

# **THE SCIENCE CREATIVE QUARTERLY ISSUE TWO PART FIVE OF SIX SEPTEMBER 6TH 2005 BLING!**

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Our masthead, we think, will be forever evolving, although at present we have two Daves, a Bethany, a Caitlin, a Stephen, a Claire, a Russell, an Alex, a Justin, and Andrew and a Caley

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

Maybe 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](mailto:tscq@interchange.ubc.ca)

# OVER ONE HUNDRED PIECES CAUGHT! A.K.A. AS GOOD AS TIME AS ANY TO DO AN EVALUATION REPORT.

To celebrate our one hundredth piece, the SCQ would like to thank everyone with an assessment of the site using google ranking techniques. As of 8AM P.S.T. September 5th, 2005, all aforementioned phrases resulted in a number one rank result.

(Good)

“bestest most kick ass”  
“an awesome force to be reckon with”

(Not so good)

“horribly, wretchedly, and obviously stinky”  
“Pffffssstttt”

(Not sure if it's good or not)

“profoundly change a person's appetite for sex”  
“aliens hatch out of us at breakfast”  
“lazy-ass starfish”

(Frankly, a bit embarrassing)

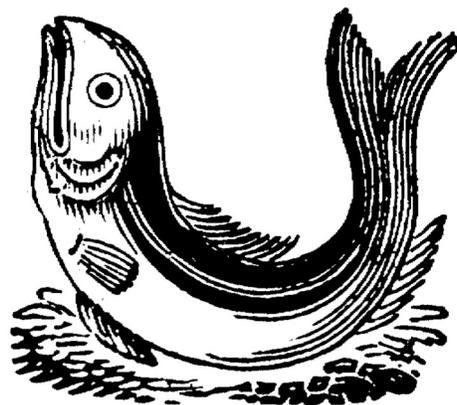
“look like rats wearing coats and sneakers”  
“they took shots of me pooping”

(Worrying)

“We are, in reality, pretty clueless”

(An overall good sign since this was really the whole point anyway)

“science literature presented in a myriad of ways”



# SQUIRREL FISHING INSTRUCTIONS

By Annie Tomlin



This picture is a good example of how the basic squirrel fishing model works. It's best to find a fairly open space with enough room to walk around a bit. We stayed away from a group of ne'er do-well hippie hooligans who were playing games, as they were likely to inadvertently interfere with our fishing agenda. Keep in mind that squirrels often live in public places, so it might take time to find a secluded area. Trust me, though: it's worth it in the long run. It doesn't matter if people are somewhat close (see the man in the picture). Once they see what you're doing, they tend to keep their distance.

There are two ways to go about casting a line. Evan opted to use his line sans rod, using a key to weigh the end down. This method was what I initially tried, but on my first cast, I wasn't holding on to the string tightly enough. A squirrel grabbed the bait and began to run away. I chased the squirrel in an effort to regain my equipment, but he was too quick for me. I wound up falling on my arse and slipping in the grass. Chattering, the squirrel ran up a tree and defiantly nibbled on the nut. After a considerable amount of work, I was able to reclaim my fishing gear, but I decided to create a makeshift fishing rod.

Just be sure to select a sturdy twig and tie the line tightly around the end. I wouldn't suggest using an actual fishing rod and reel, as that could cause problems with ornery park rangers who do not appreciate the fine art of squirrel fishing. Plus, a shorter pole allows greater contact with your friends the squirrels, and isn't that what we're all looking for?



### **Form and Technique:**

Here, Evan demonstrates how to effectively lure the squirrel. Notice his slight crouch and bent knees. This position says to the squirrel, “Hello, squirrelie! I am your friend! I’m not a big scary human - I’m a nice human who wants to meet you!” The squirrel, though hesitant, will approach slowly. It’s important to refrain from sudden or jerky movements; this will frighten the squirrel, who usually scampers up a tree.

I’ve found that the human voice is music to a squirrel’s ears. Squirrels seem to be entranced by a soft coo or a gentle greeting. Evan and I took different approaches to the vocal lure.

Me: “Oh, hello, lovey! Hello, squirrelie! Oh, come HERE, I have a lovely treat for you, sweetie! Come on, lovey! That’s nice!”

Evan: “C’mere. C’mere, bub.”

You can guess who the squirrels came to see first.



### **Zen and the Art of Squirrel Fishing Maintenance:**

Assuming that the aforementioned steps were maintained, a happy little squirrel should be within reach. But the rodent does not yet trust the human; the squirrel is by nature a skeptical creature, and he requires careful surveillance.

Gauge the squirrel's temperament. Research has shown that squirrels may appear to be relaxed, but if they turn their backs to you or fluff their tail, they are not completely prepared to relax. You can help to de-stress your squirrel by being patient and tempting it with the bait. Eventually, the squirrel will become so intoxicated with the nut that he will overcome his fears.

Watch the squirrel and get to know his style. Some squirrels are skittish and jumpy; these tend to be the thinner, smaller ones. On the other end of the spectrum lie the chubby squirrels, who tend to be less inhibited when it comes to approaching humans. Go for the roly-poly ones. They're friendlier, and fat for a reason.

As this picture illustrates, it's fairly simple to bring the animal near you. Nuts entice the squirrel, rendering him under your spell. The larger the nut, the closer the squirrel.



### **Capturing the Creature:**

Jackpot! We've caught a squirrel!

If the bait is tied securely to the string, then you should be able to play a bit with your catch. Try playing the classic tug-of-war game. Or pull the bait up with your pole, watching as the squirrel toddles about on his hind legs. These variations are always amusing and adorable.

