Infoteca's E-Journal

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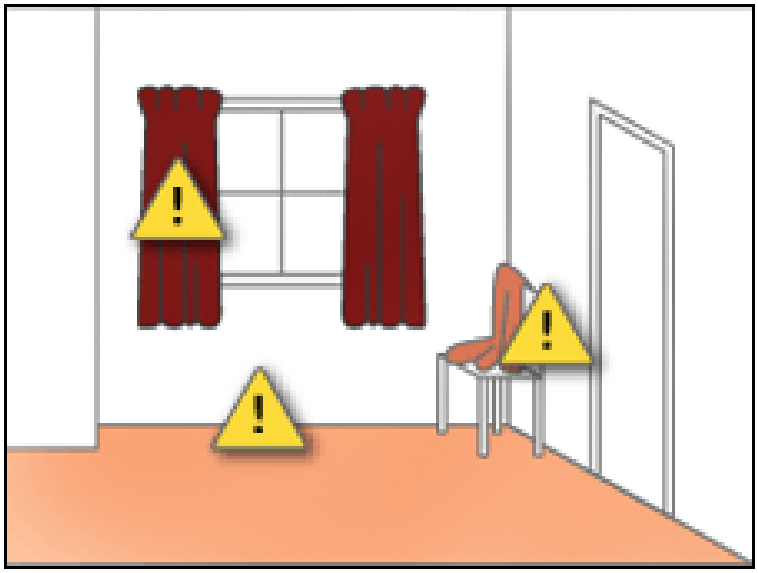
Fruit and veg allergies soaring

By Sue Emmett
BBC News

Cases of oral allergies to fruit and vegetables are rapidly increasing, according to a British specialist.



Dr Pamela Ewan, an allergy consultant at Addenbrooke's Hospital in Cambridge, said the rise in cases appears to be outstripping even peanut allergies.

Dr Ewan, who sees more than 8,000 people with allergies a year, said most patients with reactions to fruit and vegetables were youngsters.

Symptoms include swelling in the mouth and throat, and breathing difficulties.

ALLERGY OR INTOLERANCE?
- An allergy is when the immune system reacts to a harmless substance such as a food or pollen, as if it isn't safe
- A severe allergy can cause a potentially life threatening shock known as anaphylaxis
- An intolerance does not affect the immune system
- An intolerance is generally not life threatening and the symptoms less severe
- An intolerance is being unable to digest certain foods such as lactose in milk

She said: "We have seen a big rise in the number of cases in the past four to five years.

"It is a bit like the peanut allergy was the epidemic of the 1990s. I think fruit and vegetables are becoming the epidemic now.

"In term of numbers, fruit and vegetables are the new form of peanut allergy."

Dr Ewan urges parents to take the problem seriously.

"We think fruit and vegetables are healthy, which they mostly are, but you can be allergic to them."

"Early on when we first picked it up, it was passed off as not being serious. It began with fairly mild itching in the mouth.

"But now we are seeing people who are getting really severe throat closure, a significant swelling at the back of the throat which can impede breathing."

Reaction to bananas

One of her patients is Alexander Lambert, a 15-year-old schoolboy from Essex. He first discovered he had a reaction to bananas when he was 11.

Tests have since proved positive to other fruits. Alexander said that now he even has to be careful about what fruits other people can eat around him for fear of triggering a reaction.

Other specialist centres in the UK have confirmed to the BBC that allergies to fruit and vegetables is a growing problem.

Dr Adam Fox, a consultant paediatric allergist at Guy's and St Thomas' Hospital in London, said: "We are certainly seeing lots of oral allergy syndrome.

"This affects people who are actually allergic to pollen - such as birch pollen.

"There is a cross-reactivity between the protein in that pollen with those in fruit and vegetables, so people start getting a reaction to fruits such as apples and pears.

" **Now we are seeing people who are getting really severe throat closure, a significant swelling at the back of the throat which can impede breathing** "
Dr Pamela Ewan, allergies expert

"Normally we would see this among young adults as they start to develop hay fever but we are starting to see more of it among young children.

"As there is more allergy, the severity seems to be increasing and the patterns are changing."

Pollution a factor

Whilst allergy to hay fever is seasonal, allergy to fruit and vegetables can continue all the year round.

Dr Jonathan North, from Birmingham, agrees with Dr Fox. He believes that particles from diesel exhaust may be making the situation worse as these make pollen more allergenic.

He said: "Fruits are a particular new problem, possibly due to similarities between the proteins in some tree pollens, birch especially.

"The chance of cross-reactions with fruits increases with the larger number of types of fruit to which we are exposed."

Dr Paul Williams, a clinical immunologist at the University Hospital of Wales, has also seen a rise.

"There is a real increase in the number of patients seen with Oral Allergy Syndrome in the specialised allergy service we run.

The records indicate a five-fold increase in the rate of oral allergy syndrome in the same six year period, albeit from a low base.

The rate of final clinically diagnosed cases rose from about one for every 100,000 of the population in the Cardiff and South Wales area, to five in the year 2007/8.

Resources issue

However, the centre emphasises that it does not yet know why this is.

It could, for example, be due to improved diagnostic procedures.

Many of the consultants contacted by the BBC have raised concerns that the UK has inadequate resources to cope with the growing demands being placed on allergy services.

They say there are too few specialist centres and specialists.

Dr Ewan estimates that, with the current facilities, it would take 50 years to see all the people estimated to be currently suffering from severe or complicated allergies.

But the Department of Health says it is responding to rising demand with an increase in staffing. It is also planning a pilot allergy centre as a potential model for the future.

On the BBC News website tomorrow: How much is the modern, Westernised lifestyle to blame for the allergy epidemic?

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/7988483.stm

Published: 2009/04/15 00:29:27 GMT

Manifesto of a Comic-Book Rebel

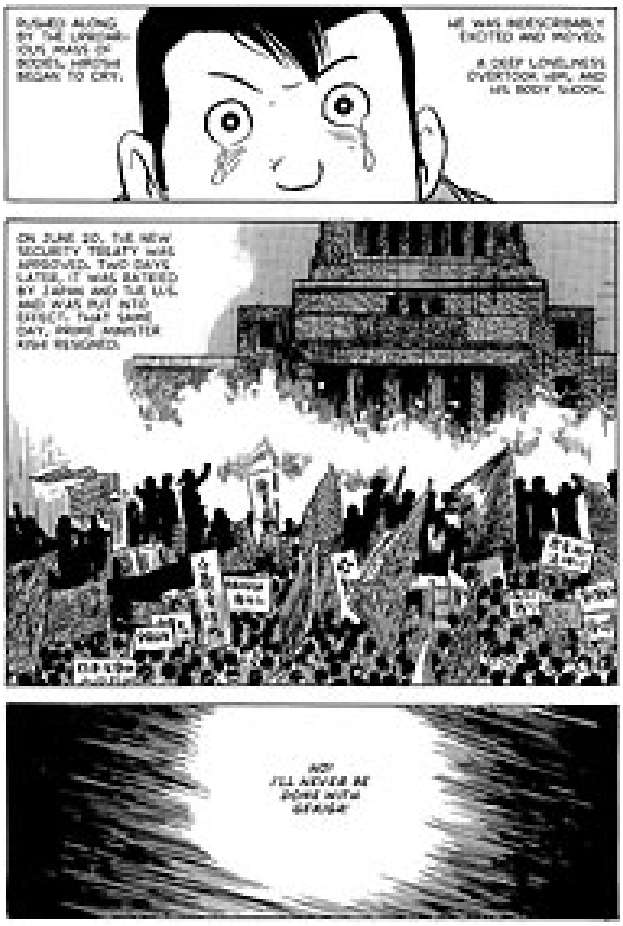
By DWIGHT GARNER

A DRIFTING LIFE

By Yoshihiro Tatsumi

Translated by Taro Nettleton.

855 pages. Drawn & Quarterly Publications. $29.95.



Underground comics took root in America in the 1960s and ripened with the counterculture; artists like R. Crumb, Kim Deitch and Art Spiegelman discarded the old funny-page formats and themes — beat it, "Blondie" — like so many desiccated cornhusks. In Japan, however, there had already been a comics revolution, and the man at its rowdy vanguard was Yoshihiro Tatsumi.

Mr. Tatsumi, born in 1935, came of age alongside Japan's postwar obsession with manga, serialized black-and-white comics whose characters have a distinctive iconography: big, dewy eyes; tiny mouths; piles of spiky hair. Most manga takes place in a bright alternate universe where it seems as if any problem might be resolved with a cute-off: batting eyelashes at 10 paces.

Mr. Tatsumi began drawing manga as a child, but he quickly rebelled against the form's aesthetic limitations. Manga was aimed largely at children, and its emotional and intellectual palette was circumscribed. Along with a cohort of young writers and illustrators, Mr. Tatsumi introduced in the late 1950s a bolder form of manga he called "gekiga" — darker, more realistic, often violent. The name stuck. And he became one of Japan's most important visual artists.

Mr. Tatsumi's work, long unavailable in English, has begun to be translated and issued by the Canadian publishing house Drawn & Quarterly in an annual series of books edited by the cartoonist Adrian Tomine. Now comes the big kahuna: Mr. Tatsumi's outsize autobiography, "A Drifting Life."

It's a book that manages to be, all at once, an insider's history of manga, a mordant cultural tour of post-Hiroshima Japan and a scrappy portrait of a struggling artist. It's a big, fat, greasy tub of salty popcorn for anyone interested (as Americans increasingly are) in the theory and practice of Japanese comics. It's among this genre's signal achievements.

Manga, like rock 'n' roll, is fundamentally a young person's game. Mr. Tatsumi, 73, was born the same year as Jerry Lee Lewis; "A Drifting Life" was 10 long years in the drafting. But no strain of composition shows in this book's marathon 855 pages, which chronicle his career from 1945 to 1960, the period of its greatest ferment.

Mr. Tatsumi was, he explains here, a geeky comics genius from the time he was in short pants. He began to draw manga in seventh grade in Osaka. Soon published widely, he formed a groundbreaking group, the Children's Manga Association. The form's masters were like gods to him. "Stories that capture the minds of children all over Japan," his character says to himself. "How amazing it must be to be the person creating them."

If success came quickly, confidence did not. Mr. Tatsumi's family was poor. His father, a philanderer, was barely and sometimes shadily employed. Mr. Tatsumi's mother and his three siblings made do as well as they could. Drawing manga was the author's ticket to ride.

Once he was finished with school, Mr. Tatsumi began toiling in the cheesy, exploitative and highly competitive field of "rental manga." These books were grab-bag collections that printed the work of several artists; readers borrowed them from stores and then returned them like video rentals.

Publishing houses cranked out rental manga like so much spicy sausage. To get the work done, publishers sometimes crammed their writers and illustrators into communal apartments for days or weeks at a time. In one scene in "A Drifting Life," a publisher delivered a watermelon to one such apartment to "keep up your morale."

Mr. Tatsumi does not deny the pleasures of this kind of quick-and-dirty work. His comics were being devoured by a wide and eager audience, and he was honing his craft. "For this 19-year-old boy with no guarantees for his future," he writes, "the only place where he felt alive was in the realm of imagination." There was "no freedom in reality," he continues, but "any kind of transformation was possible in the imaginary world."

All along, however, Mr. Tatsumi was also dreaming of something better: experimental work, "manga that isn't manga." He became obsessed with movies, both American and Japanese, and took note of their stylized visuals and their cool realism. He wanted to produce narrative comics instead of "manga with wild characters jumping about" or "manga that concerns itself with 'humor' and 'punch lines.' "

After watching "Shane," he was taken with the vividness of Jack Palance's cruelty. And he fell hard for Mickey Spillane's hard-boiled phrasings. Mr. Tatsumi drafted a "Gekiga Manifesto" and, along with a group of like-minded artists, started a movement that ultimately changed the face of manga.

As "A Drifting Life" progresses, it becomes clear that Mr. Tatsumi is not content merely to tell his own story — or just the story of gekiga. He charts Japan's small cultural milestones in the wake of the war. This book begins with a panel depicting Emperor Hirohito's surrender but soon moves on to topics like Japan's first domestically manufactured washing machine, its Miss Universe contestants, maritime disasters and taste for Coca-Cola. It's ground-level pop history.

The rap against graphic novels or memoirs is that they're a bastard form that guarantees that both the art and the writing will be second-rate. There's a speck of truth there, to the extent that the relationship between illustration and prose, in long-form comics, is symbiotic: you wouldn't necessarily want to pry one from the other.

Mr. Tatsumi's prose has been translated from the Japanese, fluidly, by Taro Nettleton. The occasional banalities of the language are, you suspect, not the translator's fault. But I wish Mr. Nettleton hadn't continually saddled Mr. Tatsumi with long-winded verbs like "utilized" instead of simple ones like "used."

Mr. Tatsumi's art is more sophisticated, retaining the form's strange sparkle even at gloomy moments; he definitely does write manga that isn't quite manga. The genre can be a difficult one in which to portray aging. Mr. Tatsumi looks just about the same here at ages 10 and 25.

A book like "A Drifting Life" is fairly easy to pick apart on a drawing-by-drawing or line-by-line basis. Don't make that mistake. Its pleasures are cumulative; the book has a rolling, rumbling grandeur. It's as if someone had taken a Haruki Murakami novel and drawn, beautifully and comprehensively, in its margins.

http://www.nytimes.com/2009/04/15/books/15garn.html?_r=1&th&emc=th

A Man With Opinions on Food With a Face

By ERIC KONIGSBERG

DID you hear the one about the vegan who mistook his anorak for a sandwich? He realized the error only because it tasted so good.

O.K., O.K. Laugh all you like. And Jeffrey Moussaieff Masson — author, former psychoanalyst and Freudian scholar, animal lover and vegan — will probably laugh with you. "You know, we don't have restaurants like Chez Panisse in the vegan world, not yet," Mr. Masson said. "A vegan diet takes getting used to, and I'm somebody who was raised vegetarian."

A matter of particular dissatisfaction for Mr. Masson at the moment is his overconsumption of muesli. "I'm looking for a new breakfast food," he said. The problem intensified when his 12-year-old son was found to be sensitive to glutens. "They make him aggressive," Mr. Masson said. "And the thing is, I can't bring home delicious, wonderful French bread and just eat it in front of him while he has to eat that gluten-free bread that tastes like paper or something."

Mr. Masson, who came through New York last week to promote his new book advocating veganism, "The Face on Your Plate: The Truth About Food," is not exactly known for having a great comfort level in regard to poking fun at himself. Before devoting much of his prolific writing career to the subject of animals and their emotional lives — his books include "When Elephants Weep" and "Dogs Never Lie About Love," both best sellers — he waged a 10-year libel lawsuit against the writer Janet Malcolm, disputing quotations that she attributed to him. These included one in which she wrote that he boasted that he would someday be regarded as the greatest analyst since Freud himself. (A jury ultimately found two quotations to be false, and one of those to be defamatory, but ruled that Ms. Malcolm had not shown the recklessness required for a libel verdict.)

Mr. Masson began eating meat as an adult and became vegan just five years ago.

"I call myself an aspiring vegan — sometimes I say veganish," Mr. Masson said. "I make mistakes sometimes." If he's at a restaurant and finds out he ate cake made with a bit of butter, he said: "I can live with that. It's just too weird and too hostile to go 'blech' and throw up and say, 'I can't believe I just ate that.' "

But that, Mr. Masson said, is a fairly typical response to accidental dairy consumption by vegans, who will eat nothing produced by or from an animal.

Time — and, undoubtedly, tempeh — have been kind to Mr. Masson. At 68, he is silver-haired and hollow-cheeked, and bench-presses 200 pounds. With his second wife, Leila, a German pediatrician who is 25 years his junior, he has a 7-year-old son in addition to the 12-year-old.

This week, his family is relocating to Berkeley, Calif., from Auckland, where they have lived for the last eight years. "I didn't make one friend the whole time we were there," Mr. Masson said. "They ask me what I eat, and when I tell them, that's pretty much the end of the conversation at a barbecue."

Over dinner at Angelica Kitchen, the vegan stalwart in the East Village, Mr. Masson was energized by the young crowd. "This place is hopping," he said. "They don't have vegan places like this in New Zealand."

The meal included a raw kimchi salad, walnut-lentil pâté and a casserole of cauliflower and string beans. He chatted with every member of the staff who came near, including a busboy he addressed in Spanish until the young man told him he was actually from Nepal. Mr. Masson began serenading him with the Bhagavad-Gita.

He was curious what percentage of the restaurant's patrons were vegans, but a waiter he asked said it was difficult to know for sure. "It may come up in casual conversation, but we don't ask," the waiter said.

"That's a lot of tact," Mr. Masson said a minute later. "I could learn to use some of that."
For an author of polemics — and "The Face on Your Plate," though it's more measured and engaging than most, is definitely that — Mr. Masson has a deep inclination to forgive. He said that the best excuse for eating meat (or butter or eggs) is "because you like the taste."
What he gets more worked up about are "rationalizations," such as the argument that animals like cattle and chickens exist only because we eat them and their milk and eggs. "That's denial," he said. "We're the only animal who gets to choose what we eat, so we can choose to do what's humane and also much healthier."
Cats, by contrast, can't make a rational choice — they were made to eat meat. "Cats don't appreciate it when you give them vegetables," Mr. Masson said.
Wayne Pacelle, president of the Humane Society of the United States, said: "He's had great success in breaking down this notion that animals are commodities or automatons. By showing the richness of their emotional experiences, it makes us ponder our responsibilities to them in a more serious way."
In the book, Mr. Masson draws on the argument that humans evolved primarily as herbivores, as evidenced by our small mouths, flattened teeth and long small intestines. "So I don't believe it's natural for us to eat meat," he said.
One of the epiphanies that led Mr. Masson to veganism came in 2004 when his family took in a puppy, a kitten, two chickens and two rats. "The chickens were very sociable," he said. "They would come inside the house and watch me writing at the computer. And I would be picking up after them with a box of Kleenex. My wife made me put them outside. And do you know what they did? They banged on the window: 'Let us in. Let us in.' They have such strong personalities."
Suddenly, the idea of raising livestock in cruelty-free environments didn't hold up for him. "When people say their chickens lead such a good life, I say, 'According to whose definition of a good life, are parents separated from their young?' " he said. "Chickens like to fly. They like to take dust baths. They're programmed to hide their eggs, so it would be very time-consuming to give them 10 acres and then go searching all over the place for the eggs."
His mother and father, who were disciples of the British mystic Paul Brunton, raised Mr. Masson and his younger sister as vegetarians in Los Angeles and Uruguay, though Mr. Masson said his parents abandoned the regimen when he was 12.
"They went on a trip to Europe and sent a telegram telling us to get a turkey ready because Thanksgiving was coming up," Mr. Masson said. "My sister and I sobbed."
As a Harvard undergraduate, Mr. Masson saw his own demons in a can of tuna. "They put me in Adams House, which had parietal rules, and that wasn't going to work for me because I was very active with women," he said. He ended up by accident in a large faculty apartment with a kitchen where he made meals with his best friend, a practicing vegetarian from India.
"One day we were shopping and we saw this tuna fish," he said. "We looked at each other and we said, 'We'll just try this once.' And before you knew it, I was just like everyone else."
Avoiding animal products has given Mr. Masson "a purer sense of taste," he said. He does not cook much. "I make beautiful salads, with lots of avocado and lots of garlic," he said, adding that if his sons, who are vegetarians, ever started eating meat, he wouldn't feel right stopping them. He still misses mozzarella.
This summer, Mr. Masson and his wife and sons are going on a bicycling tour of Italy. "I can see a situation where we've been riding all day, and we're going to be hungry and the Italian people are going to give us pasta with cheese and we don't want to hurt their feelings," he said. "So I may just not be vegan for two weeks."

http://www.nytimes.com/2009/04/15/dining/15mass.html?ref=books

Life in Iran, Where Freedom Is Deferred
By MICHIKO KAKUTANI

HONEYMOON IN TEHRAN

Two Years of Love and Danger in Iran

By Azadeh Moaveni

340 pages. Random House. $26.

In her compelling 2005 book, "Lipstick Jihad," the journalist Azadeh Moaveni chronicled the underground youth culture in Tehran at the turn of the millennium, writing about teenagers who embraced an "as if lifestyle," acting as if their country were not under the control of hard-line mullahs, as if they were allowed to hold hands on the street, blast rock 'n' roll at parties, read censored books, speak their minds, challenge authority, wear too much lipstick. Ms. Moaveni argued that grass-roots changes in Iran — from the spread of illegal satellite dishes and illegal video dealers to the popularity of blogging — would eventually alter the trajectory of that country's history, while the demographic ascendance of a younger generation would transform the nation from below.

Ms. Moaveni's new book, "Honeymoon in Tehran," which describes the fallout that the 2005 election of President Mahmoud Ahmadinejad would have on Iran, paints a far less optimistic portrait of the country. It depicts the author's own struggles to make a home for herself in Tehran — where she fell in love, married an Iranian and gave birth to a boy — and her realization that she could no longer pursue a career as a journalist and raise a family there. It is a book that uses the author's own experiences as a prism by which to view political developments in Tehran, a book that leaves the reader with an indelible portrait of the author's family and a highly personal picture of Iran's social and political evolution.

Ms. Moaveni, who grew up in California, the daughter of Iranian émigrés, and who has covered the country for Time magazine, left Tehran in 2002, in the wake of President Bush's depiction of Iran in his State of the Union address as part of the "axis of evil." When she returned to Tehran in 2005 to cover the presidential election, she was initially encouraged by changes she saw in the city and thought "Iranians had reached a tacit accommodation with the government over which taboos might be reconsidered." Novels by women, full of romance and sex, dominated the best-seller lists; students had started underground rock bands; and Iranians, "accustomed to a bland, mullah-controlled existence lacking in entertainment and retail" prospects, could now choose among a variety of household products, American-

style foods and designer goods. (A billboard for Dolce & Gabbana, she notes, weirdly loomed over a site where demonstrators gathered to chant "Death to America.")
The election of the little-known Mr. Ahmadinejad — a hardliner, who had campaigned not on a platform of strict Islamic values but on populist promises of economic opportunity — came as a surprise to much of the country and the world. It was a result, Ms. Moaveni argues, not only of possible vote tampering, but also of moderates' failure to unify around one persuasive candidate, and apathy on the part of voters who'd grown disillusioned with years of stalled reform.
The election would have serious consequences — for Iran and for the world. President Ahmadinejad has pursued a confrontational approach toward the United States and used Western opposition to Iran's nuclear program to try to generate national unity; in addition, his government has clamped down on the limited freedoms afforded journalists and women.
One day in spring 2007, Ms. Moaveni reports: "The authorities launched the most ferocious crackdown on 'un-Islamic' dress in over a decade. Overnight, they revised the tacit rules governing women's dress. The closets of millions of women across the country contained nothing but short, tailored coats; ankle-length pants; and bright headscarves. Suddenly, these styles were grounds for arrest. In the days that followed, the police detained 150,000 women for failing to abide by the official dress code."
"I suppose to people living in free countries where women wear what they please, the difference between a relaxed dress code and a stern one sounds inconsequential," she writes. "In fact, it mattered desperately. In the years when women could wear colors, could show off the lines of their figures, what in effect became acceptable was the expression of individuality. Between the year 2000 until that April of 2007, I wore a headscarf and manteau in Tehran, but I still looked, from head to toe, like Azadeh. I did not resemble the thousands of other women on the street, but only myself. As I presume was the case for most women, this helped me to perceive the oppressive weight of the regime as lighter than it perhaps actually was."
In these pages Ms. Moaveni does an affecting job of conveying how the Islamic government's edicts permeated every aspect of people's private lives. Couples wishing to hold a "mixed wedding," where men and women commingle, are advised to hire expensive security details to guard against police raids. Baby names have to be chosen with care so as to avoid forbidden names, including European names, Kurdish names and the names of pre-Islamic Persian heroes.
Attention must be paid to neighbors, who are liable to report people who pursue an "alternative lifestyle" — sometimes "out of genuine pious indignation, sometimes as revenge for neighborly quarrels." And parents must worry that bringing up their children with liberal values can have troubling consequences for them down the road: "for espousing their real beliefs openly, they might one day be punished by a teacher, expelled from school, arrested by the police, fired from a job."
After a government minder tells Ms. Moaveni that "it is no longer appropriate for you to work," that she is "guilty of propaganda against the regime," and that judiciary proceedings are being started against her, she and her husband — who worked for his father's textile business and who, like Ms. Moaveni, came from a family split between Iran and exile in the West — decide to move to England with their young son. It is a difficult decision, for it means abandoning the extended family that has enveloped them in Tehran, and for Ms. Moaveni, it means acknowledging that "Iran wasn't livable enough" for them, that all the talk there about "mending and changing and improving was a charade," that "Iran is all heavy and rotten at the core."
Why has the reform movement stalled in Iran? Why hasn't there been more protest against the government's repressive policies or a broader movement for political change? As Ms. Moaveni sees it, young Iranians care "far more about finding jobs and raising their living standards than about whether Islam would become compatible with Western-style democracy during their lifetime."
That young people "were willing to shout down a police officer or flirt during a public Islamic ritual meant mostly that they were concerned with freedom in their immediate 10-foot radius," she caustically concludes. "Beyond that, the risks involved in rebellion swiftly outgrew the rewards. Busy investing in the logistics of emigration — the English proficiency tests, visa applications and language courses — many young people envisioned their futures abroad, and were unwilling to compromise those hopes for the sake of somehow changing Iran, a notion they considered chimerical, costly and best left to a future generation."

http://www.nytimes.com/2009/04/14/books/14kaku.html?ref=books

Generation of Benders, Some Tabs Paid in Full

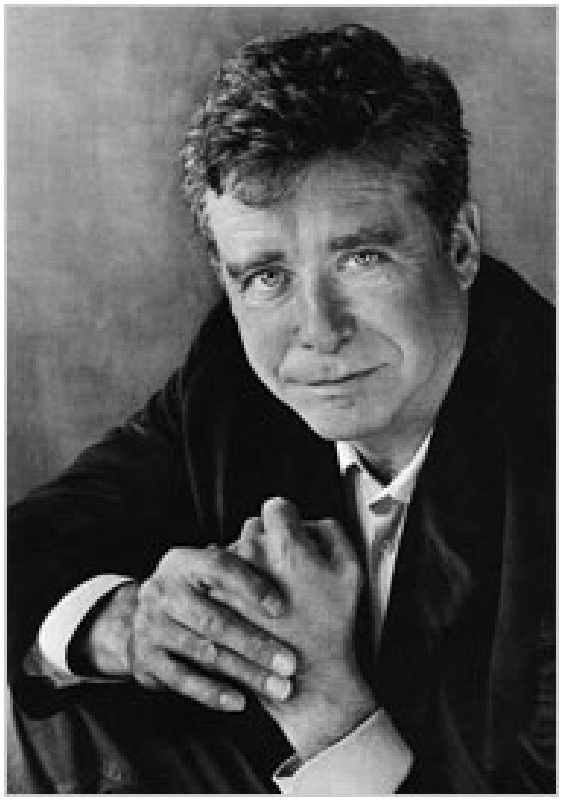
By JANET MASLIN

HOW IT ENDED

New and Collected Stories

By Jay McInerney

331 pages. Alfred A. Knopf. $25.95.



Jay McInerney's writing career has lasted nearly three decades, and what has Mr. McInerney got to show for it? Seven novels, but the world at large can name only his first ("Bright Lights, Big City"). Two essay collections devoted to wine. Prizes (from the James Beard Foundation and the Deauville Film Festival), but not the ones to which literary lights usually aspire. A party-guy reputation borne out by the elements (drugs, infidelity, name dropping and social climbing) that loom large in his fiction. And an etiquette that dictates that when a woman is about to snort cocaine, a gentleman helps by holding back her hair.

Now comes the game changer: "How It Ended," a collection that comprises 26 short stories spanning 26 years. From afar this concept does not seem promising. The stories' consistent length (an average of 12 pages) suggests an author who can hack them out as magazine filler.

The contention that seven of them belong in this collection because they were published in hardcover but not in paperback sounds feeble. And Mr. McInerney's introductory comment that the short story is like a one-night stand also has the ring of an excuse. On the frequent occasions when his characters enjoy one-night stands, they're guilty about it in the morning.

Yet the dodgiest aspect of "How It Ended" turns out to be this book's most interesting device. As a means of disguising the stories' repetitions and similarities, the book presents them in scrambled, unpredictable order. Not until you finish a story will you find out when it was written. Hence, a guessing game: The signposts of Mr. McInerney's writerly evolution are fascinating to pinpoint. Collectively they validate the artistic growth that this book seeks to display.

Mr. McInerney was a callow, facile and extremely entertaining writer from the very first. He had a smart student's command of technical virtues and an eagerness to show them off. He also had such a tiresome infatuation with 1980s-style decadence that it lingers sentimentally even now. But his stories have grown more elegant, subtle, shapely and reflective over time, to the point where some of the recent works are perfect specimens. He has quietly achieved the literary stature to which he once so noisily laid claim.

This collection opens with a sure thing: the vignette that became the basis for "Bright Lights, Big City." Out come the Bolivian Marching Powder and the grating second-person narrative voice in "It's Six A.M. Do You Know Where You Are?"

With its scenes of nightlife followed by convenient early-morning redemption, this story glitters with the funny, glib locutions ("all messed up and no place to go") that put the author on the map. "You are a republic of voices tonight," its narrator tells himself. "Unfortunately, that republic is Italy."

That was the McInerney of 1982. By 1999, in "Third Party," he had honed his gifts for satirical detachment without giving up his favorite milieu. "Difficult to describe precisely, the taste of that eighth or ninth cigarette of the day, a mix of ozone, blond tobacco and early-evening angst on the tongue," that story begins. "But he recognized it every time. It was the taste of lost love."

Here the self-pity has grown deliberate and sly, as a lovelorn American named Alex savors Paris self-importantly. Though the heart of the story describes how two exotic strangers cloud Alex's vision, Mr. McInerney's acuity has gotten sharper. In a half-empty club, "the only person they recognized was Bernard-Henri Lévy," he writes. "Either they were too early or a couple years too late."

"How It Ended" is careful to separate this story of a seductive three-way flirtation from "Invisible Fences," a clumsy, condescending version. Written in 2007, it's one of the few recent stories that are subpar. Beware Mr. McInerney's occasional but infrequent ordinary-guy characters; if he has any idea what ordinary guys are like, it hasn't yet surfaced in his work. This story's "pretty normal" main character works at a mall, has a son named Bucky and enjoys pimping out his wife to strangers.

Mr. McInerney uses sexual betrayal so deftly as a plot device that it would be a shame if the collection's most glaring example overshadows others. That example is "Penelope on the Pond," in which Mr. McInerney revisits Alison Poole, the hilariously debauched female narrator of his novel "Story of My Life." The real person on whom Alison was based rose to unwanted prominence in the last presidential campaign. She, like Alison, was the so-called media consultant for a very good-looking, rich, folksy Southern candidate with nice hair.

"Like, check out his stump speech, where he basically makes it sound like he didn't have shoes till he got to Duke on scholarship," Alison says. The story goes on to denigrate the candidate's marriage, call another Democratic contender a skirt chaser and let Alison bitterly claim that her lover "traded his soulmate for something he loved more."

The single best illustration of Mr. McInerney's finesse comes with "Summary Judgment," the witty and impeccably structured tale of a social-climbing scheme that goes awry as an ersatz contessa with a checkered past tries to marry a rich rube. "She only thanked God they hadn't found out about Riyadh," the story says about the woman's suspicious stepchildren. Mr. McInerney knows it's best that we don't find out either.

"Summary Judgment" has no great depth or resonance. What it has is a highly polished urbane wit and a wisdom apparently based on longtime observation. Henry James's dictum, "Try to be one of those people on whom nothing is lost," is invoked by Mr. McInerney sardonically in "Everything Is Lost." But this author has truly taken that credo to heart. And in his best work he becomes "one of those people."

Mr. McInerney's first characters really did live unexamined lives. ("If you can't remember — then you did," one of them says.) But this author examines them ever more closely as time goes by.

http://www.nytimes.com/2009/04/13/books/13masl.html?ref=books

A Lovely Way to Burn

By KATIE ROIPHE

FALLING HARD

100 Love Poems by Teenagers

By Edited by Betsy Franco

144 pp. Candlewick Press. $15.99. (Ages 14 and up)

TELL THE WORLD

Teen Poems From WritersCorps

By 116 pp. Harperteen/HarperCollins Publishers. Cloth, $16.99; paper, $8.99.(Ages 12 and up)

MORE THAN FRIENDS

Poems From Him and Her

By Sara Holbrook and Allan Wolf

64 pp. Wordsong. $16.95. (Ages 11 to 14)

Some of us may remember with embarrassment those lines of poetry, typed, single-spaced, urgent, blazingly original, that we stayed up late writing when we were 16. Poetry is a perfect medium for adolescence: it lends itself to the fierce dramas and false clarities of those years. I remember highlighting, for 10th-grade English, the Wallace Stevens lines "Knows desire without an object of desire, / All mind

and violence and nothing felt. . . . / Like the wind that lashes everything at once," and thinking no one would ever again so completely understand me.

Assimilating the concision of poetry can be a useful exercise for the excesses of the teenage mind. How do you condense a conflicting and unmanageable universe into a simple line, or make sense of the rush of feeling? With its inherent, formal claim to importance, its pleasing aphoristic effect, the sheer drama of the wide margin, poetry offers a natural language for coming-of-age, which is probably why teenagers everywhere write lots of it.

In "Falling Hard: 100 Love Poems by Teenagers," edited by Betsy Franco, some of the contributions are predictable, some are clever, some show a flash of true gift, but what comes through the book as a whole is a surprisingly clear picture of the peculiar trials and exhilarations of teenage attachments. There is an energy running through these poems that brings back the intensity and bewilderment of those first few forays into what you might at the time have thought of as love. "Let me assure you / That it would be acceptable for you to eat my leg / I want to sneak you into my ginger ale," a 16-year-old, Seph Kramer, writes. Emma Marlowe, 17, writes: "I don't care what they tell you girls — / sex is sex / and you can't make love."

The book conjures living, theatrical teenagers, lurking in their rooms, texting their best friends. Here we recognize the contempt for nearly everybody under the sun:

> Unquestionable intelligence is certainly
> A most rare trait in this bleak
> Seascape, the mass of grey humanity,
> And certainly why I love that man.

Or the self-hatred mingled with pretension: "Metaphysics was my topic dear. / Who am I? Who are you? / Why the monkey, and not I, in the zoo?" Or the high of first attractions ("I still can't imagine / Why he won't believe me / When I tell him / All I've had to drink tonight / Is you") and all the ambivalence and need rolled up in physical encounters:

> I grit my teeth and think to myself
> 'so this is how it's lost'
> and
> 'when will he be done?'
> . . . then calm
> a hot shower
> steamed mirrors
> those hands suddenly so soft
> an embrace like crutches keeps me up.

"Tell the World," with a foreword by Sherman Alexie, is a less sophisticated and more varied collection from poets as young as 12. They write about everything from homelessness to police harassment to a dance lesson in Chinatown. In an excellent poem, "Learning English Is Like," Luany Teles, 18, writes about the arduousness of life in a new language:

> trying to see something in the darkness
> seeing your boyfriend with another girl
> standing in the rain without an umbrella
> your house burning down.

All the poems in this collection are gathered from literacy workshops run by WritersCorps, which teach students, often from schools in poor neighborhoods, how to use poetry to write about their lives. Again one sees the benefit of writing as a way of defining and mastering and clarifying. These kids are using the

verse form, stripped bare, to communicate, using the silences and emphases of a single line on the page to get through the tangle of an emotion. As a talented 12-year-old named Kionna McCurdy writes, “Poems say stuff like her eyes are like the sky or / Her skin is like concrete / But it’s supposed to clear your chest.”

Sara Holbrook and Allan Wolf, adult poets writing in the voices of teenagers, have written a lively verse novella in “More Than Friends” — essentially a conversation between a boy and girl written in poems ranging in form from free verse to villanelle (there is a guide to the poetic forms they use in the back of the book). The poets present the his-and-her sides of a fairly banal and universal teenage-type relationship. They are just friends. They are more than just friends. They are just friends again. The intimate, chatty poems have titles like “You Think I Dressed Myself for Him Today?” and “Veggie Panini Is the Answer to Everything.”

These are not great or even good poems; and yet the book is as vivid in chronicling teenage relationships as many of the trendier novels written for those years. If you are like me you may entertain fantasies of your children curling up in their bunk beds with John Donne, but it may be refreshing and kind of useful for them to consume their slightly junky young adult stuff in verse.

The advantage of all of these books is that poetry is taken out of the realm of homework and meter scanned on blackboards and made approachable, fun, easy, readable. Especially in the work written by teenagers themselves, one gets the sense of reading someone’s journal, glimpsing a private universe. There is an honesty and life to the poems, in all of their poses and self-consciousness, that raises them above more polished adult attempts to recollect those years in tranquillity. These books could also inspire our disgruntled or confused young Wordsworths and Blakes to take out their spiral notebooks and white MacBooks, and write, in wide margins, their latest laments. There’s plenty of time to be embarrassed later.

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http://www.nytimes.com/2009/04/12/books/review/Roiphe-t.html?ref=books

Architects Chosen for Black History Museum
By RANDY KENNEDY

A dream almost a century old moved another step closer to reality on Tuesday as the Smithsonian Institution chose a team led by David Adjaye, the celebrated Tanzanian-born architect, to design the National Museum of African American History and Culture, scheduled to open on the National Mall in Washington in 2015.

The winners of the design competition — which also include the Freelon Group, Davis Brody Bond and SmithGroup — were chosen over five others, including well-known architects like Norman Foster and Diller Scofidio & Renfro.

The museum is expected to cost $500 million and will be built on a site near the Washington Monument after a three-year design period to turn the winners' idea into a workable blueprint. The museum was established in 2003 by an act of Congress. And although it does not have a building yet, it has already begun collecting artifacts and conducting seminars and other events, including a recent two-day program on the Black Power movement.

Efforts to build a national museum of black history stretch back to the early 1900s, but they were thwarted by political opposition well into the 1990s. Among the opponents was Jesse Helms, Republican of North Carolina, who in 1994 blocked Senate passage of a bill authorizing the museum, saying Congress should not have to "pony up" for such a project. The museum's cost will be borne half by the federal government and half through private donations.

Mr. Adjaye, who works in London and recently opened offices in New York and Berlin, is known for his colorful and eclectic designs for the Nobel Peace Center in Oslo and the Museum of Contemporary Art in Denver, as well as for the homes and studios he has designed for artists and celebrity clients like Alexander McQueen, the fashion designer, and Ewan McGregor, the actor.

In accepting the commission, Mr. Adjaye described it as "the dream of my career" and said that the group's concept for the building — an elevated "mound" dominated by a two-tiered structure that he called a "celebration crown" — focused on the idea of a canopy or porchlike setting for people "to come

as a respite, to come and view, to learn." He said he believed that the primary spirit behind the building, whose interior will be open to skylights at its top, would be one of praise.

"Throughout the history of African-American struggle and celebration, there are these moments of praise," he said. "It's for us a deeply spiritual and powerful culture."

The Freelon Group, led by Philip G. Freelon, will be the architect of record for the project. Based in Raleigh-Durham, N.C., the firm has designed the Museum of the African Diaspora in San Francisco and the Reginald F. Lewis Museum of African American History and Culture in Baltimore. The inclusion of Davis Brody Bond in the group was bittersweet; J. Max Bond Jr., a partner in the firm, a dean of African-American architects and educators and one of a few black architects of national prominence, died in February.

"It is his legacy and his vision that we stand upon now as we move forward," Mr. Freelon said.

The announcement of the design winners, at a news conference at the Smithsonian Castle, the oldest building on the Mall, was a reminder of the disagreements that have long simmered over where the museum should be built. Some groups had lobbied heavily for its placement south of the Mall, arguing that the new museum would help bring about a much-needed physical and psychological expansion of the Mall beyond its current boundaries.

But the museum's advisory council — which includes numerous influential black leaders, including Richard D. Parsons, recently named the chairman of Citigroup; Robert L. Johnson, the founder of Black Entertainment Television; and Oprah Winfrey — recommended the 15-acre site that was eventually chosen: across the street from the National Museum of American History. The council rejected three other possibilities, two of which were not on the Mall. In an interview in 2006 Mr. Johnson said he had told Smithsonian officials that he would resign from the council if the Smithsonian's board chose a site off the Mall.

"To have relegated this museum to another site," he said, "when people are looking to it to answer everything from the need for an apology for slavery to reparations, would have been the ultimate dismissal."

Lonnie G. Bunch, the director of the museum, who also served as chairman of the jury that selected the design team, said at the news conference on Tuesday that "as we moved through this process, one thing was central to our thinking: we continue to be guided by our respect for this wonderfully important site."

He added, "What I can tell you is, this is a building that I think will sing for all of us, and I think that's what we wanted."

http://www.nytimes.com/2009/04/15/arts/design/15smit.html?ref=design

ALFREDO JAAR
One Image of Agony Resonates in Two Lives

By ROBERTA SMITH

Using human tragedy as an artistic readymade has definite pros and cons.

Relevance is usually guaranteed; the heartstrings are likely to be pulled.
But the art may be overshadowed by the story, which may in turn be trivialized and exploited by the art.
"The Sound of Silence," Alfredo Jaar's film installation at Galerie Lelong in Chelsea, accomplishes all of the above. It leaves you moved yet irked, feeling raw yet manipulated. You may wonder whether Mr. Jaar is an artist or just some finely tuned hybrid of set designer, art director, editorial writer and graphic designer.
The piece dates from 1995 and has been shown in the United States twice before. As is often the case with the work of the Chilean-born Mr. Jaar, it presents journalism's basic components — images, information and narrative — placing them in slick, imposing Minimalist contexts.
This installation centers on an unforgettable photograph taken in Sudan during a famine in 1993 by the South African photojournalist Kevin Carter. The image shows a small, starving girl, crouched over in the bush, her forehead almost touching the ground. She might be praying. Behind her stands a vulture, watching and waiting.
The image set off a furor when it appeared on Page 3 of The New York Times on March 26, 1993, and then in other publications worldwide. Most of it was directed at Mr. Carter. Hundreds of readers called or wrote editors wanting to know what had happened to the little girl and asking why the photographer had not helped her instead of taking her picture. Mr. Jaar's combinations of words and images usually tackle big subjects: the Rwandan massacres, the oppressed gold-mine workers of the Amazon. But this piece isolates a single image to examine the reverberations of news photographs and the ways they exploit their subjects, implicate their makers and often inform yet buffer the public.
While such images may capture instants of time, the most powerful also have significant preludes and aftermaths. Each is a nanosecond in an arc leading up to and then away from its own creation, a tipping point between cause and effect.
Mr. Jaar's piece recounts this arc in a stripped-down way that is both sensationalizing and understated. Spoiler alert: it is hard to describe the piece without giving away some of the jolts and surprises that are essential (maybe a little too essential) to its effect.

"The Sound of Silence" begins by aggressively blanching our vision: to enter the piece you must first confront a triple bank of blazing white fluorescent lights, like those that frequently illuminate light-box images in Mr. Jaar's work. The lights cover one side of a room-size box otherwise sheathed in aluminum. At the opposite end of this shiny structure something quite different awaits: a dark opening. The box is a small theater.

The austerity continues inside. The eight-minute film (more like a slide show, really), consisting of text about Mr. Carter and this photograph, unfolds in silence. On a black screen, short phrases fade in and out, in small white lower-case letters reminiscent of those from an old typewriter. The terse narrative sketches Mr. Carter's background, which included a natural hatred of apartheid that made him go AWOL from his mandatory South African military service.

It recounts the taking of the photograph, the details of which exemplify the inherent, maybe necessary, opportunism of photojournalism. Mr. Carter was about to photograph the little girl, who was slowing making her way to a feeding center; noticing the vulture, he waited another 20 minutes, hoping the creature would spread its wings, which it did not.

Finally, he took the picture and shooed the bird away. The little girl continued her journey; then, in Mr. Jaar's words, he "sat under a tree and lit a cigarette/talked to god/and cried."

