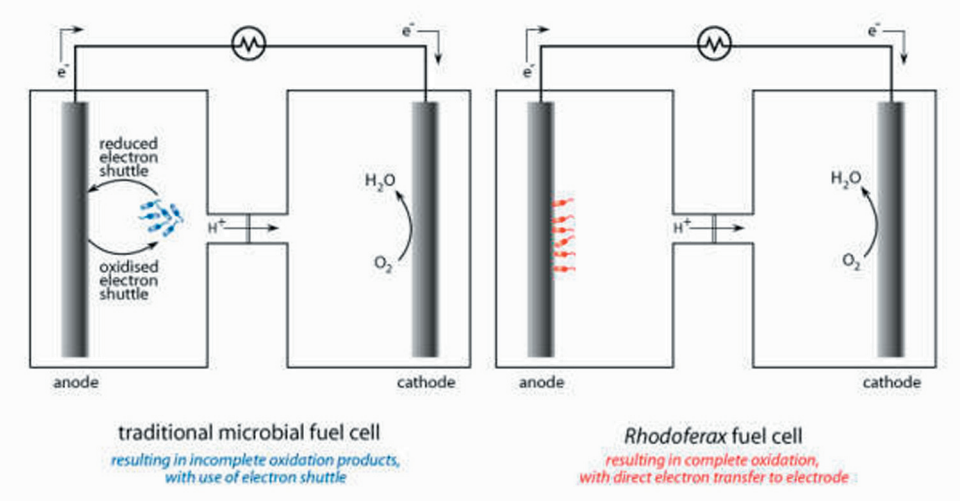
Microbial Fuel Cells

Before developing the concept of microbial fuel cells, it may be useful to recall the basic concepts of the conversion of chemical energy into electricity.

A battery converts chemical energy into electricity through an electro-chemical process. The basic unit of a battery is called a cell. There are three main parts involved in the process: (1) The anode, which is the negative terminal; (2) the cathode, which is the positive terminal; and (3) the electrolyte, which is the ionic conduction medium that allows the ions to travel from anode to cathode. Electrons flow from anode through external load to the cathode (generating electricity). To complete the circuit ions pass through the electrolyte between anode and cathode

Fuel cells operate in principle like a battery: they convert fuel to electricity by electrochemical means. However, unlike a battery, a fuel cell does not require recharging since it produces energy as long as fuel is supplied. Hydrogen fuel is fed into the anode of the fuel cell, and oxygen (or air) enters the cell through the cathode. The hydrogen atoms split into protons and electrons, promoted by a catalyst. The protons pass through the electrolyte, whereas the electrons create a separate current that can be used before they return to the cathode to react with the hydrogen and oxygen, forming water.

A microbial fuel cell (MFC) is a system that recovers electrons produced during microbial metabolism and channels them for generation of electrical current. MFCs can be divided into three different types (A, B and C). In type A fuel cells, artificial redox mediators are added to the culture in the anodic fuel cell compartment. These mediators penetrate the bacterial cells and transport the electrons to the anode. Type B fuel cells use metal-reducing bacteria, such as members of the families Geobacteraceae or Shewanellaceae, which exhibit special cytochromes bound to their membrane. These are capable of transferring electrons to the electrodes directly. Finally, type C fuel cells oxidize fermentation products (hydrogen, methanol, etc.) on electrocatalytic electrodes, that is, electrodes that have been chemically modified to oxidize such metabolites.



Rhodoferax ferrireducens microbial fuel cell

R. ferrireducens reduces Fe(III) during the oxidation of glucose to CO_2 and quantitatively transfers electrons to graphite electrodes. It is able to grow at 4 to 30°C (with an optimum at 25°C). Various substrates can support its growth, ranging from organic acids to simple carbohydrates (such as glucose or fructose). Cells in these MFCs are grown under strict anaerobic conditions in a bicarbonate-buffered defined medium, under N_2/CO_2 (80% and 20%, respectively) at 25°C. For growth on Fe(III), 10 mM Fe(III) chelated with nitrilotriacetic acid (FE(III)-NTA) is provided.

The reported MFC is composed of a two-chambered glass vessel connected with a cation-selective membrane with either graphite rods or finely woven graphite felt as electrodes. The liquid volume in each chamber is approximately 210 mL with a headspace of about 160 mL. The anode chamber is continuously flushed with N_2/CO_2 to maintain anaerobic conditions and maintain the pH balance of the growth medium. The cathode chamber contains 30 mM Tris buffer, and is continuously flushed with sterile water-saturated air.