Keep in mind, though, that teasing the squirrel too much will result in frustration for the little tree rat. After a bit, it's important to give the squirrel what he wants, and that's the nut. Sometimes they are clever enough to bite the nut off the string, in which case you will just tie a new nut to your equipment. However, this does not always happen, and on occasion you should just toss out a nut to the squirrel. Yes, it's giving away nuts for free, but it wouldn't be fair to just taunt the squirrel. In addition, giving the squirrel a nut will help create a special bond of trust between human and animal.

Once you've caught the squirrel, you should appreciate the fine features of his appearance. Take time to notice his cute little nose and his plump, furry belly. As he looks at you, his paws curling around the nut, know that this is your reward for your work in squirrel fishing.



### **The Joy of Squirrel Fishing:**

Look, it's a happy and satisfied squirrel! And it's all because of squirrel fishing, the sport of the future.

For more information on squirrel fishing, please visit Yasuhiro Endo, who inspired our adventures. ([http://www.eecs.harvard.edu/%7eyaz/en/squirrel\\_fishing.html](http://www.eecs.harvard.edu/%7eyaz/en/squirrel_fishing.html))

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# A BRAKE ON THE EVER EXPANDING GENOME

**By David Secko**

Want to expand a genome? Previous thinking suggests you only need some transposable elements, often nicknamed “jumping genes”, to repeatedly, and irreversibly, insert into the genome. Time will take care of the rest.

However, new research is now challenging this view by revealing that transposable elements can also be deleted during evolution.

The new findings were recently reported by Louie van de Lagemaat, Dixie Mager and their colleagues from the Terry Fox Laboratory in Vancouver, BC. They compared the human, chimpanzee and Rhesus monkey genomes and found 37 instances where transposable elements were present in the primitive Rhesus monkey, but lost in the human and chimpanzee genome.

In finding that transposable elements can be deleted during evolution, van de Lagemaat and colleagues also discovered that such deletions occur between short flanking repeats of DNA -- a finding that points to a mechanism for how genome size may be attenuated during evolution.

“Our work strongly suggests an important role for short, non-adjacent, identical segments of DNA in genomic deletions,” said Dr. Mager in a press statement, “and it lends insight into deletion mechanisms that help to counterbalance genome expansion in primates.”

Transposable elements are a well known cause of genomic expansion, and in mammals, have been reported to comprise upwards of 50% of the genome. The prevailing theory is that such expansions are unidirectional, with transposable elements becoming irreversibly maintained in a population over time.

However, this theory wasn't what van de Lagemaat and colleagues were originally interested in. Instead, they were simply looking for new transposable elements in the human genome.

“We were looking at supposedly new transposable elements but they instead appeared to be of a very old variety,” said van de Lagemaat, who is the lead author of the current study. “So we

started to wonder if some of them were deleted,” he said, thereby making them look new when they weren’t.

van de Lagemaat and colleagues therefore went about aligning the entire human, chimpanzee and Rhesus monkey genomes, to see how many transposable elements had deletions. They estimate that 0.5 to 1.0% of transposable elements that look like insertions are instead deletions. The results of the study appear in the September issue of Genome Research.

“The baseline belief is that anything can happen but some things are more frequent than others,” said van de Lagemaat about what he first thought when he saw the data. “This is one of those ‘any-things’ that isn’t very frequent,” he said.

Although the frequency of precise transposable element deletion is rare, van de Lagemaat said the mechanism that causes their deletion is not.

The mechanism involves flanking identical repeats of at least 10 base pairs of DNA, which play a role in recombining and removing DNA sequence between them. van de Lagemaat and colleagues suggest that 19% of genomic deletions between 200-500 base pairs since humans diverged from chimpanzees are due to these repeats.

“We are looking at a generalized deletion

mechanism,” said van de Lagemaat, “and such deletions are important in a lot of circumstances like disease, giving us the potential to more deeply understand them.”

# COMPOSURE

**By Claire Salvador**

On page 1420 of the old Second Edition Webster's Unabridged my father bought over 20 years ago for my brothers and me, it states that in music, a prelude is *an introductory section or movement of a suite or fugue*, and that since the 19th century it has become *any short romantic composition*.

I was not quite four when my family moved to Vancouver from Manila. I remember it was the nearing the end of the rainy season, and it was overcast and grey. I was wearing my best dress - crinoline and lace that made a wedding cake of my middle. Tito Jimmy and Tita Boubot, my mother's siblings, each held one of my arms, and I was swung over the gigantic puddles that the rains had carved into the dirt roads. My shoes got wet, despite their best efforts.

The collective of moving parts in a piano that is responsible for striking the string is called the action. When a key is depressed, a domino-like cascade of events ultimately results in vibrations from the hammer's contact with the string. These vibrations are carried along the length of the string and pass over a short straight bridge for the bass notes, or a long curved one for the treble, and are kept in place by steel pins. These pins clearly delineate the terminal node of each string and aids in sound transmission to the soundboard.

When I was nine, my parents rented our first piano, and I started lessons with Nancy, a quiet awkward Chinese girl who had just finished grade 12 of the Royal Conservatory of Music Piano Studies. She was just barely nineteen, and lived in a new Vancouver Special on the east side, a white stucco two storey house with red brick paneling the height of the faux oak double doors. It took my father two months to warm up to the idea of allowing my lessons, and another two to rent the piano. It was an old plywood upright that dominated our small living room, but soon I was well on my way to conforming to the vogue that many immigrant families could boast of; a child prodigy.

A typical piano has 226 strings. From the extreme bass, 10 notes each have a single string. To produce the low pitch of these notes, these strings have a steel core which are wrapped in copper or iron wire to reduce the speed of vibration. To avoid being overpowered by the thicker and louder bass notes, the next 18 notes have two strings each, and the 60 notes that lead to the top treble each have 3 strings. The bass notes are strung in a diagonal across the treble to centre them on the soundboard, and to conserve space.