The text proceeds to recount the aftermath of publication: the ensuing hue and cry; how the image received the Pulitzer Prize for photography in April 1994; and how, in July of that year, Mr. Carter killed himself at 33. During his brief professional career he had been one of four South African photojournalists who became known as the Bang Bang Club: they endured arrests and physical danger to document the murderous cruelties of the anti-apartheid struggle. In a suicide note he said that he had seen too much death and suffering.

Suddenly, the photograph at the center of the tale is seen for an instant on the screen, followed by a single flash discharged by four strobe lights that echo the introductory glare of the fluorescents. Two rather theatrical things have happened: Mr. Jaar has refused to exploit the image by not allowing us to dwell on it and re-enact our disengaged horror. We have experienced the camera's flash, as in the taking of a photograph — whose subject is us.

The words continue: Mr. Carter was survived by his young daughter, who owns the rights to the image, which are managed by the Corbis photo agency, owned by Bill Gates.

Thus we are led to the idea that Mr. Carter, who abandoned the starving girl, was pushed, by the weight of his experiences, to abandon his own child. But reality is not quite so simple. The text itself points out that Mr. Carter had attempted suicide once before. Yet it omits another part of the story: Mr. Carter's obituary in The New York Times noted that a few days after his Pulitzer was announced, Mr. Carter was "nearby" when Ken Oosterbroek, another member of the Bang Bang Club, "was shot dead photographing a gun battle in Tokoza township."

So the photographer's history becomes the artist's to frame in his own way. In the end Mr. Jaar does exploit a sensational story, and in shaping it, he manipulates us. Except for its savvy presentation, the piece is like shooting fish in a barrel.

Yet it works. When I first encountered "The Sound of Silence," I thought its point was largely conceptual; seen once, it would never have to be seen again. But it sustained repeated visits. The words may be nothing but the facts, but they fade in and out rhythmically, at an elegiac pace. Mr. Carter's first name is repeated, like a lament — either alone or "Kevin. Kevin Carter" — creating a sense of foreboding from the onset.

After a while the words, which you have only read, not heard, start reverberating in your head.

One implication is that silence is impossible; thought is its own kind of noise. Another is that the real silence is passivity, humanity's acquiescence to inhumanity. And a third is that the silence is the little girl, the absence at the center of the tale. She is gone forever, yet to focus on her and her image is to miss Mr. Jaar's point, and Mr. Carter's too.

"Alfredo Jaar: The Sound of Silence" remains on view through May 2 at Galerie Lelong, 528 West 26th Street, Chelsea; (212) 315-0470 or galerielelong.com.

http://www.nytimes.com/2009/04/15/arts/design/15jaar.html?ref=design

An Icon, Despite Itself

By ALICE RAWSTHORN

LONDON — What is the unbreakable rule of "good design"? It is not looking great, or being dazzlingly innovative. Nor is it reflecting changes in the way we see the world, or even scoring lots of environmental and ethical points.

Great though all of those things are, design can still be "good" without them. The one thing design must do is fulfill its function efficiently. If not, it risks looking ridiculous, regardless of whatever else it has to offer.

Yet there is one example of something that is generally considered to be "good design," which does break the golden rule. It is part of our daily lives, and has been designed to similar specifications for more than a century — the glass Heinz Tomato Ketchup bottle. If you asked the millions of people who use that glass bottle whether it is well designed, they would probably say "yes." If not they would be fools, because they could achieve exactly the same outcome — seasoning their food with fresh ketchup — by buying one of Heinz's plastic bottles, which are not only cheaper, but do the job more efficiently.

The job in question does not sound particularly challenging. It is to protect and preserve the ketchup, and to enable it to be extracted quickly and easily. The glass bottle executes the first part perfectly well, but not the second. Heinz Ketchup is what is called a "pseudoplastic" substance, which thickens when static, and thins again when moved. This means that it clogs up in the bottle, becoming too thick to pour. You can thin it again by shaking the bottle, but risk making the ketchup so runny, that it gushes out in a splodge.

There are various ways around this. If you tap the neck of the bottle, it should release the ketchup. (Heinz has helpfully identified the best place to tap, with the number 57 on the American bottle and the royal crest on the British one.) You can also try plunging a knife into the ketchup, though that could get messy. An alternative is to use either the squeezable plastic bottle or upside down one that Heinz has devised to solve this problem. Some 75 percent of Heinz Tomato Ketchup is now sold in plastic bottles. So why do millions of people still choose to pay more for a glass bottle, which will not work as well?

The obvious answer is because they like it. (I should come clean here by admitting that I like the glass bottle too, though not the taste of tomato ketchup — Heinz's or anyone else's.) What makes that glass bottle seem so special that we are willing to overlook its shortcomings?

One reason is that it looks familiar. Heinz patented the original in 1882, and has refined its design over the years, although the basic shape of the gracefully curved neck and sturdy base has stayed the same, as has the geometric silhouette of the label.

But familiarity is not necessarily attractive. It is just as likely to seem dull, as seductive. Heinz has succeeded in triggering fond childhood memories of its glass ketchup bottles and respect for its corporate heritage, without seeming to be stuck in the past. The subtle changes in the bottle's design have helped, but so does its styling. There is nothing fussy or flamboyant about the glass or labels; instead they seem gentle, uncomplicated and reassuring. Critically, they look uncontrived, which is much more appealing than the truth: that every element of their design has been carefully planned and executed to create the illusion that the bottle has evolved organically.

Take the glass. The shape is dictated by the bottle's function, which gives it a pleasingly no-nonsense air. The smooth neck eases the flow of ketchup (once you've unclogged it) and the octagonal base ensures that the bottle nestles comfortably in your hand. The weight is just right — heavy enough to feel substantial, but not too much so — and there is no need for eco-neurosis, because the glass can be recycled. The only hint of decoration is the row of tiny 57s carved on to the neck as a reminder of Heinz's "57 Varieties" slogan, which was coined by the founder Henry John Heinz to impress the public with the breadth of his product range. (The company made more than 60 products at the time, but he chose 57, because 5 was his lucky number and 7 his wife's.)

The labels are styled in the same spirit. The colors are restrained: just black, red, green and gold (a muted gold, not a blingy one) against a white background. The letters are printed in the bold strokes of hand-drawn typography with tiny traditional serifs at the ends to hint at Heinz's heritage. The only decorative motif is an illustration of a tomato growing on a vine rendered in the style of early botanical drawings. It strikes another nostalgic note, but balances it with a contemporary one by soothing our eco-concerns with the gentle reminder that Heinz ketchup contains lots of natural ingredients.

Last but not least, the glass bottle is a great example of democratic design. Like the Apple iPod, a Rawlings baseball and 3M's Post-it Notes, Heinz Ketchup is a rare example of a best-selling brand that is also generally considered to be best in class. It would seem silly to splash out on a more expensive alternative, especially as the glass bottle affirms its stellar status.

That is why Heinz Tomato Ketchup is one of the very few branded products you see in its original packaging in expensive restaurants. "Sometimes we have to accept that we can't better something that already exists," said Jeremy King, who co-owns The Wolseley in London and is now re-opening The Monkey Bar in New York. "When a customer asks for ketchup they generally want Heinz. The iconic glass bottle reassures them that they are getting it." Quite a coup for something that does not really do its job properly.

http://www.nytimes.com/2009/04/13/fashion/13iht-design13.html?ref=design

Because Everyone Deserves a Trophy
By HILARIE M. SHEETS

MODELED on the protests and celebrations that erupt on the National Mall, Jean Shin's latest installation — a roiling, shoulder-to-shoulder crowd in miniature — will carpet a 45-foot-long rectangular space at the Smithsonian American Art Museum in Washington beginning May 1. The figures will be gleaming trophies, stripped of their sports paraphernalia and refashioned with new props into janitors, cashiers, mailmen and other unsung laborers, now pushing their strollers or swinging their hammers in exalted form.

Ms. Shin, who was commissioned by the museum to create the installation, "Everyday Monuments," as part of her exhibition "Common Threads," was inspired by Washington as a city planned around its heroic monuments. "I thought of these trophies as a way to bring the monumentality to a more intimate level," said Ms. Shin, 37, an artist known for her vast accumulations of singular castoff objects — old clothing, empty prescription bottles, losing lottery tickets — which she transforms into arresting installations that loosely reflect the people who once used the items.

For "Everyday Monuments," which will be on view through July 26, she gathered donations of more than 2,000 trophies with the help of the Smithsonian and local donors who included parents of students at Walt Whitman High School in Bethesda, Md., which she attended after her family moved from South Korea when she was 6. "The trophies can have a second life and be updated to represent all the people who maybe never won trophies or decided not to be sports stars but live their lives through work," she said.

When Ms. Shin first conceived of the piece a couple of years ago, she was thinking of grand moments on the National Mall like the Rev. Dr. Martin Luther King Jr.'s historic speech there and the Million Man March, but she could never have foreseen the flooding of people into the space for President Obama's inauguration. Joanna Marsh, curator of the exhibition, considers it serendipity. "It was wonderful to see that actualized just as the piece was coming together, and it will be so fresh in people's minds when they see the work," she said, adding that the exhibition will also include seven other large-scale installations Ms. Shin has created since 2000.

On a recent morning at her small studio in Brooklyn, filled with a team of assistants meticulously attaching tiny cast mops, paint rollers, cash registers and computers to hundreds of trophies, Ms. Shin described watching her parents, who had both been professors in Seoul, struggle with discrimination and menial jobs when they moved to the Washington area, where they eventually owned a supermarket and liquor store. For a child the adjustment was easier. In high school she was encouraged to pursue painting seriously, and in her senior year in 1990 she entered the national Presidential Scholars in the Arts competition and won a full scholarship to the Pratt Institute in Brooklyn, her own trophy of sorts.

After receiving her B.F.A. in painting in 1994, she went on at Pratt to get a master's degree in art history and criticism and then took a day job at the Whitney Museum as a curatorial assistant. "My studio

practice really shifted by studying art history and criticism," said Ms. Shin, who began questioning her reasons for making figurative painting and struggled to find a new direction and choice of materials.

One day it occurred to the petite Ms. Shin as she was organizing her cluttered Williamsburg apartment that all the cuffs of fabric that she had trimmed from the bottom of her pants were the same size. "I didn't fit fashion's standard by exactly two-and-a-half inches," she said. "Fashion is so much about these ideals. I began to think about how using the leftover pant legs could be personal and physical as well as speak to our collective desires."

She canvassed alterations shops and found people who agreed to save their pant-leg scraps for her. Gathering hundreds of these cylindrical forms, Ms. Shin dipped them in wax to make them stiff. Then, for a group show at Gen Art in New York in 1998, she installed a roughly 12-by-12-foot cityscape of cuffs across the floor, suggesting a population that didn't measure up. Called "Alterations" and purchased by the collector Peter Norton, the piece also alluded to the largely Asian immigrant work force that does most of the tailoring jobs in New York.

"Now that's become a really important part of my work," she said of the community collaboration required for "Alterations," "going up to total strangers and somehow implicating myself in the objects of their lives. Any material I get is the beginning of a conversation and a relationship."Ms. Shin's earlier work was defined by her use of clothing as surrogates for people. But since 2004, when she had her first solo show, at the Frederieke Taylor Gallery in New York, Ms. Shin has branched out more to nonfabric materials that still have a physical relationship to the body. For "TEXTile," made in 2006 in collaboration with the Fabric Workshop and Museum in Philadelphia, she took apart old computer keyboards to illuminate how these objects, touched by rote with our fingertips, project our thoughts out into the world. More than 22,000 key caps, spelling out all the e-mail messages between the artist and the Fabric Workshop about the making of the artwork, were embedded into a 20-foot-long fabric scroll.

"Chemical Balance," also part of the Smithsonian show, alludes to how we change the chemistry of our bodies through prescription drugs. Ms. Shin gathered empty orange pill bottles and assembled them into towering arrangements that appear to grow out of the floor or dangle from the ceiling. "Any organic structure that we see in nature bonds together and then falls apart for its own purposes of growth and decay," said Ms. Shin, who is interested in mirroring society's dependence on these drugs.

She has very particular criteria for the salvaged materials she uses in her work: that something is "cast off from a person's life because its desirability and usefulness are questioned, that it in some way archives a personal history but also can speak to larger issues going on in our culture." "And then," she added, "can I deconstruct it and make it new?"

Her recently completed mosaic, "Celadon Remnants," commissioned by the Metropolitan Transportation Authority's Arts for Transit program and installed along the outdoor stairwell of a Long Island Rail Road station in a densely populated Korean-American community in Queens, was inspired by the elegance and fragility of celadon pottery commonly found in Korean homes. "It's a celebrated moment in history when Koreans perfected this ceramic that people take lots of pride in," she said. For the project Ms. Shin traveled to Icheon, just outside Seoul, and persuaded the government to donate a vast landscape of broken pottery from outside one of the major kilns.

She then used her budget for materials to ship the three tons of shards back to the United States, where she worked with a fabricator to reconstitute the fragments into large, partial silhouettes showing just enough of the curves to suggest vases but also evoking the abstract shapes of Ellsworth Kelly. Literally and metaphorically she reunited something broken in Korea in a new form in America. "For me," she said, "the greater only happens by the accumulation of many, one piece at a time."

http://www.nytimes.com/2009/04/12/arts/design/12shee.html?ref=design

Recycled Artwork for Forward Thinkers

By SUSAN HODARA

WHITE PLAINS

"HANGING by a Thread," the current exhibition at the Arts Exchange in White Plains, includes a tapestry woven from hair curlers, a comforter made of canvas gloves and a room draped with yarn re-knitted from unraveled sweaters. The show is the first of three consecutive exhibitions organized by ArtsWestchester and sponsored by Swiss Re whose themes integrate a commitment to sustainability and the commemoration of the Hudson River quadricentennial.

Curated by Julia Dixon,

ArtsWestchester's exhibition coordinator, "Hanging by a Thread" consists of 51 pieces by 16 artists who work with reused or found materials. "Instead of a general show of recycled items, this show uses textiles as the lens through which sustainability can be viewed," Ms. Dixon, 25, said. "The artists have either constructed something commonly made with fabric, like clothing or quilts, or used recycled textiles to create their pieces."

For example, Mary Ann Lomonaco, of Larchmont, wove standing vessels from the plastic bags in which newspapers are delivered. Vadis Turner, a Brooklyn-based artist, transformed used pantyhose into sculptures of chocolate candies. Elizabeth Lundberg Morisette, of Colorado, made "Shrug" out of layers of zippers sewn together.

Inside the vault in the Grand Banking Room is a re-creation of Peoria Emporium, a Bronxville-based boutique that sells clothing, furniture and gifts made from recycled goods. All pieces in the exhibition are for sale, including more than 120 items in the Peoria installation.

Before "Hanging by a Thread" closes, there will be several supplementary events at the Arts Exchange, including a panel discussion with some of the artists and a children's workshop. The second exhibition, "Scrap," also curated by Ms. Dixon, will feature works made from scrap metal and found wood; it opens May 16. The third show, opening in the fall, will focus on the Hudson River.

"The quadricentennial looks back over the past 400 years," Ms. Dixon said. "With these shows, we're looking ahead to the next 400."“Hanging by a Thread" is open through May 2. Admission is free. A panel discussion with participating artists will take place April 15, 5 to 6:30 p.m. An artSpeak discussion with Ms. Dixon and representatives from Clearwater will be held April 17, noon to 1 p.m. On April 19, 2 to 4 p.m., "Transforming Trash Workshop" for children will be led by Ms. Lomonaco ($5); register at (914) 428-4220, extension 223. "Hilltop Hanover Farm's Recycling Old Sweaters for New Uses" workshop will be held April 29, 6 to 7 p.m. ($10); register at (914) 428-4220, extension 223.

The Arts Exchange is at 31 Mamaroneck Avenue in White Plains. (914) 428-4220 or

artswestchester.org.

Study Finds a Pattern of Severe Droughts in Africa

By ANDREW C. REVKIN

For at least 3,000 years, a regular drumbeat of potent droughts, far longer and more severe than any experienced recently, have seared a belt of sub-Saharan Africa that is now home to tens of millions of the world's poorest people, climate researchers reported in a new study.

That sobering finding, published in the April 17th issue of Science, emerged from the first study of year-by-year climate conditions in the region over the millenniums, based on layered mud and dead trees in a crater lake in Ghana. Although the evidence was drawn from a single water body, Lake Bosumtwi, the researchers said there was evidence that the drought patterns etched in the lakebed extended across a broad swath of West Africa.

More such mega-droughts are inevitable, the research team that studied the patterns said, although there is no way to predict when the next may unfold.

The lead authors of the report, Timothy M. Shanahan of the University of Texas at Austin and Jonathan T. Overpeck of the University of Arizona, warned that global warming resulting from human-generated greenhouse gases was likely to exacerbate those droughts and that there was an urgent need to bolster the resilience of African countries in harm's way.

The study said that some of the past major droughts appeared to be linked to a distinctive pattern of increases and reductions in surface temperatures of the Atlantic Ocean, known as the Atlantic multidecadal oscillation.

Typically over the last 3,000 years, a severe drought developed every 30 to 65 years, they researchers said. But several centuries-long droughts in the climate record, the most recent persisting from 1400 to around 1750, are harder to explain, they said.

While that extraordinary drought occurred during a cool spell in the Northern Hemisphere called the "little ice age," other extreme droughts appear to have hit West Africa at points when the world was relatively warm over all.

In interviews, a range of independent experts on African climate and poverty said that the study underlined that it was important for developed countries to curb greenhouse gases to keep climate shifts around the globe in as manageable a range as possible.

But many stressed that the most urgent concern arising from the study was for the welfare of tens of millions of people with little capacity to endure today's vagaries in rainfall, let alone epic dry spells.

"It's a critical report," said Kevin Watkins, the director of the Human Development Report office of the United Nations.
"Many of the 390 million people in Africa living on less than $1.25 a day are smallholder farmers that depend on two things: rain and land," he said. "Even small climate blips such as a delay in rains, a modest shortening of the drought cycle, can have catastrophic effects."
Given the sub-Saharan region's persistent vulnerability, Mr. Watkins added, the new findings and the prospect of further global warming could be "early warning signs for an unprecedented and catastrophic reversal in human development."
To gather the data, the research team extracted cylinders of mud from the lakebed. The bottom of the circular lake, formed when a crater was blasted into the region one million years ago, has unusually fine layers of mud. Each layer represents a year's accumulation, yielding a trove of chemical and physical clues to past temperatures and other conditions.
The team also studied wood samples from ancient dead trees that still poke from the lake's surface, in areas that were exposed and forested during dry spells several centuries ago but are now under 45 to 60 feet of water.
Recent climate data from the lake analysis were compared with weather records from across the region, providing confidence that the lake record was a reasonable reflection of conditions elsewhere, according to the paper.
Richard Seager, a climate scientist at the Lamont Doherty Earth Observatory of Columbia University who has studied past extreme droughts in other dry areas, including the American Southwest, described the century-scale droughts revealed in the lake mud as "startling."
He said the study showed that much more work needed to be done to refine computer simulations of climate so they could replicate such phenomena. Only then is there a chance that scientists can move toward predicting climate shifts reliably in particular regions and within specific time frames, he noted.
"The most pressing problem we now face is to predict climate in the near-term future — years to decades," Dr. Seager said.
Mr. Watkins of the United Nations said that the urgency was multiplied by high population growth rates in West Africa. Just in the last century, when its populations were far smaller, periodic droughts in sub-Saharan African claimed hundreds of thousands of lives.
In an interview, Dr. Shanahan of the University of Texas said that the growing population density around Lake Bosumtwi itself, which is 20 miles southeast of Ghana's second-biggest city, Kumasi, suggested the potential human impact of a seismic drought. (From 1972 to 1974, when Ethiopia's population was around 31 million people, one million died in a severe drought, for example. Today Ethiopia has more than 70 million residents.)
"There was nothing between the lake and Kumasi when we first went there," he said. "But three years later it's a traffic jam."

http://www.nytimes.com/2009/04/17/science/earth/17drought.html?ref=science

Writing About Values Lifts Some Students' Grades

By BENEDICT CAREY

Some seventh graders who were struggling in class did significantly better after performing a series of brief confidence-building writing exercises, and the improvements continued through eighth grade, researchers are reporting Thursday. The students who benefited most were blacks who were doing poorly, the study found; the exercises made no difference for whites, or for black students who were already doing well.

Experts cautioned that the writing was hardly transforming: Those who benefited were still barely getting C's, on average, by the end of middle school.

Yet the results were surprising, because interventions to improve school performance tend to have short-term benefits, and the writing assignments were simple, 15-minute efforts. By the end of eighth grade, the students who benefited had nearly a half-point higher grade point average than struggling peers who completed a different writing exercise. The study was published in the journal Science.

"A difference of a third or more on G.P.A. is a large effect, and what's surprising is that there was apparently no fadeout of the effect," said Greg Duncan, an economist at the University of California, Irvine, who was not involved in the research. "Fadeout is the coin of the realm in school intervention studies."

The researchers, led by Geoffrey L. Cohen, a social psychologist at the University of Colorado, had seventh graders in suburban Connecticut schools perform the assignment three to five times through that school year. It asked them to simply choose from a list which values were most important to them — including athletic ability, sense of humor, creativity and being smart — and to write why those values were so important. The students were randomly assigned, within classes, to perform this exercise or another "control" writing assignment that was not focused on their own values.

In previous studies, researchers have found that such exercises reduce stress and the psychological threat of failure in some students. By the end of eighth grade, among black students who were struggling, those who had expressed in writing their most important values had an average G.P.A. that was 0.4 points higher than those who had not.

"The idea is that a bad experience early in school can have lasting effects, and that if we can do something in that crucial window, it could alter the student's trajectory slightly and change the arc of their experience over time," Dr. Cohen said. The assignment, he said, reminded students that their entire self-worth was not riding on a single test result. His co-authors were Julio Garcia of Colorado; Valerie Purdie-Vaughns of Columbia University; and Nancy Apfel and Patricia Brzustoski of Yale.

The authors found, too, that those who benefited from the exercises felt more adequate as students on average than those struggling peers who performed the control assignment. One reason black students benefited more than whites may be that they have more anxiety over academic performance because of racial stereotypes, the authors suggest. The writing exercised did not mention race, but previous research has found that reminding minorities of stereotypes can worsen their performance on a variety of tests.

"But there's no reason to think that it couldn't benefit kids who are highly anxious about tests, of any race," Dr. Cohen said. "We haven't looked at that yet."

http://www.nytimes.com/2009/04/17/science/17esteem.html?ref=science

Third-World Stove Soot Is Target in Climate Fight

By ELISABETH ROSENTHAL

KOHLUA, India — "It's hard to believe that this is what's melting the glaciers," said Dr. Veerabhadran Ramanathan, one of the world's leading climate scientists, as he weaved through a warren of mud brick huts, each containing a mud cookstove pouring soot into the atmosphere.

As women in ragged saris of a thousand hues bake bread and stew lentils in the early evening over fires fueled by twigs and dung, children cough from the dense smoke that fills their homes. Black grime coats the undersides of thatched roofs. At dawn, a brown cloud stretches over the landscape like a diaphanous dirty blanket.

In Kohlua, in central India, with no cars and little electricity, emissions of carbon dioxide, the main heat-trapping gas linked to global warming, are near zero. But soot — also known as black carbon — from tens of thousands of villages like this one in developing countries is emerging as a major and previously unappreciated source of global climate change.

While carbon dioxide may be the No. 1 contributor to rising global temperatures, scientists say, black carbon has emerged as an important No. 2, with recent studies estimating that it is responsible for 18 percent of the planet's warming, compared with 40 percent for carbon dioxide. Decreasing black carbon emissions would be a relatively cheap way to significantly rein in global warming — especially in the short term, climate experts say. Replacing primitive cooking stoves with modern versions that emit far less soot could provide a much-needed stopgap, while nations struggle with the more difficult task of enacting programs and developing technologies to curb carbon dioxide emissions from fossil fuels.
In fact, reducing black carbon is one of a number of relatively quick and simple climate fixes using existing technologies — often called "low hanging fruit" — that scientists say should be plucked immediately to avert the worst projected consequences of global warming. "It is clear to any person who cares about climate change that this will have a huge impact on the global environment," said Dr. Ramanathan, a professor of climate science at the Scripps Institute of Oceanography, who is working with the Energy and Resources Institute in New Delhi on a project to help poor families acquire new stoves. "In terms of climate change we're driving fast toward a cliff, and this could buy us time," said Dr. Ramanathan, who left India 40 years ago but returned to his native land for the project.

Better still, decreasing soot could have a rapid effect. Unlike carbon dioxide, which lingers in the atmosphere for years, soot stays there for a few weeks. Converting to low-soot cookstoves would remove the warming effects of black carbon quickly, while shutting a coal plant takes years to substantially reduce global CO2 concentrations.

But the awareness of black carbon's role in climate change has come so recently that it was not even mentioned as a warming agent in the 2007 summary report by the Intergovernmental Panel on Climate Change that pronounced the evidence for global warming to be "unequivocal." Mark Z. Jacobson, professor of environmental engineering at Stanford, said that the fact that black carbon was not included in international climate efforts was "bizarre," but "partly reflects how new the idea is." The United Nations is trying to figure out how to include black carbon in climate change programs, as is the federal government.

In Asia and Africa, cookstoves produce the bulk of black carbon, although it also emanates from diesel engines and coal plants there. In the United States and Europe, black carbon emissions have already been reduced significantly by filters and scrubbers.

Like tiny heat-absorbing black sweaters, soot particles warm the air and melt the ice by absorbing the sun's heat when they settle on glaciers. One recent study estimated that black carbon might account for as much as half of Arctic warming. While the particles tend to settle over time and do not have the global reach of greenhouse gases, they do travel, scientists now realize. Soot from India has been found in the Maldive Islands and on the Tibetan Plateau; from the United States, it travels to the Arctic. The environmental and geopolitical implications of soot emissions are enormous. Himalayan glaciers are expected to lose 75 percent of their ice by 2020, according to Prof. Syed Iqbal Hasnain, a glacier specialist from the Indian state of Sikkim.

These glaciers are the source of most of the major rivers in Asia. The short-term result of glacial melt is severe flooding in mountain communities. The number of floods from glacial lakes is already rising sharply, Professor Hasnain said. Once the glaciers shrink, Asia's big rivers will run low or dry for part of the year, and desperate battles over water are certain to ensue in a region already rife with conflict. Doctors have long railed against black carbon for its devastating health effects in poor countries. The combination of health and environmental benefits means that reducing soot provides a "very big bang for your buck," said Erika Rosenthal, a senior lawyer at Earth Justice, a Washington organization. "Now it's in everybody's self-interest to deal with things like cookstoves — not just because hundreds of thousands of women and children far away are dying prematurely."

In the United States, black carbon emissions are indirectly monitored and minimized through federal and state programs that limit small particulate emissions, a category of particles damaging to human health that includes black carbon. But in March, a bill was introduced in Congress that would require the Environmental Protection Agency to specifically regulate black carbon and direct aid to black carbon reduction projects abroad, including introducing cookstoves in 20 million homes. The new stoves cost about $20 and use solar power or are more efficient. Soot is reduced by more than 90 percent. The solar stoves do not use wood or dung. Other new stoves simply burn fuel more cleanly, generally by pulverizing the fuel first and adding a small fan that improves combustion.

That remote rural villages like Kohlua could play an integral role in tackling the warming crisis is hard to imagine. There are no cars — the village chief's ancient white Jeep sits highly polished but unused in front of his house, a museum piece. There is no running water and only intermittent electricity, which powers a few light bulbs.

The 1,500 residents here grow wheat, mustard and potatoes and work as day laborers in Agra, home of the Taj Majal, about two hours away by bus.

They earn about $2 a day and, for the most part, have not heard about climate change. But they have noticed frequent droughts in recent years that scientists say may be linked to global warming. Crops ripen earlier and rot more frequently than they did 10 years ago. The villagers are aware, too, that black carbon

can corrode. In Agra, cookstoves and diesel engines are forbidden in the area around the Taj Majal, because soot damages the precious facade.

Still, replacing hundreds of millions of cookstoves — the source of heat, food and sterile water — is not a simple matter. “I’m sure they’d look nice, but I’d have to see them, to try them,” said Chetram Jatrav, as she squatted by her cookstove making tea and a flatbread called roti. Her three children were coughing. She would like a stove that “made less smoke and used less fuel” but cannot afford one, she said, pushing a dung cake bought for one rupee into the fire. She had just bought her first rolling pin so her flatbread could come out “nice and round,” as her children had seen in elementary school. Equally important, the open fires of cookstoves give some of the traditional foods their taste. Urging these villagers to make roti in a solar cooker meets the same mix of rational and irrational resistance as telling an Italian that risotto tastes just fine if cooked in the microwave.

In March, the cookstove project, called Surya, began “market testing” six alternative cookers in villages, in part to quantify their benefits. Already, the researchers fret that the new stoves look like scientific instruments and are fragile; one broke when a villager pushed twigs in too hard.

But if black carbon is ever to be addressed on a large scale, acceptance of the new stoves is crucial. “I’m not going to go to the villagers and say CO2 is rising, and in 50 years you might have floods,” said Dr. Ibrahim Rehman, Dr. Ramanathan’s collaborator at the Energy and Resources Institute. “I’ll tell her about the lungs and her kids and I know it will help with climate change as well.”

http://www.nytimes.com/2009/04/16/science/earth/16degrees.html?ref=science

Coral Fossils Suggest That Sea Level Can Rise Rapidly

By ANDREW C. REVKIN

Evidence from fossil coral reefs in Mexico underlines the potential for a sudden jump in sea levels because of global warming, scientists report in a new study.

The study, being published Thursday in the journal Nature, suggests that a sudden rise of 6.5 feet to 10 feet occurred within a span of 50 to 100 years about 121,000 years ago, at the end of the last warm interval between ice ages.

"The potential for sustained rapid ice loss and catastrophic sea-level rise in the near future is confirmed by our discovery of sea-level instability" in that period, the authors write.

Yet other experts on corals and climate are faulting the work, saying that big questions about coastal risks in a warming world remain unresolved.

Among the most momentous and enduring questions related to human-caused global warming are how fast and how high seas may rise. Studies of past climate shifts, particularly warm-ups at the ends of ice ages, show that fast-melting ice sheets have sometimes raised sea levels worldwide in bursts of up to several yards in a century.

A question facing scientists is whether such a rise can occur when the world has less polar ice and is already warm, as it is now, and getting warmer.

Citing the evidence from fossil coral reefs, the authors of the new study say with conviction that the answer is yes.

The study focuses on a set of fossil reef remains exposed in excavations for channels at a resort and water park, Xcaret, about 35 miles south of Cancún on the east coast of the Yucatán Peninsula.
Paul Blanchon, the lead author of the study, said he sought a position as a research scientist at the National Autonomous University of Mexico's Institute of Marine Sciences in Puerto Morelos so he could

focus on the unusual fossil reefs, visible for hundreds of yards where canals were cut into the rocky ground.

"I spent the last four years looking at those cross sections and piecing the story of those reefs together bit by bit like a jigsaw," he said in a telephone interview.

With three co-authors from Germany, Dr. Blanchon calculated the ages of coral samples by measuring isotopes of thorium in the fossils. The team then confirmed the ages by comparing the Mexican reefs with coral reefs in the Bahamas whose ages had been thoroughly studied.

The team says it found that two Mexican reefs grew during the last "interglacial," or warm interval between ice ages.

To determine the pace of sea-level rise in that period, Dr. Blanchon charted patterns of coral revealed in excavations at the resort. He said his work revealed a clear point where an existing reef died as the sea rose too quickly for coral organisms to build their foundation up toward the sea surface. Once the sea level stabilized again, the same group of corals grew once more, but farther inshore and up to 10 feet higher in elevation, a process known to geologists as backstepping.

Such an abrupt change from stable coral growth to death and a sudden upward and inshore shift of a reef could happen only because of a sudden change in sea level, he said.

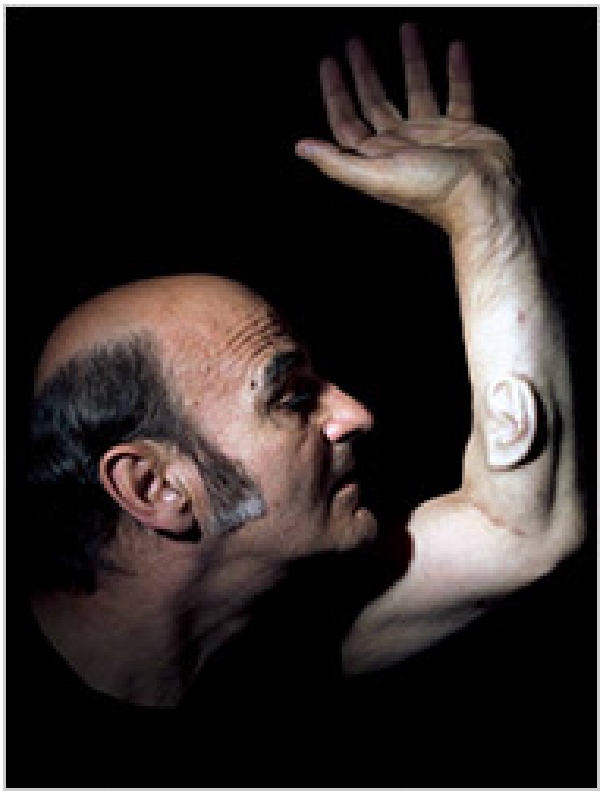
But in interviews and e-mail messages, several researchers who focus on coral and climate said that although such a rapid rise in seas in that era could not be ruled out, the paper did not prove its case. Daniel R. Muhs, a United States Geological Survey scientist who studies coasts for clues to past sea level, cited a lack of precise dating of the two reef sections. William Thompson, a coral specialist at the Woods Hole Oceanographic Institution, agreed, saying that given the importance of the conclusion, Dr. Blanchon interpreted the physical features without enough corroborating evidence.

But Dr. Blanchon maintains that the work will hold up, saying the signs of abrupt change are etched in the rock for everyone to examine.

http://www.nytimes.com/2009/04/16/science/earth/16coral.html?ref=science

Hello Van Gogh, Can You Hear Me Now?

By DENNIS OVERBYE



Luckily for us, the Australian performance artist known as Stelarc, formerly Stelios Arcadiou, is not prone to sensationalism.

He only wants to transform his body into a portal on the Internet. Which is why visitors to Exit Art, a gallery in Midtown Manhattan, are being treated to a video of Stelarc's left arm being cut up like a rare tenderloin to implant what will eventually be a Bluetooth-enabled artificial ear. Stelarc's video is one the more grisly highlights of "Corpus Extremus (LIFE+)," an exhibit about the wonders and horrors of "PostNatural History," and the ways in which technology is blurring the traditional notions of life, death and identity.

In the gallery of postnatural history, for example, is a goat that has been genetically tinkered with to produce spider silk, useful for fishing line and bulletproof vests, in its milk. Elsewhere you can look through a microscope and see a movie projected on living cells, watch a movie of Russian cosmonauts examining grains of kefir, a yogurtlike drink popular in Russia, to determine the grains' potential worthiness as "cosmonauts," or see a mock documentary about an S&M organic farm collective.

In the early days of the show you could walk through a forest of poles wired with antennas transmitting signals of your presence to a vat of neurons at the Georgia Institute of Technology. Signals back from the neurons would activate pen recorders to run up and down the poles and inscribe them with stripes.

"Silent Barrage," as it is called, is dormant now, the connection to the neurons having been turned off. But if this gadget was alive while it was awake, could running around in it too much make it crazy and constitute abuse?

Nine years ago, when Exit Art presented an earlier show about genetics, the burning debate was about whether genes and life forms could be patented. Ownership of our genes might be at stake, but not our humanity or our identities as trees or people, dead or alive and machine or animate. I remember wandering around that show, "Paradise Now: Picturing the Genetic Revolution," marveling at the dedication and the scientific acumen of the artists, who had done things like raise photosensitive grass and clone trees.

Now it's all up for grabs, and paradise has gotten a lot darker.

"A foundational idea for this show was that we are permanently in a condition of creating, being excited or horrified by our inventions," said Boryana Rossa, a Bulgarian-born artist and graduate student at Rensselaer Polytechnic Institute in Troy, N.Y.

She said it was all right if people were confused and left the gallery wondering whether what they had seen was art or science. The important thing was to start a conversation about what technology could do to us. The artists, she said, have hands-on experience with biology in programs like SymbioticA, a lab at the University of Western Australia where artists and biologists collaborate.

Artists are the antennas of society, but they are not the only ones thinking about these issues.

Some thinkers, including Freeman Dyson, the physicist and futurist at the Institute for Advanced Study at Princeton, have suggested that the "Darwinian interlude" of three billion years of evolution by means of mutations passing down through species is coming to an end. In its place would be a technologically

enabled swapping of genes across species. Carl R. Woese, an evolutionary biologist at the University of Illinois, Urbana-Champaign, has theorized that such horizontal gene transfer prevailed in the primordial soup before cells got locked in species. We will be fine with it, Dr. Dyson has said, when children start breeding miniature dinosaurs with rabbit ears and other exotic creatures for science fairs the way horticulturists turn out new breeds of tomatoes.

The body, however, has its ways of fighting back against the 5-year, or 500-year plans of its owners. Geneticists report that our own genes are still evolving, to what end, no one can guess. No supercomputer can yet predict from simply reading a sequence of A's, C's, T's and G's that make up a genetic code what creature will emerge.

The progression to postnatural history may be a painful birth if the experience of Stelarc, 62, who splits his time between Brunel University in West London and the University of Western Sydney in Australia, is any example. The body, he says, is obsolete and needs to map its "post-evolutionary strategies."

To that end, Stelarc has outfitted himself at times with an extra hand (nonsurgically), swallowed a camera that would explore the sculpture of his stomach and hung himself in the air on hooks. For a show called "Fractal Flesh," he wired half his body, in Luxembourg, up to muscle stimulation equipment that could be controlled by computers in Paris, Helsinki and Amsterdam. The result, he told an interviewer later, "was a split body experience."

The ear on his arm, he said, is a work in progress that has required a couple of surgeries so far. It took him 12 years to find the doctors and the financing, which was provided by the Discovery Channel as part of a series in experimental surgery, to do the work.

The doctors, Stelarc said, were a little dubious that this was art. "They were overheard discussing, though, that perhaps they were really the artists and my body was just the canvas!" he said in an e-mail message.

The ear was originally slated for the outside of his left arm, but during the process of stretching the skin to provide space for the ear, a necrosis developed and the ear's location had to move. In 2006, as shown in the gallery video, surgeons in Los Angeles installed a porous polyethylene ear-shaped prosthesis in his forearm and then snugged his skin down over it. At the same time, he says, they installed a tiny microphone, which picked up the doctor's voices even through bandages and a face mask.

Unfortunately the microphone became seriously infected and had to be removed. "I could have lost an arm for an ear," Stelarc said.

Stelarc's own tissues and blood vessels have since grown into the prosthesis, anchoring it permanently. More surgeries are planned to improve its sculptural relief, including adding a bag of his own stem cells for an earlobe.

"The ear visualizes that idea that we can now engineer additional organs, Internet-enabled, to better function in the technological terrain that we now inhabit," he said. "It is also an image of excess, of ambivalence and of the alternate."

Once the microphone is reinstalled, Stelarc said, anything it "hears" will be wirelessly transmitted to the Web. Someone in Paris could log in and hear what Stelarc is up to in Australia — or presumably hear him snoring.

Stelarc says he understands that some people may be uneasy and squeamish about what he is doing. For his own part, he said, "You're never in your comfort zone." Such is the price of being a performance artist.

"Most of the projects and performances I've done have either been physically difficult or technically complicated to achieve," he said. "Sometimes both, ha ha."

http://www.nytimes.com/2009/04/14/science/14corp.html?ref=science

Another Awkward Sex Talk: Respect and Violence

By PERRI KLASS, M.D.

Not long ago, in the clinic, a fellow pediatrician and mother asked whether we were still teaching our sons old-fashioned elevator etiquette: stand back and let the ladies off first.

We all protested that we don't particularly like it when men pull that elevator stunt — hospital elevators tend to be packed, and the best thing to do if you're near the door is get out promptly — but we had to admit we thought our adolescent sons should know the drill. Once you start asking about whether there are special lessons that should be taught to boys, people jump pretty quickly from elevators to sex (or maybe that's just the crowd I run with). Sex, after all, is a subject on which pediatricians give plenty of advice. And it becomes very tricky to formulate that advice without making some unpleasant assumptions about adolescent sexuality.

It has never been easy for adults to deal with young teenagers honestly and sensibly on this subject, and it isn't easy now. We live with an endless parade of hypersexualized images — and a constant soundtrack of adults lamenting children's exposure to that endless parade. There's increasing knowledge of dating violence, including well-publicized celebrity incidents. And there's always a new movie to see about how adolescent boys are clueless, sex-obsessed goofballs.

Stir it all together, and you may get an official worldview in which boys are viewed as potential criminals and girls as potential victims.William Pollack, a psychologist at Harvard Medical School who wrote "Real Boys: Rescuing Our Sons From the Myths of Boyhood" (Owl Books, 1999), argues that the way we talk to boys and young men about sex often stereotypes them and hurts their feelings.

"One boy said, 'They treat us like we're perpetrators — we have sexual needs but we also have other needs,' " Dr. Pollack told me. Somehow, there has to be a way to talk about sex and relationships beyond the anatomical details, and a way to discuss what happens in school and what happens on the cover of People magazine.

My friend Dr. Lee M. Sanders is associate professor of pediatrics at the University of Miami Miller School of Medicine, where he takes care of many adolescent boys. "Six or seven years ago," he told me,

"a mother said to me: 'Listen, there's no dad in the home and I'm worried about the way I see my son treating other girls. Will you talk to him about it?' "

Over time, Dr. Sanders incorporated this conversation into his regular exam room routine, starting with boys around age 12: "We'll talk about respect, about whether they feel they are respected in their own families, the respect they have for their mothers, the respect they see other men paying to their own mothers or sisters — do you think that applies to other girls that you meet?

"At first it was a very awkward conversation for them to have," he went on. "But now I'm used to having it with them, and they're used to having it with me."

So are we teaching our sons any special lessons? The psychologist Michael G. Thompson, the author of "Raising Cain: Protecting the Emotional Life of Boys" (Ballantine, 2000), says it isn't a question of girls and boys, just a question of well-behaved kids and not-well-behaved kids; everyone should learn the same lessons about care and consideration and even about giving up a seat on the subway.

"I think manners get you very far in a rather uncivil world," Dr. Thompson said. "A simple respect for adults goes a long way in this day and age." There is a special lesson for boys in deploying their good manners, he continued. "I would teach boys that there are many adults who are scared of boys, who have fears of boy aggression, and I think politeness is the surest way that a boy can reassure the adult world that he is O.K. and trustworthy."

Dr. Sanders thinks that a double standard is legitimate here — "maybe because I have two girls and no boys of my own."

"Girls need to be treated with more respect," he said. "We need to focus more on empowering girls in relationships, particularly relationships with the opposite sex. I think of myself very much as a feminist."

As a pediatrician with two sons and a daughter, I acknowledge the need to emphasize manners and respect as boys maneuver into adolescence and adulthood, and to help them understand the implications and obligations of their increasing size and strength. And I acknowledge that for their own protection, boys need to understand that there are people — male and female — who will see them as potential predators, and judge them automatically at fault in any ambiguous situation.

But I am enough of an old-fashioned feminist to want to teach daughters the same fundamental lessons I teach sons: err on the side of respect and good manners; understand that confusion, doubt and ambiguity abound, especially when you are young; never take advantage of someone else's uncertainty; and, just as important, remember that adolescence should be a time of fun, affection, growth and discovery.

It's too bad that one side of teaching our children about sex and relationships means reminding them that there are bad people in the world; stay away from them, stay safe, speak up if someone hurts you or pushes you. But everyone needs that information, and that promise of adult support. We have to get that message across without defining some of our children as obvious perpetrators and others as obvious victims, because that insults everyone.

And speaking of insulting everyone, I would offer everyone the even less-palatable lesson that sometimes people make dumb decisions. Sometimes you decide to do something and then you wish you hadn't done it, and that doesn't necessarily make you bad or good, though it may make you sadder and wiser.