The stoichiometry of glucose oxidation and iron reduction is as follows:

$$C_6H_{12}O_6 + 6\ H_2O + 24\ Fe(III) \rightarrow 6\ CO_2 + 24\ Fe(II) + 24\ H^+$$

Potential of R. ferrireducens fuel cells for electricity generation

R. ferrireducens has the ability to directly transfer electrons to the surface of electrodes. MFCs using this organism are superior to previously described microbial fuel cells, for various reasons.

First of all, this metal-reducing bacterium is able to oxidize glucose at 80% electron efficiency (other organisms, such as Clostridium strains, oxidize glucose at only 0.04% efficiency). In other

fuel cells that use immobilized enzymes, glucose is oxidized to gluconic acid, which generates only two electrons, whereas in MFCs using R. ferrireducens, glucose is completely oxidized to CO_2.

Secondly, these cells do not require the addition of toxic electron shuttling mediator compounds employed in other microbial fuel cells.

They also have a remarkable long-term stability, providing steady electron flow over extended periods. Current density of 31 mA/m^2 has been produced over a period of more than 600 hours. These MFCs exhibit many of the desirable features of secondary storage batteries, including the ability to be recharged, no severe capacity fading, the ability to accept fast recharge, reasonable cycle life and low capacity loss under open circuit conditions.

Finally, they allow the harvest of electricity from many types of organic waste matter or renewable biomass. This fact provides an advantage over other microorganisms in the family Geobacteraceae, which can also transfer electrons directly on electrodes, but which cannot metabolize sugars.

Conclusion

Even though microbial fuel cells are not yet able to compete with other types of chemically-generated electricity, advancements in this area render this a possibility. Two key challenges in the quest for sustainable societies are energy generation and waste disposal; electrochemical fuel cells, such as the one described in the referenced works can provide a promising solution by linking both tasks.

References

1. Chaudhuri S. K., et al., Electricity generation by direct oxidation of glucose in mediatorless microbial fuel cells, Nature Biotechnology, 2003, 21:10, pp 1229-1232.

2. Scholz F. et al, Bacterial batteries, Nature Biotechnology, 2003, 21:10, pp 1151-1152.w

DESPARATELY SEEKING A MATE FOR GROVER.

By Angela Genusa

Concerned over the failing health of Grover, PBS is in a frantic search for a mate for the rare blue species. Grover is presently in poor health. It is, incidentally, the country's lone blue Grover held in captivity.

The rare animal is caged in a pen inside the muppet animal research center in Alexandria, Va., and has been for the past 36 years since his birth. For reasons shrouded in mystery, Grover has shunned mating since he attained adulthood.

PBS sources said muppet personnel are actively considering finding a suitable match for Grover, preferably of a blue category, from the muppet research center. A proposal to this effect is shortly being sent to PBS headquarters after experts gave the nod to the proposal in order to better the health of the animal and preserve the species.

It has also been planned to shift the captive species from the present habitat to a more spacious area within a special sanctuary.

A muppet research officer said that 36-year-old Grover, hatched and bred by the muppet research center as part of a muppet conservation program, will be given the utmost care in the sanctuary pen.

Things have reached tragic proportions in the past when Grover violently attacked a female partner that had been released into the pen for mating purposes. Grover almost lost its left eye in the clash with the female partner.

The captive blue species has been under constant observation during the last two years as his health deteriorated. The enigmatic Grover has also alarmed muppet personnel because he frequently skips food and water for weeks on end.

Muppet personnel had earlier contemplated a release into the wild, after which an intense round of public scutiny from wildlife conservationists ensued. However, the proposal was ultimately shelved after apprehensions were voiced that competing organisms might assault the lovable and furry Grover.

PAT THE DEAN.

By Eric Schulman and Caroline V. Cox

Here are Robert and Virginia.
They are interviewing for faculty positions at a small liberal arts college.
YOU can interview for a faculty position at a small liberal arts college, too.

Robert can talk with Pat the Dean about research with undergraduates.
Now YOU talk with Pat the Dean about research with undergraduates.

Virginia can give a research talk about clusters of galaxies.
Now YOU give a research talk about clusters of galaxies.

Robert can teach a class on stellar structure and interiors.
Now YOU teach a class on stellar structure and interiors.

Virginia and Robert can go out to dinner with the search committee.
Now YOU go out to dinner with the search committee.

Robert can have breakfast with the Chair of the Division of Basic Sciences and Mathematics.
Now YOU have breakfast with the Chair of the Division of Basic Sciences and Mathematics.

Virginia can meet with Pat the Geology Professor and listen to him say that he hopes to see her in the fall.
Now YOU meet with Pat the Geology Professor and listen to him say that he hopes to see you in the fall.