On Tuesday nights, I was allowed to accompany my brothers to their scout meetings at the old church on 41st Avenue. While they learned to tie knots and mend buttons, I would sneak into the dark chapel, turn on all the lights and play *Studies* on the baby grand to an empty hall. I'd look up at the vaulted ceiling and play without looking at my fingers, liking the reverberations the chapel provided me but refusing to acknowledge its size. I used to hate it when sounds of my struggles attracted curious parents to leave their sons to their ropes and seek out my solitude, and I would always stop and leave, saying I didn't really know any songs - I was just learning.

A piano frame is called a harp, and is usually made of iron cast in a single incredibly strong structure that can withstand the tension wrought by the strings. The average upright has a combined pull of 50 000 pounds of pressure. Attached to the harp is a hardwood pinblock which houses the steel tuning pins to which each string is coiled. To maintain the proper tension in the strings, the pinblock must be able to hold each pin by friction alone.

My first piano was a monstrosity of an upright. It was stood five feet high, its long thin frame bearing tiny scars where the finish had chipped on the right front corner and in a cloud above the pedals to reveal cream coloured striations. It had a rather ornate music stand that would unfold impossibly from the case, and housed yellowed ivory keys, chipped at B and high D. An octave would barely be enclosed by my five fingers; my little right pinky was perpetually being caught by B's sharp teeth. And sitting on the edge of a bench that was a just a bit high, my bare feet still recall the places where the brass had worn away on the pedals, and where the geography of these seas pressed against my soles.

The two bridges transmit the insubstantial sounds made by vibrating strings to a thin wooden diaphragm called the soundboard. This is slightly crowned towards the strings to maintain compression and vibrancy, and to keep it from buckling under the tension of the strings. Through a balance of rigidity and flexibility, the soundboard radiates the vibrations into the air.

On page 720, a fugue is described as *a polymorphic composition constructed on one or more short subjects or themes, which are harmonized according to the laws of counterpoint, and introduced by the various instruments or voices in succession with various contrapunctal devices.*

My father never understood why I couldn't play sonatas right away. I found myself playing quieter and quieter so as not to disturb him, cutting short my practice time to cut short the time he would berate me for not progressing fast enough. I took to playing just until he was due home from work, and learned to have the case closed and the piano books away well before he came in the door. As the colours of my Piano Studies books slowly deepened from yellow to wine red, I started coming home from school later and later so that I would have to spend only a short while in front of the monster.

In music, pure tones are rarely heard. There is no such thing as an ideal string - one composed of the perfect alloys to allow it to vibrate without any stiffness, and at any frequency. Instead, we hear notes made of a matrix of pure and over tones determined by the vibrational capacity of the materials from which the sound originates, and these in turn, allow us to distinguish the sound of one instrument from another.

By the time I turned a gangly, bucktoothed thirteen, my father had been promoted to master controller at Pacific Coach Lines, and he invested in a new piano. It was smaller; a sleek apartment sized Royale with only two pedals. It stood three foot six, and only just over four across, and was stained a dark mahogany. Looking at it, I felt as if it was missing something that had so appealed to me in the beginning with the first piano. Looking at it, I'm sure he felt it a great achievement, something so much greater than polishing shoes for 50 centavos on the streets of Manila.

An instrument's timbre is the fusion of all the separate tones the vibrating system produces. Warmth is attributed to the number and relative loudness of the partial tones that accompany the fundamental. Woodwind and most stringed instruments produce harmonic overtones that are simply ordinals of the fundamental. However, there is a force that governs the vibrations of any string that seeks to restore it to its original position after being displaced, and is influenced by the stiffness of the string itself. In a piano, this stiffness generates partial tones that depart from simple harmony as the notes climb to the upper registry.

The less I played, the more clumsy my fingers became on the piano, and I started to forget how to move my hands above the keys. As a teenager, on the very few occasions that I was left the house to myself, I would sit in front of the piano and play snippets of music that had somehow gotten caught in the confused composite that was my memory; old studies, fragments of my imagination. It was at these times that I wished that I had never started piano lessons, and felt shame that I couldn't be what my father wanted me to be. And I wouldn't close my eyes, for at any moment, the door could open and I would be caught and reprimanded. I became more quiet and introverted, hidden by baggy clothes and braces.

The resonance of two or more frequencies produce beats equal to the difference in cycles per second between each tone that is sounded. Small differences in fundamentals are amplified in a piano's inharmonic partial tones. The beats sounded by a chord, or by the multiple strings in 78 of a piano's keys sound a remarkable simultaneous aural complexity.

*A suite is a set or series of related things; an early form of instrumental composition consisting in a series of dances in the same or related key, a modern composition in a number of movements, page 1823.*

I left home early. Got involved with a boy who slowly but steadily devoured my confidence. I lost value in my father's eyes. I remember what it felt like to have the birthday gift I offered as a truce to the silence between us, refused. How afterward I went home, and tore the handmade card into a thousand, thousand pieces. It would be four years before he acknowledged me again.

Sound is a vibration of matter. A vibrating source transmits its movement to adjacent air molecules that in turn agitate their neighbours. In this manner, compression waves travel from the source in spherical ripples through the air.

In my first year of university, I hired movers to transfer the piano from my parent's home to mine. I sat without words in my living room the first night, my hands resting on the smooth cool surface of its case, making up excuses as to why I couldn't, shouldn't play. For years afterward, it sat as a beautiful shelf, holding incidentals - plants, CD's, the occasional drink. It was rare to see the stark dichotomy of the black and white keys, and even rarer hear anything, even discordant clusters of notes, from the soundboard.

Sound waves are collected by the pinna. The fine membrane of the eardrum is stimulated by the force of each compression wave and vibrates. In a well timed reversal, this drum begins a cascade of vibrations that begin with the hammer to the coils of the cochlea, then carried and transformed

along the strings of our neurons from raw data to music in the cerebral cortex of the brain.