Got that, boys and girls? Now, if you would all please get out of the way, I would like to get off the elevator.

http://www.nytimes.com/2009/04/14/health/14klas.html?ref=science

Prenatal Testing of Thyroid Is Debated

By INGFEI CHEN

When women think about pregnancy, the thyroid gland is seldom the first thing that leaps to mind. Nestled in the neck, the gland makes hormones that govern metabolism, helping to regulate body weight, heart rate and a host of other factors.

But if the thyroid malfunctions, it can produce too little or too much of these hormones. During pregnancy those conditions, known as hypothyroidism and hyperthyroidism, respectively, may lead to miscarriage, premature birth and pre-eclampsia — and in the case of hypothyroidism, impaired intelligence in the child.

A decade and a half of research has now brought the cumulative evidence of these risks to a critical mass. Clinical guidelines call for vigilant monitoring and treatment of patients to keep thyroid reserves normal and to safely guide women through pregnancy and early motherhood.

But because thyroid problems can easily go undiagnosed, the hazards have also set off a debate over whether every woman who is pregnant or planning to be should have a blood test to check her thyroid. That test measures for thyroid-stimulating hormone, or T.S.H., which spurs the gland's hormone production.

Most doctors' groups have not endorsed universal prenatal thyroid screening, citing uncertainties over whether it would yield health benefits justifying the expense of testing in roughly 6.4 million pregnancies each year and educating doctors to read results that are tricky to interpret.

But the big unanswered question — and crux of the debate — is whether treatment would help women with a mild, common form of thyroid deficiency, called subclinical hypothyroidism. For now, medical societies advise testing only high-risk women.

As a matter of policy, Dr. Kenneth D. Burman, the president of the American Thyroid Association, agrees with that stance for now. Yet like more and more endocrinologists, he offers T.S.H. pregnancy testing in his practice, at Washington Hospital Center in Washington.

"Every patient I see who's considering getting pregnant or is pregnant gets a thyroid function test," he said. "And I think that's the right thing to do."

He and others say they expect more and more doctors and medical societies to support universal screening after weighing all the evidence. The thyroid association is holding a symposium this Thursday and Friday in Washington to discuss the most recent research.

Symptoms of a wayward thyroid can be subtle, and pregnancy can mask them. Fatigue, weight gain and dry skin — all typical in pregnant women — can also result from hypothyroidism, said Dr. Alex Stagnaro-Green, an endocrinologist at Touro University College of Medicine in Hackensack, N.J.

The opposite condition, hyperthyroidism, affects roughly 2 in 1,000 pregnancies. But again, its symptoms — poor sleep, weight loss and nervousness after childbirth — could result from other postpartum conditions. (Renaissance painters unknowingly depicted the link between thyroid problems and pregnancy by showing women with goiters from an overactive thryoid after childbirth.)

Hypothyroidism, which usually arises from underlying autoimmune disease, is the more frequent and worrisome concern. As many as 10 to 20 percent of reproductive-age women test positive for antibodies that attack the thyroid gland and may eventually destroy it. Their risk of miscarriage is doubled.

Three to five out of 1,000 women of childbearing age suffer from overt hypothyroidism, in which thyroid hormone, or T4, is low and T.S.H. is abnormally high. But the most common thyroid dysfunction is subclinical hypothyroidism, in which T4 is normal but T.S.H. is slightly elevated. That condition affects 2 to 3 percent of women but often goes undiagnosed when it causes no obvious symptoms.

Hypothyroidism may harm fetal brain development. Ten years ago, researchers in Maine analyzed blood samples from 25,216 pregnant women and identified 62 with hypothyroidism. Their children, by then 7 to 9 years old, were given intelligence tests. Nineteen percent of the children born to women with an untreated underactive thyroid had an I.Q. of 85 or lower, compared with 5 percent of those whose mothers had a healthy thyroid. "At about 85 or below, that's where you begin to have trouble in school and in life in general," said Dr. James E. Haddow, a pediatrician at Brown University who was an author of the study. But if mothers had their hypothyroidism treated, their children's intelligence was not impaired.

In reaction, the American Association of Clinical Endocrinologists endorsed routine T.S.H. testing in all women considering pregnancy. But other organizations, including the American College of Obstetricians and Gynecologists, have said wide-scale screening is premature until more data prove that treating subclinical hypothyroidism would prevent adverse effects in women and their offspring.

Studies do suggest that T4-replacement therapy is protective. But few large clinical trials have rigorously tested this intervention in mildly thyroid-deficient women. So far, promising results have come from one major, well-designed Italian study that showed miscarriage and preterm delivery rates dropped sharply when thyroid hormone pills were given to pregnant women who tested positive for thyroid antibodies.

Experts are now looking to the outcomes of two other major clinical trials under way in Wales and the United States. Both aim to confirm the I.Q. effects and the ability to avert them by studying pregnant women with underactive thyroids who receive hormone therapy or no treatment.

Pregnancy is such a critical time that "to expose a baby to a medication without known benefit may not be the best thing, unless we truly know that it's helpful," said Dr. Catherine Spong, the chief of pregnancy

and perinatology at the National Institute of Child Health and Human Development, which is sponsoring the American trial.

That study will track 1,170 expecting mothers, including women with subclinical hypothyroidism, and their children will undergo I.Q. testing at age 5. Results are expected in 2015.

Advocates of routine testing see no need to wait for more answers, though. Dr. Terry F. Davies, an endocrinologist at the Mount Sinai School of Medicine in New York, finds the evidence "overwhelming" that a shortage of maternal thyroid hormone harms intellectual function in babies. "Once you believe that," he said, "it would seem to me illogical not to be sure that all women have normal thyroid function during pregnancy."

And Dr. Haddow said universal prenatal testing could be justified on the grounds of benefiting a woman's general health. In the Maine study, 58 percent of the pregnant women who had hypothyroidism but did not know it eventually did have it diagnosed, but it took an average of five years. Pregnancy is "an optimal time" for T.S.H. testing, he said.

Most medical societies endorse only selective screening. Two years ago, the Endocrine Society released recommendations for testing T.S.H. in women at high risk for thyroid disorders, including anyone with symptoms of a goiter or sluggish thyroid, or a family history of thyroid problems, as well as those with Type 1 diabetes or autoimmune disease or previous miscarriage or premature delivery.

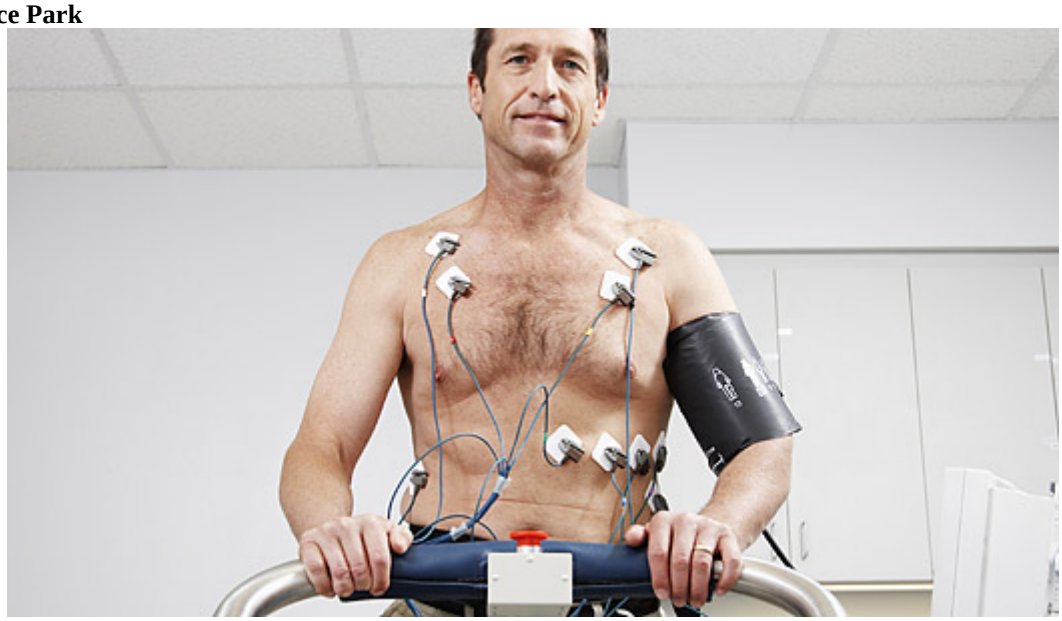
But research since then has revealed flaws in that strategy. "The problem is, it's not good enough," Dr. Stagnaro-Green said. A British study found that such testing missed 30 percent of those with hypothyroidism and 69 percent of those with hyperthyroidism.

For now, until there is confirmation that treatment truly helps, Dr. Stagnaro-Green said he still favored selective thyroid screening. But he added, "My belief is that data will be forthcoming that will push us towards universal screening."

http://www.nytimes.com/2009/04/14/health/14thyr.html?ref=science

Heart Risk for Diabetics May Be Exaggerated

By Alice Park



Type 2 diabetes is growing fast in the U.S. — more than 23 million Americans have the disease and another 57 million are hovering dangerously close to developing it — and the diagnosis automatically puts patients at increased risk of other health problems, including heart disease, stroke, kidney problems and eye abnormalities.

But exactly how great that added risk is appears to be in question. The results of a large, multicenter trial raise the possibility that the danger of some diabetes complications may not be as great as earlier data has indicated and that doctors may be screening diabetes patients to no benefit. Reporting from a group of institutions in the U.S. and Canada, researchers involved in the Detection of Ischemia in Asymptomatic Diabetics (DIAD) study found that screening diabetes patients for heart risk fails to predict which patients are most likely to have a heart attack. DIAD also found that the risk of heart disease among diabetes patients may be exaggerated overall, according to the data published April 14 in the *Journal of the American Medical Association* (*JAMA*). (See the top 10 medical breakthroughs of 2008.)

Based on the number of type 2 diabetes patients who typically go on to develop heart problems, DIAD researchers began with the assumption that as many as 60% of the study's 1,123 volunteers with diabetes, who showed no outward signs of heart disease, might be harboring silent heart problems. Researchers expected that screening these patients — using the common treadmill stress test and then imaging their hearts — would help root out any heart abnormalities, such as early blockages or irregular heart rhythms, quickly enough to be treated before leading to a potentially deadly cardiac event. (Read "The Year in Medicine 2008: From A to Z.") "We proved our expectations three times wrong," says Dr. Frans Wackers, professor of diagnostic radiology and medicine at Yale University School of Medicine and an author of the DIAD study. "We found to our surprise that there was not an increase in heart abnormalities among diabetic patients, but actually fewer abnormalities. And the next surprising thing was that this was true in both the group that received screening and the group that received no screening at all."

Among the patients who were screened, 5.5% needed procedures, such as bypass or angioplasty, to restore blood flow to the heart during the course of the trial. A similar proportion, 7.8%, of unscreened patients required similar procedure. The difference was not statistically significant, meaning that the screening did little to predict or prevent heart problems in diabetes patients.

One reason that screening didn't appear to provide any health advantage, Wackers theorizes, may be that patients with diabetes (particularly the ones being monitored carefully in the study) are already benefiting from well controlled blood sugar — in patients, both with diabetes and without, high blood sugar is associated with increased heart risk. So, if diabetes patients are already being treated for potential heart risk factors before they become hazardous, screening becomes redundant.

Wackers stresses, however, that these findings do nothing to diminish the very real risk of heart disease in diabetics. A 1998 Finnish study documented that diabetes patients who had not suffered a heart attack had the same poor health profile as those who had — findings that prompted the American Diabetes Association to recommend heart-disease screening for all diabetes patients with two or more additional risk factors for heart disease, such as high cholesterol or hypertension, even in the absence of symptoms. "That study really changed the field," says Wackers, "and told us we cannot miss the risk of heart disease and should start testing all of our patients."

With his latest findings, however, Wackers thinks the ADA guidelines are ready for a revision. Heart screenings may not be as important as basic primary prevention strategies, such as ensuring that diabetes patients control their weight, cholesterol and blood pressure, and stop smoking. He argues that if the rate of heart problems is indeed declining in diabetes patients because they are being adequately treated for the risk factors for heart disease, then the stress test recommendation becomes redundant — and expensive.

"Our results show that with standard of care, diabetes patients actually do quite well," he says. "I believe now that it's far more important to do primary prevention, such as keeping cholesterol levels on target, and blood pressure controlled, and not smoking."

Dr. John Buse, a DIAD investigator and immediate past president of the American Diabetes Association, agrees that the screening should be limited. "We probably should not be doing stress tests in people without heart symptoms," he says. "But doctors need to make sure to ask questions of their patients about any possible symptoms they may be having of heart trouble."

Some experts note that while the rate of heart disease in the people without diabetes may be improving — due in part to increasing efforts to lower patients' cholesterol and blood pressure, among other risk factors — diabetes patients who have already had heart attacks appear not to be benefiting as much from the same preventive measures, and continue to suffer and die from higher-than-average rates of heart problems.

"How do we decrease the bad outcomes in people who get heart disease within the setting of diabetes?" says Dr. David Nathan, director of the diabetes center at Massachusetts General Hospital. "There is just no clear answer to that." In fact, the answers are sometimes conflicting. In March, scientists from Australia and New Zealand reported in the *New England Journal of Medicine* that aggressively lowering blood sugar in diabetes patients who have had a heart attack does not reduce their future risk of heart disease, but in fact puts these patients at higher risk of hypoglycemia (low blood sugar) and death. Meanwhile, in the current issue of *JAMA,* another study found that intensive blood-glucose therapy in diabetes patients was not linked with greater mortality.

Such results make it difficult to know for sure whether the risks of abnormally high or abnormally low levels of glucose are more dangerous for diabetes patients who land in the hospital with a heart attack and high blood sugar levels. "It's a moving target," says Nathan. "But we are winning the battle. It's been an incredibly exciting several decades in diabetes research, but a lot more work needs to be done. We know what we need to do, we just need to apply what we learn better — to the right patients at the right time."

http://www.time.com/time/health/article/0,8599,1891572,00.html

Da Vinci Portrait Found in Cathedral Window

Rossella Lorenzi, Discovery News

April 14, 2009 -- A new, vividly colored portrait of Leonardo da Vinci has emerged from the windows of Arezzo's Cathedral in Tuscany, Italy, claims an Italian scholar who has published the finding in a new book, "The Portraits of Leonardo."

Depicting an amiable, bearded old man wearing a red hat, the portrait is one of many figures appearing in the stained glass on the cathedral's right wall.

The scene, which shows the biblical story known as the Raising of Lazarus, is part of a renowned portfolio of stained-glass work by the undisputed master of the time, the French artist Guillaume de Pierre di Marcillat (1475-1529).

"The image distinguishes itself by its dazzling intensity," said Alezzandro Vezzosi, director of the Museo Ideale in the Tuscan town of Vinci, where da Vinci was born in 1452.

According to Vezzosi, the stained-glass portrait dates to around 1520, one year after Leonardo's death in Amboise, France.

"The hypothesis is strengthened by the fact that a detail from 'The Last Supper' is evoked in the scene," Vezzosi said. "The figure next to the old bearded man strongly recalls the profile of the apostle Matthew in Leonardo's masterpiece."

After becoming a Dominican friar, probably to avoid murder charges, di Marcillat left France and worked in Italy with the architect Donato Bramante and fellow artist Raphael Sanzio. His most famous pupil was the painter, architect and art historian Giorgio Vasari.

"I believe he also met Leonardo, while traveling between Arezzo and Rome," Vezzosi said.

No one can say for certain what exactly da Vinci looked like: There isn't a single portrait known for certain to bear his likeness. According to Vezzosi, there are five types of da Vinci portraits. They share some common features (the beard, for example) but have enough variation to keep experts guessing.

"When studying Leonardo, everything should be considered an hypothesis," Carlo Pedretti, director of the Armand Hammer Center for Leonardo Studies at the University of California at Los Angeles, wrote in the foreword to the book.

The only drawing widely accepted as a self-portrait is a sketch in "Manuscript A," which is kept at the Institute de France in Paris. Created by da Vinci when he was 40, the portrait shows only the enigmatic silhouette of a man with a hat.

Historic sources, including Vasari in his "The Lives of the Artists," describe Leonardo as "an artist of outstanding physical beauty."

As he aged, portraits and reports suggest that the once-handsome Florentine genius wore the years on his face. Various sources report that at 60, da Vinci appeared much older.

Moreover, several portraits depict the left-handed artist with his right hand hanging stiffly at his side, hinting at the paralysis that afflicted da Vinci during the last years of his life.

"Di Marcillat's stained-glass portrait belongs to the typology of the old bearded man with a hat," said Vezzosi, referring to one of the five portrait types. "It certainly adds a new element to Leonardo's never-ending puzzle."

http://dsc.discovery.com/news/2009/04/14/da-vinci-portrait.html

Elephant hair reveals competition

By Jason Palmer
Science and technology reporter, BBC News

The diet and behaviour of elephants evidenced by the chemical makeup of their tail hairs shows how they compete with other species, researchers say.

The six-year study, published in Proceedings of the National Academy of Sciences, followed a single family of elephants in northern Kenya.

The study shows how the elephants lost out to cattle grazing on grasses.

It also shows the rate of conception rising as food and water resources become more abundant each year.

The study is part of an ongoing research programme tracking the elephant family using GPS receivers on each individual and determining a dietary history from their tail hairs.

That history is laid out chronologically in an "isotope record" along the hair. Isotopes are naturally occurring variations of atoms that are chemically identical but have a slightly different mass.

Different food or water sources that the elephants might access contain different ratios of isotopes of carbon, hydrogen or nitrogen.

The team's prior work in 2006 showed the power of the maxim "you are what you eat"; a clear record of the elephants' diets was evident in the proteins that made up their tail hairs.

'Out-competed'

“ **You have to worry about the conflict of how humans want to use resources and how wildlife wants to use resources** ”
Thure Cerling

"Now, we have a long-term record so we can really see what one normal family is doing over a long period of time," said Thure Cerling, the University of Utah professor who leads the research.

In the new work, the team also analysed the content of deuterium - an isotope of hydrogen - in the elephants' tails to determine the source of the water they drink.

"During the dry season, the river they're accessing comes from quite far away, so the water has had a lot of time to evaporate and change its isotope composition," Professor Cerling told BBC News.

"Then during the rainy season, the rivers come up and the whole isotope composition changes and we're able to actually see that."

But the surprise finding came from one season in which the elephants apparently did not eat grasses that should have been readily available.

"When the rainy season comes you get this big sprouting of grasses, but they can't access it until it is 30 to 50 centimetres high," Professor Cerling said. "It's got to grow tall enough before they can actually yank it off with their trunks.

"We have this one incident where they apparently missed an entire good season of grass resource; the GPS data shows that they were outside [Samburu National Reserve] in a community area where it appears that they had to compete with cattle. "They got out-competed in that situation."

The team also noted that conceptions rose sharply just a few weeks after the rainy season brought abundant food and water.

"They bulk up during the rainy season, get into good condition, right as things are starting to get good," Professor Cerling explained. What is more, the elephants' 22-month gestation period means that the maximum birthing period is shortly before things get good again.

"That's right when they have adequate water and just about the right time to access this high-protein grass source," he added.

Future conflicts

The approach gives an intimate look into the elephants' behaviour and diet in a way that traditionally could not be done. While that is of tremendous academic interest to wildlife ecologists, Professor Cerling says the recent findings point to an imminent problem of broader interest.

"It points out you have to worry about the conflict of how humans want to use resources and how wildlife wants to use resources," he says. "As we have global climate change, that's going to change the available resources. As you have populations increase - and all African populations are increasing dramatically - then you'll have more competition for the resources.

"If you're concerned about preservation of wildlife then you have to worry about that competition."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/science/nature/7992786.stm

Published: 2009/04/13 23:24:07 GMT

Thieving dwarves cause supernovae

Researchers have come up with a theory for how stars can end in a spectacular so-called Type Ia supernova in less than 100 million years.

While such early-stage supernovae are well-known, theory has been unable to explain them.

The secret, the researchers say, is that white dwarf stars steal mass from nearby "helium stars" until they have enough mass to initiate a supernova.

The research appears in Monthly Notices of the Royal Astronomical Society.

The new theory concerns white dwarf stars, the dense remains of stars like the Sun that have fused their hydrogen into helium and then the helium into carbon and oxygen.

Existing theory held that these carbon/oxygen white dwarves can gather up further mass from nearby companion stars.

When they reach a critical mass, about 40% more than the Sun, they can undergo further fusion. In just a few seconds, the white dwarf's carbon is fused into heavier elements in a runaway process that releases huge amounts of energy into the cosmos: a supernova.

Too fast

Because the process happens with a known brightness, such supernovae have been used by astronomers as a standard for distances.

“ **Before this investigation, there was no model which could produce a large population of such young Type Ia supernovae** ”
Xuefei Chen

However, the theory held that the mass-accreting process would take more than 100 million years to occur. However, observations have it that about half of the Type Ia supernovae observed occur in less than that amount of time.

Bo Wang and colleagues of the National Astronomical Observatories at the Chinese Academy of Sciences investigated the problem, performing calculations based on 2600 relatively nearby white dwarf/companion star pairs.

They found that if the companion star was a so-called helium star - which had fused all its hydrogen to form a helium core - then the white dwarf could steal away mass more quickly, leading to a supernova event in less than 100 million years.

"Before this investigation, there was no model which could produce a large population of such young Type Ia supernovae, and no knowledge of a way to produce such numbers," study co-author Xuefei Chen told BBC News.

Dr Chen said that the theft of mass from helium stars is likely to produce most of the "young" Type Ia supernovae that we observe, if not all of them.

"A significant population of young Type Ia supernovae may have an effect on models of galactic chemical evolution, since they would return large amounts of iron to the interstellar medium much earlier than previously thought," Dr Chen added.

"It may also have an impact on cosmology, as they are used as cosmological distance indicators."

The team now plans to study the extremely high-velocity helium stars that would be the remnants of such supernovae.

While such fast-moving stars have been spotted before, their speed was attributed to gravitational interactions, rather than supernovae. Those remnants may now serve as proof of the team's theory.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/science/nature/7996852.stm

Published: 2009/04/14 00:12:12 GMT

Drug offers hope on Alzheimer's

A new drug which shows promise as a treatment for Alzheimer's disease has been developed by UK scientists.

The Proceedings of the National Academy of Sciences reports the drug, CPHPC, removes a protein thought to play a key role in Alzheimer's from the blood.

Tests at the University College London found the protein also disappeared from the brains of five Alzheimer's patients given the drug for three months.

Longer and larger scale clinical studies are now being planned.

" **New treatments for Alzheimer's disease are desperately needed** "
Rebecca Wood Alzheimer's Research Trust

The protein - serum amyloid P component (SAP) is always present in both the sticky clumps (plaques) and the tangles of nerve fibres that are found in the brains of people with Alzheimer's disease, and are thought to damage healthy cells.

It appears to prevent both structures from breaking up, and has also been shown - in lab experiments at least - to promote formation of the amyloid protein which forms the damaging plaques.

There is also some evidence that SAP itself can damage brain cells directly.

Two of the big potential advantages CPHPC are that it is not broken down once inside the body, and it has a very specific action, not interacting with cells at all, thus reducing the risk of side effects.

Molecular process

The researchers expected a depletion of SAP in the five patients' blood - but were taken aback at the drug's apparent effect on the brain.

By using laboratory tests they were also able to reveal both the molecular process underpinning the effect of the drug, and the way in which SAP accumulates in the brain in Alzheimer's disease.

The study also confirmed that use of the drug - and the removal of SAP from the brain - had no side effects on the patients.

CPHPC has already been given to patients with other diseases without any any adverse effects.

Although the three-month treatment period was too short to show any clinical benefit there was no obvious deterioration.

Longer and larger scale clinical studies are being planned to confirm safety and seek evidence of benefit to the patients.

Lead researcher Professor Mark Pepys said: "The complete disappearance of SAP from the brain during treatment with CPHPC could not have been confidently predicted, and the drug, also to our surprise, entered the brain.

"Coupled with the absence of any side effects, these new findings strongly support further clinical studies to see whether longer term treatment with CPHPC protects against the inexorable mental decline in patients with Alzheimer's disease."

Dr Susanne Sorensen, head of research at the Alzheimer's Society, said: "A key characteristic of Alzheimer's disease is the clumping together of proteins in the brain.

"It's very exciting that this drug could potentially interfere with this process, but it's too early to say how much it will benefit people with the disease."

Rebecca Wood, of the Alzheimer's Research Trust, said the study was small, but the results were cause for "cautious optimism".

"New treatments for Alzheimer's disease are desperately needed, and it's possible that this small molecule could be a future candidate."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/7989814.stm

Published: 2009/04/13 23:35:34 GMT

Alcohol flush 'shows cancer risk'

People who get a flushed face when they drink alcohol should be particularly wary of gullet cancer, experts warn.

About 8% of the population - mostly people of East Asian descent - have an enzyme deficiency that causes their skin to redden when they drink alcohol.

National Institute on Alcohol Abuse and Alcoholism research found even moderate drinkers with this deficiency were more at risk of oesophageal cancer.

The report authors told PLoS Medicine such people may benefit from screening.

" **We estimate that at least 540 million people have this alcohol-related increased risk for oesophageal cancer** "
Lead researcher Dr Philip Brooks

Alcohol-induced flush is predominantly down to an inherited deficiency in an enzyme called aldehyde dehydrogenase 2 (ALDH2).

Although this is widely known, few are aware of the accumulating evidence that ALDH2-deficient individuals are at much higher risk of oesophageal cancer from alcohol consumption, say the researchers.

Dr Philip Brooks and his team from the National Institute on Alcohol Abuse and Alcoholism, working with Japanese colleagues, assessed how big the extra risk is.

They found individuals with one copy of the inactive gene causing ALDH2-deficiency were 6-10 times more likely to develop oesophageal cancer than individuals with the fully active ALDH2 enzyme who drank comparable amounts of alcohol.

They said if moderate or heavy drinking people with this deficiency were to become light drinkers instead, 53% of oesophageal cancers might be prevented among Japanese men.

They based their calculations on light consumption being fewer than 25 UK units of alcohol per week, moderate being fewer than 50 UK units and heavy being more than 50 UK units per week.

Raising awareness

In the UK, a unit of alcohol is 8g and the Department of Health recommends men should not drink more than three to four units of alcohol a day, and women should drink no more than two to three.

Dr Brooks said: "Cancer of the oesophagus is particularly deadly, with five-year survival rates ranging from 12% to 31% throughout the world.

"And we estimate that at least 540 million people have this alcohol-related increased risk for oesophageal cancer.

"We hope that, by raising awareness of this important public health problem, affected individuals who drink will reduce their cancer risk by limiting their alcohol consumption."

He said doctors could determine ALDH2 deficiency simply by asking about previous episodes of flushing.

Then people could be counselled to reduce alcohol consumption, and those high-risk patients could be assessed for endoscopic cancer screening.

Oliver Childs, of the charity Cancer Research UK, said: "We know that drinking alcohol increases the risk of several different cancers, and that the more you cut down on your drinking, the more you reduce your cancer risk.

"This research helps us better understand how our environment and genes work in tandem to influence our risk of cancer."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/7961943.stm

Published: 2009/04/13 23:55:56 GMT

Scientists find 'pleasure nerves'

Scientists say they understand more about how the body responds to pleasurable touch.

A team, including scientists from the Unilever company, have identified a class of nerve fibres in the skin which specifically send pleasure messages.

And people had to be stroked at a certain speed - 4-5cm per second - to activate the pleasure sensation.

They say the study, published in Nature Neuroscience, could help understand how touch sustains human relationships.

" **There are some mechanisms in place that are associated with behaviour and reward which are there to ensure relationships continue** "
Professor Francis McGlone

For many years, scientists have been trying to understand the mechanisms behind how the body experiences pain, and the nerves involved in conveying those messages to the brain.

This is because people can suffer a great deal.

Neuropathy, where the peripheral nervous system is damaged, can be very painful and sometimes the messaging system goes wrong and people feel pain even when there is no cause.

Hairy skin

But the researchers involved in this work were looking to understand the opposite sensation - pleasure.

This research, which also involved experts at the University of Gothenburg in Sweden and at the University of North Carolina, recorded nerve responses in 20 people.

They then tested how people responded to having their forearm skin stroked at a range of different speeds.

They identified "C-tactile" nerve fibres as those stimulated when people said a touch had been pleasant.

If the stroke was faster or slower than the optimum speed, the touch was not pleasurable and the nerve fibres were not activated.

The scientists also discovered that the C-tactile nerve fibres are only present on hairy skin, and are not found on the hand.

Professor Francis McGlone, now based at Unilever after an academic career where he carried out research into nerve response, says this is likely to be a deliberate "design".

"We believe this could be Mother Nature's way of ensuring that mixed messages are not sent to the brain when it is in use as a functional tool."

He said the speed at which people found arm-stroking pleasurable was the same as that which a mother uses to comfort a baby, or couples use to show affection.

Professor McGlone said it was part of the evolutionary mechanism that sustained relationships between adults, or with children.

"Our primary impulse as humans is procreation, but there are some mechanisms in place that are associated with behaviour and reward which are there to ensure relationships continue."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/7992299.stm

Published: 2009/04/12 23:02:26 GMT

Red Pandas Reveal An Unexpected (Artificial) Sweet Tooth

Red panda. The red panda is the first non-primate mammal to display a liking for the artificial sweetener aspartame. (Credit: iStockphoto)

ScienceDaily (Apr. 16, 2009) — Researchers from the Monell Center report that the red panda is the first non-primate mammal to display a liking for the artificial sweetener aspartame. This unexpected affinity for an artificial sweetener may reflect structural variation in the red panda's sweet taste receptor.

The findings may shed light on how taste preferences and diet choice are shaped by molecular differences in taste receptors.

"The red panda's unique taste receptor gives us a tool to broaden our understanding of how we detect sweet taste," said the paper's senior author, Joseph G. Brand, PhD, a biophysicist at Monell. "Greater insight into why we like artificial sweeteners could eventually lead to the development of more acceptable sugar substitutes, potentially benefiting diabetics and other individuals on sugar-restricted diets."

Many species like sweet-tasting foods, but there are some exceptions. In an earlier study, Brand and Monell comparative geneticist Xia Li, PhD, reported that cats – both domestic and wild – can not taste sweets due to a defect in one of the genes that codes for the sweet taste receptor.

The current research extended those findings by relating sweet preferences to genetic analyses of sweet receptor structure in six related species. Like the cat, each of the species tested -- red panda, ferret, genet, meerkat, mongoose, and lion -- belongs to the Order Carnivora.The species, although closely related, vary widely with regard to the types of foods they eat. For example, lions, like other cats, are obligate carnivores, meaning that they eat almost exclusively meat. Meerkrats are mainly insectivores, while red pandas are primarily herbivores that almost exclusively eat bamboo leaves and shoots.

By studying the structure and function of the sweet receptor gene across species and how this relates to differences in taste preferences and diet selection, the researchers seek to provide a framework to increase understanding of individual differences in human taste function, food choice and nutritional health.

"The taste world of every species, and even every individual, is unique, defined in part by the structure of their taste receptors," said Li. "We need to know more about these differences and how they influence our diet."

In the study, published online in the *Journal of Heredity*, preferences for six natural sugars and six artificial sweeteners were tested in a zoo setting. For each sweet molecule, the animal was given access to both the sweet solution and water for 24 hours. The animal was said to prefer the sweet solution when it drank much more sweet fluid than water.

DNA samples from each species were used to examine the structure of the sweet receptor gene Tas1r2, which codes for the T1R2 sweet taste receptor. T1R2 is one of two taste receptors that join together to recognize sweetness.The sweet taste receptors contain binding sites for a variety of natural sugars and artificial sweeteners. However, species vary regarding which sites they possess, due to subtle differences in receptor structure.

As expected from the previous findings, the lion did not prefer any of the sweet solutions. This could be explained by its defective Tas1r2 gene, which prevents the lion from expressing a functional sweet taste receptor. With no sweet receptor, the lion is unable to detect – or prefer – sweet-tasting compounds.

Each of the remaining species preferred at least some of the natural sugars. Consistent with having a functional sweet receptor, Tas1r2 genes from these species did not show the defect found in lion and other cats.

Because only primates were believed to be able to taste aspartame, the researchers predicted that none of the Carnivore species tested would show a preference for the artificial sweeteners.

This indeed was the case for five of the species. However, the sixth species – the red panda – drank large amounts of the artificial sweeteners aspartame, neotame, and sucralose.

Seeking to explain this unexpected behavior, the researchers compared Tas1r2 genes from various species that can and cannot taste aspartame. They were surprised to find no consistent differences between aspartame tasters and nontasters.However, the genetic analysis did reveal that the red panda's sweet receptor has a unique structure that is different from any of the other species examined.

"This may explain why the red panda is able to taste artificial sweeteners," said Li, who is the paper's lead author. "What we don't know is why this particular animal has this unusual ability. Perhaps the red panda's unique sweet receptor evolved to allow this animal to detect some compound in its natural food that has a similar structure to these sweeteners."The findings suggest that the receptor mechanisms for sweet taste are more complex than previously suspected. "This is the essence of molecular science," remarked Brand, "Asking a behavioral question and getting a molecular answer."

Future studies will explore how protein structure of taste receptor genes predicts stimulus binding and ultimately provide insight into how variations in taste receptor genes affect taste perception, food choice and nutritional status.

Taste tests for the red panda and other animals in the study were conducted at two zoos in Switzerland by Dieter Glaser, PhD, from the University of Zurich. Also contributing to the study were Monell scientists Gary Beauchamp and Weihua Li, along with Warren Johnson and Stephen O'Brien from the National Cancer Institute.

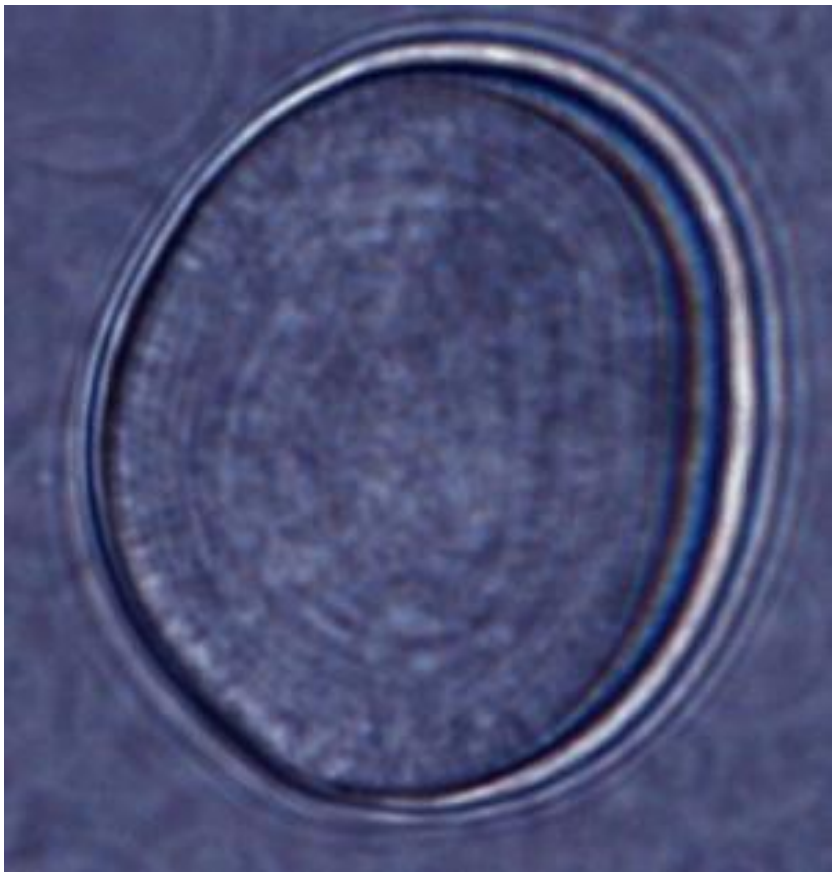
Journal reference:

1. Xia Li, Dieter Glaser, Weihua Li, Warren E. Johnson, Stephen J. O'Brien, Gary K. Beauchamp, and Joseph G. Brand. **Analyses of Sweet Receptor Gene (Tas1r2) and Preference for Sweet Stimuli in Species of Carnivora**. *Journal of Heredity*, 2009; DOI: 10.1093/jhered/esp015

Adapted from materials provided by Monell Chemical Senses Center, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com/releases/2009/04/090415120959.htm

Long-lasting Nerve Block Could Revolutionize Pain Management



Multilamellar liposome containing local anesthetics. (Credit: Image courtesy of Children's Hospital Boston)

ScienceDaily (Apr. 16, 2009) — Researchers at Children's Hospital Boston have developed a slow-release anesthetic drug-delivery system that could potentially revolutionize treatment of pain during and after surgery, and may also have a large impact on chronic pain management.

In NIH-funded work, they used specially designed fat-based particles called liposomes to package saxitoxin, a potent anesthetic, and produced long-lasting local anesthesia in rats without apparent toxicity to nerve or muscle cells.

"The idea was to have a single injection that could produce a nerve block lasting days, weeks, maybe even months," explains Daniel Kohane, MD, PhD, of the Division of Critical Care Medicine in the Department of Anesthesiology at Children's, and the report's senior author. "It would be useful for conditions like chronic pain where, rather than use narcotics, which are systemic and pose a risk of addiction, you could just put that piece of the body to sleep, so to speak."

Previous attempts to develop slow-release anesthetics have not been successful due to the tendency for conventional anesthetics to cause toxicity to surrounding tissue. Indeed, drug packaging materials have themselves been shown to cause tissue damage. Now, Kohane and colleagues report that if saxitoxin is packaged within liposomes, it is able to block nerve transmission of pain without causing significant nerve or muscle damage.

In lab experiments, the researchers evaluated various formulations--various types of liposomes containing saxitoxin with or without dexamethasone, a potent steroid known to augment the action of encapsulated

anesthetics. The best liposomes produced nerve blocks lasting two days if they contained saxitoxin alone and seven days if combined with dexamethasone.

Cell culture experiments and tissue analysis confirmed that the formulations were not toxic to muscle or nerve cells. Furthermore, when the team examined expression of four genes known to be associated with nerve injury, they found no up-regulation.

"If these long-acting, low-toxicity formulations of local anesthetics are shown to be effective in humans, they could have a major impact on the treatment of acute and chronic pain," says Alison Cole, PhD, of the NIH's National Institute of General Medical Sciences, which partially funded the work. "This slow-release technology may also have broader applications in drug delivery for the treatment of a variety of diseases."

Kohane is currently optimizing the formulation to make it last even longer, while avoiding local and systemic toxicity. "It is conceivable we could have a formulation that is suitable for clinical trials before too long," he says.

The research is published online on April 13 by the *Proceedings of the National Academy of Sciences*. The study was supported by the National Institute of General Medical Sciences. Hila Epstein-Barash, PhD, was first author on the paper.

Journal reference:

1. Hila Epstein-Barash, Iris Shichor, Albert H. Kwon, Sherwood Hall, Michael W. Lawlor, Robert Langer, and Daniel S. Kohane. **Prolonged duration local anesthesia with minimal toxicity**. *Proceedings of the National Academy of Sciences*, 2009; DOI: 10.1073/pnas.0900598106

Adapted from materials provided by Children's Hospital Boston.

http://www.sciencedaily.com/releases/2009/04/090415113332.htm

Home Tooth Bleaching Slightly Reduces Enamel Strength

New research shows that human teeth lost some enamel hardness after the application of several different products used in the home to whiten teeth. (Credit: iStockphoto/Iryna Kurhan)

ScienceDaily (Apr. 16, 2009) — New research shows that human teeth lost some enamel hardness after the application of several different products used in the home to whiten teeth. The study suggests that future generations of such products might be reformulated in an effort to reduce these side effects.

The researchers noted that teeth typically can restore their previous hardness after losing small amounts of enamel calcification. But this is the first study to show at a nanometer scale – measuring in billionths of a meter – how human teeth are affected by the popular home whiteners.

"There is some significant reduction in nano-hardness of enamel, but we are talking on a very minute scale. So even though it may not be visible to the human eye, it's important for research because that's how we improve products," said Shereen Azer, assistant professor of restorative and prosthetic dentistry at Ohio State University and lead author of the study.

Azer and colleagues applied the recommended treatments of five name-brand home whiteners to samples of human teeth and compared the effects to tooth samples that received no treatment. In all cases, the products reduced the hardness of the enamel as well as what is called the elastic modulus or stiffness, a measure of the ability of the tooth surface to bounce back in response to applied force.

Many studies have sought to determine how tooth whitening affects tooth enamel hardness, but results have been inconclusive. Azer said that previous studies measured the loss of enamel hardness in microns, or millionths of a meter, rather than on the nanometer scale used in his study.

"So this just gives us a better understanding of precisely how these products affect human teeth," he said.

Tooth bleaching products contain solutions of various strengths of either hydrogen peroxide or carbamide peroxide, which provide the whitening effect. They bleach teeth by producing unstable free radicals that attack pigment molecules in the organic parts of enamel. The reduction in pigment means the molecules no longer reflect light, so the teeth appear whiter.

Enamel, which is almost entirely inorganic and translucent, appears yellow in most teeth because it reflects the color of the dentin underneath, which is naturally yellow.

"Especially nowadays, people tend to see beauty in white teeth," Azer said. "And bleaching does have a beautiful effect, but not without side effects."

The study did not test for two other common side effects of tooth whitening, gum irritation and tooth sensitivity. Azer said these side effects have been addressed by other products, such as toothpastes and treatment gels designed to lessen sensitivity and irritation.

He and colleagues used extracted molars to assemble 65 human tooth samples measuring 4 millimeters square and 2 millimeters deep for the study. Ten samples were used in a pilot study that determined they could achieve accurate results for the research under dry conditions rather than wet conditions simulating the presence of saliva.

Of the remaining samples, five were left untreated, and 50 were divided into five groups of 10 each to undergo treatment.The researchers used whitening strips on two groups of samples and trays filled with whitening gel on three groups. The treatment times included up to 60 minutes once per day or 60 minutes twice per day according to manufacturer recommendations. All treatments lasted for three weeks except for one tray method, which lasted 10 days.

The treatments included both over-the-counter and professionally provided products to be used in the home.

The scientists used a specialized tool to apply force to test the enamel hardness and stiffness (the surface ability to bounce back), and an atomic force microscope to observe the tiny nanometer-scale effects on the teeth.The average loss of enamel ranged from 1.2 to 2 nanometers on the treated teeth. The control teeth, on average, actually gained 0.4 nanometers of hardness in comparison over the treatment time frame. The surface ability to bounce back from applied force was reduced by an average of between 6 percent and 18.8 percent among the treated teeth, depending on the type of treatment.

Among the different products, most of the reductions in hardness and elastic modulus were similar. However, there was a significant difference between one strip treatment method and one tray method, with the tray method reducing enamel hardness more dramatically than the strip treatment.

Enamel is the hardest structure in the human body. It protects teeth and maintains the integrity of the bite. But enamel is subject to abrasion by certain products and even too-vigorous brushing, which is why it is important to figure out ways to reduce damage to this part of the tooth, Azer said.

"In the case of these products, manufacturers might be able to alter the concentrations of the materials and the vehicles used to apply the bleach," he said.

The study did not address how to restore hardness to bleached teeth, but Azer noted that extensive research has indicated that fluoride treatments, including the use of fluoride toothpaste, can promote enamel remineralization.