Robert and Virginia can fly back home and wait for news.
Now YOU fly back home and wait for news.

Virginia and Robert can read e-mail saying that the search committee didn't think they'd be a good fit for the small liberal arts college.
Now YOU read e-mail saying that the search committee didn't think you'd be a good fit for the small liberal arts college.

Robert and Virginia have no choice but to leave academia and hope that they can get jobs designing Web sites for banks.
Can YOU get a job designing Web sites for banks?

("Pat the Dean" was first published in 1998 in the Annals of Improbable Research (volume 4, number 6, page 28).

ELSEWHERE AND OVERHEARD

By Caitlin Dowling

Overheard

"These men believe they are the head of the family but in fact they're not."
Dr. Nicolae Vlad, head of Botosani's Psychiatry Hospital, Romania, on the mental struggle for men living with their mothers-in-law. Bless. (ananova.com)

"Failure to do so may mean that there is no place in the oceans of the future for many of the species and ecosystems that we know today."
The effects of CO2 emissions on the ocean, according to John Raven, from the University of Dundee. (Guardian)

"At the moment of orgasm, women do not have any emotional feelings," says Gert Holstege of the University of Groningen in the Netherlands. Apparently orgasm 'turns off' parts of the female brain… (New Scientist)

Elsewhere

(http://www.ananova.com/news/story/sm_1438830.html?menu=news.scienceanddiscovery)
The Halle Berry brain cell

(http://www.999today.com/science/story/1331.html)
(999 today) Birds are more likely to crap on white cars, study finds

(http://www.guardian.co.uk/life/news/page/0,12983,937443,00.html)
Is your brain male or female? A couple of light quizzes, and article about new research from Cambridge University (Guardian)

(http://www.guardian.co.uk/life/feature/story/0,13026,1517186,00.html)
Where belief is born (The Guardian)

A BRIEF HISTORY OF MY ON-GOING LOVE AFFAIR WITH SCIENCE.

By Patrick Francis

May 8th, 1988

I encounter science for the first time during recess. As my friends and I are busy using the magnifying lens that Billy Stewart had gotten for his eighth birthday to burn some sticks, she breaks off from the pack of girls she usually travels around the schoolyard with to tell me that she likes my shoes. I don't understand how anyone could possibly dislike my shoes as they are brand new and have little zippered compartments where I have carefully secreted away the coins I will later use to buy myself some Gobstoppers, so I'm a little befuddled as I return to the sticks. Achieving only faint smoke from the wood we foolishly move on to try, using the same techniques, to freeze a small puddle.

September 10th, 1990

As I patiently explain to Todd Walters that his newest scheme to attain flight will probably end disastrously Science approaches. Relations have been cool since the shoe incident and I am surprised that she's coming my way. Timidly, she asks if I'm going to the lunch hour dance taking place the following day. Rumours abound that Science has been dating an older boy so I am shocked that she seems to be asking me to a dance. I try desperately, and ultimately unsuccessfully, to maintain my cool as I explain that, since I suspect the only tapes that will be played at said dance are by The New Kids on the Block and M.C. Hammer, I will not be going anywhere near the gym. As Science retreats dejectedly I agree with Todd that invisibility on the other hand is totally doable. I learn later that Science and Billy Stewart were seen kissing in a corner of the gymnasium during "Groove is in the heart". No doubt this is in retribution for my breaking his magnifying glass.

October 22nd, 1993

During Math class Science's friend Sarah Jensen passes my friend Cam Sparks a note that says, after a lengthy digression paralleling the math teacher's personal hygiene and his family name, that Science thinks I am cute. I hear about this note later in the library as I am perusing a pop-up book about the human circulatory system that I discovered while searching for a compendium of the 1001 worst sports injuries. I immediately pen a response that is both witty and sweet, asking if Science would like to go steady. After school I walk her home and during a brief pause in her explanation of why, contrary to a popular movie of the day, it would be impossible to clone dinosaurs from a mosquito, I slip my hand into hers.

December 3rd, 1998

I accidentally run into Science in the cafeteria. Ever since we broke up I have been practicing in my dorm room's mirror what I would say in just such a chance encounter. In these sessions I kept my composure as I listed the reasons, sensible to the last, that I had, during the previous semester, decided to simultaneously transfer into theology and end our relationship of 4 years. Now, I am pathetically trying to mask my sobs with a sudden and illogical case of mid-winter hay-fever; in the face of Science's composure my reasons sound contrived and immature. Eventually I break down into tears, call my foray into the arts ill-advised and proclaim my everlasting love. Embarrassed by my own overflow of emotion and disappointed by her cold façade I regrettably erupt, calling Science a "heartless bitch". I apologize immediately blaming the outburst on her absence from my life. It takes months of cajoling but eventually Science, whether out of pity, nostalgia or something else, agrees to take me back on the condition that I transfer back into Chemistry.