Now and then I tell myself I'm saving it for my future children, this misplaced, good intention of my father's. It took me a long time to get over my anger, and gain a small understanding of what it must've been like to leave a life, a country behind and begin by working the graveyard shift at the local corner store to support a family of six. I hope that my children will never know what it is like to be ashamed of your accent when you had mastered English back home, nor have an ocean to separate you from your roots. And we never speak, my father and I, of old disappointment.

# A DIALOG ON NUCLEAR WARFARE: CHARLES SHAW, HERMAN KAHN AND ME

**By Justin Kahn**

## **The Participants**

Charles Shaw: A brand of wine, widely known as “two buck chucks” for its affordability (although in Ohio, one can’t seem to find it for no less than \$3.33). An acquaintance of both participants in this dialog.

Herman Kahn—Arguably the most celebrated and controversial nuclear strategist of his time. Often said what was on everyone’s mind, was Director of the Hudson “think tank” and wrote “On Thermonuclear War.” Also a rather large man.

Me-- Pacifist. Has the last name Kahn, but is probably unrelated to Herman Kahn and related to Justin Kahn only in his own imagination. Definitely smaller than Herman Kahn though.

## **The Dialog**

Charles Shaw: Let’s party. For tomorrow we die.

Herman Kahn: That fact that nuclear war is a terrible prospect does not mean that we can justify avoiding thinking about the possibility. In order for a threat of retaliation to be credible, we must be willing to make provisions for survivors in the event of thermonuclear war.

Me: Tolstoy believed that drinking and war were both ubiquitous human experiences, that could be universally abstained from if people were at all happy.

Charles Shaw: You both need to relax.

Herman Kahn: I joke about a nuclear war. But that’s because I want people to recognize that this is a serious reality which deserves to be treated as an eventuality, not as some impossibility. I believe that if we are fully prepared to face a nuclear war, we can avoid it. At least until Mr. Kahn learns how to dance.

Me: I’m sorry my mind was elsewhere. I don’t want to die. What’s going on?

Charles Shaw: I serve Dionysus. Think wine, think freedom. I could teach Mr. Kahn to dance.

Herman Kahn: I serve the city, the organization and protection of people. I already know how to dance. Oh, right. The other Kahn.

Me: I'm sorry what's the difference?

Charles Shaw: The divine grape hurts no one.

Herman Kahn: Anyone who refuses to think about the nature of modern warfare is hurting. I refuse to allow the emotions or other components of the individual overtake the concerns of the future. Our children deserve better.

Me: You two deserve each other.

Charles Shaw (to Herman Kahn): Will you be mine?

Herman Kahn: I have been so concerned with applying systems analysis to artificial scenarios, that I forgot how wonderful it is to be human, to feel the warmth of a cup of coffee. O.K. I stole that coffee bit from the Wim Wender's film.

Me: I love you both. I hate myself for it.

Charles Shaw: Love is a strong word. But not strong enough.

Herman Kahn: Hate is a strong word. But not strong enough.

Me: What I was thinking would be ideal would be to have Herman set up a war game, so I could get a sense. I mean try everything at least once. Charles, I was thinking one drink, maybe two, just to take the edge off of things.

Charles Shaw: You don't understand me, because you overestimate thought.

Herman Kahn: You don't understand me, because you overestimate sobriety.

Me: So what am supposed to do?

Charles Shaw & Herman Kahn: We will leave you here to think about that.

Me: Alone?

# **BIOPROSPECTING: A NEW WESTERN BLOCKBUSTER, AFTER THE GOLD RUSH, THE GENE RUSH.**

**By Corinne Cluis**

Picture a group of scientists exploring tropical forests to collect plants, fungi or microorganism samples. They are bioprospecting. In other words, they are looking for new compounds that may help remediate so-far incurable diseases. Picture them settling in villages and discussing with the shaman to learn their traditional way of using plants to heal their people. These local medicine men are often rich of a secular oral tradition about nature's secrets. Now, picture the scientists coming back to their wealthy country with their suitcase full of unexplored drug candidates. Ten years later, after intense research work and numerous trial and errors, one of the plants used by the shaman is found to be a revolutionary cure for cancer. At first glance, this seems like blockbuster story! But is it, really? Alas, the reality is more complex, and the happy end is not always within reach for all the story's characters.

Bioprospecting refers to the search of biological products with characteristics interesting for humankind. In the past, bioprospecting has focused on the quest for new chemical compounds with medicinal or anti-microbial properties, and has many times been successful. In 1958, for example, a research group was able to isolate two new therapeutic agents from a Madagascar plant called the rosy periwinkle. The plant was found using cues from local shamans and spiritual herbalists [1]. If bioprospecting leads to a successful commercial product, it is likely that the company financing the initial "hunting" effort will want to protect their intellectual property rights on the product. But how are the country or the indigenous communities that traditionally use the beneficial natural resource going to be acknowledged or rewarded for their contribution? Moreover, how are they going to be affected by the sudden commercial value of the species producing the active compound? For instance, a curing plant that was a free commodity for the local communities of a tropical country may become a marketed one, now unaffordable for the people who discovered its virtues. Even worst, maybe the patent filed by the pharmaceutical company that developed the drug in its commercial form will prohibits the use or sell of the plant by indigenous groups.