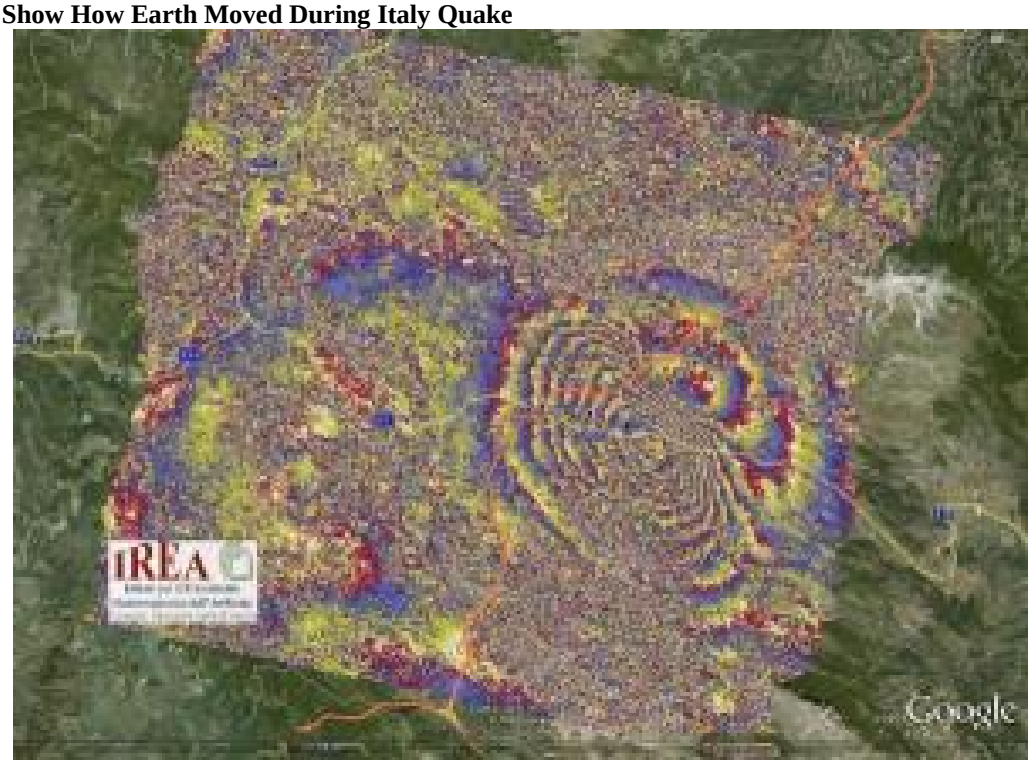
The products used in the study were Crest Whitestrips Premium Plus, Crest Whitestrips Supreme, Nite White ACP, Oral B Rembrandt and Treswhite Opalescence. The final three are tray treatments.

The research is published in a recent issue of the *Journal of Dentistry.* Azer conducted the research with Camilo Machado and Robert Rashid of the Division of Restorative and Prosthetic Dentistry and Eliana Sanchez of the Division of Primary Care, all in Ohio State's College of Dentistry.

Adapted from materials provided by Ohio State University.

http://www.sciencedaily.com/releases/2009/04/090414110816.htm

Satellites Show How Earth Moved During Italy Quake



An Envisat Advanced Synthetic Aperture Radar (ASAR) interferogram over the L'Aquila area in central Italy showing the deformation pattern caused by the seismic events in early April 2009. This interferogram was generated by Italy's Istituto per il Rilevamento Elettromagnetico dell' Ambiente (IREA-CNR) in Naples, Italy just a few hours after Envisat's acquisition on 12 April 2009. It combines that acquisition with a pre-seismic acquisition on 1 February 2009, with an estimated baseline (separation between the two Envisat orbital positions) of about 154 m. The satellite's right-looking angle is 23 degrees. Each fringe of the interferogram, corresponding to a colour cycle, is equivalent to an Earth surface displacement of 2.8 cm along the satellite direction. (Credit: IREA-CNR)

ScienceDaily (Apr. 15, 2009) — Studying satellite radar data from ESA's Envisat and the Italian Space Agency's COSMO-SkyMed, scientists have begun analysing the movement of Earth during and after the 6.3 earthquake that shook the medieval town of L'Aquila in central Italy on 6 April 2009.

Scientists from Italy's Istituto per il Rilevamento Elettromagnetico dell' Ambiente (IREA-CNR) and the Istituto Nazionale di Geofisica e Vulcanologia (INGV) are studying Synthetic Aperture Radar (SAR) data from these satellites to map surface deformations after the earthquake and the numerous aftershocks that have followed.

The scientists are using a technique known as SAR Interferometry (InSAR), a sophisticated version of 'spot the difference'. InSAR involves combining two or more radar images of the same ground location in such a way that very precise measurements – down to a scale of a few millimetres – can be made of any ground motion taking place between image acquisitions.

The InSAR technique merges data acquired before and after the earthquake to generate 'interferogram' images that appear as rainbow-coloured interference patterns. A complete set of coloured bands, called 'fringes', represents ground movement relative to the spacecraft of half a wavelength, which is 2.8 cm in the case of Envisat's ASAR.

The first Envisat data, acquired after the earthquake on 12 April, were made immediately available to the scientists.

"We produced an interferogram just a few hours after the Envisat acquisition by combining these data with data acquired before the earthquake on 1 February. We were pleased that we were able to immediately see the pattern of the earthquake," said Riccardo Lanari of IREA-CNR in Naples, Italy.

The Envisat interferogram, as explained by Stefano Salvi from INGV's Earthquake Remote Sensing Group, shows nine fringes surrounding a maximum displacement area located midway between L'Aquila and Fossa, where the ground moved as much as 25 cm (along a line between the satellite's orbital position and the earthquake area).

"By using available 3D ground displacements from five GPS location sites around the affected area, we were able to confirm the preliminary results obtained with Envisat data," Salvi said.

The COSMO-SkyMed constellation, which is currently made up of three satellites, allows for frequent data. This means new interferograms can be calculated every few days.

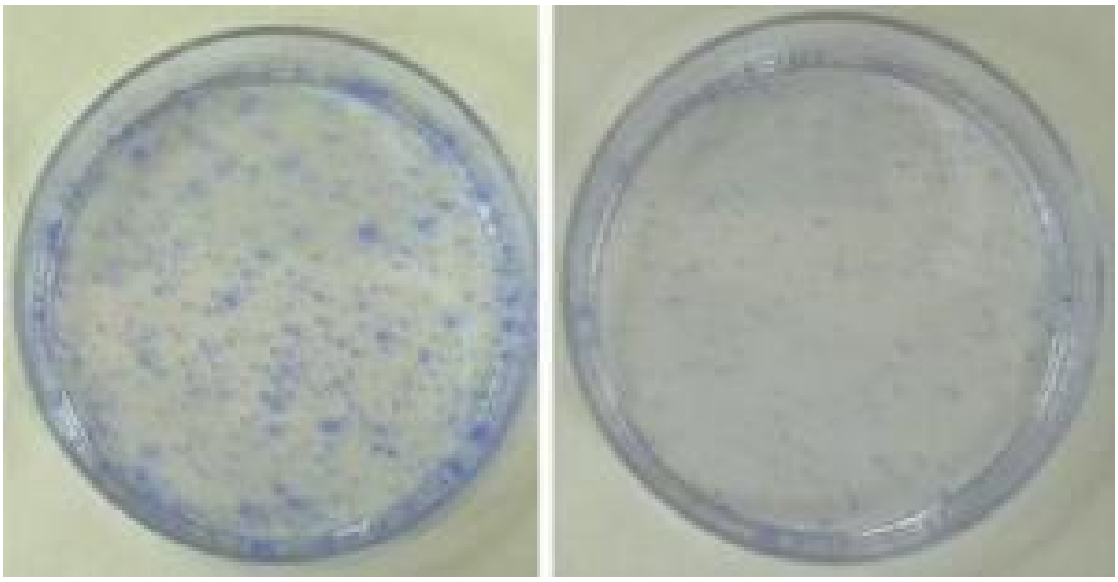
The COSMO-SkyMed data together with the Envisat data and possibly SAR data from other satellites will ensure a dense sampling of the ground deformation around the L'Aquila area in the next months, which could make this earthquake one of the most covered by SAR Interferometry measurements.

To ensure all scientists are able to contribute to the analysis of the earthquake, ESA is making its Earth observation dataset collected over the L'Aquila area freely accessible with an innovative fast data download mechanism. The dataset will be continuously updated with the newest Envisat acquisitions.

Adapted from materials provided by European Space Agency.

http://www.sciencedaily.com/releases/2009/04/090415120121.htm

Another Anti-cancer Effect Of The 'Longevity' Protein SIRT1 Identified



Cells that make c-Myc proliferate in culture (left), but not when SIRT1 is present (right). (Credit: Yuan, J., et al. 2009. J. Cell Biol. doi:10.1083/jcb.200809167)

ScienceDaily (Apr. 15, 2009) — Yuan et al. have identified another anti-cancer effect of the "longevity" protein SIRT1. By speeding the destruction of the tumor promoter c-Myc, SIRT1 curbs cell division.

The yeast and nematode equivalents of SIRT1 are fountains of youth that stretch lifespan. Whether SIRT1 slows aging in mammals isn't certain, but it's beneficial in other ways. The protein tunes up metabolism, reducing blood levels of glucose and insulin, and might forestall neurodegenerative illnesses such as Alzheimer's disease and ALS. Given its pro-life credentials, you might expect SIRT1 to inhibit cancer. And several studies suggest that it does. But other work indicates that the protein aids tumors. For example, SIRT1 chops off acetyl groups, which can inactivate the tumor suppressor p53.

Yuan et al. determined SIRT1's effect on the transcription factor c-Myc, whose expression surges in many breast, colon, and liver cancers. The two proteins are tangled in a regulatory loop, the team found. c-Myc latched onto SIRT1's promoter, spurring cells to manufacture more SIRT1. In turn, SIRT1 detached acetyl groups from c-Myc, hastening its breakdown. To test SIRT1's effects on tumor growth, the researchers implanted cancerous cells expressing c-Myc into nude mice that lack immune defenses. Boosting production of SIRT1 blocked tumor formation.

How deacetylation of c-Myc sparks its destruction is still a mystery. The researchers say that the results don't necessarily conflict with studies suggesting that SIRT1 is pro-tumor. Whether SIRT1 promotes or prevents cancer probably depends on the situation.

The study will be published online April 13 and will appear in the April 20 print issue of the Journal of Cell Biology.

Reference: Yuan, J., et al. 2009. J. Cell Biol. doi:10.1083/jcb.200809167.

Adapted from materials provided by Rockefeller University Press, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com/releases/2009/04/090413083311.htm

Mild Dementia Detected In Humans Through Eye Tracking

ScienceDaily (Apr. 15, 2009) — Researchers at the Yerkes National Primate Research Center, Emory University, developed a test in nonhuman primates that is now using infrared eye tracking to detect mild cognitive impairment (MCI) in humans. The researchers hope the advanced technology will be helpful in predicting the onset of Alzheimer's disease.

The test, which is featured in the current online issue of *The American Journal of Alzheimer's Disease and Other Dementias*, is helping researchers further understand the role of the brain structures critical to human memory.

Individuals who have been diagnosed with MCI show memory loss but relatively preserved abilities in other cognitive areas. However, many individuals with MCI appear to be at a higher risk for developing other forms of dementia, including Alzheimer's disease. Accordingly, individuals with MCI play an important role in the development of research strategies that could lead to early diagnosis and possible prevention of such dementias.

To study the brain changes related to memory loss, Yerkes director and lead researcher Stuart Zola, PhD, developed an infrared eye-tracking test that involves showing individuals one image and then another after a several-second delay. The researchers then repeat the test several minutes later. In doing so, they found patients with MCI spent less time looking at the new picture than control subjects.

"Someone without any impairment spends most of the time focusing on the new image because the person quickly recognizes the previously shown image," says Zola. In contrast, individuals with MCI show less interest in the new image because, as time passes, they may not remember seeing the original image. This is similar to individuals with Alzheimer's disease, who will look at both images equally because they cannot remember seeing the first image," Zola continues.

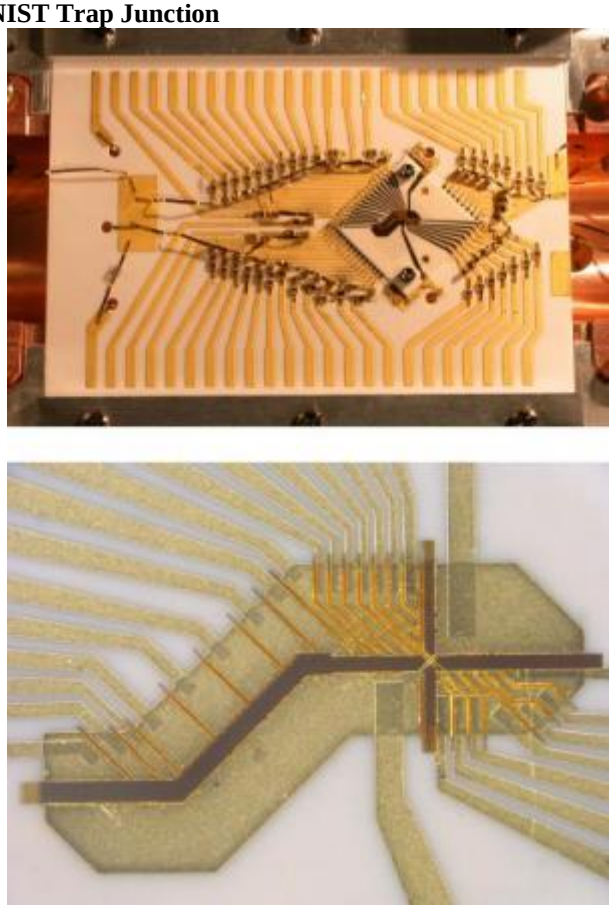
The results of the study indicate the possibility of detecting dementias much earlier than ever before. By doing so, intervention can begin sooner, which offers hope for more effective treatment and, thus, encouraging outcomes. The researchers plan to follow up the study by tracking and observing study participants to determine whether they develop any forms of dementia.

To listen to Zola's own words about his research involving diagnosing cognitive impairment, access Emory's new Sound Science podcast at http://whsc.emory.edu/soundscience/.

Adapted from materials provided by Emory University.

http://www.sciencedaily.com/releases/2009/04/090415102207.htm

X Marks The Spot: Ions Coldly Go Through NIST Trap Junction



The NIST X-trap is constructed from a sandwich of two diamond-shaped alumina wafers, visible in the right center of the top photo. The bottom photo shows a close-up of the wafers. Ions are created in the lower left portion of the dark grey channel, which is a trench cut through both wafers. By controlling voltages on the 46 electrodes, the ions can be shuttled along the channels and through the junction—between the two gold-coated bridges that form the X—while remaining much cooler than in previous experiments. (Credit: R.B. Blakestad/NIST)

ScienceDaily (Apr. 15, 2009) — Physicists at the National Institute of Standards and Technology (NIST) have demonstrated a new ion trap that enables ions to go through an intersection while keeping their cool. Ten million times cooler than in prior similar trips, in fact. The demonstration, is a step toward scaling up trap technology to build a large-scale quantum computer using ions (electrically charged atoms), a potentially powerful machine that could perform certain calculations—such as breaking today's best data encryption codes—much faster than today's computers.

NIST's new trap with a junction solves a key engineering issue for future possible ion-trap quantum computers: how to move ions in a particular quantum mechanical state back and forth between different locations for data storage or logic operations, without heating them up so much that they lose their fragile quantum properties, which are critical to information processing.

The new ion trap, a rectangle roughly 5 by 2 millimeters in outer dimensions, was constructed from laser-machined alumina, with a gold coating to form electrodes. It is more complex than previous NIST ion traps, with 46 electrodes supporting 18 ion trapping zones. Its unique feature is an X-shaped bridge connecting electrodes across a junction between zones. Junctions are required to allow ions to be grouped together efficiently for logic operations. As voltages are applied to different electrodes to move the ions, the electric fields restrain an ion as it moves between trapping zones. The fields created by the X-bridge are required for smooth transport through the junction and to keep ions from popping out at the junction.

NIST scientists transported single beryllium ions through the X-junction more than 1 million times while maintaining the properties critical to information processing with greater than 99.99 percent success. Pairs of ions were transported over 100,000 times. Ion transport through a junction has been reported once before, but the ions in the NIST trap received over 10 million times less heat than the earlier effort. The low heating, achieved through careful control and reductions in electrical noise, minimizes a major source of computation errors and processing slowdowns.

Over the past 15 years, NIST has demonstrated the basic building blocks for a computer based on ion traps, a promising design for a quantum computer. Now, the latest demonstration shows how information might be moved through a quantum processor rapidly and reliably enough for computing. It takes about 20 microseconds to move an ion across the junction and about 50 to 100 microseconds for transport between zones—times compatible with logic operations using ions. The trap design makes large-scale information processing possible while keeping the number of ions in each trap zone relatively small, such that individual ions can be manipulated without unwanted effects.

The work was funded in part by the Intelligence Advanced Research Projects Agency and Office of Naval Research.

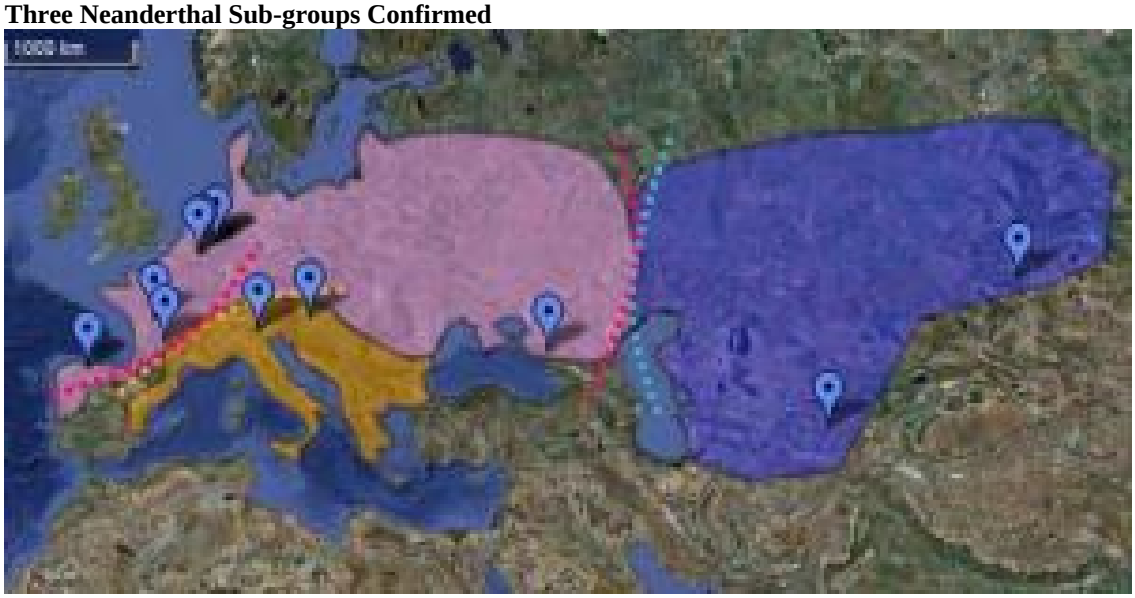
Journal reference:

1. R.B. Blakestad, C. Ospelkaus, A.P. VanDevender, J.M. Amini, J. Britton, D. Leibfried, and D.J. Wineland. **High fidelity transport of trapped-ion qubits through an X-junction trap array**. *Physical Review Letters*, (in press)

Adapted from materials provided by National Institute of Standards and Technology.

http://www.sciencedaily.com/releases/2009/04/090408140217.htm

Three Neanderthal Sub-groups Confirmed



Map representing Neanderthal geographical distribution in groups. (Credit: Fabre et al. PLoS One; DOI: 10.1371/journal.pone.0005151)

ScienceDaily (Apr. 15, 2009) — The Neanderthals inhabited a vast geographical area extending from Europe to western Asia and the Middle East 30,000 to 100,000 years ago. Now, a group of researchers are questioning whether or not the Neanderthals constituted a homogenous group or separate sub-groups (between which slight differences could be observed). Paleoanthropological studies based on morphological skeletal evidence have offered some support for the existence of three different sub-groups: one in Western Europe, one in southern Europe and another in the Levant.

Researchers Virginie Fabre, Silvana Condemi and Anna Degioanni from the CNRS Laboratory of Anthropology (UMR 6578) at the University of Marseille, France, have given further consideration to the question of diversity of Neanderthals by studying the genetic structure of the mitochondrial DNA (mtDNA) and by analyzing the genetic variability, modeling different scenarios. The study was possible thanks to the publication, since 1997, of 15 mitochondrial DNA (mtDNA) sequences (the mtDNa is maternally transmitted) that originated from 12 Neanderthals.The new study confirms the presence of three separate sub-groups and suggests the existence of a fourth group in western Asia. According to the authors, the size of the Neanderthal population was not constant over time and a certain amount of migration occurred among the sub-groups. The variability among the Neanderthal population is interpreted to be an indirect consequence of the particular climatic conditions on their territorial extension during the entire middle Pleistocene time period.Degioanni and colleagues obtained this result by using a new methodology derived from different biocomputational models based on data from genetics, demography and paleoanthropology. The adequacy of each model was measured by comparing the simulated results obtained using BayesianSSC software with those predicted based on nucleotide sequences.The researchers hope that one day this methodology might be applied to questions concerning Neanderthal cultural diversity (for example the lithic industry) and to the availability of natural resources in the territory. This could provide new insights into the history and extinction of the Neanderthals.

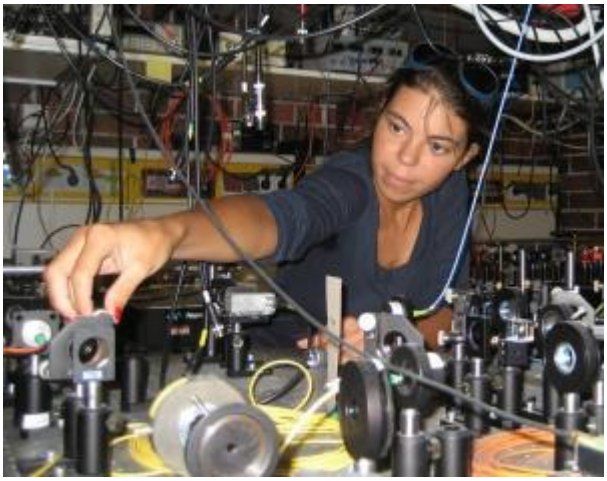
Journal reference:

1. Fabre et al. **Genetic Evidence of Geographical Groups among Neanderthals**. *PLoS ONE*, 2009; 4 (4): e5151 DOI: 10.1371/journal.pone.0005151

Adapted from materials provided by Public Library of Science, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com/releases/2009/04/090415075150.htm

From Three To Four: A Quantum Leap In Few-body Physics



Dott. Francesca Ferlaino. (Credit: Image courtesy of University of Innsbruck)

ScienceDaily (Apr. 15, 2009) — In 2007 and 2008 two groups of theoretical physicists (Hammer and Platter, and von Stecher, D'Incao, and Greene) predicted the existence of universal four-body states that are closely tied to Efimov trimer states.

Now, a team of scientists of the Institute for Experimental Physics of the University of Innsbruck, Austria, has proven these states experimentally in an ultracold gas of cesium atoms. At particular energy separations from an Efimov state, they found two four-body loss resonances, which are a strong evidence for the existence of a pair of four-body states closely tied to Efimov trimers. "Ultracold atomic clouds provide a very good system to study these few-body phenomena in experiments", Francesca Ferlaino says, „because we are able to accurately control the interaction conditions and, thus, the separation between the particles."Few-body problems are among the most difficult ones in physics and for centuries the cleverest minds have been engaged in looking for solutions to the problems that arise in this field. Today it takes comprehensive experiments and an enormous numerical computing effort to solve the problems. The scientific world has now made an important step towards finding simple laws for the complex relations between several interacting objects.

The starting point was the discovery of the Russian physicist Vitali Efimov at the beginning of the 1970s, who predicted the existence of an infinite series of universal three-body quantum states. One of the remarkable properties is the fact that three particles bind to form a weakly bound entity – a trimer - while a dimer of the same particles is not formed. In 2006, 35 years after Efimov presented his paradigm, scientists led by Rudolf Grimm succeeded in proving the phenomenon experimentally and the research on Efimov states has now become a field of research in its own right in the physics of ultracold atoms.

The Innsbruck scientists report on their findings in the journal Physical Review Letters. The project is supported by the Austrian Science Fund (FWF). The successful Italian physicist Francesca Ferlaino, who has worked as a junior scientist in Rudolf Grimm's group for three years, is supported by the Lise-Meitner program of the Austrian Science Fund. She has started to establish her own research group at the Institute for Experimental Physics of the University of Innsbruck.

Journal references:

1. Ferlaino et al. **Evidence for Universal Four-Body States Tied to an Efimov Trimer**. *Physical Review Letters*, 2009; 102 (14): 140401 DOI: 10.1103/PhysRevLett.102.140401
2. B. D. Esry. **Viewpoint: Ultracold experiments strike universal physics--again**. *Physics*, 2, 26 DOI: 10.1103/Physics.2.26

Adapted from materials provided by University of Innsbruck, via AlphaGalileo.

http://www.sciencedaily.com/releases/2009/04/090407075144.htm

'Pleasant Touch' Decoded: Signals From Stroking Skin Have Direct Route To Brain

A new study may explain why touching the skin can relieve pain. (Credit: iStockphoto/Valentin Casarsa)

ScienceDaily (Apr. 15, 2009) — Nerve signals that tell the brain that we are being slowly stroked on the skin have their own specialised nerve fibres in the skin. This is shown by a new study from the Sahlgrenska Academy in Sweden. The discovery may explain why touching the skin can relieve pain.

The specialised nerve fibres in the skin are called CT nerves (C-tactile) and they travel directly to the areas in the brain that are important in the emergence of feelings.

”Basically the signals that tell the brain that we are being stroked on the skin have their own direct route to the brain, and are not blocked even if the brain is receiving pain impulses from the same area. In fact it’s more the opposite, that the stroking impulses are able to deaden the pain impulses,” says Line Löken, postgraduate student in neurophysiology at the Sahlgrenska Academy.

The results are being published in the distinguished scientific journal, Nature Neuroscience. The research group examined a group of healthy subjects using a technique called microneurography.“By inserting a thin electrode into a nerve in the forearm we can listen in on the nerve and pick up signals from one of the thousands of nerve fibres that make up a nerve,” explains Associate Professor Håkan Olausson, who is leading the research group behind the discovery, together with Johan Wessberg.

Each individual nerve fibre is responsible for touch signals from roughly a square centimetre of skin. The research team used a specially-designed robot, which brushed over the exact area of skin for which a particular nerve fibre is responsible. The subjects were also asked to rate how pleasant or unpleasant they found the brushing.”As the nerve signals that were sent in the CT nerves became more frequent, the subjects reported the experience as being increasingly pleasant. Of the skin nerves that we studied, it was only the CT nerves that had this strong link between the frequency of the signals and how pleasant it felt,” says researcher Johan Wessberg.

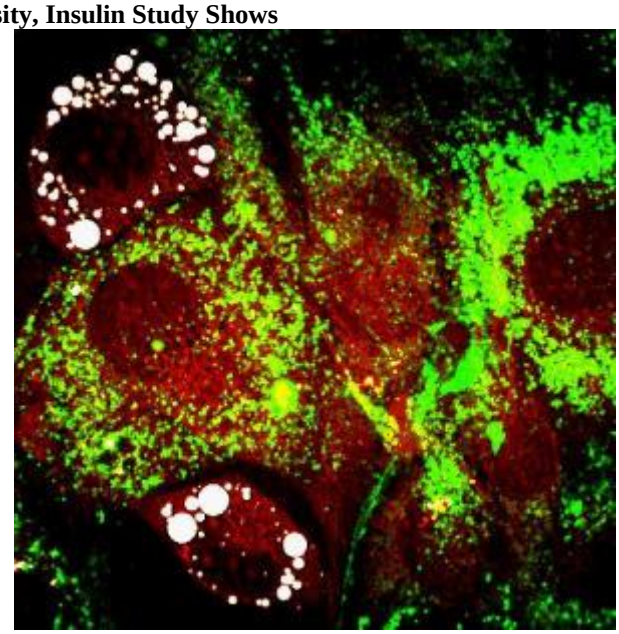
Journal reference:

1. Löken et al. **Coding of pleasant touch by unmyelinated afferents in humans**. *Nature Neuroscience*, 2009; DOI: 10.1038/nn.2312

Adapted from materials provided by University of Gothenburg.

http://www.sciencedaily.com/releases/2009/04/090414084453.htm

Factors Other Than Genes Could Cause Obesity, Insulin Study Shows



Purdue researchers have uncovered new evidence that factors other than genes could cause obesity, finding that genetically identical cells store widely differing amounts of fat depending on subtle variations in how cells process insulin. Here, insulin (green) is present in cells with no fat storage and absent in cells with fat storage at two days after insulin addition. This observation indicates faster insulin processing rates in cells with fat storage. Fluorophore-labeled insulin (green) is visualized with fluorescence imaging, and fat is visualized with coherent anti-Stokes Raman scattering - or CARS - imaging (red/white). (Credit: Weldon School of Biomedical Engineering, Purdue University)

ScienceDaily (Apr. 15, 2009) — Researchers have uncovered new evidence suggesting factors other than genes could cause obesity, finding that genetically identical cells store widely differing amounts of fat depending on subtle variations in how cells process insulin.

Learning the precise mechanism responsible for fat storage in cells could lead to methods for controlling obesity."Insights from our study also will be important for understanding the precise roles of insulin in obesity or Type II diabetes, and to the design of effective intervention strategies," said Ji-Xin Cheng, an assistant professor in Purdue University's Weldon School of Biomedical Engineering and Department of Chemistry.

Findings indicate that the faster a cell processes insulin, the more fat it stores.

Other researchers have suggested that certain "fat genes" might be associated with excessive fat storage in cells. However, the Purdue researchers confirmed that these fat genes were expressed, or activated, in all of the cells, yet those cells varied drastically - from nearly zero in some cases to pervasive in others - in how much fat they stored.

The researchers examined a biological process called adipogenesis, using cultures of a cell line called 3T3-L1, which is often used to study fat cells. In adipogenesis, these cells turn into fat.

"This work supports an emerging viewpoint that not all biological information in cells is encoded in the genetic blueprint," said Thuc T. Le, a National Institutes of Health postdoctoral fellow at Purdue who is working with Cheng. "We found that the variability in fat storage is dependent on how 3T3-L1 cells process insulin, a hormone secreted by the pancreas after meals to trigger the uptake of glucose from the blood into the liver, muscle or fat cells."

"This varied capability to store fat among genetically identical cells is a well-observed but poorly understood phenomenon," Cheng said

The researchers determined that these differences in fat storage depend not on fat-gene expression but on variations in a cascade of events within an "insulin-signaling pathway." The pathway enables cells to take up glucose from the blood.

"Only one small variation at the beginning of the cascade can lead to a drastic variation in fat storage at the end of the cascade," Cheng said.

The researchers conducted "single cell profiling" using a combination of imaging techniques to precisely compare fat storage in cloned cells having the same fat genes expressed.

Single cell profiling allows researchers to precisely compare the inner workings of individual cells, whereas the conventional analytical approach in biochemistry measures entire populations of cells and then provides data representing an average.

"In this case, we don't want an average. We need to find out what causes fat storage at the single-cell level so that we can compare one cell to another, " Le said. "By profiling multiple events in single cells, we found that variability in fat storage is due to varied rates of insulin processing among cells."

The cell culture used in the research contains cloned mice fibroblast cells.

"This particular type of cell culture has been used to study the molecular control of obesity for the past 35 years," Cheng said. "Researchers have observed tremendous variability in how much fat is stored in cells with identical genes, but no one really knows why. Our findings have shed some light on this phenomenon."

The researchers used a specialized imaging method called coherent anti-Stokes Raman scattering, or CARS, combined with other techniques, including flow cytometry and fluorescence microscopy.

"This multimodal imaging system allows us to correlate different events, like fat storage, gene expression and insulin signaling," Le said. "We can monitor these different events at the same time, and that's why we can determine the mechanism at the single-cell level."

Insulin attaches to binding sites on cell membranes, signaling the cells to take up glucose from the blood. Cells that are said to be resistant to insulin fail to take up glucose, the primary cause of Type II diabetes, a medical condition affecting nearly 24 million Americans. About two-thirds of U.S. adults are overweight, and nearly one-third obese.

The research, which has been funded by the National Institutes of Health, is ongoing. Future work may seek to pinpoint specific events in the insulin-signaling cascade that are responsible for fat storage.

Journal reference:

1. Le et al. **Single-Cell Profiling Reveals the Origin of Phenotypic Variability in Adipogenesis**. *PLoS ONE*, 2009; 4 (4): e5189 DOI: 10.1371/journal.pone.0005189

Adapted from materials provided by Purdue University.

http://www.sciencedaily.com/releases/2009/04/090414153525.htm

Brain's Cognitive System Processes Vowels And Consonants At Different Speeds

Our cognitive system processes vowels and consonants at a different speed. (Credit: SINC)

ScienceDaily (Apr. 15, 2009) — Through a study carried out at the Universities of La Laguna and Valencia, it has been verified that the brain distinguishes between vowels and consonants differently. Neuronal mechanisms change when they are processed and, when it comes to lexical access; both have a different status in our mind, thus contributing differently to this basic process of visual word recognition.

The group of researchers led by Manuel Carreiras wanted to research the neuronal bases of an activity involving daily cognition such as the processing of vowels and consonants.

Manuel Carreiras, who also acts as director of the new Basque Centre on Cognition Brain and Language (BCBL), observed that conclusions from previous studies already suggested that consonants and vowels contribute differently to lexical access, something that this study wants to examine in detail.

During the new research, the researchers submitted 31 students from La Laguna (23 women and 8 men, all native speakers of Spanish who had no neurological or psychiatric problems) to experimental situations that involved showing a word twice for only 50 milliseconds on its first appearance: the first relay of words were identical and followed the pattern "CHOCOLATE - CHOCOLATE"; during the second, two consonants were removed on the first appearance and followed the pattern "CHO O LATE - CHOCOLATE", and during the third, the same was done with two non-adjacent vowels, as in "CHO L TE - CHOCOLATE".

"We chose 120 words of between seven and eleven letters that, on average, appeared 26 times per million in the Lexesp Spanish database", Carreiras explains to SINC. The participants were placed in a dark, soundproof cubicle to see the stimuli on a monitor. There they were asked to press one of two buttons, "yes" or "no" to answer the following question: "Is this a legitimate Spanish word or not?"

The scientists assessed the error percentages and response times. Data were also recorded with an electroencephalogram, as well as eye movements and blinking.

The results of this approach show that omitting two letters within each word for 50 milliseconds also slowed down identification of the word, but even more important is the fact that this delay was greater when consonants were hidden rather than vowels.

For Carreiras and his team, there is "an alternative vision regarding the differences observed between consonants and vowels", which is related to frequency. "Vowels tend to be more frequent than consonants". In most languages there are more consonants, but vowels are more frequent, which opens the door to the debate of whether consonant-vowel status is more important than the frequency of the letter in question.

Computerized Spanish lexicon (Lexesp)

Lexesp-corco is a database of Spanish words made up of two parts. In the first, a collection of sloganized words is used as the database, which allows for searches to be made of appearances and co-appearances of words, slogans, and categories of words, within a given context. In the second, lists of previously indexed words are used for the creation of studies that make it possible to search for word characteristics.

Journal reference:

1. Carreiras et al. **Are Vowels and Consonants Processed Differently? Event-related Potential Evidence with a Delayed Letter Paradigm**. *Journal of Cognitive Neuroscience*, 2009; 21 (2): 275 DOI: 10.1162/jocn.2008.21023

Adapted from materials provided by Plataforma SINC, via AlphaGalileo.

http://www.sciencedaily.com/releases/2009/04/090414084623.htm

Two New Hereditary Corneal Disorders Discovered

ScienceDaily (Apr. 15, 2009) — Two new disorders affecting the cornea have been discovered by researchers at Linköping University. The hereditary disorders were discovered in two Swedish families.

The story begins with a mother and daughter arriving at the eye clinic at the University Hospital in Linköping. They both suffer from recurrent wounds on the cornea, causing pain, watery eyes, sensitivity to light and decreased vision. At the clinic they are seen by Professor Per Fagerholm and Specialist Consultant Björn Hammar.

"They had been referred from a hospital in the county of Småland and their complaint did not match any previously diagnosed disorders. It transpired that many in their extended family suffered from the same problem", says Björn Hammar, who now publishes the research results in his doctoral thesis at LiU.

He created a family tree, going back six generations with 171 individuals born 1854 and later. Of these 44 had suffered from the disorder and nine had undergone corneal grafting. Most had developed symptoms before the age of one. It soon became apparent this was a disorder with autosomal dominant inheritance, meaning you only need to get the abnormal gene from one parent in order for you to inherit the disorder.

Close clinical studies and genetic analyses showed this disorder was clearly demarcated from other disorders with similar symptoms. The disorder was named after the area of Sweden where this family had lived for generations, Dystrophia Smolandiensis.

The research led to data about a similar phenomenon in a different Swedish county, Hälsingland, being revisited and closer examined. This family tree included seven generations and 342 people, of which 84 had symptoms similar to that of the family from Småland, but the overall picture of the disorder deviated enough for a separate diagnosis. The onset in Dystrophia Helsinglandica was usually later, at the ages of 4-7, and the symptoms were worse but less frequent.

"Clinically we can determine that this is two similar but separate disorders. The next stage is to find the mutations in these families and then continue our research with ten further families we know of. This is likely to just be the tip of the iceberg" says Björn Hammar.

Further information.

Adapted from materials provided by Linkoeping Universitet, via AlphaGalileo.

http://www.sciencedaily.com/releases/2009/04/090407105601.htm

Mobile technology battles HIV

By Victoria Gill
Science reporter, BBC News

"When I arrived here, I saw people with HIV being carried all day to get to the clinic," Paul Williams recalls.

"There were no testing services, no education, no treatment and certainly no monitoring of treatment. People just died."

That was the situation in Bwindi, Uganda, three years ago. Dr Williams, formerly a GP in North-East England, has since transformed a tiny and very basic health centre on the edge of the Impenetrable Forest into an efficient community hospital.

And for the past five months, thanks to a small but important piece of equipment, Dr Williams' medical team has been able to monitor the health of patients with HIV from a clinic that fits into the back of their four-wheel-drive "community ambulance".

Bwindi Community Hospital now provides health care for about 40,000 people.

It has a dedicated maternity programme and a children's ward that deals with many cases of malnutrition, as well as other common diseases including malaria and HIV. In total, the hospital takes care of 1,000 HIV positive patients.

Dr Williams describes the environment in which he works: "We're a mile away from the rainforest where there are mountain gorillas, right on the border between Uganda and the Democratic Republic of Congo.

"There aren't any tarmac roads here, there isn't any public transport, and lots of the patients live a day's walk from the hospital. Many of them live a subsistence existence and they can't afford to get here."

So his team packs an "HIV outreach clinic" into its vehicle, and takes it out to remote communities.

Along with the rest of the equipment loaded into the back and strapped on to the roof of the ambulance, there is one modest-looking grey box.

This piece of equipment is a PointCare NOW machine. It was donated to the hospital last year, and has since transformed the care Dr Williams can offer HIV patients.

The machine is a portable blood-testing device - pop in a blood sample and, within 10 minutes, it gives a print-out detailing the condition of a patient's immune system.

It counts CD4 positive T cells. These are the white blood cells that the HIV virus latches on to - attacking and destroying them.

"When we say someone has a weak immune system because of HIV, we mean their number of CD4 cells is low," explains Dr Williams.

"During the course of infection, the number of these cells gets less and less - so you have to count them to see how advanced the HIV is."

The quest

The machine was developed by PointCare, a company based in the US that specialises in diagnostic equipment for the developing world.

It's an organisation with an impressive pedigree. Petra Krauledat, and her long-time business partner Peter Hansen, founded the company in 2003, having both already had long and successful careers in HIV research.

" **What people needed was a test that could be used in a little shack of a clinic, transported to remote areas, and that could withstand the heat** "
Petra Krauledat PointCare

"Peter invented the first automated CD4 test in the late 1970s, and I led the group in 1982, in Germany, that launched the first HIV screening test in Europe," explains Dr Krauledat.

In the 1990s they were approached by former colleagues who asked them to turn their attention to developing a much-needed, cheap CD4 test for the developing world.

"So we went to Southern Africa to talk to the [medics] actually working there," she says.

What they found surprised them both. "People showed us tonnes of donated instruments just sat in storage. The reagents [or chemicals needed to run the tests] had simply perished in the heat," she relates.

"So 'cheap' wasn't people's biggest concern. What they needed was a test that could be used in a little shack of a clinic, transported to remote areas, and that could withstand the high temperatures.

"We've fulfilled that quest."

Surviving the heat

Dr Hansen invented a test that uses chemical reagent that can be freeze-dried and stored in temperatures of over 40C.

CD4 screening tests use antibodies - molecular tags that recognise and latch onto a chemical marker on the surface of the cell. By attaching to the cells, they act as flags distinguishing CD4 cells from other white blood cells.

But these antibodies need to be "labelled", so they can be detected by a machine.

Traditionally, antibodies are labelled using fluorescent markers, but these fluorescent chemicals perish if they are not kept refrigerated. So they're useless for a medical team operating from a temporary clinic in the heat of an African summer.

Dr Hansen developed a new label. "We use colloidal gold," explains Dr Krauledat. "It's true nanotechnology - extremely tiny gold particles attached to the anti-CD4 antibody."

The gold-bound antibodies are very heat-stable - they can be stored at over 42C for an entire year.

Immediate result

Inside the PointCare machine, the freeze-dried, gold-labelled antibody is liquefied and combined with the blood sample, and with a chemical accelerator that speeds up the attachment of the antibody to the cells. "How the accelerator works is a trade secret, but it allows us to complete the test within eight minutes," says Dr Krauledat.

"Before we had this machine, we'd see somebody in the clinic, then we'd have to see them on another day to collect a blood sample," recalls Dr Williams.

"We had a system of motorcycle riders that went round all of our outreach sites on a particular day to collect samples. They would have to ride for four hours along a muddy road through the Impenetrable Forest, to a laboratory on the other side, where we could get them tested.

"It took us three days to get the result, and we couldn't get it back to the patient until we saw them again two weeks later.

"Now, with this simple piece of technology, we can deal with problems immediately."

The machine is also far cheaper to run than traditional instruments. It is powered via a battery pack. "Because we use colloidal gold, we have an instrument that doesn't consume a lot of power," explains Dr Krauledat.

"Fluorescently labelled antibodies have to be detected with a laser, and those systems are quite fragile and consume more power. We use a [light-emitting diode] detector. It's technology with a lifetime of 180,000 days, doesn't break and it uses almost no power."

'**Productive lives**'

As well as a CD4 count, the device also counts five other subtypes of white blood cell.

This gives a complete picture of the patient's immune system.

The results provide a physician with a good indication of whether an HIV positive patient might have tuberculosis, give a warning sign of other opportunistic infections, and find out if the patient has anaemia - a debilitating condition that is fairly common in the latter stages of HIV.

“ **We've been able to change HIV from being a death sentence to being something that people can live with and lead productive lives** ”
Paul Williams Bwindi Community Hospital

It also means that a patient's treatment can be monitored. "HIV treatment is great - anti-retroviral drugs can add up to 30 years to a person's life," says Dr Williams.

"But there are some people who develop resistance to the drugs, or in whom the drugs fail, and we can spot that early on to take action to be able to stop them from getting sick."

In three years, Dr Williams and his team have transformed the lives of their HIV positive patients.

"I started a testing centre in the hospital, then the mobile testing services, and then, once we had access to drugs, developed a treatment programme.

"Now our death rates from HIV are very low. We're able to diagnose it early, manage it early and keep people living with HIV fit and well.

"Over a reasonably short period of time, we've been able to change HIV from being a death sentence into something that people can live with and lead productive lives."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/science/nature/7989856.stm

Published: 2009/04/12 18:00:54 GMT

Classroom powers 'not being used'

Head teachers and governors should do more to support teachers dealing with bad behaviour, according to a report on discipline in English schools.

The study by the government's behaviour expert Sir Alan Steer says school leaders do not make enough use of powers to deal with problem pupils.

It calls for teachers and schools to be made more aware of these powers.

Sir Alan Steer also says children who disrupt classes should be isolated so they do not disturb classmates.

He recommends using "withdrawal rooms" as a temporary measure to stop class disruption. Withdrawal rooms are usually used for support or short-term classes.

'Reasonable force'

In his report, Sir Alan calls on ministers to work with unions and school leaders to explain the rules to teachers and to give them the confidence to enforce them. He said: "School provision out of the classroom should be used as part of a planned early intervention strategy and, if possible, before incidents of serious misbehaviour occur.

"These strategies could include a withdrawal room on the school site when pupils need to be removed from class immediately or for internal exclusion." BBC education correspondent Kim Catcheside said the government had legislated to give teachers an explicit legal right to discipline pupils - but it was up to each school to decide how that should be implemented.