May 31st, 2005

My mind wanders from Karl Popper's The Logic of Scientific Discovery to my impending nuptials. Have I made a huge mistake? Can I really spend the rest of my life with Science? There is no question that I love her, that I've always loved her, but sometimes I catch myself gazing wistfully at other girls. Girls who read novels, play the guitar and don't quantify the beauty of a sunset for ease of comparison. Of course, they don't seem to care about string theory.

JOURNAL CLUB SELECTION.

The all pervasive principle of repetitious recurrence governs not only coding sequence construction but also human endeavor in musical composition. (1986) Immunogenetics 24(2): p71
In which Chopin, the bastard, apparently pilfered his material from genetic sequences.

(Found by David Ng, pdf of title page, available on line)

Immunogenetics. 1986;24(2):71-8

The all pervasive principle of repetitious recurrence governs not only coding sequence construction but also human endeavor in musical composition.

Ohno S, Ohno M.

Organisms which have evolved on this earth are governed by multitudes of periodicities; tomorrow is another today, and the next year is going to be much like this year. Accordingly, the principle of repetitious recurrence pervades every aspect of life on this earth. Thus, individual genes in the genome have been duplicated and triplicated often to the point of redundancy, and each coding sequence consists of numerous variously truncated as well as variously base-substituted copies of the original primordial building block base oligomers and their allies. This principle even appears to govern the manifestations of human intellect; musical compositions also rely on this principle of repetitious recurrence. Accordingly, coding base sequences can be transformed into musical scores using one set rule. Conversely, musical scores can be transcribed to coding base sequences of long open reading frames.

PMID: 3744439

NEW (THIS TIME AROUND) CONTRIBUTORS

Ronnie Cordova lives in Portland, Oregon and may be harboring a small quantity of dark matter on his person. His writing has appeared in various places and he is easily googled.

Caroline Cox is a PhD astronomer, educator, and astronomy education consultant. She was a research assistant professor of astronomy at the University of Virginia, where she studied galaxies and clusters of galaxies and taught introductory astronomy classes. Then she was an astronomy education specialist at the Smithsonian National Air and Space Museum, where she helped develop educational materials for the Explore the Universe exhibit. She currently teaches high school physics and astrophysics.

Angela Genusa is a writer, poet and artist whose work has been published online at McSweeneys, Yankee Pot Roast, Opium Magazine, The Black Table, and many places in print. Her father is a physicist and her mother, a chemistry major. She thinks Steve Martin solved all of the mysteries of the universe when he wrote about "Schrödinger's Cat," "Wittgenstein's Banana," "Apollo's Non-Apple Non-Strudel," and "Chef Boyardee's Bungee Cord" (which begins, "A bungee cord is hooked at one end to a neutrino, while the other end is hooked to a vibraphone...").

Mario Jardon is a PhD candidate in the Michael Smith Laboratories at the University of British Columbia, who hasn't been in Vancouver long enough to be able to say cool things about himself.

Eric Schulman is a PhD astronomer, author, and science humorist. One of his science humor articles, "The History of the Universe in 200 Words or Less", has been translated into more than thirty languages and provided the inspiration for his humorous popular science book, A Briefer History of Time: From the Big Bang to the Big Mac(R). His "History of the Universe in 60 Seconds or Less" slide show can be found on the United States National Science Foundation website.

James Weldon is a journalism student and space enthusiast at the University of British Columbia. With one arts degree under his belt and another on the way, James is on the fast track to fame and fortune.

ABOUT SUBMISSIONS:

Anything will do, but if you like more direction, we are happy to look at:

Things with some link (however weak) to science.

Things in English.
Things in other languages that are more or less readable when translated with Google tools.

Things with many words.
Things with few words.
Things with pictures.

Things that are news worthy.
Things that are not terribly so.

Things that educate.
Things that entertain.
Things that both educate and entertain.

Things that are important to ones well being, or perhaps to the global community at large.
Things that (at the end of the day) are really only there for the sake of being there.

Things from famous people who think that this is a pretty neat thing going on here.
Things from infamous people - they're interesting too.
Things from everyone else.

Things that could win you an iPod of some shape and form.

And things whose copyright ultimately remain with the author, although it would be nice to be acknowledged as being involved in presenting it to others.

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