These questions and issues are now getting even more complex, as advances in biochemistry and molecular biology make the own genetic material of living organisms very easy to extract and exploit for commercial purposes. In effect, with the recent sequencing and analysis of a growing

number of plant and microbial genomes, biologists have gained a great knowledge about the genes allowing for the synthesis of interesting chemical compounds. These genes, which encode for enzymes capable of converting one molecule into another, are the best tools you can possibly dream of to push even farther the limits of chemical diversity that may be generated in a laboratory, and thus increase the production of new molecules to be tested as drug candidates. As a result, scientists believe that the future of bioprospecting lies in the search for genes rather than for chemical compounds [2]. Once an interesting gene has been found in a given species, bioengineers are able to isolate the DNA stretch corresponding to it and even to modify its sequence in order to alter the structure of the protein resulting from the translation gene. They can then insert the modified gene into another organism and control when and where it is going to be expressed. In this case, after such a number of modifications and transfers, should which organism originally contained the gene and the country it comes from still be acknowledged? At this point it seems difficult to bridge the gap between the people who discovered a product through trial and errors of the course of their culture history and a the biotech company which can, by highly technical and costly efforts, transform and improve that product to make it efficient and available to the greatest number of people [3].

When it comes to the expropriation of land for mining purposes, several indigenous communities were previously able to obtain a financial compensation. Therefore, it would be logical that, in a similar way, they get a share of the benefits resulting from the use or exploration of their genetic resources, especially if they provide cues to scientists as where to look. Unfortunately, the current patent laws clearly favors “western science” and innovative economies rather than traditional medicine and oral wisdom. As a result, many civil society groups and activists describe bioprospecting as a form of piracy. They argue that bioprospecting leads to a loss of power of indigenous people over their own resources, which is particularly threatening to their lifestyle since most of these people heavily depend on the local biodiversity for their survival [4]. Some countries are now developing strict measures in order to restrict access to their resources by foreign companies. For example, India has recently established a national gene bank and created a new body of legislation in order for all exportations of plant genetic resources to be highly regulated by the government. The new legislation forbids open access to the gene bank by all American agri-businesses, revoking an agreement previously made with the US government. These measures were taken in reaction to several cases of controversial exploitation of resources by first world parties. One of these cases

involves a plant called neem, which has been used for millennia in India for its anti-microbial properties, but on which a corporation recently tried to put patent rights [5].

Unfortunately, many developing countries do not have the economical power or the political commitment necessary to put in place similar national protective measures. They also face great pressure by countries lending them money to open their frontiers to the latter's companies. In addition, the World Trade Organization (WTO) recently brought about an international agreement on intellectual property rights that supports the idea that government control of resources is in itself an obstacle to economical growth and should therefore be avoided. Having individuals empowered to negotiate the price for the share of their biological resources is considered an obstacle to the creation of a free global market [3]. The treaty imposes no requirements for the bioprospecting parties obtain approval from local communities or their government before proceeding to natural resource hunting. In addition, the benefits obtained for the commercialization of a product obtained by bioprospecting do not have to be shared with indigenous communities. Despite these controversial aspects, all countries that are members of the WTO are under great pressure to sign this agreement because failure to do so can lead to trade sanctions.

At first glance, it really seems like the indigenous people's claims on bioprospecting are hopeless, a typical David and Goliath battle. However, the story is not as dark as it sounds. Indeed, there are still considerable efforts made to integrate bioprospecting with the needs and rights of the developing countries. For example, The Convention on Biological Diversity, brought about in 1992 by the United Nations (UN), stipulates that bioprospecting shall not be done without the consent of the host country. According to that convention, the exploitation of local resources for drugs and medicine purposes shall be approved and actively involve local traditional communities, and the benefits made from such resources be shared in a fair and equitable way [6]. Another promising initiative is the International Cooperative Biodiversity Group (ICBG), a network of bioprospecting projects funded by the US government. The main goal of ICBG is to find plants bearing chemical compounds that could cure key diseases in the United States. However, countries that are hosting the searches can expect fair rewards and benefits. Typically the projects are set up so that the first extraction steps and analysis of candidate compounds are carried out in local laboratories, therefore creating new jobs and the development of a certain expertise. If a compound shows desired properties, further research and clinical trials are transferred to laboratories in the United States. If the compound leads to

commercialized drug, 50% of the royalties are invested in a community development fund run by indigenous people and another 30% goes to research on tropical diseases.[7]

Finally, bioprospecting is also beginning to foster a renewal of awareness toward the conservation of biodiversity [1]. In fact, it appears ironic that the countries where biodiversity is the richest and the most extensive are often some of the poorest in the world. Bioprospecting actors such as European and North American research institutes and pharmaceutical companies are of course interested in the preservation of such biodiversity, as they see it as bounties of potential new drugs. However, for developing countries, preserving biodiversity is luxury that they cannot afford, especially when these natural resources can provide a quick profit. The spread of initiatives such as the ICBG that propose a fair share of the benefits made out of bioprospecting activity is likely to influence governments of biodiversity-rich countries regarding the management of their natural resources. On these bases, bioprospecting has the potential to bring not only hope to human health but also to social justice and environment conservation. Now that is a great blockbuster story!

## References

1. Onaga, L., Cashing in on nature's pharmacy:

Bioprospecting and protection of biodiversity could go hand in hand. *EMBO Rep*, 2001. 2(4): p. 263-5.