A new government pamphlet on children's behaviour spells out the methods teachers are able to use to maintain discipline.

It says teachers have the right to use reasonable force to control or restrain unruly pupils. " **It is unacceptable for a pupil to disrupt the learning and teaching of an entire class** "
Schools Secretary Ed Balls

And it says that school management teams must take reasonable measures to protect their staff.

The pamphlet says: "There are a range of laws to protect you against harassment, malicious communications and defamation. "For example if pupils misuse the internet or other camera phones to ridicule or attack you."

Schools secretary Ed Balls said he was working with the teaching union the NASUWT to launch a new leaflet to give teachers in England the information they need. Mr Balls will respond to Sir Alan's final recommendations at the union's annual conference in Bournemouth later this week.

He said: "I agree with Sir Alan Steer that it is unacceptable for a pupil to disrupt the learning and teaching of an entire class. Pupils need to know that when certain boundaries are crossed they will have to bear the consequences."

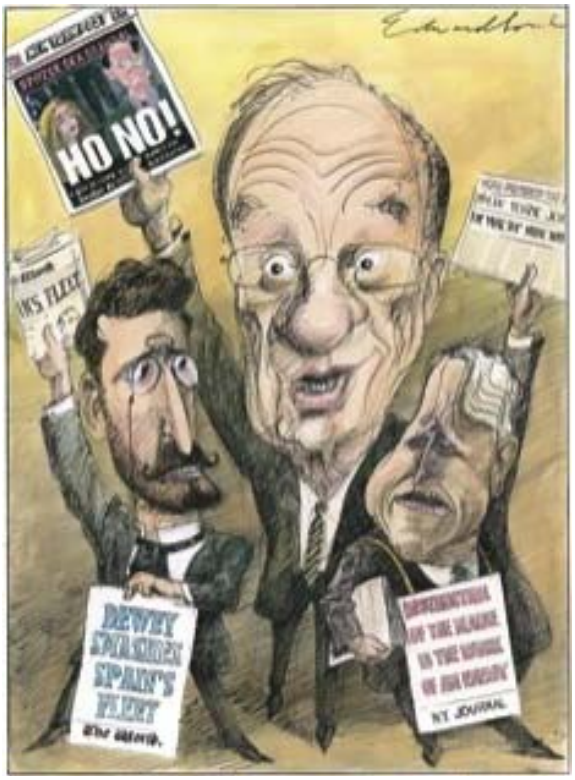
Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/uk_news/education/7996146.stm

Published: 2009/04/13 08:46:38 GMT

PAPER TIGERS

What media moguls make.

by Nicholas Lemann April 13, 2009



Murdoch is closer to old-school press barons such as Pulitzer and, especially, Hearst than he is to their more mannerly successors.

Keywords

Newspapers;
"The Uncrowned King: The Sensational Rise of William Randolph Hearst" (Counterpoint; $30);
Kenneth Whyte;
"Restless Genius: Barney Kilgore, *The Wall Street Journal*, and the Invention of Modern Journalism" (St. Martin's; $25.95);
Richard J. Tofel;
"The Man Who Owns the News: Inside the Secret World of Rupert Murdoch" (Broadway; $29.95);
Michael Wolff

The *Wall Street Journal* began as a late-nineteenth-century version of a Bloomberg terminal—a high-priced, custom-produced collection of timely data on the financial markets which was distributed to people who planned to trade on the information. Starting in 1882, Dow Jones & Co. published a financial newsletter that messenger boys would deliver to its customers on Wall Street. Not long after, the company came out with the *Customer's Afternoon News Letter*, an end-of-day summary, and in 1889 this publication changed its name to the *Wall Street Journal.* Seven years later, Adolph Ochs, the young owner of the Chattanooga *Times*, bought the listless New York *Times* for seventy-five thousand dollars, and the rise of the two great élite American newspapers had begun.

Back then, nobody would have picked the *Times* and the *Wall Street Journal* as the country's most important newspapers. That distinction belonged to two papers that have long since disappeared: Joseph Pulitzer's New York *World* and William Randolph Hearst's New York *Journal*. The papers, and their owners, were flamboyantly rich, Democratic, populist, and popular. Although they sometimes purveyed

information and analysis, in the manner of the *Times* and the *Wall Street Journal*, their business was mainly telling stories—turning the life of the world's rising metropolitan, industrial superpower into captivating adventure and drama.

Because Pulitzer and Hearst were so irresistibly colorful, they have long been catnip for biographers. Kenneth Whyte, the editor and publisher of the Canadian news magazine *Maclean's*, has just produced a new partial, though lengthy, biography called "The Uncrowned King: The Sensational Rise of William Randolph Hearst" (Counterpoint; $30), which he evidently wrote more as a result of having fallen in love with his subject than of having come across new material to reveal. Occasionally, Whyte takes a swat at previous biographers for having got something wrong, or rises to proclaim Hearst's superiority to Pulitzer, especially as a person whom it was pleasant to work for. Mainly, though, he focusses on retelling the story of the brief period from 1895, when Hearst bought the *Journal*, to 1898, when its famous coverage of the Spanish-American War drew to a close—only because the war did, too.

Pulitzer, a cultivated but penniless Hungarian immigrant, bought the *World* in 1883, after having launched his career in St. Louis, first as a protégé of Carl Schurz, the German-American reformer, then as a state legislator, and, finally, as the owner of the *Post-Dispatch*. Although he established himself as a gentleman scholar, an art connoisseur, and a high liver, Pulitzer had an almost magical connection with the common man. He rose in journalism in the days when it was a branch of politics (as did Hearst, whose father was a U.S. senator, and who served two terms in Congress himself, while longing for the Presidency), but he figured out how to get the market, rather than the political parties, to support a newspaper.

Pulitzer's fortune was built on single-copy sales, at a penny a paper, on the streets of New York. His estimation of the reading appetites of immigrants was far higher than that of many of his reformist friends, and his readers proved him right. He served up a blend of investigative reporting, instruction about city life, comics (including "The Yellow Kid," the source of the derisive label "yellow journalism"), cheerleading for the Democratic Party, adventure, and true-life soap opera about tycoons and trusts, cops and crooks, Madonnas and whores. In Pulitzer's words, the *World* would become "a journal that is not only cheap but bright, not only bright but large, not only large but truly democratic." (In 2005, the novelist Nicholson Baker and his wife, Margaret Brentano, published a book called "The World on Sunday," which, simply by reproducing a few dozen color spreads from the Sunday edition of the *World*, conveyed the Pulitzer formula beautifully.)

Hearst, a decade and a half younger than Pulitzer, first encountered the *World* when he was a student at Harvard. After dropping out, he went home to San Francisco and took over the management of the *Examiner*, a minor holding of his father's, successfully using the Pulitzer editorial formula. By the time Hearst bought the *Journal*, Pulitzer was ailing, and Hearst was prepared to go him one better (or, depending on one's perspective, worse). To promote the *Journal*, Hearst printed posters and sent brass bands through the streets of New York. He hired away many of Pulitzer's brightest stars, such as Morrill Goddard, whose scoops had included dressing as an undertaker and sneaking into Julia Dent Grant's carriage as she rode in the funeral procession of her husband, President Grant, and persuading a sixteen-year-old "artist's model" to reveal that she was hired to burst naked out of a papier-mâché pie at a dinner party for a group of prominent men. Other bylines that appeared in the *Journal* are Winston Churchill, Benito Mussolini, Jacob Riis, Stephen Crane, Richard Harding Davis, Julian Hawthorne (son of Nathaniel), and Frederick Remington, the artist who claimed (without proof, alas) to have received a telegram from Hearst that said, regarding Cuba, "You furnish the pictures, and I'll furnish the war."

As a Westerner and the son of a self-made silver baron, Hearst understood better than Pulitzer the appeal of William Jennings Bryan and his attacks on the gold standard. He and two of his star journalists, the correspondent Alfred Lewis and the cartoonist Homer Davenport, also saw that Bryan's opponent in the 1896 Presidential election, William McKinley, was too stolid to play the villain in the pages of the *Journal*—but that Mark Hanna, his campaign mastermind and the Karl Rove of the day, would make an ideal substitute. The 1896 campaign became, in the *Journal*, a titanic, circulation-building battle of rural virtue against capitalist rapacity.

After the campaign, Hearst found his next monster story in Spain's brutal suppression of the uprising by liberation forces in Cuba. Nothing that appeared in the American press in 2002 and 2003 about the misdeeds and dangers of Saddam Hussein is in the same league of journalistic excess as Hearst's treatment of Spain between 1896 and 1898. Hearst was especially adept at finding melodramatic hooks that could help whip up martial sentiment (and *Journal* sales). One was the imprisonment, by the Spaniards, of seventeen-year-old Evangelina Cossio y Cisneros, who was said to be the niece of the

President of the Cuban revolutionary government, which the *Journal* played as a classic story of a beautiful virgin princess menaced by swarthy brutes. When she was freed, Hearst's headline was "EVANGELINA CISNEROS RESCUED BY THE JOURNAL." Another hook was the sinking of the battleship U.S.S. Maine in the Havana harbor in February, 1898. Whether the Spaniards deliberately sank the Maine, whose presence in Havana was itself partly testament to the influence of the *Journal*, is still the subject of historical dispute, but the *Journal's* coverage was untroubled by doubt. On the third day after the incident, its headline was "THE WHOLE COUNTRY THRILLS WITH THE WAR FEVER." (Whyte insists, not very persuasively, that this only appears "blatantly jingoistic when torn from context.") In May, after Congress had declared war, Hearst ran the slogan "How do you like the *Journal's* war?" on either side of the paper's nameplate.

Whyte ends his account with Hearst only in his mid-thirties (and more than half a century before his death), so he doesn't describe how Hearst acquired a series of newspapers and magazines and built them into a big media company that is still prominent today, decades after the demise of the New York *Journal*. (In 2006, the company completed a grand headquarters skyscraper, a project planned in the nineteen-twenties and halted during the Great Depression; Joseph Pulitzer's heirs sold their family's media business in 2005.) During Hearst's lifetime, his properties continued to make most of their money from sales on the street or on newsstands. But, as the twentieth century wore on, new media—national magazines, then radio, then television—took on the entertainment function that big-city newspapers had performed in Hearst's heyday, and newspapers shifted their economic base from street sales to subscriptions and advertising.

Say what you like about the sacred separation of a newspaper's editorial and business sides: the way a publication makes its money inevitably affects its tone and content. When political parties were primary supporters of newspapers, in the nineteenth century, the newspaper barons were editor-politicians, like Horace Greeley. The twentieth century eventually brought us a more respectable and authoritative kind of newspaper journalism that went down more smoothly with advertisers and subscribers than the raffish journalism that generated street sales. Along with this change, most of the people who ran newspapers became less like impresarios and more like burghers. One of these was Adolph Ochs; another, fifty years younger, was Barney Kilgore, who built the *Wall Street Journal* into the first national mass-circulation daily newspaper.

Kilgore, the son of a small-town schools superintendent turned insurance agent, grew up and went to college in Indiana, was promptly hired by the *Wall Street Journal* (in 1929, just a few weeks before the stock-market crash), and never worked anywhere else. Richard J. Tofel's new biography, "Restless Genius: Barney Kilgore, *The Wall Street Journal*, and the Invention of Modern Journalism" (St. Martin's; $25.95), makes it clear that the *Journal*, despite its name, is culturally a Midwestern institution, much of whose high command, during the years of its rise, had, like Kilgore, graduated from DePauw University, in Greencastle, Indiana.

Kilgore's children made available to Tofel a trove of letters that Kilgore wrote to his parents, the first in 1913, when Kilgore was five; the last in 1954, five years before his father died, at eighty-four. Never was there a more devoted son, a more attentive father and mother, or a more uncomplicated parent-child relationship. Kilgore matter-of-factly reported home on just about every grade in every class in college, every story for the *Journal*, every step up the ranks of management; and his father (his mother died in 1941) gave gruff encouragement, sometimes leavened with a plainspoken notation of how there might be room for improvement in his performance. For several periods during the Depression, Kilgore sent his parents a little money every week to help them get by, which they accepted gratefully, and without embarrassment, but returned if they didn't need it. We are inside a competent, unflashy, steady-on-the-tiller world here.

Tofel, who worked at the *Wall Street Journal* for many years, writes in clean, precise newspaperman's prose. Every time he mentions a sum of money, such as Kilgore's salary in 1936, he tells us what it would be in today's dollars. Every once in a while, he lets loose a string of superlatives meant to make the case for Kilgore's historical importance—Kilgore helped invent anecdotal leads, and journalism that explains technical topics to lay audiences, and the publication of strings of small news items that run down a column on a page—but these usually seem like reaching, in a salesman's voice that doesn't come naturally to Tofel.

Kilgore and his colleagues did figure out how to publish a home- and office-delivered daily newspaper nationally, something that was far more difficult to accomplish in the nineteen-forties and fifties than people who have grown up with the Internet can imagine. The *Journal's* circulation, which

was thirty-two thousand when Kilgore became its managing editor, in 1941, rose to just above a hundred and fifty thousand in 1950, eight hundred and twenty-five thousand in 1962, and almost a million when Kilgore died, of cancer, at the age of fifty-nine, in 1967. When Kilgore started out at the *Journal*, reporters sometimes sold advertising, and Kilgore's own early work as a reporter entailed experimentation with forms carried over from the nineteenth century, such as articles written as letters to an imaginary friend. By the time the *Journal* had come to full maturity, it had helped establish the journalistic norms of reportorial nonpartisanship and of independence from advertiser pressure. As Tofel observes, it was less a standard newspaper than a news-and-business magazine published daily on newsprint, closer to *Fortune* and *Business Week* than to either Hearst's New York *Journal* or the *Times*, both of which were edited on the assumption that they would be their readers' sole source of news.

Still, Kilgore did much more than develop the manners and mores of modern élite journalism. The newspaper he built was full of idiosyncrasies and peculiarities, like the use of line drawings on the front page instead of photographs, the heavy use of peppy news briefs in lieu of stories, the not very funny daily cartoon cornily titled "Pepper . . . and Salt," the right-wing editorial page, and the goofy human-interest story in the middle of every day's front page. No less than Hearst's *Journal* and Pulitzer's *World*, the *Wall Street Journal* bore the stamp of Kilgore's personality, which turned out to be one that appealed to a large audience of phlegmatic businessmen like him.

When Rupert Murdoch bought the *Wall Street Journal*, in 2007, it was as if somebody had hit the rewind button on the history of journalism. The paper still bore Kilgore's stamp—Peter Kann, who was the C.E.O. of Dow Jones until 2006, started out in journalism as a copy boy at the Princeton *Packet*, which Kilgore owned—but Murdoch represents a throwback to the pre-burgher age in newspapers. He is much closer to Hearst than to Kilgore; in fact, the similarities are striking. Murdoch, like Hearst, was the son of a prominent father who died when he was young, grew up in the distant frontier reaches of a great power, was raised to think of himself as an aristocrat and was educated at the finest schools of the establishment, took over a provincial newspaper that his father had acquired (in Murdoch's case, the Adelaide *News*), and conquered the world through a golden touch for mass-circulation journalistic populism. What Hearst created in the *Journal,* Murdoch created in the *Sun*, the popular down-market British tabloid that he acquired in 1969, best known for its bare-breasted "Page 3 girl" and its gossip about the Royal Family. Like Hearst, Murdoch flouts the rules decreeing strict separation of journalism and politics and of news and entertainment, is hated by the respectable classes, lives lavishly, and sits atop a great pile of media holdings—much greater, thanks to globalization and the advent of new technologies, than Hearst's ever was.

"Inside Rupert's Brain," by Paul R. La Monica (Portfolio; $24.95), is a short book that does not suggest extensive authorial labor. Aside from a few quotes from stock-market analysts and journalism-school professors, there is no evidence of original research, and certainly not of access to Murdoch or anybody who knows him. It is useful mainly as a précis of Murdoch's long and frenetic career, which involves machinations in Australia, Italy, Britain, the United States, China, and outer space (if you count his satellite businesses), and the endless buying and selling of newspapers, magazines, book publishers, television stations, cable systems, Web sites, and sports franchises. Most of Hearst's biographers (though not Kenneth Whyte) have portrayed him as a man who often did business in economically irrational ways; "I didn't care about making money," he supposedly once said. Murdoch can seem to be like that—he has stuck with the *Times* of London, the New York *Post*, and the conservative magazine *The Weekly Standard* through years of unprofitability—but he can also be unsentimental in unloading properties that disappoint him, like *TV Guide, New York,* the *National Star,* the *Village Voice*, and the Los Angeles Dodgers. Congenitally incautious, he lives in a free-floating jurisdiction all his own, borrowing, buying, selling, influencing, negotiating, and manipulating according to no easily discernible plan.

Murdoch usually avoids the press, unless he's buying one, but over the years he has made a few characteristically unpredictable choices about which reporters to talk to. In the early nineteen-nineties, he gave access to the crusading British journalist William Shawcross, which resulted in an admiring biography; now Michael Wolff, the dyspeptic media columnist for *Vanity Fair*, has written a Murdoch book called "The Man Who Owns the News: Inside the Secret World of Rupert Murdoch" (Broadway; $29.95). Wolff talked not only to Murdoch and to Murdoch's chief lieutenants at NewsCorp but also, on Murdoch's insistence, to his four adult children (most of whom have a complicated relationship with him), his wife, and his mother, who has just turned a hundred.

It's possible to guess at Murdoch's calculation here—though, as usual, he was taking a gamble. Unlike most journalists, Wolff finds media deal-making completely fascinating. He's clever and

attention-commanding, partly because you know there's another nasty poke at somebody waiting around every turn in the story, and he can make asset acquisition, the stuff of Murdoch's career, come to life by endowing it with emotional significance. Wolff also identifies with Murdoch's sense of being an anti-establishment maverick. (Not long ago, he described me in his *Vanity Fair* column as "as stuffy a grandee as you're likely to find in this disintermediated age, a mandarin in his self-conceit, gray and indistinct in his affect.") He's on the side of the colorful guys, the outsiders and the risk-takers. He'd be the last one to get all huffy about Murdoch's departures from the norms and standards of the journalistic high priesthood.

So how did the arrangement work out for Murdoch? Not all that well. Wolff never subjects Murdoch to moralizing, and seems to admire his success, but he has learned a great deal and he uses that knowledge mercilessly. Wolff has a permanent case of what Dorothy Parker used to call "the frankies." He can't resist using the telling, belittling detail whenever he encounters it, which in this case is often. (There's a funny list of all the names that Murdoch's wife, Wendi, dropped during Wolff's interview with her.) The details accrete. To anyone who has been socialized to admire the bourgeois values, Murdoch seems repellent in his need to control and dominate every relationship and every situation, to find and exploit everybody's weakness. He is surrounded by yes-men. Two of his children have quit or been driven out of executive jobs at NewsCorp. Murdoch is at roughly the stage of his career that Hearst was when Orson Welles made "Citizen Kane"; historically speaking, not enough time has elapsed for him to come across as a colorful figure from the rough-hewn past, as Hearst does now.

"The Man Who Owns the News" is mainly the story of Murdoch's successful pursuit of Dow Jones, interwoven with a brisk recap of his life up to that point. Before Murdoch bought Dow Jones, the company was owned by the Bancroft family, comprising dozens of heirs, none of whom were working at the *Wall Street Journal.* It was not remotely for sale, but Murdoch picked the lock of the family's hold on the company, in one big way—publicly offering a price that was far higher than what Dow Jones stock was trading for—and many small ones. Murdoch, Wolff tells us, first had a fund manager named Andy Steginsky quietly approach sale-friendly family members and use the information he got from them to compile a detailed chart that explained the complicated factions and alliances within the family. Then, in one of the most chilling set pieces in the book, Murdoch expertly played Dow Jones's new chief executive, Richard Zannino, getting him to open up a back channel of communication without telling the company's board. (Soon after the sale, Murdoch tossed Zannino over the gunwales.) In the final stages, family members who favored the sale were transmitting to Murdoch's agent Steginsky, via concealed cell phone, the proceedings of a crucial private meeting. In the end, the family was so eager to sell that it failed to figure out that Murdoch was willing to increase his price.

It was a deal-making triumph—and a financial disaster. Murdoch overpaid, taking on debt to do so, just at the moment that both the newspaper business and the financial sector upon which the *Journal* depends for advertising were about to plummet. NewsCorp stock traded at twenty-one dollars a share on the day the *Journal* sale closed, and is under eight dollars today. That's thirty billion dollars of lost value. In February, Murdoch announced an $8.4-billion write-down, a good chunk of which is attributable to the *Journal*, and in the last quarter of 2008 his company lost $6.4 billion. But then, in Wolff's portrayal, Murdoch is a man in love with a probably bygone style of newspapering, and also with power but not with money. Since coming to America, in the nineteen-seventies, he has never really made a newspaper work economically; his billions have come from television and movies. His masterstroke as a businessman was assembling the Fox television network and then making it home to low-budget hits like "American Idol." But, according to Wolff, this part of his empire bores Murdoch: his true obsession is not the *Journal* but the New York *Times*, which he would like either to drive out of business or to buy, no matter what the cost.

Murdoch turned seventy-eight last month. The heir to NewsCorp appears to be his second son, James, whom Wolff presents as stylish and glib. Wendi Murdoch, his third wife and the mother of his two youngest children, comes across as a trendy, globalist liberal under whose influence Murdoch has come to regard Fox News and some of his other right-wing associations as embarrassing. It's easy to imagine NewsCorp suffering the same fate that he visited upon the Bancrofts' Dow Jones—a sale brought on by weak economic performance and family disharmony.

So far, Murdoch has followed the *Times* of London script with the *Journal* (and has brought someone over from the *Times*, Robert Thomson, to run it). Murdoch obviously means to transform it from a second read to a first read. Therefore many of the quirks are gone—there are big color photographs on the front page now, and headlines that aren't confined to a single column, and stories that are about the same

subjects as the stories on other newspapers' front pages—but he certainly has not turned the *Journal* into a national edition of the New York *Post*. It's still a great paper, but in a more conventional way.
Media moguls—journalism moguls, anyway—need two sets of skills. They have to be able to select and package material from the world in a way that gives it order and narrative drive and swagger. They also have to forge, through creativity, cunning, and force, a set of arrangements with customers, competitors, governments, advertisers, production facilities, and distribution networks which can generate a lot of money. Even in an era of focus groups and marketing research, any news publication that attracts an audience has to have a personality, which means that it has to bear the stamp of a real person. (That person doesn't have to be glamorous or trendy; he or she just has to have an industrial-strength sensibility—think of DeWitt Wallace, of *Reader's Digest*, or Michael Bloomberg.) Often, the personality remains, preserved by successors, long after the original mogul is gone.

These days, there is an unspoken longing, at least among journalists, for media moguls. Even Murdoch is accorded a sneaking gratitude for his willingness to make heavy investments in the newspaper business, at a time when everybody else seems to be disinvesting. Who cares if he's not being rational? We now may see the history of journalism rewinding even farther, back to the time before the burghers and before the impresarios, when there wasn't much of a market for news and there was a seamless connection between journalism and politics. Substantial realms of journalism, especially in newer media like the blogosphere and cable television, are already hard to distinguish from political activity. As government gets bigger and more consequential, the worry is not that there will be no one to purvey the news but that the news will no longer remain an independent and countervailing power.

Of course, politicians and press barons have a lot in common: they both build a constituency by representing reality in a particular way, and they are both perpetually trying to gain advantage. Most media moguls, as they have built up their empires, have tried to exercise political power. Sometimes, they've wanted political influence in order to help themselves economically—think of William Paley, of the heavily regulated CBS television network—and sometimes they've wanted to expand their business in order to have more political power, as in the case of Henry Luce, of Time Inc., who was perhaps the most politically influential media mogul in American history. Even the publishers who think of themselves as straitlaced holders of a "public trust" are not entirely uninterested in political power—why else let politicians woo their endorsements?

Still, the owners of media empires seldom have direct access to the levers of state power. Indeed, all the qualities that make them appear menacing when they're alive, and admirably larger than life when they're dead, contribute to their ability to constitute a genuine Fourth Estate. A power-hungry media mogul is an independent social force—more independent, of course, when politicians he disapproves of are in power. That ought to count for something. And if, in the bargain, we get news, or entertainment, or even higher blood pressure from being infuriated, that's another benefit. These days, we seem to be drifting toward the world that media reformers have dreamed about for half a century, where the press is made up entirely of small players. If we get there, we may find ourselves missing the dinosaurs who once roamed the earth. ♦

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50 Years of Stupid Grammar Advice

By GEOFFREY K. PULLUM

April 16 is the 50th anniversary of the publication of a little book that is loved and admired throughout American academe. Celebrations, readings, and toasts are being held, and a commemorative edition has been released.

I won't be celebrating.

The Elements of Style does not deserve the enormous esteem in which it is held by American college graduates. Its advice ranges from limp platitudes to inconsistent nonsense. Its enormous influence has not improved American students' grasp of English grammar; it has significantly degraded it.

The authors won't be hurt by these critical remarks. They are long dead. William Strunk was a professor of English at Cornell about a hundred years ago, and E.B. White, later the much-admired author of *Charlotte's Web*, took English with him in 1919, purchasing as a required text the first edition, which Strunk had published privately. After Strunk's death, White published a *New Yorker* article reminiscing about him and was asked by Macmillan to revise and expand *Elements* for commercial publication. It took off like a rocket (in 1959) and has sold millions.

This was most unfortunate for the field of English grammar, because both authors were grammatical incompetents. Strunk had very little analytical understanding of syntax, White even less. Certainly White was a fine writer, but he was not qualified as a grammarian. Despite the post-1957 explosion of theoretical linguistics, *Elements* settled in as the primary vehicle through which grammar was taught to college students and presented to the general public, and the subject was stuck in the doldrums for the rest of the 20th century.

Notice what I am objecting to is not the style advice in *Elements,* which might best be described the way *The Hitchhiker's Guide to the Galaxy* describes Earth: mostly harmless. Some of the recommendations are vapid, like "Be clear" (how could one disagree?). Some are tautologous, like "Do not explain too much." (Explaining too much means explaining more than you should, so of course you shouldn't.) Many are useless, like "Omit needless words." (The students who know which words are needless don't need the instruction.) Even so, it doesn't hurt to lay such well-meant maxims before novice writers.

Even the truly silly advice, like "Do not inject opinion," doesn't really do harm. (No force on earth can prevent undergraduates from injecting opinion. And anyway, sometimes that is just what we want from them.) But despite the "Style" in the title, much in the book relates to grammar, and the advice on that topic does real damage. It is atrocious. Since today it provides just about all of the grammar instruction most Americans ever get, that is something of a tragedy. Following the platitudinous style recommendations of *Elements* would make your writing better if you knew how to follow them, but that is not true of the grammar stipulations.

"Use the active voice" is a typical section head. And the section in question opens with an attempt to discredit passive clauses that is either grammatically misguided or disingenuous.

We are told that the active clause "I will always remember my first trip to Boston" sounds much better than the corresponding passive "My first visit to Boston will always be remembered by me." It sure does. But that's because a passive is always a stylistic train wreck when the subject refers to something newer and less established in the discourse than the agent (the noun phrase that follows "by").

For me to report that I paid my bill by saying "The bill was paid by me," with no stress on "me," would sound inane. (I'm the utterer, and the utterer always counts as familiar and well established in the discourse.) But that is no argument against passives generally. "The bill was paid by an anonymous

benefactor" sounds perfectly natural. Strunk and White are denigrating the passive by presenting an invented example of it deliberately designed to sound inept.

After this unpromising start, there is some fairly sensible style advice: The authors explicitly say they do not mean "that the writer should entirely discard the passive voice," which is "frequently convenient and sometimes necessary." They give good examples to show that the choice between active and passive may depend on the topic under discussion.

Sadly, writing tutors tend to ignore this moderation, and simply red-circle everything that looks like a passive, just as Microsoft Word's grammar checker underlines every passive in wavy green to signal that you should try to get rid of it. That overinterpretation is part of the damage that Strunk and White have unintentionally done. But it is not what I am most concerned about here.

What concerns me is that the bias against the passive is being retailed by a pair of authors so grammatically clueless that they don't know what is a passive construction and what isn't. Of the four pairs of examples offered to show readers what to avoid and how to correct it, a staggering three out of the four are mistaken diagnoses. "At dawn the crowing of a rooster could be heard" is correctly identified as a passive clause, but the other three are all errors:

- "There were a great number of dead leaves lying on the ground" has no sign of the passive in it anywhere.
- "It was not long before she was very sorry that she had said what she had" also contains nothing that is even reminiscent of the passive construction.
- "The reason that he left college was that his health became impaired" is presumably fingered as passive because of "impaired," but that's a mistake. It's an adjective here. "Become" doesn't allow a following passive clause. (Notice, for example, that "A new edition became issued by the publishers" is not grammatical.)

These examples can be found all over the Web in study guides for freshman composition classes. (Try a Google search on "great number of dead leaves lying.") I have been told several times, by both students and linguistics-faculty members, about writing instructors who think every occurrence of "be" is to be condemned for being "passive." No wonder, if *Elements* is their grammar bible. It is typical for college graduates today to be unable to distinguish active from passive clauses. They often equate the grammatical notion of being passive with the semantic one of not specifying the agent of an action. (They think "a bus exploded" is passive because it doesn't say whether terrorists did it.)

The treatment of the passive is not an isolated slip. It is typical of *Elements.* The book's toxic mix of purism, atavism, and personal eccentricity is not underpinned by a proper grounding in English grammar. It is often so misguided that the authors appear not to notice their own egregious flouting of its own rules. They can't help it, because they don't know how to identify what they condemn.

"Put statements in positive form," they stipulate, in a section that seeks to prevent "not" from being used as "a means of evasion."

"Write with nouns and verbs, not with adjectives and adverbs," they insist. (The motivation of this mysterious decree remains unclear to me.)

And then, in the very next sentence, comes a negative passive clause containing three adjectives: "The adjective hasn't been built that can pull a weak or inaccurate noun out of a tight place."

That's actually not just three strikes, it's four, because in addition to contravening "positive form" and "active voice" and "nouns and verbs," it has a relative clause ("that can pull") removed from what it belongs with (the adjective), which violates another edict: "Keep related words together."

"Keep related words together" is further explained in these terms: "The subject of a sentence and the principal verb should not, as a rule, be separated by a phrase or clause that can be transferred to the beginning." That is a negative passive, containing an adjective, with the subject separated from the principal verb by a phrase ("as a rule") that could easily have been transferred to the beginning. Another quadruple violation.

The book's contempt for its own grammatical dictates seems almost willful, as if the authors were flaunting the fact that the rules don't apply to them. But I don't think they are. Given the evidence that they can't even tell actives from passives, my guess would be that it is sheer ignorance. They know a few terms, like "subject" and "verb" and "phrase," but they do not control them well enough to monitor and analyze the structure of what they write.

There is of course nothing wrong with writing passives and negatives and adjectives and adverbs. I'm not nitpicking the authors' writing style. White, in particular, often wrote beautifully, and his old professor would have been proud of him. What's wrong is that the grammatical advice proffered in *Elements* is so misplaced and inaccurate that counterexamples often show up in the authors' own prose on the very same page.

Some of the claims about syntax are plainly false despite being respected by the authors. For example, Chapter IV, in an unnecessary piece of bossiness, says that the split infinitive "should be avoided unless the writer wishes to place unusual stress on the adverb." The bossiness is unnecessary because the split infinitive has always been grammatical and does not need to be avoided. (The authors actually knew that. Strunk's original version never even mentioned split infinitives. White added both the above remark and the further reference, in Chapter V, admitting that "some infinitives seem to improve on being split.") But what interests me here is the descriptive claim about stress on the adverb. It is completely wrong.

Tucking the adverb in before the verb actually de-emphasizes the adverb, so a sentence like "The dean's statements tend to completely polarize the faculty" places the stress on polarizing the faculty. The way to stress the completeness of the polarization would be to write, "The dean's statements tend to polarize the faculty completely."

This is actually implied by an earlier section of the book headed "Place the emphatic words of a sentence at the end," yet White still gets it wrong. He feels there are circumstances where the split infinitive is not quite right, but he is simply not competent to spell out his intuition correctly in grammatical terms.

An entirely separate kind of grammatical inaccuracy in *Elements* is the mismatch with readily available evidence. Simple experiments (which students could perform for themselves using downloaded classic texts from sources like http://gutenberg.org) show that Strunk and White preferred to base their grammar claims on intuition and prejudice rather than established literary usage.

Consider the explicit instruction: "With *none,* use the singular verb when the word means 'no one' or 'not one.'" Is this a rule to be trusted? Let's investigate.

- Try searching the script of Oscar Wilde's *The Importance of Being Earnest* (1895) for "none of us." There is one example of it as a subject: "None of us are perfect" (spoken by the learned Dr. Chasuble). It has plural agreement.
- Download and search Bram Stoker's *Dracula* (1897). It contains no cases of "none of us" with singular-inflected verbs, but one that takes the plural ("I think that none of us were surprised when we were asked to see Mrs. Harker a little before the time of sunset").
- Examine the text of Lucy Maud Montgomery's popular novel *Anne of Avonlea* (1909). There are no singular examples, but one with the plural ("None of us ever do").

It seems to me that the stipulation in *Elements* is totally at variance not just with modern conversational English but also with literary usage back when Strunk was teaching and White was a boy.

Is the intelligent student supposed to believe that Stoker, Wilde, and Montgomery didn't know how to write? Did Strunk or White check even a single book to see what the evidence suggested? Did they have any evidence at all for the claim that the cases with plural agreement are errors? I don't think so.

There are many other cases of Strunk and White's being in conflict with readily verifiable facts about English. Consider the claim that a sentence should not begin with "however" in its connective adverb sense ("when the meaning is 'nevertheless'").

Searching for "however" at the beginnings of sentences and "however" elsewhere reveals that good authors alternate between placing the adverb first and placing it after the subject. The ratios vary. Mark Liberman, of the University of Pennsylvania, checked half a dozen of Mark Twain's books and found roughly seven instances of "however" at the beginning of a sentence for each three placed after the subject, whereas in five selected books by Henry James, the ratio was one to 15. In *Dracula* I found a ratio of about one to five. The evidence cannot possibly support a claim that "however" at the beginning of a sentence should be eschewed. Strunk and White are just wrong about the facts of English syntax.

The copy editor's old bugaboo about not using "which" to introduce a restrictive relative clause is also an instance of failure to look at the evidence. *Elements* as revised by White endorses that rule. But 19th-century authors whose prose was never forced through a 20th-century prescriptive copy-editing mill generally alternated between "which" and "that." (There seems to be a subtle distinction in meaning related to whether new information is being introduced.) There was never a period in the history of English when "which" at the beginning of a restrictive relative clause was an error.

In fact, as Jan Freeman, of *The Boston Globe,* noted (in her blog, The Word), Strunk himself used "which" in restrictive relative clauses. White not only added the anti-"which" rule to the book but also revised away the counterexamples that were present in his old professor's original text!

It's sad. Several generations of college students learned their grammar from the uninformed bossiness of Strunk and White, and the result is a nation of educated people who know they feel vaguely anxious and insecure whenever they write "however" or "than me" or "was" or "which," but can't tell you why. The land of the free in the grip of *The Elements of Style.*

So I won't be spending the month of April toasting 50 years of the overopinionated and underinformed little book that put so many people in this unhappy state of grammatical angst. I've spent too much of my scholarly life studying English grammar in a serious way. English syntax is a deep and interesting subject. It is much too important to be reduced to a bunch of trivial don't-do-this prescriptions by a pair of idiosyncratic bumblers who can't even tell when they've broken their own misbegotten rules.

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Compassion: Easier For A Broken Leg Than Heart

by Jon Hamilton

People are born hard-wired to react to other people's emotions, such as as pain or fear. When one baby starts crying, other babies tend to join in. *iStockphoto.com*

All Things Considered, April 13, 2009 · When we see someone with a broken leg, we feel his pain instantly. But it takes a bit longer to feel compassion for a broken heart, say researchers from the University of Southern California.

A team led by Mary Helen Immordino-Yang used functional MRI to study the brains of 13 people as they responded to stories designed to provoke a range of emotions.

Immordino-Yang reported in the online edition of the *Proceedings of the National Academy of Sciences* that it was easy to get people's brains to react to another person's physical pain. All it took was a few seconds of video.

"For example, a tennis player reaching for an outside shot," Immordino-Yang says. "And then you just see her ankle break as she lands on it."

The response is immediate because people are born hard-wired to react to other people experiencing simple emotions like pain or fear, Immordino-Yang says. That's why when one baby starts crying, other babies tend to join in.

Scientists know quite a bit about which parts of the brain make us wince when we witness a physical injury. They're the same parts of the brain that respond when we're injured ourselves.

And there's evidence that a basic ability to feel another's pain emerged pretty early in human evolution, says Antonio Damasio, a co-author of the study. Damasio is the David Dornsife Professor of Neuroscience at USC and the director of USC's Brain and Creativity Institute.

Damasio says early humans were probably more likely to survive if they could tell when a friend needed help or a foe was in pain.

"It probably took longer in evolution to get to a stage in which human beings could look at another human being, not see anything externally wrong with them, but imagine that there was something quite wrong in terms of their feelings, in terms of their mental pain," he says.

Damasio says people still aren't born with this sort of compassion. They have to learn it.

And the USC team found that the brain had to work a lot harder to react to another person's psychological pain than to physical pain.

Immordino-Yang says the team was able to induce that sort of compassion using recordings of real stories told by real people. One involved a woman with cerebral palsy who had given up hope of having a romantic relationship.

And the team was also able to provoke admiration — another complex social emotion — with stories about people helping the poor or disabled.

Damasio says brain scans showed that even the most complex psychological emotions engaged many of the same brain systems that responded to physical states.

That suggests these emotions "go deep in our brain and they also go deep in our body, in our flesh," he says.

But Immordino-Yang notes that it took the brain up to six seconds to react to a complex emotion like emotional pain, while reactions to physical pain occurred almost instantly. Reactions to emotional pain also took much longer to dissipate.

That raises questions about the effects of news programs and video games in which a traumatic psychological event may flash by in a just a second or two, Damasio says.

He says that might not be long enough for children who are still learning compassion.

"What if it is happening to a child who does not have parents or a guardian around who can say, well, 'Wait a minute, there are terrible implications for the person who just underwent that particular event'?" Damasio says.

Without that sort of help, some children may not acquire the full range of compassion for other people, Damasio says. They also might not develop admiration for people who do virtuous things.

Damasio says that would be a big problem because compassion and admiration help anchor moral systems — and society itself

http://www.npr.org/templates/story/story.php?storyId=103043173

Is a high IQ a burden as much as a blessing?

By Sam Knight

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Marilyn vos Savant with husband Robert Jarvik outside New York's Metropolitan Club

The Metropolitan Club, on Fifth Avenue at 60th street, is a palazzo in the mighty Manhattan style. Damn the expense. That's what J.P. Morgan is supposed to have said when he

commissioned Stanford White, the city's most flamboyant architect, to build him a private gentleman's club in 1894. Inside, on a Monday evening in late January, only a few members drifted over the red, monogrammed carpets, but it was still early, only a little after seven. This, however, is when Marilyn vos Savant likes to show up.

Savant, who has the world's highest recorded IQ, is fond of dancing. She took it up seriously a few years ago with her husband, Robert Jarvik, the inventor of the Jarvik artificial heart, and they get to the club about once a month. If they arrive early enough, they can have the dance floor to themselves. And so it proved that Monday. The room was largely empty, the band were playing "Anything Goes" and once a happy, though quivering, old man was led from the floor by his partner, Savant and Jarvik could foxtrot wherever they pleased. A slim, prosperous couple in their sixties, they moved easily: she with a simple precision, he with the odd heel-tap, a bit of dash. After a time, though, as the floor filled up and became a carousel of perfectly tailored, carefully moving couples, they came back to their table. "It's a social scene," said Savant, who is 62, with a smile. "But it's not our social scene. Let me just say that." A few minutes later, when a serious-looking man happened to make a goofy swish right in front of them, Savant

and Jarvik caught each other's eye and couldn't help laughing. Not long afterwards, they took a taxi home, to their midtown penthouse. "We usually dance more, a lot more," said Savant as they are leaving. It is only 8.30pm. "And then we go back to the office."

Savant – the surname is real, it was her mother's maiden name – has had a unique claim to fame since the mid-1980s. It was then, almost 30 years after she took a test as a schoolgirl in downtown St Louis, Missouri, that her IQ came to light. In 1985, Guinness World Records accepted that she had answered every question correctly on an adult Stanford-Binet IQ test at the age of just 10, a result that gave her a corresponding mental age of 22 years and 11 months, and an unearthly IQ of 228.

The resulting publicity changed Savant's life. She appeared on television and in the press, including on the cover of an in-flight magazine that Jarvik chanced to pick up. He decided to track her down and ask her out. It also led to the role for which she remains best known in America, writing a question-and-answer column, "Ask Marilyn", for Parade, a Sunday magazine syndicated to more than 400 regional newspapers. For the past 22 years, Savant has tended their ceaseless queries – "How happy are larks, really?" "My wife blow-dries her hair every day. Can the noise damage her hearing?" – and in the process achieved a status that is Delphic yet tabloid. To her fans and other members of the world of high IQ, Savant is a prodigious, unusual talent who delights in solving problems. To her detractors, she is either trivial, someone who has squandered her gift, or proof, if they needed it, that IQ scores don't add up to anything. In whatever form, she lodges in people's minds. As evidence of her imprint on the national consciousness, Savant featured in an episode of *The Simpsons* in 1999. She was a member of the Springfield Mensa society, along with Geena Davis, the Hollywood actress and one-time star of *Earth Girls are Easy*.

In conversation, Savant steers clear of fancy remarks. She is overtly normal. "People expect me to be a walking encyclopaedia or a human calculator," she says, or to "have very unusual, very esoteric, very arcane gifts and I'm really not that way at all." Instead, she talks with the practised clarity of her columns, the pedantry of someone wary of misinterpretation. At one point, for example, Savant was describing a house where she lived in St Louis. "You could actually see stars," she said, "unlike here in New York, where you can only see Venus," then she halted. "I'm sorry, Venus is not a star." When Savant, who is the author of several plays and half-a-dozen self-help books, does makes a cultural reference, she is careful not to sound too snooty. She prefers Proust to Joyce, she told me, although, she concedes, "Joyce does some nice bits in Ulysses."

This blandness masks the rarity of her brain. Because whatever else Savant is, she is not a fraud. Her IQ has been tested and tested and tested again. When I asked her to describe how her mind approaches a problem, she said: "My first thought, maybe not thought, it's almost like a feeling, is overview … It's like, almost, a wartime decision. I keep thinking about all of the fronts, what's supplying what, where are the most important points … " Jarvik, her husband for the past 21 years, says Savant's gift is to be able to approach questions dispassionately, without our usual fears of or hopes for a particular answer. Walter Anderson, the chief executive of Parade, who has been friends with Savant since he hired her in 1986, believes she is a genius and, as with other geniuses, her ability is inexplicable to him. "Marilyn just does it," he said. "Her answer is so quick. If light or electricity travels at 186,000 miles per second, do you realise how quick those synapses are? She knows the answer to your question. She knows the answer before you've finished the question."

All of which only makes people wonder why Savant has found no higher purpose. In 1995, the issue became so bothersome to Herb Weiner, a software engineer in Portland, Oregon, that he set up a website called Marilyn is Wrong! Weiner says that he aims to redress errors in her column and ensure that Savant's daunting IQ does not mean that she goes unquestioned. But what really seems to nag him is that she writes the column at all. "Look at Barack Obama, look at how he is applying his intelligence," he told me. "It just sort of seems strange to me that instead of dealing with more complex problems, a lot of what she does is just answer riddles or simple research things, things that anybody could go to a library and look up the answer to."

Weiner's complaint is oddly deferential. As his website notes: "Marilyn is more intelligent than I am, as measured by standard intelligence tests." But for many people, the story of Savant and "Ask Marilyn" are just two more pieces of evidence in a larger, decades-long argument about the accuracy and objectivity of intelligence testing. Even Guinness has succumbed. In 1990, two years after inducting Savant into its Hall of Fame, the publisher, in its parlance, "rested" its high IQ category altogether, saying it was no longer satisfied that intelligence tests were either uniform or reliable enough to produce a single record holder. Depending on how you look at it, Savant will either never be beaten, or was not worth beating in the first place.