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# HOW THE SCIENTIFIC DEVELOPMENTS ELUCIDATED IN SCIENCE MAGAZINE WILL AFFECT MY LIFE (VOLUME I)

By Patrick Francis

## Papers Discussed:

1. Jeffrey B. Bingenheimer, et al., Firearm Violence Exposure and Serious Violent Behavior, Science, 2005, 308:5726, pp1323-1326.
2. Paolo A. Mazzali et al., An Asymmetric Energetic Type Ic Supernova Viewed Off-Axis, and a Link to Gamma Ray Bursts, Science, 2005, 308:5726, pp 1284-1287
3. Roger Guimerà et al., Team Assembly Mechanisms Determine Collaboration Network Structure and Team Performance, Science, 2005, 308:5722, pp 697-702
4. Trevor Jones et al., The Highland Mangabey *Lophocebus kipunji*: A New Species of African Monkey, Science, 2005, 308:5725, pp 1161-1164

\* \* \*

A collaboration between scientists at the University of Michigan and Harvard medical school has shown that exposure to firearm violence doubles the probability that an adolescent will himself perpetrate a violent crime (1). To be honest I didn't read the whole report but the bits that I skimmed over made me extremely nervous. Just last year someone was shot outside of my apartment and, while I wasn't home at the time, I was able to inspect the bullet-holes the next morning. This is just the sort of exposure I assume the authors were referring to. I did some quick calculations and determined that my pre-shooting chances of perpetrating some violence were about 50% as I was either going to not going to display aggression. These chances have now rocketed up to 100% which is why I'm a bit anxious; I'm too pretty for jail.

I am even more concerned after reading a study on asymmetric energetic type Ic supernovas (2). These supernovas have associated gamma ray bursts that could, theoretically, like they did to Bruce Banner/The Incredible Hulk, endow me with super powers. The article didn't discuss the specifics of these super powers, and it was the poorer for it, but it didn't explicitly state that I would respond any differently than Mr. Banner who, along with his super strength and alluring green coloring, suffered from some rage issues. This is cause for concern for if I too were to be cursed with a very bad temper along with what I can only hope will be some combination of invisibility, power of flight and super speed I would become quite a menace to society, especially considering my aforementioned increased penchant for violence.

In order to channel by forthcoming powers/bloodlust towards the doing of good I will probably need to form “Team Awesome” a crime-fighting squadron of daredevilry. Luckily, the mechanisms behind assembling such a team have been studied using data from the Broadway musical industry and the scientific fields of social psychology, economics, ecology and astronomy (3). Extrapolating from this study and assuming that crime fighting and Broadway musicals are analogous, I have decided to limit the team to 6 members. This is enough individuals to enable specialization and effective division of labor while at the same time allowing us all to travel around in our bitchin’ van. True, Broadway musicals are typically composed of 7 artists but Team Awesome doesn’t really need a lyricist. It does, however, need a master of disguise, an explosives expert, a strongman, a gadgetry whiz and a choreographer. This should be enough diversity to spur creativity but not so much as to cause conflict and miscommunication. The team will also have to consist of a healthy mix of rookies and grizzled veterans so as to ensure we have innovative ideas but also a reservoir of past experience.

Crime-fighting will no doubt be draining, thankless work. The members of “Team Awesome” will therefore be in no mood for housework upon returning from foiling the latest schemes of our nefarious nemeses. Instead we will want to be catered to as we lounge poolside in our secret, intra-volcanic headquarters. However, “Team Awesome” will require something special in a butler. Which is why the current discovery of a new species of African monkey in Tanzania is so intriguing (4). *L. kipunji* is arboreal and is distinguished by its black eyelids, brown coloring, upright crest, and its off-white tail and ventrum. It is not yet known as to the quality of this new-found species’ butlering but it can be assumed that it will be of a higher quality than all previously-known monkey species who are, to the last, unreliable menservants: baboons are more likely to attack a visitor than to show them into the lounge and when, in the off-chance, a spider monkey actually fetches a beer it seems to be a random occurrence rather than the result of a deep-seeded fealty. Only Chimpanzees have shown any promise in the arena of servitude but even they have the unhygienic habit of soiling their custom-made miniature tuxedos.

“Team Awesome” will be a dedicated force for good, battling jewel theft, insurance fraud and the like. It will be a mundane existence until that time that the pages of Science magazine unlock the mysteries of time-travel, account the first successful genetically engineered (and evil) shark-man or report on some crazed doctor’s giant laser-oriented plot. Then things will become a bit more awesome.

# HOT SCIENCE-Y GUY OF THE MONTH - KAYSAR RIDHA

By Melissa Bell



Aw heck, it's nearly Labour Day, so let's just call this lovely man the *Hot Science-y Guy of the Summer* and be done with it. Now I doubt if he's going to include that on his updated résumé, but one thing I am willing to bet on is that Kaysar Ridha would prefer not to be remembered as *The Guy Who Took His Finger Off the Button on Big Brother 6™*; therefore I am not even going to mention the fact that he's the guy who...well, let's just say the end of the season came tragically early for the ~~feed junkies~~ viewers who voted His Royal Decency back into the Big Brother House of ~~Mental Freaks~~, only to see his fresh, juicy brain evicted for a second time before he'd even had a chance to unpack. Personally, I'm glad he and his lethal handsomosity have been shown the door on that ~~silly~~ show; now millions of ~~women~~ people can get back to their jobs and deadlines. It's all fun and games until some poor Canadian girl (stop looking at me like that) loses an entire short-lived summer being "entertained" by caged strangers.

Oh, right. The science-y part. Here it is: Mr. Ridha's BB6 profile says he's currently a graphic designer, but a little web-~~stalking~~ sleuthing uncovers a background in biological sciences. Here's hoping he might just expand on that knowledge and discover what it takes to clone himself, because if he's selling, I'm pre-ordering. The world needs more Kaysar Ridhas. Lots more. And for all the rest of you hookah-smoking, chess players out there, you can come out of the basement; you're hotter than you think.

# ELSEWHERE AND OVERHEARD

By Caitlin Dowling

## Overheard

*“If you’re with a phone company and you know they’re not an ideal match, you’re going to look for someone who is. It’s a very similar situation.”*

Richard Ecob, who has adapted a system for modelling atoms in radioactive decay to investigate how we look for partners. (BBC News)

*“The frog’s distinctive Norfolk accent, the buried remains and genetic studies all provided crucial clues.”*

A frog with a regional accent is being re-introduced to England. (BBC)

*“Clearly we need to capture that lightning in a bottle.”*

Dmitri Williams, whose research finds no connection between violent video games and violent behaviour. He now wants to harness the skills involved in video gaming for use in management and problem solving jobs. That time with the PS2 clearly wasn’t a waste (EurekAlert)

Save the banana! Apparently, the north American favourite, the Cavendish, is becoming extinct due to a fungus. Banana growers in Central America are “trying to create a replacement that looks and tastes so similar to the Cavendish that consumers won’t notice the difference.” But we’ll still know it’s different. (New York Times)

## Elsewhere

The Unbearable Lightness of Flying - Guardian

(<http://www.guardian.co.uk/life/feature/story/0,13026,1546172,00.html>)

We knew it! Why some erotic images could in fact make you blind - New Scientist

(<http://www.newscientist.com/article.ns?id=dn7845>)

Will cheetahs and elephants roam North America? – Globe and Mail

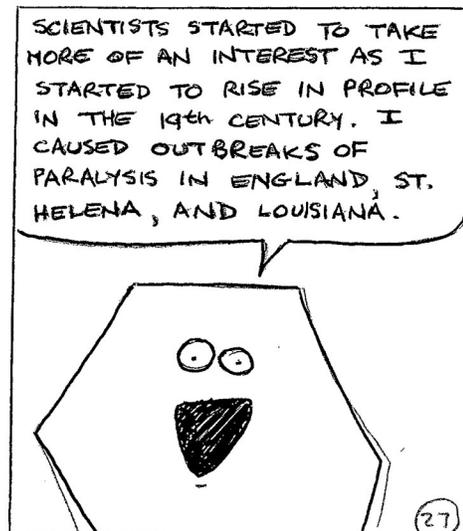
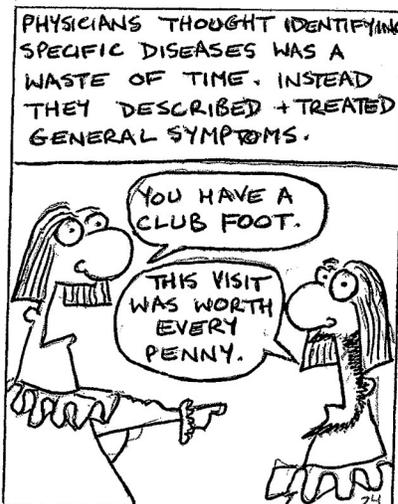
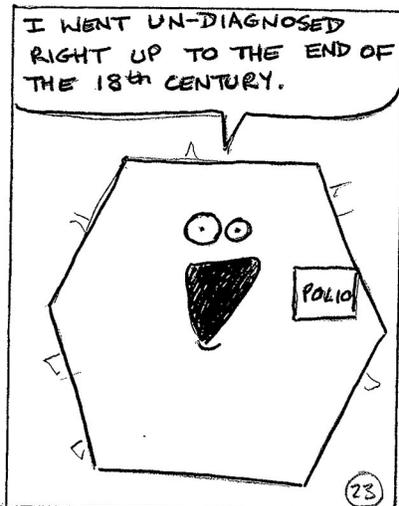
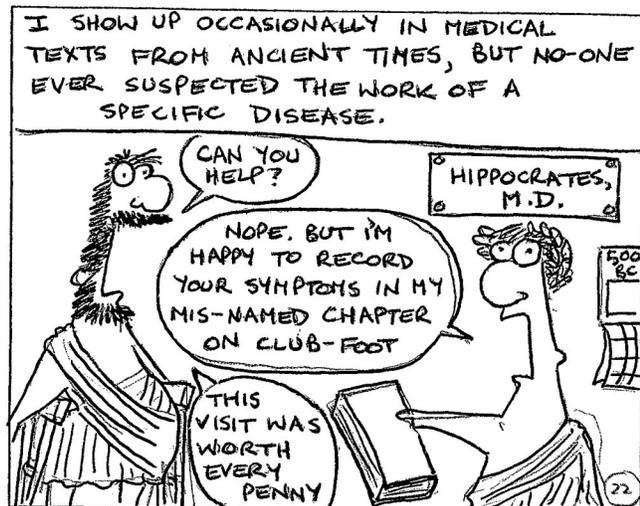
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New Lemurs found in Madagascar – BBC

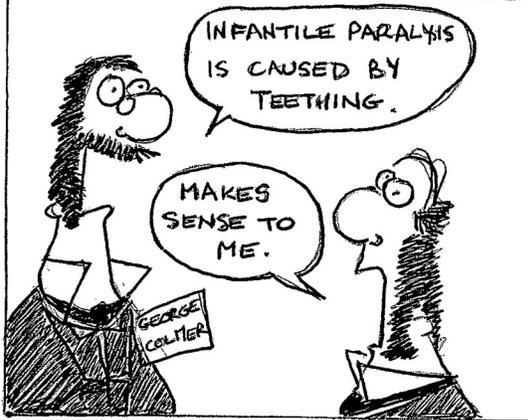
(<http://news.bbc.co.uk/1/hi/sci/tech/4135670.stm>)

# POLIO: ITS STORY...(PART THREE)

By James Weldon



STILL NO-ONE KNEW SUBCLINICAL CASES WERE EVERYWHERE, OR EVEN THAT I WAS CONTAGIOUS



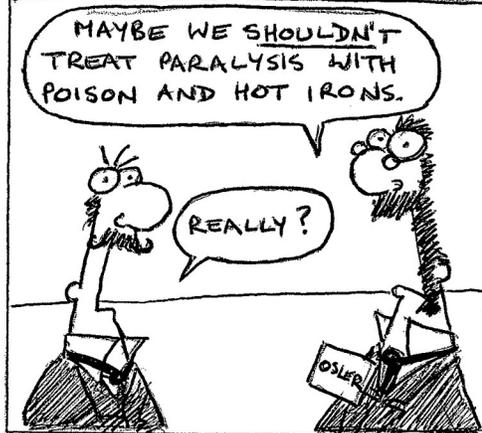
THE FIRST SIGNS OF TROUBLE SHOWED UP IN THE LATE 19th CENTURY, WITH THE RISE OF MICROBIOLOGY.