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Humans have been measuring each other's intelligence for a long time. In China during the Xi Zhou dynasty (1046 to 771BC), candidates for official positions were formally tested on a range of criteria including the "six skills": arithmetic, archery, horsemanship, music, writing and the performance of rituals and ceremonies. The notion of a universal, objective scale of intelligence, however, did not take shape until the 19th century and the arrival of Darwinism. If Charles Darwin is the father of modern biology, then the father of modern intelligence testing is his cousin, Francis Galton – statistician, polymath and founder of eugenics. In 1884, he set up an "anthropometric laboratory" at the International Health Exhibition in London, and measured, among other things, the reaction times, eyesight, colour sensitivity and steadiness of hand of more than 9,000 men and women as he looked for links between their physical and mental characteristics.

Searching for genius, Galton failed to develop a working intelligence test. That was left to a French psychologist, Alfred Binet, and his student, Victor Henri. Binet was commissioned to study the large numbers of poor children in the city's asylums and to find out whether they were mentally incapacitated or simply untaught. His resulting 1904 test of 30 indicators – from the eye being able to follow a lit match, to memory and vocabulary questions – provided the basis of modern intelligence testing. In 1916, Lewis Terman, a professor of psychology at Stanford University, revised and expanded the test, creating the Stanford-Binet IQ test, which is still used today. Although more moderate than many of his contemporaries, Terman adhered to the social Darwinism of his time – in 1930, 24 US states had sterilisation laws – and he had hopes for the social potential of his work. "This," he wrote in 1919, "will ultimately result in the curtailing of the reproduction of feeble-mindedness."

Intelligence testing has proved contentious ever since. In the US, where more than nine million men underwent various forms of IQ and ability tests during the second world war, the enthusiasm for testing has been matched only by the ferocity of arguments over what exactly it proves. IQ tests for children, the SAT Reasoning Test for college applicants and psychometric testing by companies may have been designed with the goal of identifying individual talent, but often their larger consequence has been to highlight differences already inherent in society. Variations between the sexes and ethnic groups have led to toxic arguments about bias and inequality and power: who gets to define intelligence? Who designs the tests? In its various iterations, the debate about IQ testing in the US normally returns to the persistent, albeit shrinking, lag between results for white and black populations.

The last time the debate flowered in full was in 1994, on the publication of *The Bell Curve* by the psychologist Richard Herrnstein and the conservative political scientist, Charles Murray. They argued that intelligence test scores were both a good indicator of social success and strongly determined by our genes. The implication, that an unequal society was inevitable and fair, and that a black, inner city "cognitive underclass" was having too many children, made it seem as though eugenics had never gone away. "Mr Murray can protest all he wants," wrote Bob Herbert, a columnist for The New York Times, "his book is just a genteel way of calling somebody a nigger."

Underlying the heated politics – making the arguments even harder to resolve – is an incomplete science. After *The Bell Curve* controversy, the American Psychological Association convened a task force, which

concluded that children's IQ scores could predict about 25 per cent of the variation in future academic performance. They were, in other words, on the cusp of being statistically reliable, better than nothing.

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There is an almighty gap between what IQ tests can measure and what we want to them to show. "If you tell anyone their IQ at any age they will remember it for the rest of their life," says Professor John Rust, the director of the Psychometrics Centre at the University of Cambridge. "It's like an astrological chart." Rust reminded me of the contrast between the quasi-spiritual idea of intelligence rooted in western language and culture – the notion of a single, overarching quality comparable to, say, a saint's halo – and what we can learn from our response to a series of logical problems. Yet in the absence of anything better than IQ tests, whose questions still underpin many modern "ability" tests, people continue to see something in these IQ scores that, while not meaningless, do not hold "the answer".

The fault, in the end, lies on both sides: in us, the credulous patients, who see too much in our results, and the doctors, who have also been furiously theorising and extrapolating. "Tests of IQ have never simply been about our ability to solve problems," said Rust. "There has always been the idea that people with high IQs are actually more advanced, more evolved, closer to the human destiny, if you believe that sort of thing, closer to God. But in fact all you have really got is answers to questions."

The world of high IQ societies certainly does not suggest the existence of a higher evolutionary plane. Although the best known, Mensa, was set up in the UK in 1946 with utopian goals – it was envisioned by its founder, Roland Berrill, as a panel of brilliant minds that would improve society – such groups are often a refuge for people who have trouble fitting in elsewhere. "High cognitive ability is very often a mixed blessing," Patrick O'Shea, the president of one such society, the International Society for Philosophical Enquiry (ISPE), told me. Too wide a deviation from the mean IQ of 100 brings with it an inherent isolation. "If you have an IQ of 160 or higher," O'Shea explained, "you're probably able to connect well with less than 1 per cent of the population." Among the 600 or so members of the ISPE, whose IQs are all around 150 or higher, O'Shea described a "common experience of being socially marginalised" and the challenge of finding suitable outlets for their gifts. "It's good to be smart, it's good to get ahead, but past a certain threshold, you can't be trusted: you're a nerd, you're a geek," he said. "You have somehow a tremendous social deficit."

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In between conversations with Marilyn vos Savant, I also spent time in New York with a man called Ron Hoeflin. Hoeflin is two years older than Savant, also from St Louis, and also has a remarkable IQ score – 190 – yet has frustratingly little to show for it. He lives only a few blocks from Savant's penthouse, above a café/Laundromat, and describes himself as self-employed. I met Hoeflin in the local Wendy's, a hamburger place where he spends every afternoon working on the final volume of a self-published philosophical treatise called *The Encyclopaedia of Categories: A Theory of Categories and Unifying Paradigm for Philosophy With Over 1,000 Examples.*

We slowly went back to Hoeflin's apartment – he is almost blind due to repeatedly detached retinas – and I asked him what his IQ and intelligence testing had done for him. Hoeflin, who devised a series of well-respected tests in the 1980s, said that it has provided him with a degree of confidence and recognition that he had been denied by mainstream education, in which he struggled. Hoeflin believes the objectivity of IQ tests makes them more reliable than the subjective evaluations of teachers and professors. "I don't want to have some ruthless creep mess me up," he said.

A fan of psychometric testing in general, Hoeflin also showed me the results of a personality test he once took. Lines of Xs march across the page, showing the extent of his various personality traits, from the "vigilant" to the "leisurely". In one column, for the "dramatic", there were no Xs at all. "Zero," said

Hoeflin, evenly. “This is why I don’t write novels because on the dramatic level I’m zero.” When I objected, saying that surely our personalities are too complex, too cosmic, to be captured in a questionnaire, Hoeflin suggested politely that maybe I was incurious, or afraid, or both. “Why do you think a personality can’t be measured?” He asked me. “Just because it’s complicated doesn’t mean we shouldn’t try and figure it out. It’s patterns. Even our personalities are just patterns, right? Like waves on the ocean. You can do a study in hydrodynamics and figure out how waves rise and collapse. It’s the same for human beings.” In an e-mail a few days later, Hoeflin explained his interest in psychometrics another way: “Being this shy makes one wonder what is going on.”

Knowing all this makes high IQs and the story of Marilyn vos Savant seem rather different. Has her IQ been a burden as much as a blessing? According to John Rust, at Cambridge, to produce an extraordinary IQ score a mind must have two unusual qualities. The first is “mechanical facility” – useful but sometimes harmful in extreme cases, hence the preponderance of people with Asperger’s syndrome who have high IQs. And you must also excel at a wide variety of tasks. Intelligence tests measure a range of mental abilities, whereas most people naturally, and happily, concentrate on just a few. Abnormally high IQ scores, by their nature, often speak of a brain too general to be of much use. “Effectively,” said Rust, “you are mastering far too many things.”

Broadness, though, is what Savant craves. “Reading all about these subjects,” she says of her work, “I am becoming amazingly informed to a superficial extent.” One afternoon we met in her office, 50 floors up among the foggy, snowbound towers of Manhattan, and she showed me her desk. Three computer screens and an old word processor looked out, north-west, over a thousand roofs towards the Hudson River. It is from this vantage point that she answers the 200 or 300 e-mails a day that come in for her column in Parade magazine: questions on every subject, from the personal to the algebraic, that are bothering those down below. “I’m hearing from everyone, I told you, this vast range,” she said. “And I really enjoy that view. It’s hard to express. It’s like being at a scenic outlook point. I feel like I am gaining so much insight about people, and there is a particular joy in that.”

It has taken her a long time to get there. Savant was born Marilyn Mach in south central St Louis in 1946. Her parents, Joseph Mach and Marina vos Savant, were immigrants, German and Italian respectively, and ran a bar and grill in a blue-collar part of town. Savant describes her childhood, the first half of her life in fact, at a kind of ironic distance. She laughed when she told me about how her parents tried to raise her and her two older brothers as Americans. “All I heard around the house was this fractured, lame, ungrammatical English for I don’t know how long. It was really very funny. You know, this was their best effort.” And she gently warned me off reading too much into her past. “It’s funny how these background things mean so much to people,” said Savant. “It feels strange, a bit, to me because it seems like the dark ages or another time, or another persona, which I guess I was.”

In school she was quickly identified as gifted, getting maximum scores on IQ tests at the ages of seven, eight and nine. And when Savant got full marks on the adult Stanford-Binet at the age of 10, a psychologist from the local school board said he had never seen anything like it. Savant, however, recalls no surprise. “That didn’t seem like news,” she said. “It just seemed perfectly normal.” Her principal, however, was sufficiently impressed to pull Savant out of several classes and put her to work in his office, so beginning an odd phase in her life in which she was one of the only people in the school with access to the other pupils’ IQ scores. Her hobby became matching her fellow students to their results. “I would make my best guess after talking to them for a while and then I would go and see how accurate my guess was,” she recalled. “I got to be very good at it.”

By the age of 16, however, Savant’s precocious schoolgirl was no more. She married, as her mother had done at her age, and was drawn into the family business, which by this time was a chain of dry cleaners. “It was a long time. It was a long time,” she said when I asked her when she realised that this life was not for her. “You have to understand the level of control. I was not aware of things outside.” Apart from a few audited classes at the city’s Washington University, Savant’s formal education ended in her late teens when she had her two children. She divorced in her twenties and married again, all the while working

with her brothers and father to expand the business to about 40 dry cleaners and a firm that sold dry cleaning equipment. She joined Mensa, she says, to help her educate her children, but most of the time Savant was busy keeping the family accounts. "I was the trustworthy one," she said. "I was the one that everyone could turn to for an unbiased decision."

It was only after her second marriage ended, when she was 35, that Savant began to think about leaving St Louis. She decided to become a playwright. She saved some money and started spending time in New York, even renting an apartment in Manhattan. When her father died, she permanently moved away.

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Savant is elliptical about her early years in New York – the crucial period from 1983 to 1985 in which she went from being a dry cleaner to the cleverest person in the world. "It was just a confluence of things," she says. But contemporaries, such as Ron Hoeflin, recall her as a member of the various high IQ societies in the city. "She wanted to be a writer, I know that," he said. Savant now distances herself from the world of high IQ, but at the time she was willing to see how it could help her prospects. She says she can no longer recall how her childhood scores were submitted to Guinness, but Andrew Egendorf, a lawyer from Boston, says the idea came up over a dinner in 1983. Egendorf, who wanted to write a book about high IQ societies, says he remembers proposing a couple of book ideas to Savant, and suggesting that they send her IQ results to Guinness as a way of making her famous. "She was just another person trying to make it in New York," he told me. "The fact that she had this credential just gave her something different and I remember thinking, 'How can we cash in on it?' It didn't matter what it was. She could have been green, the only green person in the world." Egendorf first wrote to Guinness on Savant's behalf on July 25 1983. In 1985, the IQ record was hers, 31 points higher than the two previous holders. The next year, she was writing for Parade.

And since then it has been questions, questions, questions. Walter Anderson, at Parade, remembers how at cocktail parties in the 1980s people would throw Savant riddles and mathematical puzzles. It was hard to persuade her not to reply. "From the time she was a little girl, she was asked questions all the time," he explained. Not that these logical problems seem to faze Savant. Rather, they have been the scene of her greatest triumphs [The "Monty Hall dilemma"], and Anderson still gets excited, after all these years, about what conundrum Savant will answer next. He is convinced, for instance, that she understands the financial crisis in ways that most of us do not. "You know for the last quarter of a century, people have written stone bullshit about Marilyn," he said at the end of our interview. "Writers want to come and show off how clever they are. But the real question is: what should we be asking her? We should take her seriously."

There is only one question that seems the wrong thing to ask Savant, and that is what else she is supposed to have done with her life, with her glimmering brain. To ask it is to miss the point. I told her when we met that I had always imagined intelligence to be nothing more than a tool. On that foggy afternoon, before we said goodbye, she wanted to correct me. "I suppose it could be and it should be," she said. "But it also seems to be an attribute or a quality or an aspect of one's humanity that one need not use to get something that you want … It can just simply be part of you. And I think that's fine too."

Sam Knight is a regular contributor to FT Weekend Magazine.

Do you have a question for the world's cleverest person? E-mail your questions to AskMarilyn@ft.com *– the pick of them will be put to Marilyn vos Savant and featured with her answers in a future issue.*

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The "Monty Hall dilemma"

Marilyn vos Savant's column gained national notoriety in the early 1990s, thanks to her response to the "Monty Hall dilemma": the make-or-break decision facing contestants on the game show Let's Make a Deal that was then hosted by Hall. The question was posed by Craig Whitaker, of Columbia, Marinaland, on September 9 1990. "Dear Marilyn," wrote Whitaker. "Suppose you're on a game show, and you're given the choice of three doors. Behind one door is a car, behind the others, goats. You pick a door, say #1, and the host, who knows what's behind the doors, opens another door, say #3, which has a goat. He says to you: 'Do you want to pick door #2?' Is it to your advantage to switch your choice of doors?"

Savant's answer, that it was better to switch doors, provoked an extraordinary response: thousands of letters of complaint, many of them from science teachers and academics. "There is enough mathematical illiteracy in this country, and we don't need the world's highest IQ propagating more. Shame!" wrote one reader from the University of Florida. "You are the goat!" said another. "You made a mistake, but look at the positive side," wrote Everett Harman, of the US Army Research Institute. "If all those PhDs were wrong, the country would be in some very serious trouble."

But Savant had not made a mistake. In the end it took her four columns, hundreds of newspaper stories and a challenge to children to test the options in classroom experiments, to convince her readers that she was right. "Oh, that was so much fun. I just enjoyed these nasty letters I got," she said. "The audacity of people! I just loved them."

The key to the solution lies in the role of the host, who will always pick a door which does not have a prize behind it. Statistics from the game show, in which those who switched won about twice as often as those who did not, bear out Savant's explanation from her third column: "When you first choose door #1 from three, there's a 1/3 chance that the prize is behind that one and a 2/3 chance that it's behind one of the others. But then the host steps in and gives you a clue. If the prize is behind #2, the host shows you #3, and if the prize is behind #3, the host shows you #2. So when you switch, you win if the prize is behind #2 or #3. You win either way! But if you don't switch, you win only if the prize is behind door #1."

http://www.ft.com/cms/s/2/4add9230-23d5-11de-996a-00144feabdc0.html

Pollution link with birth weight

Exposure to traffic pollution could affect the development of babies in the womb, US researchers have warned.

They found the higher a mother's level of exposure in early and late pregnancy, the more likely it was that the baby would not grow properly.

The study, published in the Journal of Epidemiology and Community Health, looked at 336,000 babies born in New Jersey between 1999 and 2003

UK experts said much more detailed research into a link was needed.

Exposure

The researchers, from the University of Medicine and Dentistry in New Jersey, used information from birth certificates and hospital discharge records.

They recorded details including each mother's ethnicity, marital status, education, whether or not she was a smoker - as well as where she lived when her baby was born.

Daily readings of air pollution from monitoring points around the state of New Jersey were taken from the US Environmental Protection Agency.

" **Residence near a roadway during pregnancy, may affect foetal growth** "
Professor David Rich, University of Medicine and Dentistry, New Jersey

The scientists then took data from the monitoring point which was within six miles (10 km) of the mothers' homes to work out what their exposure to air pollution had been during each of the three trimesters of pregnancy.

It was found that mothers of small, and very small, birth weight babies were more likely to be younger, less well educated, of African-American ethnicity, smokers, poorer, and single parents than mothers with normal birth weight babies.

But, even after these factors had been taken into account, higher levels of air pollutants were linked to restricted foetal growth.

Two kinds of pollution produced by cars - tiny sooty particles and nitrogen dioxide - were found to have an impact.

Particulate matter is produced from vehicle exhausts and can lodge in the lungs. Fine particles, such as PM 2.5s, which penetrate deep into the lungs, have been linked to deaths from heart and respiratory diseases.

Nutrients

The risk of a small birth weight baby rose significantly with each increase in particulate matter of four micrograms per metres squared, during the first and third trimesters of pregnancy.

Similarly, the risk of a very small birth weight baby rose significantly with each 10 parts per billion increase in nitrogen dioxide.

Writing in the Journal of Epidemiology and Community Health, the team led by Professor David Rich, said: "Our findings suggest that air pollution, perhaps specifically traffic emissions during early and late pregnancy and/or factors associated with residence near a roadway during pregnancy, may affect foetal growth."

They say it is not clear exactly how air pollution might restrict foetal growth.

But they add previous research suggests that air pollution might alter cell activity, or cut the amount of oxygen and nutrients a baby receives while in the womb.

Professor Patrick O'Brien, of the UK's Royal College of Obstetricians and Gynaecologists, said: "This is an interesting study because it flags up a possibility of a link.

"But I think it needs to be looked at again in more detail because of the probability of confounding factors.

"The researchers ruled out smoking and social-economic background - other factors which are linked to small babies - but there are many other factors, such as diet, which could have an effect."

Professor O'Brien added that future research into the effects of pollution should be careful to check if babies are born small because their parents are small, and to ensure pregnancies are dated from scans, where this study did neither.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/7988619.stm

Published: 2009/04/08 23:42:57 GMT

Test 'sheds light on back pain'

A simple technique could help doctors differentiate between patients with different causes of back pain and thus improve treatment, a study suggests.

Researchers writing in PLoS Medicine have devised "bedside" tests which distinguish between neuropathic - nerve damage - and other causes of pain.

Neuropathic pain is commonly described as "burning" or "stabbing" but it is often difficult to formally diagnose.

Back pain is the most commonly cited reason for being absent from work.

A team from Massachusetts General Hospital in the US and Addenbrooke's in the UK recruited more than 300 patients with chronic back pain.

Some had a known history of nerve damage caused by diabetes or shingles, while others had low back pain with or without evidence of spinal nerve root damage.

Question time

By carrying out detailed comparisons of the patients, researchers were able to formulate a set of six questions and 10 physical tests which distinguished between the two groups.

" **Although back pain is very common, in many cases we still have a poor understanding of where the pain is coming from** "
Dries Hettinga BackCare

The results, they said, were superior to existing screening tests for neuropathic pain and even to MRI scanning of the spine, which can be misleading as many people have damage to their spinal discs without any pain.

In most types of neuropathic pain, all signs of any injury have usually disappeared but certain nerves continue to send pain messages to the brain.

Traditional pain killers often do not help - other options include antidepressants, and physical as well as psychological treatment.

"Currently clinicians measure pain only by asking how bad it is, using scales from mild to moderate to severe or asking patients to rate their pain from one to 10," said lead author Joachim Scholz, an assistant professor of anaesthesia.

"This approach misses key characteristics that reflect the mechanisms causing the pain.

"The treatment of neuropathic and nonneuropathic pain is quite different, and if a diagnosis is wrong, patients may receive treatment, including surgery, that does not improve their pain."

Dries Hettinga, head of research & policy at the charity BackCare, said: "Although back pain is very common, in many cases we still have a poor understanding of where the pain is coming from and how to tailor treatments to individual cases.

"This is why the diagnostic tool that the researchers developed could make a big difference to many people with back pain.

"People with neuropathic back pain need a different treatment approach than those with non-neuropathic pain and an accurate and easy to use tool to distinguish the two types of pain would not only benefit people with back pain, but also help to tailor treatments for people with back pain and thus decrease costs."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/7985798.stm

Published: 2009/04/08 10:54:25 GMT

Study finds stress link to asthma

Pregnant women who suffer from stress are more likely to have a child with asthma, according to research from Children of the 90s study.

Researchers working with about 6,000 families in Bristol found anxious mums-to-be were 60% more likely to have a baby who would develop the illness.

The findings show 16% of asthmatic children had mothers who reported high anxiety while pregnant.

Mothers-to-be who were less stressed had a lower incidence rate.

Key findings

Professor John Henderson, from the Children of the 90s team, said: "Perhaps the natural response to stress which produces a variety of hormones in the body may have an influence on the developing infant and their developing immune system that manifests itself later on."

The Children of the 90s study - carried out by the University of Bristol - has been following 14,000 children.

They are regularly tested and monitored to see how different lifestyles affect growth, intelligence and health.

The aim is to identify ways to optimise the health and development of children.

Key findings to come out of the project include left-handed children do less well in tests than their right-handed peers and women who eat oily fish while pregnant have children with better visual development.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/uk_news/england/bristol/somerset/7989159.stm

Published: 2009/04/08 07:38:56 GMT

Spam overwhelms e-mail messages

By Darren Waters
Technology editor, BBC News website

More than 97% of all e-mails sent over the net are unwanted, according to a Microsoft security report.

The e-mails are dominated by spam adverts for drugs, and general product pitches and often have malicious attachments.

The report found that the global ratio of infected machines was 8.6 for every 1,000 uninfected machines.

It also found that Office document attachments and PDF files were increasingly being targeted by hackers.

Microsoft said people should not panic about the high levels of unwanted e-mail.

Cliff Evans, head of security and privacy for Microsoft in the UK, told BBC News: "The good news is that the majority of that never hits your inbox although some will get through."

Ed Gibson, chief cyber security advisor at Microsoft, said the rise in spam was due to traditional organised crime figures moving away from exploiting software vulnerabilities and "targeting the weak link that is you and me".

"With higher capacity broadband and better OS (operating systems), and higher power computers it is easier now to send out billions of spams. Three or four years ago the capacity wasn't there."

Malware ecosystem

Paul Wood, senior analyst at e-mail security firm Message Labs, said he was surprised the Microsoft figure for unwanted e-mail was so high.

"Our own analysis shows that around 81% of e-mail traffic we were processing was identified as spam and unwanted," he said.

MessageLabs said spam rates had fallen at the end of 2008 as an ISP which had been hijacked to send out spam mails to users had been taken offline.

"As a result of that, a number of developers in botnet technology at the end of last year were trying to regain botnet control and increase capacity and return to previous spam levels.

"It won't be far off before we see return to those levels."

The report, which looked at online activity during the second half of 2008, also pinpoints the countries that are suffering from the most infections of malicious software, or malware.

Russia and Brazil top the global chart of infections, followed by Turkey and Serbia and Montenegro.

It said that the type of malware varied from country to country.

"As the malware ecosystem becomes more reliant on social engineering, threats worldwide have become more dependent on language and cultural factors," it reported.

In China, several malicious web browser modifiers are common, while in Brazil, malware that targets users of online banks is more widespread.

In Korea, viruses such as Win32/Virut and Win32/Parite are common.

Global average

The global average for infected machines is 8.6 for every 1,000 uninfected PCs.

The UK's infection rate is 5.7, according to the Microsoft report.

The report highlighted the need to keep operating systems, web browsers and applications up to date with the latest versions.

Increasingly, hackers are using common file formats, such as Microsoft Office documents and Adobe's PDF format as the carrier of malicious exploits or programs.

More than 91% of attacks exploiting vulnerabilities in Microsoft Office were using security holes that had been plugged by updates that had been available for more than two years.

Attacks using PDF files rose sharply in the second half of 2008, the report noted.

The vulnerabilities all of the attacks exploited had already been fixed by Adobe, and were not present in the most recent versions of the software.

Mr Gibson told BBC News people had to be aware that if they did not update their applications, such as Office and Adobe, they were not just putting themselves at risk, but others on the internet also.

"If you don't update your software you are not just a hazard to yourself, you are hazard to others because you can be part of a botnet [if your computer is hijacked]."

Mr Evans said Microsoft was very happy with the approach consumers were taking to updating applications via automatic updates.

"For consumers it is happening but for business less so. We have encourage businesses to make more use of automatic updates."

Scareware

Mr Wood said malicious hackers were exploiting Office document attachments and PDF files in order to make more targeted attacks.

"They tend to be used in selective attacks to named individuals in organisations.

"A lot of social engineering will be used to appear legitimate and convince a user to open the attachment

"Once opened, a vulnerability in the application used to open the document will be exploited and often a tiny piece of code will execute and then download a larger file from a rogue website.

"This program will then attempt to search the computer for a particular document or file and sent it to a remote PC."

The report also highlighted the rise in the use of so-called scareware, fake security programs which falsely tell people they need to install software which does nothing other than attempt to steal personal details from a users' PC.

"It's criminals playing on people's fears," said Mr Evans.

"The advice remains the same - ensuring you have up to date software, whether that's your applications, your browser or your OS."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/technology/7988579.stm

Published: 2009/04/08 09:55:05 GMT

UN demands more climate ambition

By Richard Black
Environment correspondent, BBC News website

The year's first round of UN climate talks has ended with delegates talking of a clear split between the visions of developed and developing nations.

Developing countries want big emission cuts from rich nations by 2020, as well as finance for climate protection and more transfer of "clean" technologies.

The top UN climate official said richer nations should show "more ambition".

The talks in Bonn were the first round in a series aimed at reaching a new global deal by December.

This would supplant the Kyoto Protocol, whose targets for cutting emissions expire in 2012.

" **We have reached a crossroads, and rich countries get to choose the route we all take** "
Antonio Hill Policy adviser, Oxfam

Earlier in the meeting, President Barack Obama's lead negotiator, Jonathan Pershing, told BBC News that the US would only offer cuts that were "politically and technologically achievable".

The president is looking at measures that would bring US emissions back down to 1990 levels by 2020.

But the EU has already pledged a cut of at least 20% from 1990 levels by that date; and developing countries, backed by environment groups, are calling for the industrialised world to act on recommendations made by the Intergovernmental Panel on Climate Change (IPCC) and make a reduction of 25-40% - some say the science now mandates at least 45%.

Mr Pershing said the US wanted to concentrate on achieving larger cuts but over a longer period of time, saying some of the demands from developing countries were "implausible".

But the calls for stronger action were backed by the executive secretary of the UN climate convention (UNFCCC), Yvo de Boer.

"The numbers being discussed so far are still a significant distance from that range," he said.

"More ambition is clearly needed on the part of industrialised countries."

Missing billions

Campaign groups generally welcomed the fresh US enthusiasm for the process, but warned that much greater carbon cuts and finance were needed.

"We have reached a crossroads, and rich countries get to choose the route we all take," said Antonio Hill, senior policy adviser with Oxfam.

"One route leads us out of today's economic and climate crises and towards a low carbon future.

"The other spells disaster for hundreds of millions of people across the globe."

The charity believes the West should commit about $50bn (£34bn) a year to assist poor countries in preparing for climate impacts.

Some observers contrasted the much smaller sums committed so far against the scale of the resources governments have made available to support beleaguered banks.

"Billions are flowing into recovery packages to save polluting industries and bad banks, but a financial stimulus to protect the UN climate talks from bankruptcy and to help those suffering from the impacts is missing," said Kim Carstensen, leader of WWF's Global Climate Initiative.

Delegates will reconvene in Bonn in June, by which time officials will have drawn up a draft negotiating text.

In an indication of how much negotiating lies ahead, delegates agreed to mount two extra meetings between the June gathering and the December summit in Copenhagen.

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Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/science/nature/7991039.stm

Published: 2009/04/09 01:02:20 GMT

Era of personalised medicine awaits

By Fergus Walsh
BBC News medical correspondent

A revolution in genome screening has been promised by a biotech company in the US.

Complete Genomics, says it will sequence one thousand complete genomes between June 2009 and the end of the year and one million over five years.

I visited the company, based in Silicon Valley near San Francisco, and saw, first hand, the potential significance of mass gene mapping.

Silicon Valley in California is a key centre for genetics, bio-tech research and computer technology - all of which are key for genome mapping.

Several companies are predicting a dramatic increase in the speed of gene sequencing.

" **The future that we all envisage is the day when every infant has their genome sequenced at birth and we utilise that information to optimise health throughout their life** "
Andrew Wooton X PRIZE foundation

If Complete Genomics can deliver on its promise - and it has yet to build all the infrastructure it needs - it would be an extraordinary achievement.

So far only around 20 people have had their entire genetic code mapped.

This is due to two factors: cost and complexity.

The first draft of the human genome was published nearly a decade ago.

It involved the work of hundreds of scientists in six countries and took a decade to produce.

The price tag was more than $2bn.

Since then the cost has been reduced to a few hundred thousand dollars, and the time taken to a few months - but it is still a massive undertaking.

'Language of life'

Little wonder, because the genome is a person's entire genetic code contained in chromosomes inside the nucleus of virtually every cell in the body.

It is made up of six billion letters, or three billion base pairs of DNA, half of which come from each parent.

These are arranged in a double helix, whose elegant structure was first described by Crick and Watson in 1953. At the time, their discovery barely made headlines.

" **We don't understand much about the genome yet despite all the years we've been studying it** "
Professor Steven Brenner University of California, Berkeley

The publication of the first draft of the human genome in 2000 was quite different.

In a dual Washington and London press conference, President Bill Clinton said: "We are beginning to learn the language in which God created Life".

Talking of the medical implications of genome mapping he added: "It is now conceivable that our children's children will know the term cancer only as a constellation of stars".

In Downing Street, Prime Minister Tony Blair said the achievement hailed "a revolution in medical science whose implications far surpass even the discovery of antibiotics, the first great technological triumph of the 21st century".

So what is a genome and were Blair and Clinton's comments in any sense justified?

Start of the process

The genome is nothing less than the blueprint for making a human which scientists are only just beginning to decipher.

It is a chemical alphabet of just four letters: A, T, G and C.

Genes are sections of DNA which tell cells how to function and decide things like the colour of our eyes.

In everyone's genome there are millions of minute variations called SNPs.

Most are harmless, but some make us more or less susceptible to disease.

Since 2000 scientists have made significant progress in discovering genetic links to disease.

Virtually every week there are new scientific papers which add to our knowledge.

But most of this research is based on analysing sections of DNA, not the entire genome.

Complete Genomics says all that is about to change.

Advances in nanotechnology have allowed it to miniaturise the components needed for genome sequencing.

It is able to fit the coding instructions for an entire genome - six billion characters long - onto three small rectangular silicon plates just a few centimetres across.

Speeding up

Advances in biotechnology have enabled the sequencing process to be accelerated, and improved computing power has enabled dramatic increases in the speed of gene mapping.

Complete Genomics has published its first genome, in what is called a proof of concept trial, and now plans to scale up its sequencing programme.

The knowledge to be gained from one genome, in isolation, is limited.

But if you were able to compare huge numbers of genomes then patterns should emerge.

Dr Clifford Reid, CEO of Complete Genomics said: "As soon as we can sequence thousands of genomes then we can understand for the first time, the genetic basis of disease that will enable us to develop new diagnostics for the detection of disease and new therapeutics for the treatment of disease."

It offers the hope of more personalised medicine; tailored treatments to suit individual patients.

Also it should lead to greater understanding of the balance between genetics and environmental risk - to what extent illness is the result of faulty genes inherited from our parents, or due to our lifestyle.

There are several serious single gene disorders, like cystic fibrosis, huntington's disease, and some forms of breast cancer.

But most conditions are a complex combination of multi genetic factors and environment.

Furthermore, the language of the genome - the six billion As, Ts Cs, and Gs - is still largely a mystery - we do not yet really know what most of the code means.

Much to learn

Steven Brenner, professor of biology at University of California, Berkeley, said: "We don't understand much about the genome yet despite all the years we've been studying it, although new technologies are enabling us to learn about it faster and faster.

"At best we understand what 1% of the genome does, but even within that 1%, where we see variations between individuals, in most cases we can't reliably say what the impact of that variation is."

But such is the excitement and promise of mass gene mapping that it has prompted the creation of medicine's richest prize.

Some $10m is on offer to the first company that can sequence 100 genomes in ten days, for $10,000 or less each.

The money for the Archon X PRIZE comes from a Canadian industrialist Stuart Blesson who made his fortune in diamond mining.

Andrew Wooton, from the X PRIZE foundation, says its goal is to bring about radical breakthroughs for the benefits of humanity.

He said: "The future that we all envisage is the day when every infant has their genome sequenced at birth and we utilise that information to optimise health throughout their life and enable customised personalised medicine."

That would raise issues of privacy and discrimination. What would happen if insurance companies or employers got to look at the genomes of individuals?

The beginning of the genome generation, with all its promise and potential problems, may soon be with us.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/7954968.stm

Published: 2009/04/08 16:02:26 GMT

Great Wall of China 'even longer'

The Great Wall of China is even greater than previously thought, according to the first detailed survey to establish the length of the ancient barricade.

A two-year government mapping study found that the wall spans 8,850km (5,500 miles) - until now, the length was commonly put at about 5,000km.

Previous estimates of its length were mainly based on historical records.

Infra-red and GPS technologies helped locate some areas concealed over time by sandstorms, state media said. The project found that there were wall sections of 6,259km, 359km of trenches, and 2,232km of natural defensive barriers such as hills and rivers.

The study was carried out by the State Administration of Cultural Heritage and the State Bureau of Surveying and Mapping.

Barricade

Experts said the newly-discovered sections of the wall were built during the Ming Dynasty (1368-1644), and stretch from Hu Mountain in northern Liaoning province to Jiayu Pass in western Gansu province.

The project will continue for another 18 months in order to map sections of the wall built during the Qin (221-206BC) and Han (206BC-9AD) Dynasties, the report said.

The wall, the world's largest man-made structure, was built to protect the northern border of the Chinese Empire.

Archaeologists had lobbied for the survey to be done to provide scholars with an accurate understanding of the construction.

Known to the Chinese as the "long Wall of 10,000 Li", the Great Wall is in fact a series of walls and earthen works begun in the 5th Century BC and first linked up under Qin Shi Huang in about 220BC.

It was listed as a Unesco world heritage site in 1987.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/asia-pacific/8008108.stm

Published: 2009/04/20 13:22:33 GMT

Oxfam warns of climate disasters

The number of people hit by climate-related disasters is expected to rise by about 50%, to reach 375m a year by 2015, the UK-based charity Oxfam says.

Current humanitarian systems are barely able to cope, an Oxfam study contends.

It warns agencies are in danger of being overwhelmed by events such as flooding, storms and drought. The group called for a radical shift so that humanitarian aid is sent impartially, instead of on the basis of political or other preferences.

Oxfam's Rob Bailey told the BBC a big increase was needed in aid spending, but that the problem was not just about the amount of money. "We need to see that money spent in better ways," he said.

"At the moment, poor people in the developing world who are facing up to these disasters, they are almost facing a kind of lottery on a global scale." He said that in 2004, the equivalent of more than $1,200 (£823) was spent on each victim of the Asian tsunami, compared with just $23 per person for the recent crisis in Chad.

"There's a huge mismatch in where the money goes," said Mr Bailey.

Oxfam is also calling for a greater focus on helping countries and communities to prevent, and prepare for the suffering that climate change will cause.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/science/nature/8009412.stm

Published: 2009/04/21 00:44:32 GMT

Fears over web health revolution

Concerns have been raised about the use of the internet and new technologies to revolutionise health care.

There has been a rise in the use of online drug sales and private DNA tests and scans in recent years, says the Nuffield Council on Bioethics.

But the independent group said such changes may be putting patients at risk or leading to unnecessary alarm.

Nuffield officials said more regulation may be needed and have launched a consultation to discuss the issues.

The group said it wanted to hear about patients' experiences and the views of private companies offering these services.

THE HEALTH REVOLUTION
- **Body imaging** - Private firms are promoting the use of MRI and CT scans to give people a so-called "MoT" to check for early tumours and heart problems, but there have been reports of misleading results and unnecessary exposure to radiation
- **DNA profiling** - The NHS uses more than 300 different types of genetic testing for things such as Huntingdon's disease and Cystic Fibrosis, but a host of other unproven tests are also being offered privately
- **Online drug purchasing** - Some 2m people in the UK use the internet to buy drugs, but the web also allows unregulated sales, which doctors have said could be potentially harmful
- **Internet health information** - People can use sites such as WebMD and AskDrWiki to diagnose problems, but GPs have reported a surge in the "worried well" coming to them with concerns prompted by internet searches

The council said there was a whole host of questions that needed to be addressed about a range of services.

For example, it said the information provided by DNA profiling or body imaging using MRI and CT scans could be misleading and difficult to interpret.

Professor Christopher Hood, an Oxford University expert who is heading the consultation, said this could sometimes have a knock-on effect on the NHS with people coming to it with unnecessary medical worries.

The consultation paper also raised concerns about the selling of drugs on the internet.

Last week a poll of GPs found that one in four had treated patients for adverse reaction to medicines bought online.

Professor Hood said: "Cutting out the GP may sometimes be a good thing, providing us with convenience, privacy and control over our health.

"But there is not much regulation of these new services and we may be getting information that causes more harm than good."

Benefits

But the consultation also said the advance in technology could offer opportunities to the NHS.

One of the examples given was the use of telemedicine in rural areas to allow GPs and patients to use TV link-ups for consultations.

Nuffield director Hugh Whittal said: "There is a range of benefits to be had, but it is only right some questions are asked about risks, the quality of information, equity of access and the impact on the NHS."

Professor Steve Field, president of the Royal College of GPs, said: "I think this just reinforces the need for patients to have a GP.

"Doctors should be empowering patients and help them understand and navigate their way through what is being offered."

But he also warned patients to be wary of some of the services being offered by private firms.

Meanwhile, a leading scientist has questioned the emphasis being placed on genetic research.

Since the human genome was mapped in 2003, there has been significant investment into genes in the belief that cures could be found for everything from cancer to diabetes.

But Professor Steve Jones, head of the biology department at University College London, said: "We thought it was going to change our lives, but that has turned out to be a false dawn."

He said the current "scattergun" approach needed to be re-thought as money may be better spent elsewhere.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/8008361.stm

Published: 2009/04/20 23:21:56 GMT

Psoriasis link to health problems

Women with psoriasis have an increased risk of developing diabetes and high blood pressure, a study suggests.

Harvard Medical School researchers believe the inflammation associated with the chronic skin condition may be to blame.

The study published in Archives of Dermatology study follows other work linking psoriasis with health problems.

The condition, which affects up to 3% of the population, is linked to an over-active immune system.

" **These data illustrate the importance of considering psoriasis a systemic disorder rather than simply a skin disease** "
Harvard Medical School

It causes skin cells to divide too fast, leading to the formation of scaly "plaques" of unshed cells on the surface.

The Harvard team focused on 78,000 female nurses who were free of diabetes and high blood pressure at the start of the 14-year study.

Women with psoriasis were 63% more likely to develop diabetes and 17% more likely to develop high blood pressure than women without psoriasis.

The link remained strong even after taking into account factors such as age, body mass index and smoking.

Insulin resistance

The researchers said that inflammation was a known risk factor for high blood pressure, and may also contribute to insulin resistance, a condition which often leads to type 2 diabetes.

Alternatively, they suggested that use of steroid therapy or other treatments for psoriasis may in some raise the risk of both conditions.

Writing in the journal, they said: "These data illustrate the importance of considering psoriasis a systemic disorder rather than simply a skin disease.

"Further research is needed to better understand the mechanisms underlying these associations and to find out whether psoriasis therapy can reduce the risk for diabetes and hypertension."

The Psoriasis Association said ciclosporin, a tablet used to treat moderate to severe psoriasis, had been linked to high blood pressure.

However, it said the extent of the relationship between drug therapy and problems such as diabetes and high blood pressure was unclear.

"We would urge anyone concerned about developing diabetes or high blood pressure to make an appointment to discuss it with their GP."

Ellen Mason, of the British Heart Foundation, agreed further research was needed fully to understand the effect of psoriasis on the inside of the body.

She said: "As psoriasis is already a difficult, long term condition to endure, it is important to reassure people that there were many women with psoriasis that did not develop diabetes or high blood pressure during the course of the study."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/8008038.stm

Published: 2009/04/20 23:02:07 GMT

First Novels Belong in the Basement: Against Self-Publishing

New West Books editor Jenny Shank offers five simple rules for publishing.

By Jenny Shank, 4-08-09

A few months ago, my parents got a letter in the mail from the Center of the American West that said I was invited to a banquet and the organizers wanted to give me some more money for a writing prize I'd won ten years ago. Back then, I was in grad school in Boulder and I was working on my first novel, which I entered in the Center's first annual Thompson Awards for Western American Writing competition. There was no page limit, so instead of selecting a few chapters, I actually sent the entire manuscript I had at the time, and some poor souls apparently read 250 of my pages and gave me one of the prizes, perhaps as a nod to my audacity.

The Thompson family increased the awards over the last decade and they want to give us early winners more money to make up for the difference, bless them. Extra money for no additional work? Sure, I'll take it. But I have already earned my reward, because my first novel is sitting in my basement, where it should be.

In fact, let's make that a rule:

1) Every house should have a first novel in its basement.

It gives the home ballast. It lends the basement the appropriate air of mystery, history, and parental dreams deferred that all basements should have. The longer the book, the better. Epic works of over 400 pages, like mine, really serve to anchor a house.

That's why the proliferation of self-publishing makes me uneasy. It robs future basements of their unbound novels, hastily stuffed into over-sized manila envelopes. There are lots of options for people looking to self-publish these days—CreateSpace, BookSurge, Lulu. It couldn't be easier or more convenient. But I suggest that if you can't find a publisher for your novel, instead of self-publishing, give it to a neighbor who doesn't have a novel in his basement.

Whatever you do, don't self-publish and then send the book to me for review.

Blogs are great vehicles for unedited self-expression, as are newsy Christmas letters, and even self-published nonfiction books on overly specific topics, such as the mating habits of Red-winged Blackbirds in Northern Colorado, about which I know a little.

But first novels belong in the basement. There's got to be something frightening for the children to discover, some reason for them to dare each other to go down there.

I was 21 when I started writing my first novel. Just a kid. I should have been out drinking, but I had grand ambitions. I gave it some awful title derived from a phrase in the Bible. Let's make that a rule, too:

2) All first novels should have titles derived from the Bible and/or Shakespeare.

The manuscript should be placed in a spot of the basement that's prone to flooding, because a flood hitting the manuscript on which you wasted your youth is kind of biblical, which goes along with the title. And using a title from the Bible or Shakespeare is also Faulknerian. Everyone starting out of the blocks thinks they're going to be Faulkner. You've got to, or you wouldn't start at all.

My novel concerned a girl's high school basketball team in Denver. But it didn't stop there. I decided to cram the entire modern history of Denver into it, for good measure. I did a lot of research. I went to libraries and looked at newspaper articles on microfilm or microfiche—I get those ancient technologies confused. I ordered dissertations through inter-library loan. There was one dissertation about Denver's history of busing for racial integration that was so fine I had planned to thank its author on my acknowledgments page. (Don't mock: you've planned out your acknowledgment page, too, or your Oscar acceptance speech or your post-game interview with ESPN or the heartfelt way you'll thank Terry Gross or Oprah for finally having you on the show.)

I would thank the author of that dissertation here if all of my notes for my first novel hadn't been lost in the transfer three computers ago. They might be on some ancient storage device that I can no longer access, like a floppy disk, the very name of which brings me a rush of nostalgic glee. Technology's relentless march is yet another reason why you should print out your first novel, once, and place it in the basement.

Every so often, you'll be struck by idea that maybe your novel isn't as bad as you remember. That's why you've got to keep it in the basement, so you can go down there, read a few pages, and disabuse yourself of that notion.

Some first novels are great, and they sail right through the publishing process, into bookstores and touch the hearts of millions. But most first novels belong in the basement. Most of us have to keep writing past the point where we've lost all hope to make something happen, to keep writing when you no longer have any time or any reasonable reason to continue doing what you're doing. The more broken and hopeless you become, the more cynical you get, and cynicism can be funny. Because first novels are written before you've really started to fail, they often take themselves too seriously. I say, marinate in your failure until you're properly cynical because, here comes rule three:

3) Cynicism can be funny. And that will make your second novel better.