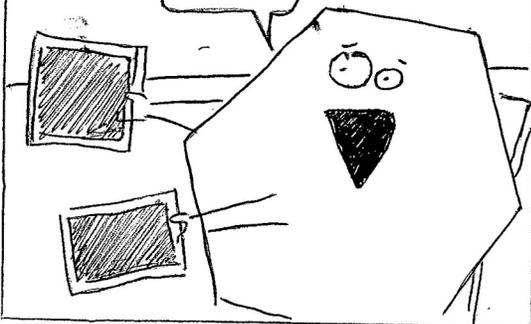
NEW IDEAS ABOUT DISCRETE AGENTS CAUSING SPECIFIC DISEASES SOON CAUGHT ON. IT WAS BAD NEWS. LUCKILY, IDEAS ABOUT HOW TO TREAT ME WERE STILL FOGGY.



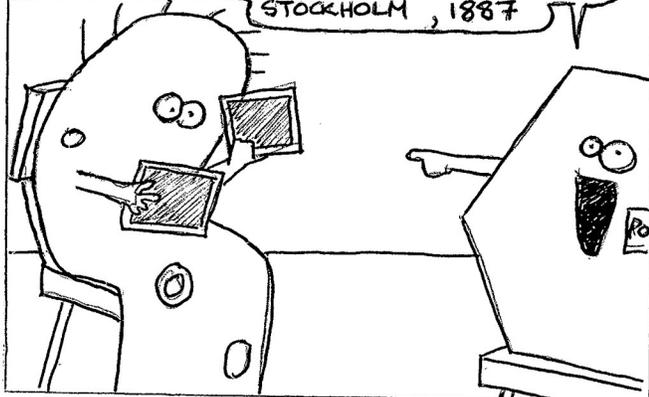
UNFORTUNATELY, UNDERSTANDING WAS IMPROVING.



AS THEIR UNDERSTANDING IMPROVED, THOUGH, I WAS MAKING PROGRESS MYSELF. EPIDEMICS GOT BIGGER. VICTIMS GOT OLDER



HERE I AM IN NORWAY. AND THAT'S A VILLAGE IN FRANCE IN THE 1880'S. I ALSO CAUSED 44 CLINICAL CASES IN STOCKHOLM, 1887



TO BE CONTINUED...

# JOURNAL CLUB SELECTION.

In Vitro-Cultured Meat Production. (2005) Tissue Engineering 11:p659  
*Would you like some test tube fries with that?*

(Found by Alex Lane, pdf of title page, available on line)

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Tissue Engineering 11 (2005) p659

## **Commentary: In Vitro-Cultured Meat Production**

**P.D. EDELMAN, D.C. MCFARLAND, V.A. MIRONOV, and J.G. MATHENY.**

Although meat has enjoyed sustained popularity as a foodstuff, consumers have expressed growing concern over some consequences of meat consumption and production. These include nutrition-related diseases, foodborne illnesses, resource use and pollution, and use of farm animals. Here we review the possibility of producing edible animal muscle (i.e., meat) in vitro, using tissue-engineering techniques. Such “cultured meat” could enjoy some health and environmental advantages over conventional meat, and the techniques required to produce it are not beyond imagination. To tissue engineers this subject is of interest as cultured meat production is an application of tissue-engineering principles whose technical challenges may be less formidable than those facing many clinical applications

# CONTRIBUTORS

Melissa Bell lives in Toronto. She is still bitter that she never received a chemistry set for Christmas, but is at least beginning to accept that her parents probably knew what they were doing. Some places her writing has appeared include online with McSweeney's and in print with Flesh & Blood.

Corinne Cluis is doing a M.Sc in plant molecular biology. She is interested in ways in which biotechnology can be used to increase quality of life, and in ethical ways to have these advances benefit populations. She is currently debating whether to become a pop icon or a meditating bum on the trails of BC parks.

Caitlin Dowling's mission is to reach Mars. If this doesn't work out, Seattle will more than do. While waiting for news on her impending travel, she'd really like to compile data for a science website and maybe even post an article or two.

Justin Kahn can be reached at [Justin\\_Kahn@hotmail.com](mailto:Justin_Kahn@hotmail.com) or by a note on the bulletin board at the coffee shop where he writes.

Over the last ten years Alex Lane has taken a keen interest in current events and issues in science/technology. This enthusiasm has been fueled partly by contributions at Government, Academic and Biotech institutions. He hopes that these articles highlight his interest in the unusual, and point out that science is as easily defined as we would like.

Claire Salvador has a degree that incorporates both biology and creative writing. She currently works as an andrologist for a fertility centre, and is somehow affiliated with the esseequeue. After years of being afraid of water, she is finally learning how to swim.

David Secko is a molecular biologist and a science writer, who is currently studying journalism at the University of British Columbia. He thinks Steven Wright was right when he asked: "ok, so what's the speed of dark?" His writing has appeared in The Scientist, The Tyee, Canadian Medical Association Journal, Science's Next Wave and UBC's Thunderbird Magazine.

More of Annie Tomlin's writing can be found at <http://annie.newdream.net/>. Also, she loves Canadians.

James Weldon is a journalism student 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.

Submissions are preferred as attached word documents, or text pasted directly into the body of the email. Please send us your good work to **[tscq@interchange.ubc.ca](mailto:tscq@interchange.ubc.ca)**