Let's move right along to rule four:

4) If you value your marriage, don't make your spouse read your first novel.

No good can come of that. If he says, "It's great, Honey," you'll know he's lying just to avoid upsetting you. If he says, "It needs some work," you'll agree with him but silently, you'll seethe, remembering that one great metaphor you had on page 67.

One last rule:

5) Just because you might have won a prize for your first novel or had a chapter of it published in some journal, that doesn't mean it shouldn't stay in the basement.

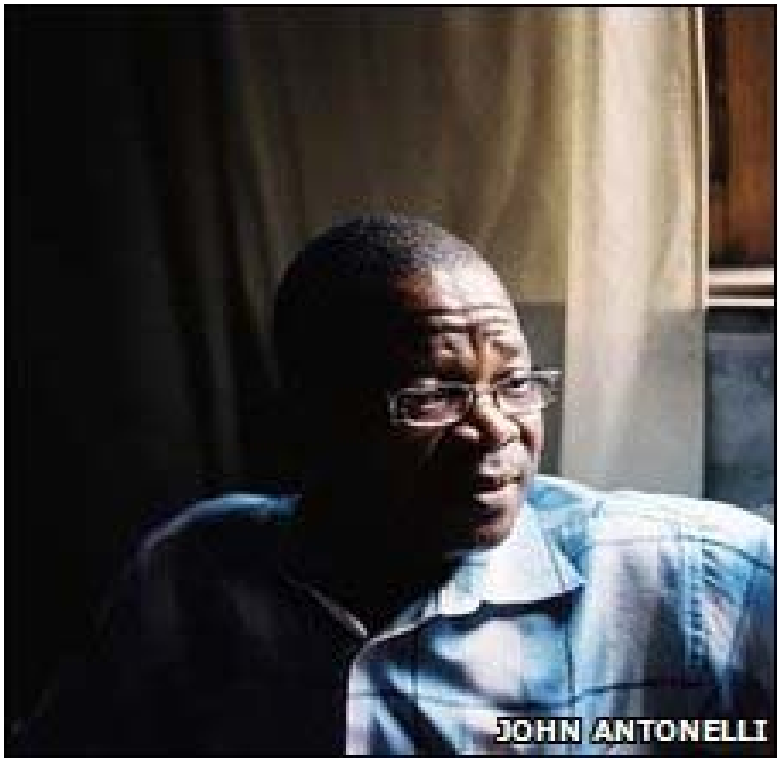
It'll feel more comfortable down there in the basement with a few laurels to rest on. So with my first novel lodged happily in my basement, near the window well that might run over with spring thaw at any moment, I'll head to the Thompson Award banquet later this month and enjoy myself as I reminisce about the novel of my youth.

http://www.newwest.net/topic/article/first_novels_belong_in_the_basement_against_self_publishing/C39/L39/

'Green Nobel' for forest champion

By Victoria Gill
Science reporter, BBC News

A campaigner who was jailed during his battle to save the rainforest in Gabon has received a top international award.



Marc Ona Essangui was honoured for his fight to stop what he describes as a destructive mining project in the Ivindo National Park.

He is one of seven people from six continental regions to be awarded an equal share of the $900,000 (£600,000) 2009 Goldman Environmental Prize.

It has been described as "the Nobel Prize for grassroots environmentalism".

Mr Ona has campaigned for three years against the Belinga mine project - a deal between the government in Gabon and the Chinese mining and engineering company, CMEC, to extract iron ore.

The project includes the construction of a large hydroelectric dam, which is already underway, to provide power for the mine.

The dam is being built on the Ivindo River, near the Kongou Falls, Gabon's highest waterfall.

Mr Ona, who described the falls as "the most beautiful in central Africa", said that Gabon's government had failed to consult the local population and had not assessed the impact of the development on the environment before it gave permission for construction to begin.

He told BBC News that he hoped his receipt of the Goldman Prize would "draw international attention to just how precious this area is".

Political protest

Mr Ona, who uses a wheelchair, dedicated his early career to improving education and communication infrastructure in Gabon, including working with the United Nations Development Programme. He later turned his attention to environmental issues.

He eventually decided to focus his efforts full time on the work of his own environmental NGO, Brainforest, which aims to protect the rainforest for the benefit local of communities.

"The government established 13 national parks here, and I became interested in all the activities within them," he said.

"In 2006, my colleagues and I noticed that roads were being built within Ivindo."

When Mr Ona investigated, he discovered that there had been no environmental impact studies carried out before the road building started.

On its website, the Gabonese government describes the national parks as having been "classified for the conservation of Gabon's rich biodiversity".

" **I want to set up a clinic where the local people can be treated using traditional medicine** "
Marc Ona Essangui Brainforest

The key goals of the national park scheme, it says, are preservation of "the wealth of the ecosystem… for current and future generations" and stimulating "the development of ecotourism as an economic alternative to the exploitation of natural resources".

Mr Ona said: "All of this construction was carried out illegally and against the code of the national parks."

He also unearthed and leaked a copy of the Belinga mine project agreement between the government and CMEC, revealing that CMEC had been offered a 25-year tax break as part of the deal.

"When we really started to look into the deal, we noticed that it was China, not Gabon, that was the major beneficiary," he said.

Under pressure

He and his colleagues embarked on their campaign, working with other environmental NGOs, holding news conferences and meeting with local communities.

"The government even motivated some protests against the NGOs involved," he recalled.

"They alleged that we were working [on behalf of] Western powers, and we received a lot of pressure to stop the campaign."

This culminated in Mr Ona being arrested and charged with "incitement to rebellion".

He was jailed by the Gabonese judicial police on 31 December 2008; but following an internationally co-ordinated campaign for his release, he was freed on 12 January 2009.

Since June 2006, however, he has been banned from travelling outside the country.

His passport was returned to him only 24 hours before he was due to travel to San Francisco for the Goldman award ceremony.

There has been no construction in Ivindo for almost a year, but Mr Ona says this has more to do with the economic crisis and the price of iron ore than with the Gabonese government backing down.

He has no plans to give up his quest.

"Some of the money from this award will go to the functioning of Brainforest, and the rest will be allocated to setting up small- and medium-sized businesses for local communities," he said.

"I want to set up a clinic near Ivindo where the local people can be treated using traditional medicine. Some of the money will serve to establish this health centre for all of those communities."

No fear

The organisers of the Goldman Prize describe the six winners as "a group of fearless grassroots leaders, taking on government and corporate interests and working to improve the environment for people in their communities".

Among the other 2009 recipients are Maria Gunnoe from West Virginia, US, who has faced death threats for her outspoken activism to stop destruction of the Appalachia by the coal industry.

Also rewarded are Russian scientist Olga Speranskaya, who connected NGOs across Eastern Europe and the Caucasus region to identify and safely remove toxic chemical stockpiles, and Rizwana Hasan, Bangladesh's leading environmental attorney, whose legal advocacy led to tighter regulations on the ship-breaking industry.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/science/nature/8000936.stm

Published: 2009/04/19 15:57:35 GMT

Key role of forests 'may be lost'

By Mark Kinver
Science and environment reporter, BBC News

Forests' role as massive carbon sinks is "at risk of being lost entirely", top forestry scientists have warned.

The International Union of Forest Research Organizations (IUFRO) says forests are under increasing degrees of stress as a result of climate change.

Forests could release vast amounts of carbon if temperatures rise 2.5C (4.5F) above pre-industrial levels, it adds.

The findings will be presented at the UN Forum on Forests, which begins on Monday in New York.

Compiled by 35 leading forestry scientists, the report provides what is described as the first global assessment of the ability of forests to adapt to climate change.

" **The fact remains that the only way to ensure that forests do not suffer unprecedented harm is to achieve large reductions in greenhouse gas emissions** "
Professor Andreas Fischlin, Assessment co-author

"We normally think of forests as putting the brakes on global warming," observed Professor Risto Seppala from the Finnish Forest Research Institute, who chaired the report's expert panel.

"But over the next few decades, damage induced by climate change could cause forests to release huge quantities of carbon and create a situation in which they do more to accelerate warming than to slow it down."

Debate defining

The scientists hope that the report, called Adaption of Forests and People to Climate Change - A Global Assessment, will help inform climate negotiators.

The international climate debate has focused primarily on emissions from deforestation, but the researchers say their analysis shows that attention must also be paid to the impacts of climate change on forests.

While deforestation is responsible for about 20% of greenhouse gas emissions from human activities, forests currently absorb more carbon than they emit.

But the problem is that the balance could shift as the planet warms, the report concludes, and the sequestration service provided by the forest biomes "could be lost entirely if the Earth heats up by 2.5C or more".

The assessment says higher temperatures - along with prolonged droughts, more pest invasions, and other environmental stresses - would trigger considerable forest destruction and degradation.

This could create a dangerous feedback loop, it adds, in which damage to forests from climate change would increase global carbon emissions that then exacerbate global warming.

The report's key findings include:

• Droughts are projected to become more intense and frequent in subtropical and southern temperate forests

• Commercial timber plantations are set to become unviable in some areas, but more productive in others

• Climate change could result in "deepening poverty, deteriorating public health, and social conflict" among African forest-dependent communities

The IUFRO assessment will be considered by delegates at the eighth session of the UN Forum on Forests, which has the objective of promoting the "management, conservation and sustainable development of all types of forest".

Co-author Professor Andreas Fischlin from the Swiss Federal Institute of Technology commented: "Even if adaption measures are fully implemented, unmitigated climate change would - during the course of the current century - exceed the adaptive capacity of many forests.

"The fact remains that the only way to ensure that forests do not suffer unprecedented harm is to achieve large reductions in greenhouse gas emissions."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/science/nature/8004517.stm

Published: 2009/04/18 09:52:13 GMT

Pancreatic cancer therapy 'hope'

Promising early results for a drug for pancreatic cancer have been reported by a team of UK and US scientists.

The drug, which targets a molecule called PKD involved in tumour growth, also seemed effective in animal tests on lung cancer, the researchers said.

The findings are especially encouraging because there are few treatments available and survival is poor.

Human trials should start within 18 months, the American Association for Cancer Research conference was told.

" **This would mean it offers a double action treatment but this needs to be proved through further work** "
Dr Sushovan Guha, researcher

PKD is a family of molecules called kinases which provide a signalling function between the outside and inside of the cell.

Also involved in cell survival and the formation of new blood vessels, PKD was discovered to be potentially key target in tumours by UK researchers some years ago.

A team at Cancer Research Technology Ltd - a company owned by Cancer Research UK - then developed molecules which would inhibit the effects of PKD.

The latest results on the resulting drug, known as CRT0066101, show it inhibits the growth of pancreatic tumours in mice and works in lung cancer models.

It is thought that future studies may show the drug to be effective on a wider range of cancers.

Human trials should be starting after safety studies have been completed, they researchers said.

'Unmet need'

CRT's discovery laboratories director Dr Hamish Ryder said the team focused on pancreatic and lung cancer tumours because they are cancers with a "significant unmet medical need".

Dr Sushovan Guha, who leads the laboratory at MD Anderson Cancer Center and collaborated in the project, added he was optimistic about the drug's potential.

In addition to killing cancer cells, it is hoped the drug will stop tumours growing and spreading by blocking blood vessel growth.

"This would mean it offers a double action treatment but this needs to be proved through further work."

Sue Ballard, the founder of Pancreatic Cancer UK, said the disease caused 5% of cancer deaths but only received 1% of disease funding.

"There is a great lack of really effective treatments, surgery gives the best chance if done early but even in that situation it can recur or spread.

"This research is in the very early stages but anything that's starting to show promising results is vitally needed."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/8004980.stm

Published: 2009/04/18 23:03:38 GMT

Hope for child cancer treatment

Scientists believe they may have found a way to treat a type of childhood cancer of the nervous system.

Neuroblastoma accounts for around 7% of all childhood cancers, and around one in six cancer deaths in children. Research by a German team suggests blocking the activity of a protein called Aurora may turn cancerous cells back into a non-malignant state.

The study, published in the journal Cancer Cell, raises hopes of new drugs to treat the condition.

" **There is a desperate need for new therapies for neuroblastoma** "
Mark Matfield Association for International Cancer Research

Neuroblastoma, found most commonly in children under the age of five, is a cancer of specialised nerve cells, called neural crest cells. These cells are involved in the development of the nervous system and other tissues. Tumours often develop in one of the adrenal glands, but may also form in nerve tissues in the neck, chest, abdomen, or pelvis.

The most aggressive forms are fuelled by the build up of a protein called Myc in the cells.

Reversing build up

A team at the University of Marburg in Germany found that Aurora stops cells from destroying the Myc protein, causing a build-up which makes the cells cancerous. They believe that inhibiting Aurora's activity would allow Myc to break down normally. In theory this would mean that cancerous cells would revert to a healthy state.

Lead researcher Professor Martin Eilers said: "We are very excited by our findings which may pave the way for the development of drugs to fight this rare but deadly cancer." Mark Matfield, of the Association for International Cancer Research, which funded the study, stressed the research was at an early stage.

But he said: "This is an important development - there is a desperate need for new therapies for neuroblastoma. "It is one of the most difficult childhood cancers to treat successfully."

Dr Penelope Brook, a child cancer specialist at London's Great Ormond Street Hospital, said the research was a "potentially very exciting" development in the treatment of what could be a "very worrying" disease.

However, she said: "There are a number of new potential treatments coming through for neuroblastoma, but it will not be until clinical trials have been carried out that we will know which one will be of most use.

"Sometimes treatments appear very active in cell cultures, or even animal models, but sadly they do not translate into improvements in clinical outcomes."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/7811161.stm

Published: 2009/04/17 23:01:12 GMT

Many unaware of alcohol calories

Many people are unaware of the calorie content of alcohol, a survey shows.

Four in 10 did not know a glass of wine has the same calories (120) as a slice of cake, or that a pint of lager and a small sausage roll have 170 each.

The poll of 2,000 adults in England was carried out as part of the government's drive to curb people's drinking habits.

The campaign also stresses that a heavy drinking session is often followed by an unhealthy breakfast, which again helps to pile on the pounds.

The Know Your Limits campaign has in the past focused on other consequences of drinking, such as disease risk.

But to coincide with the focus on weight, the Department of Health carried out research showing a regular beer drinker, who downed five pints a week or 250 over the course of a year, packed away the same number of calories as someone eating 221 doughnuts over the space of 12 months.

It also revealed the average wine drinker consumed 2,000 calories each month. Over the course of a year, that is the equivalent of eating an extra 38 roast beef dinners.

Health minister Phil Hope said: "Regularly drinking more than our recommended daily limits can have a knock-on effect on our health, including an expanding waistline.

"It's not only the calories in the drinks themselves that can help to pile on the pounds, we're also more likely to eat fatty foods when we've had one too many."

Heather Caswell, of the British Nutrition Foundation, added: "Most people would baulk at consuming a full glass of single cream, but wouldn't think twice about a couple of pints.

"But the calorie content is similar and, over time, excess alcohol intake is likely to lead to weight gain."

And a spokesman for the Drinkaware Trust added: It's imperative we are in the know when it comes to what we are drinking. "

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/8002991.stm

Published: 2009/04/17 04:47:13 GMT

1970s lifestyle 'protects planet'

Getting back to the relatively slim, trim days of the 1970s would help to tackle climate change, researchers say.

The rising numbers of people who are overweight and obese in the UK means the nation uses 19% more food than 40 years ago, a study suggests.

That could equate to an extra 60 mega-tonnes of greenhouse gas emissions a year, the team calculated.

Transport costs of a fatter population were also included in the International Journal of Epidemiology study.

Dr Phil Edwards, study leader and researcher at the London School of Hygiene and Tropical Medicine, said they had set out to calculate what the UK energy consumption would be if the weight of the population was put back a few decades.

" **Staying slim is good for health and for the environment** "
Dr Phil Edwards

A "normal" adult population, where only 3.5% are classed as obese, was compared with a population where 40% are obese.

These populations reflect the proportions of overweight and obese people living in the UK in the 1970s - and what is predicted for the UK in 2010, the researchers said.

In addition to calculating the increased food costs of the heavier population, the team worked out how much additional fuel would be needed for transportation of modern-day UK compared with the 1970s version.

Greenhouse gas emissions from food production and car travel in the fatter population would be between 0.4 to 1 giga-tonnes higher per 1bn people, they estimated.

Heavier

And people are generally bigger than they were three decades ago.

Between 1994 and 2004, the average male body mass index (BMI) in England increased from 26 to 27.3, with the average female BMI rising from 25.8 to 26.9 which equates to about 3 kg - or half a stone - heavier.

"This is not really just about obese people, the distribution of the whole population is what's important," said Dr Edwards.

"Everybody is getting a bit fatter."

"Staying slim is good for health and for the environment.

"We need to be doing a lot more to reverse the global trend towards fatness, and recognise it as a key factor in the battle to reduce emissions and slow climate change."

It is not just a UK issue - in nearly every country in the world, the average BMI is rising.

Professor Alan Maryon-Davis, president of the Faculty of Public Health said shifting the population weight distribution back to that of the 1970s would do quite a lot to help the planet.

"In the 1970s we had bigger portions of vegetables and smaller portions of meat and there's been a shift in the amount of exercise we do.

"All these things are combining to hurt the planet and this is a calculation that deserves a bit more attention," he said.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/8004257.stm

Published: 2009/04/20 00:28:50 GMT

Switch-on success for superscope

By Rebecca Morelle
Science reporter, BBC News

The first stage of the switch-on of one of the world's most powerful stargazing systems has got under way.

Seven radio telescopes around the UK have been linked with optical fibres, allowing scientists to probe deeper into the Universe than ever before.

The new data-link upgrade has replaced the older microwave technology that once connected the telescopes.

Tim O'Brien, from the e-Merlin project, said: "It will be a revolution in terms of what we can do with our astronomy."

Astronomers at Jodrell Bank say that the e-Merlin array will be fully operational later this year.

Radio telescopes work by collecting radio waves emitted from objects many light-years away, allowing scientists to look deep into the cosmos.

But a single telescope - even one as huge as the 76m-wide Lovell telescope at Jodrell Bank in Cheshire, where e-Merlin's headquarters is based - is limited in terms of what it can see.

So astronomers combine the power of several telescopes spread over a wide area, in essence creating the effect of a giant "superscope".

For the last 20 years, seven telescopes that are spread across UK have been joined together in this way to form an array.

However, the older microwave technology that once connected them was only able to return a fraction of the data that was being recorded.

Dr O'Brien, who is head of outreach at Jodrell Bank and a senior lecturer in astrophysics at the University of Manchester, told BBC News: "It's like using a very narrow pipe to transfer information - and in fact, with microwaves, most of the signal we pick up at the radio telescopes never makes it back to Jodrell Bank."

" **It is like moving from a dial-up connection on the internet to a broadband one** "
Dr Tim O'Brien

Over the past six years, a huge project has been underway to swap the older microwave links for hundreds of kilometres of optical fibre cables, which are buried beneath the ground. These thin "pipes" can carry reams of data, and scientists believe they will give the e-Merlin telescope array a new hi-tech lease of life.

Dr O'Brien explained: "It is like moving from a dial-up connection on the internet to a broadband one.

"It means we will now be able to get all of the signal back from the telescopes. We'll be able to do in one day what would have previously taken us three years to do."

This extra data will allow astronomers to see objects in the Universe in much finer detail than was previously possible, and it will also enable them to study parts of the cosmos that have never been seen before.

Professor Simon Garrington, director of the e-Merlin project, said: "This combination of a boost in resolution and sensitivity will allow a whole community of scientists in the UK and around the world to address some of the key questions in astronomy today.

"These questions cover the whole range of astronomy, from the formation of Earth-like planets to the physics that governs how stars of different types are formed." In 2007, the iconic Lovell telescope at the Jodrell Bank Observatory, which forms a key part of the e-Merlin array, celebrated its 50th anniversary.

Sir Bernard Lovell, who founded Jodrell Bank, told the BBC that the longevity of the observatory and the string of discoveries it has led to has continued to surprise. He said: "It is astonishing that despite all the new developments and all the new instruments that have been designed, the Jodrell telescope still has such an important use."

Funding struggles

The road to getting the e-Merlin project up and running has not been problem free. Last year, e-Merlin, along with a number of other high-profile physics and astronomy projects, were put at risk thanks to an £80m shortfall in science funding.

However, it was given a last-minute reprieve after the Science and Technology Facilities Council (STFC) agreed to continue funding it.

In the coming years, Jodrell Bank is set to become the headquarters to an even bigger project.

The Square Kilometre Array (SKA), which will be based in either Australia or South Africa, will link thousands of telescopes spread over thousands of kilometres, creating a system 50-times more powerful than anything we have now. Scientists say the technology developed for the e-Merlin array will be key for developing the SKA.

The e-Merlin project has been funded by the STFC, Northwest Regional Development Agency, the University of Manchester, the University of Cambridge and Liverpool John Moores University.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/science/nature/7828174.stm

Published: 2009/04/20 04:43:23 GMT

American Quilt

By LEAH HAGER COHEN

FOLLOW ME

By Joanna Scott

420 pp. Little, Brown & Company. $24.99.

Sally's quite a gal. She can crack a walnut with her front teeth and laugh the bark off a pine tree. She can mollify an ornery bear by dancing with him, and sing accompaniment to boot. No wonder: ever since she quit home for the frontier as a slip of a girl, she's had to face down any number of threats. Why, by her own estimation she can out-grin, outrun, out-lift and out-lie any old scoundrel.

That's Sally Ann Thunder Ann Whirlwind, heroine of traditional Davy Crockett stories — not to be confused with Sally Bliss (a k a Sally Werner, Sally Angel and Sally Mole) — heroine of Joanna Scott's latest novel, "Follow Me." But the Sallys bear more than a passing resemblance, just as "Follow Me" owes a lot to the tradition of the American tall tale.

Consider that Scott's Sally also runs away from home at a tender age, with no more plan than to follow the meandering (and made up) Tuskee River. Consider that she sings like a nightingale, eliciting praise from even the surliest of sources. Consider that she's got pluck enough to face down a gauntlet of drunks, a loaded pistol and a bully who beats her nearly to death, knocking out two of her teeth. So much for cracking walnuts. But Sally's not beaten, no, Sally's not broken, not so long as she can keep reinventing herself, keep moving north with the current, toward the mouth of the great Tuskee.

And Sally's not alone. Most of the characters in "Follow Me" are drawn with the bold, primitive lines of a woodcut, or — updating the allusion for the mid-20th century, when the story begins — a cartoonist's abbreviated stroke. There's "grizzled old" Swill Jackson and his "stuttering brother," Mason; boozy Gladdy Toffit, prone to getting so drunk "she couldn't think straight"; brash Benny Patterson, the "cream-cheese prince," careening around in his green Cadillac; and cheery Penny Campbell, a "freckled girl . . . in a hurry to get going with life." Even minor characters have names that would render them right at home in a vintage comic strip: Miss Krumbaldorf, Melvin Trotter, Bruce Brewster, Walter Stackhouse, Dara Bliss.

Scott, the author of nine other books (including "The Manikin," a finalist for the Pulitzer Prize), has here fashioned a densely stitched crazy quilt of a story that spans more than 60 years (from 1946 to 2008) and borrows from the conventions of a wealth of genres — not only tall tale but also historical novel, oral history, magical realism, bildungsroman, epic and soap. Everything about this book feels oversized, overstuffed. The prose style itself pays homage to variety, veering from folksy to Socratic to exclamatory to echolalic.

Not every patch serves this quilt equally well. Passing references to such real-life news items as the assassination of John F. Kennedy, the death of Mama Cass and the conditions at Guantánamo seem both unnecessary and obtrusively Gumpian. And we might have done with an abridged version of the 50-page section representing a transcript of audiotapes recorded by one garrulous character. But on the whole there's a lusciousness to all the excess, an egalitarian sensibility in keeping with the most quintessential aspects of American mythology.

Even the voice of the narrator turns out to be a mishmash. The novel is presented as an account pieced together and told by Sally's granddaughter and namesake — but other voices (an invisible Greek chorus? Sally's conscience, divided?) keep leaking in:

"Hurry up, Sally!
She can't hear you.
Dreamin' a dream of no return.
Good-bye, Sally.
Aw, let's give her another chance. . . .
Shhh.
What's going on?
She's waking up!"

Such interjections remind us that the narrative is not really in the hands of young Sally at all, derailing our suspension of disbelief. But the effect, though disconcerting, is not clumsy. Certainly, it's not unintended. At best, it produces a weird thrill. Whether readers find these voices annoying or tantalizing is likely to correspond to their appetite for indeterminacy, since we never learn to whom they belong. Scott drops a hint in the novel's early pages, where she describes legendary beings called Tuskawali, whom the "natives" believed were "the sacred incarnations of fate." These water-dwellers, we are informed, "have the faces and hair of humans and the spotted bodies of tadpoles." They turn out not to figure much in the plot, appearing — or rather, half-appearing — only a handful of times: once, while crossing a creek, Sally feels "a cold, wet wormy thing" on the back of her leg and flicks it off; a decade later, miles downriver, she glimpses "some kind of water snake or maybe a salamander or a newt," its "long-fingered hands clinging to the curve of a rock." These brief encounters function to communicate Sally's belief in "a magical being," but how, or whether, such a belief informs her actions remains less certain.

Although great at adapting to whatever chance brings, she's less adept at scripting her own course. Like a leaf being buffeted downstream, Sally lets herself be borne along by life's current, receiving with apparent equanimity unprovoked fortune and misfortune alike. She roams from town to town, encountering strangers who take her in as well as those who cast her out, all the while existing in a fog of moral relativism that allows her to abandon her newborn baby; steal from an old man who has treated her kindly; mooch off a lonely drunk; act as such a "bad influence" on a teenage boy that people blame her for his death; desert a friend on her wedding day without farewell or explanation; conduct an affair with a married man; neglect her daughter to the point of driving her away; and tell lie after lie after lie. Her resilience may be heroic, but she's no saint.

The one thing she tends faithfully throughout her peripatetic existence is the dream of reclaiming her firstborn — the baby she left "like a pile of fresh-baked biscuits" on her parents' kitchen table. But it's only a dream, not a goal, as we see from her single, desultory effort to locate him and her resignation thereafter to do no more than mail a $20 bill, week after week, to an address where she cannot be sure he lives. In fact, she cannot be sure he lives, period. It is the result of her selfish desire to believe he does — to insist on a dream-version of events that would relieve her of guilt — that gives the novel its somewhat strained, comedy-of-errors ending.

But perhaps Scott intends to derail us here, too. Perhaps what she's after, not only with the disembodied chatterings that comment on the narrative, but also with the improbable plot twists, is something more than our credulity. It's as though the author couldn't resist snatching up a pair of sewing scissors and, now and again, snipping a little rent in the fabric of her own work — not so much to reveal its artifice or the nothingness beyond the page, but in order to pay respect to the rush of voices, the press of consciousness, beyond her authority: a presence unseen yet avid, and undyingly alert to human endeavor.

Leah Hager Cohen, the author of three novels and four nonfiction books, is a frequent contributor to the Book Review.

http://www.nytimes.com/2009/04/19/books/review/Cohen-t.html?_r=1&8bu&emc=bua1

The End of the Trench Coat Mafia

By JENNIFER SENIOR

COLUMBINE

By Dave Cullen

417 pp. Twelve. $26.99

Had Dave Cullen capitulated to cliché while writing "Columbine," he would have started his tale 48 hours before Eric Harris and Dylan Klebold's notorious killing spree, stopped the frame just before they fired their guns, and then spooled back to the very beginning, with the promise of trying to explain how the two boys got to this twisted pass. But he doesn't. As Cullen eventually writes, "there had been no trigger" — at least none that would be satisfying to horrified outsiders, grieving parents or anyone in between. Eric Harris was a psychopath, simple as that. Dylan Klebold was a suicidally depressed kid who yoked his fate to a sadist. Instead, what intrigues the author are perceptions and misperceptions: how difficult a shooting spree is to untangle; how readily mass tragedies lend themselves to misinformation and mythologizing; how psychopaths can excel at the big con.

The broad outlines of what happened at Columbine High School in Colorado one decade ago are well known. On April 20, 1999, just weeks from graduation, Harris and Klebold murdered one teacher and 12 of their peers, making this the most lethal high school massacre in the nation, and wounded two dozen. Then they holed up in the school library and turned their guns on themselves.

Yet what's amazing is how much of Cullen's book still comes as a surprise. I expected a story about misfits exacting vengeance, because that was my memory of the media consensus — Columbine, right, wasn't there something going on there between goths and jocks? In fact, Harris and Klebold were killing completely at random that day. Their victims weren't the intended targets at all; the entire school was. Columbine, it turns out, was a failed attempt at domestic terrorism. Shortly after 11:14 a.m., the two boys hauled a propane bomb into the cafeteria, programmed to go off at 11:17. It never did. Had the massacre gone as planned, it would most likely have killed more than 500 people, yielding far less readily to rumors about high school's tribal politics.

It's to his credit that Cullen, a Denver journalist who covered the story for Salon and Slate, makes the reader care about getting it right. "Columbine" is an excellent work of media criticism, showing how legends become truths through continual citation; a sensitive guide to the patterns of public grief, foreshadowing many of the same reactions to Sept. 11 (lawsuits, arguments about the memorial, voyeuristic bus tours); and, at the end of the day, a fine example of old-fashioned journalism. While Cullen's storytelling doesn't approach the novelistic beauty of "In Cold Blood" (an unfair standard, perhaps, but an unavoidable comparison for a murder story this detailed), he writes well enough, moving things along with agility and grace. He leaves us with some unforgettable images — like the pizza slices floating aimlessly about the school commons, which was flooded with three inches of water because the sprinkler system had gone off — and he has a knack for the thumbnail sketch. "He was a shrink turned hostage negotiator turned detective, with an abridged version of the complete works of Shakespeare in the back seat of his car," Cullen writes of Dwayne Fuselier, an F.B.I. agent and one of the book's heroes. "He

could be a little stoic. Hugging his sons felt awkward but he would reach out to embrace survivors when they needed it."
Fuselier is one of the people Cullen spotlights in his retelling in order to clear up the historical record. Some of the confusion generated by Columbine was inevitable: Harris and Klebold started out wearing trench coats, for instance, but at some point removed them, giving the illusion that they were four people rather than two. The homemade pipe bombs they were tossing in all directions — down stairwells, onto the roof — only seemed to further the impression that there were more of them. And then there were the SWAT teams: students trapped inside the building would hear their rifle fire, assume it was the killers and report it to the media by cellphone, complicating the cops' efforts to keep them safe. "This was the first major hostage standoff of the cellphone age," Cullen notes. The police "had never seen anything like it."
But the most subtle distortions of the media echo chamber, it seems, did not concern logistics. They concerned motive. As early as two hours into the live coverage of Columbine, news stations began to report that something called the Trench Coat Mafia, a group of disgruntled goths, was possibly behind the attack. Many of the students, watching this coverage on classroom televisions while still trapped inside the building, began to repeat this information to reporters on the outside once they'd escaped. (And it made sense: the killers were wearing trench coats.) And so a loop began, reinforced by four eyewitnesses who said the gunmen were deliberately targeting their victims. One offered such a precise level of detail — the killers were taking aim at "anyone of color, wearing a white hat or playing a sport" — that it proved irresistible, both to students and to members of the media, who (Cullen speculates) were out of their element in this teenage universe, and therefore willing to repeat this rumor whether their "witnesses" had seen the gunmen or not. "Reporters," the author points out, "would not make that mistake at a car wreck."
Of course, tragedies often lend themselves to myths, so as to meet the needs of the day. For weeks after Sept. 11, the lovely legend persisted that the Rev. Mychal Judge, a New York Fire Department chaplain, died from falling debris when he took off his helmet to give last rites to a firefighter. As I wrote sometime later in New York magazine, that's not how he died. But people had a stake in that belief. And Columbine generated a similar tale of spiritual martyrdom. A boy who witnessed the murders in the school library told people afterward that a slain student, a fellow evangelical named Cassie Bernall, was asked by one of the killers if she believed in God. "Yes, I believe in God," he said she replied. Two other witnesses, both sitting near Cassie, heard no such thing, and Cullen goes on to say that a 911 tape from that day "proved conclusively" that she hadn't uttered these words. It didn't matter. The story caught the imagination of the evangelical world, and Cassie's mother, Misty Bernall, wrote a book, "She Said Yes," that has since sold more than one million copies.
"Columbine" is weakest when Cullen tries to channel the voice of Eric Harris. ("Five or six hundred dismemberments ought to be enough for one awesome afternoon of TV" is one such example.) As the author himself makes clear, Harris's mind isn't a particularly interesting place to inhabit — just sneering and young and unfathomably angry. But his nuanced dissection of the differences between Harris and Klebold is first-rate, leaving readers in the strange (and challenging) position of feeling pity, almost, for Klebold. Cullen walks us carefully through the definition of psychopathy, and how it differs from insanity, noting how perfectly Harris met the profile — particularly in his egomania, outsize contempt for humanity and talent for manipulation. (Just months before the attack, a teacher wrote on one of his essays, "I would trust you in a heartbeat.") Whereas Klebold, for most of the book, seems forlorn, awkward and miserable. "The anger and the loathing," Cullen explains, "traveled inward."
In case you're wondering, we don't get the granular details of Harris and Klebold's last 48 hours until the end of the book, when we know so much more it's almost beside the point. Which isn't to say some of the testimony still isn't chilling. That Sunday, in a homemade videotape, Harris addressed his parents. "They could not have stopped him, Eric assured them," Cullen writes. "He quoted Shakespeare: 'Good wombs have borne bad sons.' "
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http://www.nytimes.com/2009/04/19/books/review/Senior-t.html?8bu&emc=bua2

God and Politics

By ROSS DOUTHAT

BILLY GRAHAM AND THE RISE OF THE REPUBLICAN SOUTH

By Steven P. Miller

Illustrated. 304 pp. University of Pennsylvania Press. $29.95

When Billy Graham went to Flushing Meadows in 2005 for what was billed as the last revival in his 60-year career, he was joined on the platform by his fellow Southerner Bill Clinton. Clinton told the crowd how his Sunday school class had attended a Graham revival in Little Rock, Ark., in 1959. Despite the objections of local leaders, the former president recalled, Graham refused to segregate his services, inviting blacks and whites to worship together at a time when harmony between the races seemed impossible. "I was just a little boy," Clinton said, "and I never forgot it, and I've loved him ever since." This is one of the stories that can be told about Billy Graham and the civil rights era — a narrative that portrays the preacher's role in his native South's reluctant abandonment of segregation as essentially heroic. Graham's rise to prominence as an evangelist coincided with the turbulent years between Brown v. Board of Education in 1954 and the landmark civil rights legislation of 1964, and throughout that decade he wrote and sermonized in favor of racial harmony, staged desegregated rallies in balkanized cities, and counseled obedience to court rulings and legislation that many of his fellow Southerners were determined to resist. As a voice for both Christian conservatism and racial progress, he served as a bridge between the Old South and the New, and as a model for a region struggling to shed its worst baggage without losing its identity.

That's one story. But there's another story as well, one that paints Graham as a coward and an apologist for racial backlash. He supported desegregation but took few risks on its behalf; he cultivated a studied moderation in a time that cried out for moral clarity; he was more interested in flattering the white South's self-regard than in calling his region to true repentance. As a steadfast supporter of Richard Nixon's career, from the 1950s down through Watergate, he simultaneously enabled and embodied Nixon's "Southern strategy," which shut civil rights liberalism out of power and turned the region Republican for a generation.

Neither story is the whole truth, but both are true. And it's a credit to Steven P. Miller that his "Billy Graham and the Rise of the Republican South," a study of the evangelist's relationship to the cause of civil rights on the one hand and the cause of conservatism on the other, does justice to the tensions and complexities involved — for Graham, for the South and for the country. In Miller's account, one of 20th-century America's most important religious leaders emerges as a representative political actor as well, whose example is worth pondering less because he was courageous than because he often wasn't.
The story of the civil rights era is usually told as a collision between heroes and villains: the marchers on one side and the K.K.K. on the other; the Martin Luther Kings and Lyndon Johnsons making the way straight for justice, and the George Wallaces and Bull Connors standing sneering in their way. But the movement's successes and failures were ultimately determined by the choices of more unheroic men — men like Billy Graham.

These choices began with Graham's decision, in the early '50s, to shed the baggage of his segregationist upbringing and recast himself as a racial moderate — a critic of Jim Crow, albeit a determined gradualist where its elimination was concerned. This was a moral and theological conversion. Miller, a historian, is very good at teasing out the connection between Graham's religious views and his evolving opinions on race, and the way that doctrinal controversies within evangelical Christianity (for instance, the argument between moderates and fundamentalists over whether God is a father to all mankind, or only to all believers) intersected with political debates about racial equality. Yet it was also a career-minded conversion. The young Graham had grand ambitions for his ministry, and to become an international spokesman for Christianity, in the age of the cold war and decolonization, required distancing himself from the South's controversial institutions.

But a similar combination of theological principle and careerist caution meant that Graham's critique of segregation never went nearly as far as civil rights activists wanted him to go. He stressed individual conversion over political change, supporting legal reform in lukewarm terms while insisting that only the Gospel could really improve race relations. He maintained strong friendships with segregationist clergymen and politicians, and his attacks on racism were always tempered by deliberate hedges and straddles — denunciations of extremists on "both sides" of the debate, suggestions that race relations were worse in the North than in the South, and so forth. Where Martin Luther King used eschatological language as a spur to political change, Graham used eschatology to emphasize the limits of politics. "Only when Christ comes again," he reportedly said after King's speech at the March on Washington, "will the lion lie down with the lamb and the little white children of Alabama walk hand in hand with the little black children."

At the core of Graham's approach, Miller argues, was an evangelical view of political authority as essentially God-given and not to be lightly challenged. This made him a natural ally for presidents like Dwight Eisenhower and Johnson, who needed prominent white Southerners to serve as spokesmen for the acceptance of desegregation laws. And it enabled him, as Miller says, to "set the terms of the racial curve" that even as strident a segregationist as Wallace "would eventually round."

But it made him a fair-weather friend to the civil rights activists themselves. Graham supported the era's landmark legislation once it was passed into law, but he was a constant critic of the marches, demonstrations and acts of civil disobedience that helped make reform possible. His first commitment was always to law and order, and his first instinct was always to call for an end to further agitation.
Which is to say that the revivalist would have been a natural Nixon voter even if the two men hadn't been great friends. The Republican pitch to white Southerners included its share of racist dog whistles, but it was built primarily around appeals to self-conscious moderates like Graham, who accepted civil rights legislation but mainly wanted to put the issue behind them. Nixon's 1968 campaign reached out to the more reactionary Deep South, but it "focused on the region's growing Sun Belt metropolises," Miller writes, "invoking a rhetoric of racial colorblindness, rather than racial backlash."

By the late '60s, Graham was working both sides of this courtship — as an informal adviser to Nixon and a booster of the appealing but implausible idea that the emerging "New South" had escaped its racial demons.

The Nixon era was the high-water mark of Graham's political activism. After the embarrassments of Watergate, he retreated to the more apolitical ground that he would occupy for the remainder of his career and left the cultivation of the Sun Belt-Republican alliance to more partisan figures. But the alliance itself endured, and historians and polemicists have been wrangling over how to judge it ever since.
In one story, Sun Belt Republicanism was a coalition forged in cynicism and denial: it perpetuated real injustices while denying they existed and relied on the votes of bigots to achieve political dominance. In another telling, though, the majority that Nixon built managed to achieve something that seemed impossible at midcentury — using the rhetoric of Christianity and colorblindness to reconcile the white South to a legal and social revolution, and confining the once-ubiquitous support for segregation to a lunatic fringe.

Again, as with Graham, both of these stories are true. And Steven Miller's book offers a valuable contribution to the debate precisely because it manages to tell them both at once — to emphasize not only the black and white of a polarizing era, but its many shades of gray as well.
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http://www.nytimes.com/2009/04/19/books/review/Douthat-t.html?8bu&emc=bua2

A Poet's Progress

By JAMES LONGENBACH

COLLECTED POEMS

By C. P. Cavafy

Translated by Daniel Mendelsohn

547 pp. Alfred A. Knopf. $35

THE UNFINISHED POEMS

By C. P. Cavafy

Translated by Daniel Mendelsohn

121 pp. Alfred A. Knopf. $30

"A Greek gentleman in a straw hat, standing absolutely motionless at a slight angle to the universe." With this sentence the novelist E. M. Forster introduced the Alexandrian Greek poet Constantine Cavafy to the English-speaking world in 1919. Since then, Cavafy's distinctive tone — wistfully elegiac but resolutely dry-eyed — has captivated English-language poets from W. H. Auden to James Merrill to Louise Glück. Auden maintained that Cavafy's tone seems always to "survive translation," and Daniel Mendelsohn's new translations render that tone more pointedly than ever before. Together with "The Unfinished Poems" (the first English translation of poems Cavafy was still drafting when he died in 1933), this "Collected Poems" not only brings us closer to one of the great poets of the 20th century; it also reinvigorates our relationship to the English language.

In what ways did Cavafy stand at an angle to the universe? He was born in Alexandria in 1863 to a family that could trace its lineage back to the nobility of the Byzantine Empire. His father, originally from Constantinople, was a partner in a successful export business that maintained offices in London and Liverpool as well as several cities in Egypt; the young Cavafy lived in England for five years, acquiring both a longstanding fascination with English poetry and a slightly British inflection that accented his Greek. But when his father died, Cavafy's family was plunged into poverty. Socially, linguistically, personally, Cavafy lived on the outskirts. He had his first homosexual affair around the age of 20. Soon after, he found a job in the Irrigation Office of the Ministry of Public Works — the "Third Circle of Irrigation" — where he worked for more than 30 years. He wrote consistently but almost never published through traditional means. There is nothing more detrimental to art, he maintained, than succumbing to "how the public thinks and what it likes and what it will buy."

Today, Cavafy is well known for writing what might initially seem like two kinds of poems. Beginning in 1911, he wrote poems depicting homosexual desire with an unsensational directness: "They were slow getting dressed, they were sorry to cover / the beauty of their supple nudity / which harmonized so well with the comeliness of their faces." At the same time, he wrote poems about Greek history — not the well-known glories of the classical era but the long decline that finally concluded with the collapse of the Byzantine Empire: "He wasn't completely wrong, poor old Gemistus / (let Lord Andronicus and the patriarch suspect him if they like), / in wanting us, telling us to become pagan once again."

But as Mendelsohn argues in his elegant introduction to the poems, any division between the erotic and historical poems is facile. Whether Cavafy is describing an ancient political intrigue or an erotic encounter that occurred last week, his topic is the passage of time. The lines I've just quoted are in fact from the same unfinished poem, "After the Swim": the naked youths, dressing on the beach, are revealed

to be students of Gemistus, a Byzantine Neoplatonist who was condemned by authorities of the Orthodox Church for proclaiming that Zeus was the supreme god.

In Cavafy's world, everything has already happened. The fortune is spent, the pantheon abandoned, the body grown old. This overpowering sense of belatedness is what provokes the tone of his poems — rueful, distanced, knowing but never wise. Mendelsohn maintains that, given the translatability of Cavafy's tone, he has focused his attention on "other aspects of the poetry" — the exquisite care Cavafy took with diction, syntax, meter and rhyme. But in fact this is not exactly the case. It is only through attention to these minute aspects of poetic language that tone is produced. And Mendelsohn is assiduously attentive.

Earlier translators have, to varying degrees, rightly emphasized the prosaic flatness of Cavafy's language; the flatness is crucial to the emotional power of the poems, since it prevents their irony from seeming caustic, their longing from seeming nostalgic. But as Mendelsohn shows, Cavafy's language was in subtle ways more artificial than we've understood. Most important, Cavafy mingled high and low diction, employing both vernacular Greek and a literary Greek invented at the turn of the 19th century. Taking advantage of the fact that English contains words descended not only from German but from Latin roots, Mendelsohn's translations shift similarly between the lofty and the mundane:

> I ask myself whether in antique times
> glorious Alexandria possessed a
> youth more beauteous,
> a kid more perfect than he.

This poem, "Days of 1909, '10, and '11," extols the beauty of a working-class boy who sells his body to buy expensive clothes. The tensions between high and low are registered in the diction. Following a line dominated by Latinate words (glorious, possessed, beauteous), the Germanic and colloquial monosyllable in the third line carries an unexpected poignancy: a kid.

This shift in diction lets us hear something crucial about Cavafy's tone (a directness that is never not elegant), but it also lets Mendelsohn's translation exist fully as an English poem. Because of the polyglot nature of the English language, the sound of great English poetry is the sound of monosyllabic Germanic words chiming against multisyllabic Latinate words (Shakespeare's "seas incarnadine" or Tennyson's "immemorial elms"). Echoing such effects, Mendelsohn makes me wonder if it wasn't the deliciously mongrel nature of English, which Cavafy spoke and wrote perfectly, that first provoked him to forge his own hybridized idiom. The fact that the few poems Cavafy wrote in English contain phrases like "penetrating eye" and "transcendent star" (the Latinate word wedged against the Germanic) suggests that the poet's ear for English was at least as acute as his translator's.

Mendelsohn is a classicist, essayist and memoirist, the author of "The Lost: A Search for Six of Six Million." His translations of Cavafy's poems come trailing commentaries in which an immense amount of learning is gracefully and usefully borne. But Mendelsohn thinks like a poet, which is to say he inhabits the meaning of language through its movement. Listen to his translation of the famous concluding lines of "The God Abandons Antony":

> Like one who's long prepared, like someone brave,
> as befits a man who's been blessed with a city like this,
> go without faltering toward the window
> and listen with deep emotion, but not
> with the entreaties and the whining of a coward,
> to the sounds — a final entertainment —
> to the exquisite instruments of that initiate crew,
> and bid farewell to her, to Alexandria, whom you are losing.

The final line embodies the fortitude the poem recommends. While the preceding lines falter, breaking the syntax into edgy pieces, the final line is syntactically complete. As a result, the poem does not pronounce but arrives at its wisdom, making it happen to us. It is an event on the page.

It's easy to translate what a poem says; to concoct a verbal mechanism that captures a poem's movement, its manner of saying, requires a combination of skills that very few possess. Like Richard Howard's Baudelaire or Robert Pinsky's Dante, Mendelsohn's Cavafy is itself a work of art.

James Longenbach's most recent books are "Draft of a Letter," a collection of poems, and "The Art of the Poetic Line," essays on poetry.

http://www.nytimes.com/2009/04/19/books/review/Longenbach-t.html?8bu&emc=bua2

Dude, Murdoch Friended Us!

By MICHAEL AGGER

STEALING MYSPACE

The Battle to Control the Most Popular Website in America

By Julia Angwin

Illustrated. 371 pp. Random House. $27

MySpace is one of the Web's great accidents. The site was launched in the summer of 2003 by a company called eUniverse, located in an office park near the Los Angeles airport. Chris DeWolfe was a 30-something advertising executive who specialized in what is kindly called "direct marketing" but is better known as spam. DeWolfe had an antisocial employee with "wacky ideas." One day this employee, Tom Anderson, popped his head into DeWolfe's office and said: "Dude, we've got to talk. I've been thinking about Friendster."

Thus was hatched the idea that DeWolfe's team should start a copycat site. Friendster was a booming social network that boasted more than 1.5 million active users and whose founders had turned down a $30 million offer from Google. DeWolfe and his colleagues considered naming their site YoPeeps.com and Comingle.com before settling on MySpace, which DeWolfe had bought from a defunct online storage company. Within three and a half years, MySpace would surpass Yahoo as the most popular Web site in the United States, and Rupert Murdoch would acquire it for $580 million. This triumphal story is told in "Stealing MySpace" by Julia Angwin, an editor and columnist at The Wall Street Journal, without cooperation from MySpace and its founders.

It's not clear what they had to hide. MySpace has a seedier reputation than its rival Facebook, but that only makes it more alluring. Whereas sites like Yahoo and Google were birthed on the whiteboards of Stanford's comp-sci department, MySpace is a product of striving, nighttime Los Angeles, where you go to be famous, to be something new or to simply wear fewer clothes. How many Web start-ups can claim that their first party was given by a member at a club on the Sunset Strip?

It was in this culture of microcelebrity that Anderson, an intellectual drifter who had been a hacker in his teens, saw an opportunity for MySpace. He was spending time on Friendster but thought the site was making a mistake by actively deleting the profiles of so-called Fakesters, people who pretended to be, say, Homer Simpson or Britney Spears. The Fakesters were in open rebellion and had posted a remarkably prescient manifesto: "Identity is provisional. Who we are is whom we choose to be at any given moment, depending on personality, whim, temperament or subjective need." The final line could have been MySpace's motto: "Every day is Halloween." When MySpace began, it would let people be whoever they said they were.

In Angwin's telling, it was at this early stage that MySpace also benefited from an incredibly lucky mistake. When programmers rewrote the site's original code, they neglected to block users from inserting Web markup language like HTML into their personal pages. The error left the site exposed to hackers, yet the MySpace team noticed that some member pages were now tricked out with colorful backgrounds. They decided to let the error stand as a feature, allowing MySpace to be customized with blinking fonts, neon and whatever else a user dreamed up. Even now, the site can hurt your eyes.

This is when the fun starts. Anderson and DeWolfe went into marketing mode, trying to boost the audience of their one-among-dozens social network. Anderson scored an early coup: He persuaded Tila Tequila to leave Friendster and join MySpace. At the time, Tequila was not the Maxim-cover-girl bisexual role model we know today, but just another scantily clad online sensation. She was running into trouble on Friendster: "I was getting too many friend requests, and the pictures were too hot." She e-mailed all 40,000 of her Friendster friends and asked them to follow her to MySpace. As the wooing of Tequila shows, Anderson and DeWolfe were smart enough to attack the inescapable problem of social-networking sites: too many dudes. To address this imbalance, the pair put together a 17-city nightclub tour with a photographer who took provocative shots of willing women for no fee. These photos of "aspiring models" were posted on MySpace, where men could friend them and discuss geopolitics.

The other part of Anderson and DeWolfe's growth strategy was music. They frequented places like the Viper Room in the hope of persuading rising bands to start a page on MySpace and signed up more than 5,000 acts in a short time. The emo bands Fall Out Boy and My Chemical Romance began to gather audiences on the site, paving the way for later groups like the Arctic Monkeys, who charted because of online fan bases. Larger Internet developments were also tipping in MySpace's favor: broadband use was growing, allowing people to upload videos and pictures much more quickly. With this capability, the culture of the Web was changing from one of media consumption to self-production, and the freewheeling MySpace was an exciting place to be. The game was to amass friends and attract attention with photos, videos and other posts. DeWolfe had also developed a perfect selling line for his flesh-heavy, music-centered, youth-quaking site: "We want to be the MTV of the Internet."

In November 2004, MySpace welcomed its five millionth user and had 3.5 million visitors a month. That December, Rupert Murdoch was at his house overlooking Oyster Bay on Long Island when the tsunamis struck Indonesia. Angwin writes, "Murdoch was amazed that some of the best footage of the massive waves was available online through amateur video — and not on television or in newspapers." Murdoch caught Internet fever and set the News Corporation on a course for maximum dot-com acquisition. Angwin meticulously details the complicated deal structure between MySpace and its parent company, Intermix Media, and the rival courtships of News Corp. and Viacom. The detail is so granular that it passes through boring into surreal. Murdoch made an "exploding offer" for MySpace that had to be consummated over a July weekend. At one point in the crazed negotiations, Intermix's chief executive ordered an investor "to go across the street to the mall and buy new underwear and a chocolate milkshake."

Murdoch won, acquiring MySpace in the summer of 2005 and temporarily rebranding himself as an Internet mogul. His lieutenants now began the hard work of making MySpace a profit engine. Advertisers were scared — they would check out their ad and discover it next to a porn star — so "safe havens" were carved out of MySpace. The site also came under (undeserved) attack as a playground for sexual predators. In her sedulous style, Angwin recounts how DeWolfe and Anderson chafed at the demands of News Corp. as their creation became ever more unpredictable and unruly. But corporate infighting is only so interesting, and the book ends in May 2008, a year too soon. Facebook has since surpassed MySpace as the dominant social network.

The other missed opportunity was the chance to discuss MySpace as a demographic phenomenon. Angwin does quote a famous paper by the researcher Danah Boyd comparing the Facebook audience — "They are in honors classes, looking forward to the prom, and live in a world dictated by after-school activities" — with that of MySpace: "still home for Latino/Hispanic teens, immigrant teens, 'burnouts,' 'alternative kids,' . . . punks, emos, goths, gangstas, queer kids." But she doesn't follow up with any reporting. The story of MySpace as a meeting ground for outsiders is not fully here — Angwin needed Anderson and DeWolfe for their "present at the creation" perspective. It's our loss that they all didn't figure out a way to friend one another.

Michael Agger is a senior editor at Slate.

http://www.nytimes.com/2009/04/19/books/review/Agger-t.html?8bu&emc=bua2

All Sugars Aren't the Same: Glucose Is Better, Study Says

By Alice Park

Correction Appended: April 21, 2009

Think that all sugars are the same? They may all taste sweet to the tongue, but it turns out your body can tell the difference between glucose, fructose and sucrose, and that one of these sugars is worse for your health than the others.

In the first detailed analysis comparing how our systems respond to glucose (which is made when the body breaks down starches such as carbohydrates) and fructose, (the type of sugar found naturally in fruits), researchers at the University of California Davis report in the *Journal of Clinical Investigation* that consuming too much fructose can actually put you at greater risk of developing heart disease and diabetes than ingesting similar amounts of glucose. In the study, 32 overweight or obese men and women were randomly assigned to drink 25% of their daily energy requirements in either fructose- or glucose-sweetened drinks. The researchers took pains to eliminate as many intruding factors as possible by asking the volunteers to commit to a 12-week program; for the first and last two weeks of the study, each subject lived at UCD's Clinical and Translational Science Center, where they underwent rigorous blood tests to determine their insulin and lipid levels, among other metabolic measures. (Take a quiz on eating smart.)

Both groups gained similar amounts of weight by the end of the 12 weeks, but only the people drinking fructose-sweetened beverages with each meal showed signs of unhealthy changes in their liver function and fat deposits. In this group, the liver churned out more fat, while the subjects consuming similar amounts of glucose-sweetened drinks showed no such change. The fructose-drinking volunteers also were not as sensitive to insulin, the hormone released by the pancreas to capture and break down glucose in the blood and store it as fat. Insulin insensitivity is one of the first signs of diabetes. These subjects also gained more visceral fat, the dangerous kind that embeds itself between tissues in organs such as the heart and liver and secretes hormones and other chemicals that throw off the body's normal metabolism, setting the stage for atherosclerosis and heart attack. "This suggests that in the same way that not all fats are the same, not all dietary carbohydrates are the same either," says Peter Havel, professor of nutrition at the University of California Davis and lead author of the study.

But don't expect to be able to exercise your new sugar-smarts at the grocery store quite yet. Most of the sugar we encounter in products and in restaurants isn't glucose, but rather high fructose corn syrup or

sucrose, each a combination of glucose and fructose (sucrose is an even 50-50 split between the two, while high fructose corn syrup comes in either 55%-45% fructose-glucose or 42%-58% pairings). It's difficult to find anything that's mostly glucose, which means our sweeteners are setting us up for weight gain, and more insidiously, metabolic changes that can make us more prone to heart disease and diabetes.

Dr. Walter Willett, chair of the department of nutrition at the Harvard School of Public Health, notes that studies have shown that long-term consumption of sugared drinks can double the risk of diabetes, with half of that risk due to the excess weight brought on by the calories, and the other half due to the beverages' high sugar content — mostly fructose. "This study provides the best argument yet that we should either decide to consume less sugar-sweetened beverages in general, or that we should conduct more research into the possibility of using other sweeteners that may be more glucose-based," says Matthias Tschoep, an obesity researcher at the Obesity Research Center in the University of Cincinnati, and author of a commentary accompanying the study. "It's an unbelievable piece of work."

If that's the case, then why the glut of blended sugars rather than pure glucose in our foods today? Glucose isn't as sweet as fructose, and because our collective sweet teeth have become accustomed to a certain level of sweetness, anything less might be unsatisfying. "The proportion of fructose in food probably hasn't increased that much, since high fructose corn syrup simply replaced sucrose in many cases," says Havel. "But people are also simply consuming more sugar in their diet." In fact, if you think that the study subjects drank way more sweetened beverages (25% of their daily energy requirements came from the sugar in their drinks) in this study than the average American, you might want to consider this: according to recent data from an annual government survey, Americans on average wash down 16% of their daily energy needs with sugared drinks — not that far off the 25% threshold set by Havel in the study.

Willett, for one, isn't convinced that glucose-based sweeteners are an attractive option for soda makers. "I don't think any beverage company out there is considering putting pure glucose into their product," he says. "It doesn't have the same level of sweetness."

Instead, he is advocating a drastic change in the sugar content of sodas. His Department of Nutrition is urging manufacturers to produce a line of beverages containing only 1 gm of sugar per ounce, a 70% reduction in sugar content. It's all part of a campaign to re-train the American sweet tooth. "If children grow up with everything tasting super sweet, then it's hard for them to appreciate he gentle sweetness of a fresh carrot or an apple," he says. "Part of this is deconditioning palates to a much more natural level of sweetness." That certainly won't be easy, but it will surely be worth it. We could have our sugar and stay healthy too.

The original version of this story misidentified the body's insulin-producing organ. It is the pancreas, not the liver. The story also misstated that high-fructose corn syrup is cheaper than glucose. It is not, but it is cheaper than sucrose.

http://www.time.com/time/health/article/0,8599,1892841,00.html

An Organism Survives Antarctica, and Maybe Mars

By Jeffrey Kluger

Say what you will about the simple, uninteresting lives of microorganisms, they're tough little critters. You try surviving for a million and a half years without heat, food or sunlight and see how you do. A team of National Science Foundation researchers just discovered a species of Antarctic organisms that has accomplished exactly that — and the microbes' unlikely survival can tell us a lot not just about the adaptability of life on Earth, but the prospects for it on Mars.

The fact that organisms can survive in extreme — seemingly lethal — conditions is nothing new. Researchers have found creatures living at boiling vents on the floor of the ocean, in desert sands that virtually never see water; fossilized remains of microorganisms have even been found inside of rocks. Antarctic life, however, has always been a more complex matter. Antarctica was once a warmer, wetter land than it is now, but continental migration pushed it from place to place, leaving it — for the current epoch at least — at the bottom of the planet, where it became little more than a frozen desert. Its valleys are some of the driest places on the Earth, receiving less than 4 inches of precipitation per year. Species that thrived when Antarctica was green would have been entirely wiped out, unless they could adapt — and fast. (See pictures of life beneath Antarctica.)

A team led by microbiologist Jill Mikucki of Dartmouth College, set out to look for any such hangers-on at a particularly unforgiving place: Blood Falls, on the East Antarctic Ice Sheet. Blood Falls got its unlovely name due to red staining that comes from a snout on the Taylor Glacier — the result of heavy deposits of iron in its water. In ages past, a fjord ran through the area and brought with it swarms of marine life, but more than 1.5 million years ago the ice began to rise, and a pool of seawater became trapped — and then capped — creating a huge, salty deposit buried hundreds of yards beneath the glaciers.

Mikucki and her group began sampling water that runs from deep within the glacier — which warms just enough in the Antarctic summer that it melts. Freed up after 1,500 millennia of absolute blackness and utter cold, the water at first seemed completely sterile. "When I started running chemical analysis on it," says Mikucki, "there was no oxygen."

What there was, however, was life. The samples Mikucki collected did not teem with a riot of different microbial species the way ocean water does, but there was at least one species, thriving and dividing and doing all of the other things single-celled species do. "How [were] they able to persist below hundreds of meters of ice and live in permanently cold and dark conditions over hundreds of millions of years?" Mickucki asks

The trick, she found, was that they learned how to change their diet. When Mikucki studied the organisms' DNA and energy-processing systems, she found that they were indeed descended from species that once lived in the open ocean. Underneath the ice, they were deprived of light to run photosynthesis, and instead they relied on what they found around them — principally sulfur and iron — to generate energy. The genes responsible for that alternative metabolism are also found in other marine organisms but they're less important to those species because the oceans provide more options for food.

Mikucki refers to the subglacial pond as "a unique sort of time capsule from a period in Earth's history," but it also has lessons for scientists studying Mars, an entire planet that is in many ways a time capsule too. Mars, like Antarctica, was once warm and wet, but the slow loss of its atmosphere also meant the loss of much of its moisture and surface heat. Still, the place was warm and wet long enough for life to have taken hold — life that would have then had to retreat into underground water deposits and make the same kind of hurry-up adaptation Mikucki's microbes did. Similar adaptive metabolism could be in evidence on the Jovian moon Europa, where a layer of surface ice may cover a globe-girdling ocean. (See pictures of Mars' patterns.)

It's entirely possible that we'll never find any proof that life exists anywhere else in our limited little solar system. But courtesy of our own Antarctic, we now have one more piece of proof that it could.

http://www.time.com/time/health/article/0,8599,1892289,00.html

The Hobbit: Out of Africa

By Jennifer Pinkowski

A very small human ancestor made a very big splash back in 2004, when researchers discovered the remains of *Homo floresiensis*, a 3-ft., prehuman "hobbit," in a cave on the Indonesian island of Flores. The origin of the species and the route it took to Flores have been much discussed since then. Earlier this month, researchers presented work at the annual meeting of the American Association of Physical Anthropologists, in Chicago, suggesting that *H. floresiensis* may have left Africa a full million years earlier than any other hominids were thought to have ventured out from the home continent. (Read "The Riddle of the Hobbit.")

The new theory comes from recent analyses of the interior of the skull of Flo — as some call the 18,000-year-old fossil remains. A young female, Flo exhibits features that bear an uncanny resemblance to skulls from the hominid genus *Australopithecus,* which lived in Africa from roughly 4 million to 1.5 million years ago. The best-known australopithecene fossils are the 3.2 million–year-old *A. afarensis* Lucy, discovered in Ethiopia, and the 3 million–year-old *A. africanus* Taung Child, unearthed in South Africa. (See pictures of South Africa, fifteen years on.)

The problem is, the only early hominids found outside Africa are *Homo erectus,* the earliest of which date to 1.9 million years ago — about a million years after Lucy, Taung and their ilk. If Flo so closely resembles Lucy and Taung, her ancestors may have emigrated from Africa back when those famous kin were still around.

Florida State University skull-morphology specialist Dean Falk and an international team of researchers compared Flo's skull not only to skulls of other prehuman species, but also to those of modern humans, some with normal development and others with microcephaly, an abnormal smallness of the head. That last comparison was critical, since some researchers have suggested that *H. floresiensis* represents not a separate species but is instead a modern human stricken with microcephaly or similar illnesses. But the "sick hobbit" hypothesis has been unable to gain much traction.

Falk and the others identified seven specific features of Flo's brain that seem to be more-evolved versions of key characteristics of the much older *A. africanus* brain. "Over the entire cerebral cortex, there are

advanced features that make it look like a very fancy brain," says Falk. "*H. floresiensis* was clearly there a long time, because it developed its own features."

Overall, Flo's brain shows the global neural reorganization that's a mark of advancing intelligence. What's striking about this relative sophistication is that it developed in such a small brain case. A prime indicator of increasing human intelligence has long been thought to be increasing brain size. However, Falk says, the hobbit's skull is a bit of a mishmash of characteristics in terms of who it resembles. "Its brain sorts with africanus, yet its outside skull features look like *Homo erectus*," she says.

But William Jungers, one of the primary hobbit researchers, says the similarities to erectus seem to end at the neck. Analysis of various anatomical features suggests that the new species has an overall body plan that looks more ancient than that. "It's not identical to *Australopithecus*," Jungers says, "but it resembles it in limb proportions, the shape of the bony pelvis, the hands." Adds paleoanthropologist Donald Johansen, who discovered the *Australopithecus* Lucy: "It is a possibility they got out of Africa earlier than we ever thought. If they were isolated on an island and didn't have gene flow from other populations, it would make sense that they retained ancient features like small stature and small heads."

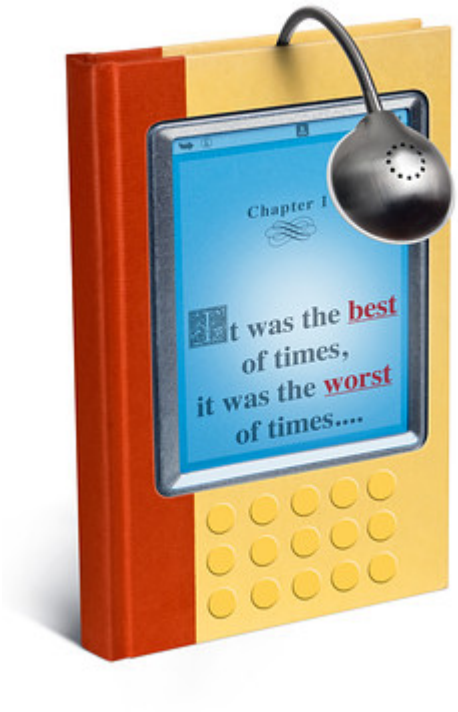
Upcoming excavations of Flores spearheaded by Mike Morwood, the lead researcher of the Australian-Indonesian team that first unearthed the bones, may help answer the essential question, as Falk puts it, "When did the first [hobbit ancestors] get to the island, and what did they look like?"

http://www.time.com/time/health/article/0,8599,1892606,00.html

How the E-Book Will Change the Way We Read and Write

Author Steven Johnson outlines a future with more books, more distractions -- and the end of reading alone

By STEVEN JOHNSON



Every genuinely revolutionary technology implants some kind of "aha" moment in your memory -- the moment where you flip a switch and something magical happens, something that tells you in an instant that the rules have changed forever.

The Journal Report

I still have vivid memories of many such moments: clicking on my first Web hyperlink in 1994 and instantly transporting to a page hosted on a server in Australia; using Google Earth to zoom in from space directly to the satellite image of my house; watching my 14-month-old master the page-flipping gesture on the iPhone's touch interface.

The latest such moment came courtesy of the Kindle, Amazon.com Inc.'s e-book reader. A few weeks after I bought the device, I was sitting alone in a restaurant in Austin, Texas, dutifully working my way through an e-book about business and technology, when I was hit with a sudden desire to read a novel. After a few taps on the Kindle, I was browsing the Amazon store, and within a minute or two I'd bought and downloaded Zadie Smith's novel "On Beauty." By the time the check arrived, I'd finished the first chapter.

Aha.

I knew then that the book's migration to the digital realm would not be a simple matter of trading ink for pixels, but would likely change the way we read, write and sell books in profound ways. It will make it easier for us to buy books, but at the same time make it easier to stop reading them. It will expand the universe of books at our fingertips, and transform the solitary act of reading into something far more social. It will give writers and publishers the chance to sell more obscure books, but it may well end up undermining some of the core attributes that we have associated with book reading for more than 500 years.

There is great promise and opportunity in the digital-books revolution. The question is: Will we recognize the book itself when that revolution has run its course?

The Dark Matter

In our always-connected, everything-linked world, we sometimes forget that books are the dark matter of the information universe. While we now possess terabytes of data at our fingertips, we have nonetheless drifted further and further away from mankind's most valuable archive of knowledge: the tens of millions of books that have been published since Gutenberg's day.

That's because the modern infosphere is both organized and navigated through hyperlinked pages of digital text, with the most-linked pages rising to the top of Google Inc.'s all-powerful search-results page. This has led us toward some traditional forms of information, such as newspapers and magazines, as well as toward new forms, such as blogs and Wikipedia. But because books have largely been excluded from Google's index -- distant planets of unlinked analog text -- that vast trove of knowledge can't compete with its hyperlinked rivals.

John Weber

But there is good reason to believe that this strange imbalance will prove to be a momentary blip, and that the blip's moment may be just about over. Credit goes to two key developments: the breakthrough success of Amazon's Kindle e-book reader, and the maturation of the Google Book Search service, which now offers close to 10 million titles, including many obscure and out-of-print works that Google has scanned. As a result, 2009 may well prove to be the most significant year in the evolution of the book since Gutenberg hammered out his original Bible.

If so, if the future is about to be rewritten, the big question becomes: How?

The World of Ideas

For starters, think about what happened because of the printing press: The ability to duplicate, and make permanent, ideas that were contained in books created a surge in innovation that the world had never seen before. Now, the ability to digitally search millions of books instantly will make finding all that information easier yet again. Expect ideas to proliferate -- and innovation to bloom -- just as it did in the centuries after Gutenberg.

Think about it. Before too long, you'll be able to create a kind of shadow version of your entire library, including every book you've ever read -- as a child, as a teenager, as a college student, as an adult. Every word in that library will be searchable. It is hard to overstate the impact that this kind of shift will have on scholarship. Entirely new forms of discovery will be possible. Imagine a software tool that scans through the bibliographies of the 20 books you've read on a specific topic, and comes up with the most-cited work in those bibliographies that you haven't encountered yet.

The Impulse Buy

The magic of that moment in Austin ("I'm in the mood for a novel -- oh, here's a novel right here in my hands!") also tells me that e-book readers are going to sell a lot of books, precisely because there's an impulse-buy quality to the devices that's quite unlike anything the publishing business has ever experienced before.

SECOND EDITION Soon you'll be able to create a digital, searchable version of your library. It's hard to overstate the impact that will have.

On another occasion, I managed to buy and download a book on a New York City subway train, during a brief two-stop stretch on an elevated platform.

Amazon's early data suggest that Kindle users buy significantly more books than they did before owning the device, and it's not hard to understand why: The bookstore is now following you around wherever you go. A friend mentions a book in passing, and instead of jotting down a reminder to pick it up next time you're at Barnes & Noble, you take out the Kindle and -- *voilà!* -- you own it.

My impulsive purchase of "On Beauty" has another element to it, though -- one that may not be as welcomed by authors. Specifically: I was in the middle of the other book, and in a matter of seconds, I left it for one of its competitors. The jump was triggered, in this case, by a sudden urge to read fiction, but it

could have been triggered by something in the book I was originally reading: a direct quote or reference to another work, or some more indirect suggestion in the text.

In other words, an infinite bookstore at your fingertips is great news for book sales, and may be great news for the dissemination of knowledge, but not necessarily so great for that most finite of 21st-century resources: attention.

Because they have been largely walled off from the world of hypertext, print books have remained a kind of game preserve for the endangered species of linear, deep-focus reading. Online, you can click happily from blog post to email thread to online New Yorker article -- sampling, commenting and forwarding as you go. But when you sit down with an old-fashioned book in your hand, the medium works naturally against such distractions; it compels you to follow the thread, to stay engaged with a single narrative or argument.

Ahead of Amazon's quarterly results, Citi analyst Mark Mahaney says the company's growth potential is robust and explains why he upgraded his rating on the stock to buy. Stacey Delo reports. (April 20)

The Kindle in its current incarnation maintains some of that emphasis on linear focus; it has no dedicated client for email or texting, and its Web browser is buried in a subfolder for "experimental" projects. But Amazon has already released a version of the Kindle software for reading its e-books on an iPhone, which is much more conducive to all manner of distraction. No doubt future iterations of the Kindle and other e-book readers will make it just as easy to jump online to check your 401(k) performance as it is now to buy a copy of "On Beauty."

As a result, I fear that one of the great joys of book reading -- the total immersion in another world, or in the world of the author's ideas -- will be compromised. We all may read books the way we increasingly read magazines and newspapers: a little bit here, a little bit there.

You're Never Alone

Putting books online will also change how we find books -- and talk about them.

Now that books are finally entering the world of networked, digital text, they will undergo the same transformation that Web pages have experienced over the past 15 years. Blogs, remember, were once called "Web logs," cultivated by early digital pioneers who kept a record of information they found online, quoting and annotating as they browsed.

With books becoming part of this universe, "booklogs" will prosper, with readers taking inspiring or infuriating passages out of books and commenting on them in public. Google will begin indexing and ranking individual pages and paragraphs from books based on the online chatter about them. (As the writer and futurist Kevin Kelly says, "In the new world of books, every bit informs another; every page reads all the other pages.") You'll read a puzzling passage from a novel and then instantly browse through dozens of comments from readers around the world, annotating, explaining or debating the passage's true meaning.

Think of it as a permanent, global book club. As you read, you will know that at any given moment, a conversation is available about the paragraph or even *sentence* you are reading. Nobody will read alone anymore. Reading books will go from being a fundamentally private activity -- a direct exchange between author and reader -- to a community event, with every isolated paragraph the launching pad for a conversation with strangers around the world.

This great flowering of annotating and indexing will alter the way we discover books, too. Web publishers have long recognized that "front doors" matter much less in the Google age, as visitors come directly to individual articles through search. Increasingly, readers will stumble across books through a particularly well-linked quote on page 157, instead of an interesting cover on display at the bookstore, or a review in the local paper.

Imagine every page of every book individually competing with every page of every other book that has ever been written, each of them commented on and indexed and ranked. The unity of the book will disperse into a multitude of pages and paragraphs vying for Google's attention.

In this world, citation will become as powerful a sales engine as promotion is today. An author will write an arresting description of Thomas Edison's controversial invention of the light bulb, and thanks to hundreds of inbound links from bookloggers quoting the passage, those pages will rise to the top of Google's results for anyone searching "invention of light bulb." Each day, Google will deposit a hundred potential book buyers on that page, eager for information about Edison's breakthrough. Those hundred readers might pale compared with the tens of thousands of prospective buyers an author gets from an NPR appearance, but that Google ranking doesn't fade away overnight. It becomes a kind of permanent annuity for the author.

Writing for Google

A world in which search attracts new book readers also will undoubtedly change the way books are written, just as the serial publishing schedule of Dickens's day led to the obligatory cliffhanger ending at the end of each installment. Writers and publishers will begin to think about how individual pages or chapters might rank in Google's results, crafting sections explicitly in the hopes that they will draw in that steady stream of search visitors.

Individual paragraphs will be accompanied by descriptive tags to orient potential searchers; chapter titles will be tested to determine how well they rank. Just as Web sites try to adjust their content to move as high as possible on the Google search results, so will authors and publishers try to adjust their books to move up the list.

What will this mean for the books themselves? Perhaps nothing more than a few strategically placed words or paragraphs. Perhaps entire books written with search engines in mind. We'll have to see.

(One geeky side note here: Before we can get too far in this new world, we need to have a technological standard for organizing digital books. We have the Web today because back in the early 1990s we agreed on a standard, machine-readable way of describing the location of a page: the URL.

But what's the equivalent for books? For centuries, we've had an explicit system for organizing print books in the form of page numbers and bibliographic info. All of that breaks down in this new digital world. The Kindle doesn't even have page numbers -- it has an entirely new system called "locations" because the pagination changes constantly based on the type size you choose to read. If you want to write a comment about page 32 of "On Beauty," what do you link to? The Kindle location? The Google Book Search page? This sounds like a question only a librarian would get excited about, but the truth is, until we figure out a standardized way to link to individual pages -- so that all the data associated with a specific passage from "On Beauty" point to the same location -- books are going to remain orphans in this new world.)

Paying Per Chapter?

The economics of digital books will likely change the conventions of reading and writing as well. Digital distribution makes it a simple matter to offer prospective buyers a "free sample" to entice them to purchase the whole thing. Many books offered for the Kindle, for instance, allow readers to download the

first chapter free of charge. The "free sample" component of a book will become as conventional as jacket-flap copy and blurbs; authors will devise a host of stylistic and commercial techniques in crafting these giveaway sections, just as Dickens mastered the cliffhanger device almost two centuries before.

It's not hard to imagine, for instance, how introductions will be transformed in this new world. Right now, introductions are written with the assumption that people have already bought the book. That won't be the case in the future, when the introduction is given away. It will, no doubt, be written more to entice readers to buy the whole book.

Clearly, we are in store for the return of the cliffhanger.

For nonfiction and short-story collections, a la carte pricing will emerge, as it has in the marketplace for digital music. Readers will have the option to purchase a chapter for 99 cents, the same way they now buy an individual song on iTunes. The marketplace will start to reward modular books that can be intelligibly split into standalone chapters.

This fragmentation sounds unnerving -- yet another blow to the deep-focus linearity of the print-book tradition. Breaking the book into detachable parts may sell more books, but there are certain kinds of experiences and arguments that can only be conveyed by the steady, directed immersion that a 400-page book gives you. A playlist of the best chapters from "Middlemarch," "Gravity's Rainbow" and "Beloved" will never work the way a playlist of songs culled from different albums does today.

Yet that modular pricing system will have one interesting, and laudable, side effect: The online marketplace will have established an easy, one-click mechanism for purchasing small quantities of text.

Tellingly, the Kindle already includes blog and newspaper subscriptions that can be purchased in a matter of seconds.

Skeptics may ask why anyone would pay for something that was elsewhere available at no charge, but that's precisely what they said when Steve Jobs launched the iTunes Music Store, competing with the free offerings on Napster. We've seen how that turned out. If the Kindle payment architecture takes off, it may ultimately lead the way toward the standardized micropayment system whose nonexistence has caused so much turmoil in the news business -- a system many people wish had been built into the Web's original architecture, along with those standardized page locations.

We all know the story of how the information-wants-to-be-free ethos of the Web threatened the newspapers with extinction. Wouldn't it be ironic if books turned out to be their savior?

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http://online.wsj.com/article/SB123980920727621353.html

Tilting at Turbines

By: Michael Scott Moore

The morning was clear and cold, with frost on the church steeple and the cemetery grass. I had a quick English breakfast at a white-cloth table, in my wetsuit, and drove to Newnham, a village on the Severn River in Gloucestershire, parking near the White Hart Inn. Glinting brown water stretched at least a hundred yards from the inn to cow pastures on the opposite side. The current moved with a placid, lazy force to my right. Across the road behind me, a pasture of sheep freezing their tails off bleated from different hapless positions on the grass.

"It's a very slow wave," an old farmer named Bill Bailey had told me in Cornwall, several hours to the south. "Just watch out for dead sheep."

I blinked.

"Dead sheep?"

Bailey was among the first people ever to surf the so-called Severn Bore, a tidal surge of water up the Severn River that sometimes builds into a rideable wave. "When the river rises," he explained, "it washes everything off the bank. Funnily enough, that's where the wave breaks, by the bank, not in the middle, and one of these guys (in 1964) rode quite a long way. But in the end he got swept up on a bank. Then he was on a farm. He had to run across a pasture, and the bullocks chased him."

Bailey is one of the nation's surf pioneers, in saltwater and in fresh. In the mid-'60s he also co-founded Bilbo, Britain's first surfboard company. Now he's an old man — pouchy, bald, with bifocals, prone to wearing ill-fitting jeans and flannel shirts — but he may live to see the end of the unusual Severn wave.

"It's gonna be stopped when they put the turbines in," said his son, who was in the room with us. He meant a dam with turbines to harness the river's power. "They say they'll do the environmental studies,

but they'll have to do it — just economically. They say it'll provide 4 percent of the power for the country."

I climbed down the high bank at Newnham on a wrought-iron ladder that had obviously not been installed for surfers. I launched my board from a mossy rock and let the current glide me downriver. Half a mile in that direction, a line of surfers in colorful wetsuits waited in the waist-high water.

People watched in keen anticipation from the parking lot, now about 30 feet above the river, at the top of a stained concrete bank that resembled the hull of a battleship. It was a formidable work of flood protection, pocked with rusted drainage valves in case the river slopped over the edge and threatened the inn. A line of damp green scum showed where the tidal surge had flowed the night before — about a third of the way up.

Waiting for the Severn Bore can be nerve-wracking. I had no idea what to expect. I stood in the river, shifting my weight in the slick fine mud. The morning was calm, but there was something deceptive about the quiet. Soon a head of rushing whitewater marched into view. I heard hoots, and the whole line of surfers — with a few exceptions — began to move. Like a single creature, they combed upriver. The surge advanced with a steady, streaming, ineluctable rush. By the time it reached me, most of the wave was mushy and broken, only 2 feet high, but I managed to paddle in front of a glassy rolling section and take off. Then I was standing among 20 other surfers, old and young, plus a number of kayaks.

"All right, mate," one of them said and made room. The bore is a limited resource, and no one feels possessive. People adjust their boards to new arrivals and keep moving, achieving a level of camaraderie I've never seen among surfers in such crowded conditions. We cut back and forth. We trimmed. We tried not to get caught in eddies or whirlpools or other spots where the stately, steady push of water might give out. The power of a wave like this would be determined not just by rocks and contours on the bottom of the river but also by the curve of banks and the power of the opposing current. People dropped away; others arrived. Soon I hit an eddy and fell. At first I was in denial — I thought I could catch another wave. A few swells followed behind the head of the bore, and I paddled after them. But nothing was really there except a high, rising, soupy volume of water. The wave comes — at most — once every 12 hours.

The whole river had changed direction. Instead of a placid flow to the right, from the parking lot's point of view, it was now moving insistently to the left. I paddled to the bank and landed on a set of slippery, slowly disappearing rocks. I had to grab long reeds to climb up. At the top of the bank waited a man with a cup of coffee and a white beard who owned the property I was about to cross.

"Y'all right, then," he said.

"Fine."

"She moves fast."

The Severn River is the largest waterway in Britain. It's as important to the West Country and Wales as the Mississippi is to the American South. At low tide, from an airplane, its estuary is just a glistening expanse of rippled mud; but at high-tide seawater covers these mudflats and pushes upriver. The Severn narrows quickly enough to give the surges momentum, and when the tide is high enough, it creates not just a surfable wave, but also a current that changes the river's flow for hours. Riverboat navigators know all about these surges. "With the aid of a good tide," a retired Severn cargo skipper called B.A. Lane wrote in a 1993 memoir, "the time between Gloucester lock to the Upper Lode lock at Tewkesbury could be cut by at least an hour. No river man worth his salt would miss the opportunity of running with a good tide."

These tidal bores have given the British government an idea for a power-generation project that could match the output of four nuclear plants over its lifespan. The U.K.'s Sustainable Development

Commission is considering proposals for a series of hydroelectric turbines — a "barrage" of underwater propellers — that in the most optimistic plan would gin up a maximum of 8.64 gigawatts of power, with no greenhouse emissions, for 120 years, humming along twice a day as an ideal renewable resource. The barrage would be "a comparable big infrastructure project" to the Three Gorges Dam in China or the Hoover Dam in the United States, says Bernard Bulkin, commissioner for climate change, energy and transport at the Sustainable Development Commission.

And it would kill the surfing wave.

America's only tidal bore, called a burro in Spanish, once hassled steamboats on the Colorado River until the Hoover Dam slowed the river in the 1930s. Now, the Colorado peters out before it reaches the Sea of Cortez, and a tidal surge just floods salt flats in northern Mexico.

British surfers, unsurprisingly, are against a barrage, even though it will be different from the Hoover Dam. "The pointless and emotive sacrifice of a fully functioning river system to the gods of climate change is a misguided indulgent 'green' luxury," says Stu Ballard, a bore surfer who runs a nonprofit called Save Our Severn. He worries that a rush by the government to build the barrage, driven by European Union carbon-reduction goals and a few special interests, will lead Great Britain down a byway explored by Canada decades ago. "For the Canadians," says Simon Haslett, a professor at the University of Wales, Newport, "the idea of a barrage is now history and doesn't even get raised as an option during tidal power debates. It's so old that they are amazed the U.K. is even considering it."

Of course, the British public doesn't have much use for any "save the bore" movement based on a surfing wave, but most environmental groups agree with the surfers, and surfers have mounted the most interesting resistance.

"Initially I was out of step with the rest of the bore riders," said Neil Law, a charity worker in Worcestershire who bodyboards the Severn and has submitted a report on the problem of silt to a government call for information. "I was prepared to contemplate the death of the bore if a viable means of generating renewable energy could be discovered." He'd still be prepared to contemplate the end of the wave, he said, if the tidal flow were truly renewable. But he's now afraid the barrage will destroy the current itself, robbing not just surfers of their waves but Great Britain of its 120 years of emissionless, guilt-free power.

The barrage will be a dam, a concrete barrier perforated with sluices and locks to let the tide push upriver, combined with a system of up to 300 underwater turbines built to spin on every falling tide. It's not a new idea. An engineer named Thomas Fulljames first proposed a mile-long masonry barrage across the Severn in 1849, and other plans surfaced in the 1920s and 1970s, only to be rejected because of the cost.

But in late 2007, the British government formally started to investigate plans for a massive, maximum-power barrage. The idea is to squeeze every drop of low-carbon energy out of the river and weigh that potential against inevitable damage to the environment. There are several plans on the drawing board, but any major dam across the Severn would become one of the largest public-works projects in the world. John Hutton, Britain's business and enterprise secretary, called the idea "a truly visionary project, unparalleled in scale. ... The government Gordon Brown leads will not be among those who say they want to tackle global warming by moving to low-carbon energy sources but then oppose every opportunity to do so."

One reason for the government's new interest is, of course, global warming. Every nation in the European Union has pledged to reduce emissions by 20 percent before the year 2020, an impractical but catchy-sounding idea. A Severn barrage would make it far easier for the U.K. to meet this goal.

The other reason is oil. North Sea oil fields won't last forever, and the government's study of a tidal barrage admits that the U.K.'s expansive oil and gas industry "is in long-term decline." So Britain needs to

find a new source of homegrown energy, and resistance to a French solution — loads of new nuclear plants — is strong.

The government is seriously considering a short list of five tidal-energy proposals, all involving dam-like barriers that risk a problem with silt. The two most prominent are 1) the "Cardiff-Weston" barrage, a 10-mile dam with 200 to 300 turbines and a long causeway for cars along the top, connecting western England with Wales, and 2) the "Shoots" dam, farther upriver, with about 30 turbines and a fraction of the output (1.05 gigawatts instead of 8.64) but crossed by a high-speed rail link.

Barrage supporters point to a French dam, in the Rance estuary near Mont St.-Michel, which qualifies as the oldest and most successful tidal barrage in the world. It was built in 1966 and has run for decades without a significant problem. It has 24 turbines with a total capacity of 240 megawatts. Some detractors point to the Petitcodiac River in Canada, which receives a huge tidal bore from the Bay of Fundy in Nova Scotia. The Petitcodiac River Causeway, built in the mid-'60s as a crossing for cars and a flood-control system, has backed up the river with a surprising amount of silt, according to Stuart Ballard. "Within 15 years the whole river silted up," he said. "They lost the capacity of the head pond to handle whatever floodwater was coming down. It's not a barrage, but it's the same principle. And now the Canadian government has agreed to take that out and replace it with a bridge."

The only other commercial-sized barrage in the world, the Annapolis Royal Generating Station in Nova Scotia, also draws power from tides on the Bay of Fundy. It was installed in 1984 and still performs. But silt and erosion have reduced the river's flow and made it less than an ideal model for a Severn barrage. The British government's report on "Tidal Power in the U.K.," which studies ideas for a barrage as well as other schemes, mentions the Annapolis station exactly once.

The trouble with silt is simple. Moving water keeps it afloat. If you let a huge volume of water through a dam and hold it for six hours, until the tide changes direction, you create a massive "head pond," twice a day, which lets particles settle out.

"The people who are pro-barrage are saying 'Look at La Rance, that works,'" Ballard said. "La Rance works, but it's on a tiny scale compared to what's being proposed here, and it's in a steep-sided granite estuary, so the water coming through is crystal clear. And even so, they have problems with siltation. They have to dredge that."

Although water in the Severn is a muddy greenish brown, silt has not been the focus of debate in Britain. Most domestic journalism on the project has focused on wildlife or on fiscal and carbon trade-offs. The long Cardiff-to-Weston dam would cost £15 billion to £20 billion (or $21.4 billion to $28.6 billion) to build, which is the cost to construct three or four nuclear power plants. And the savings in emissions would have to be balanced against the exhaust from trucks and machinery used to build the dam. So will it really save money or be "green?" These are the riddles British partisans in the barrage debate worry about, along with arguments over permanent damage to salmon, shipping, birds, eels and the delicate landscape of the Severn Estuary, which is protected by a number of British and European conservation laws.

The loss of a major estuary environment would, of course, be huge. The Severn's salt marshes host endangered worms and migratory birds. Salmon swim up it to breed. So do eels; and European eels in particular have caught the public's imagination because the larvae drift on currents across the Atlantic from the Sargasso Sea, near the Caribbean. Young eels, or "elvers," swim with tidal bores up the Severn, and fishermen along the river have caught them, for centuries, in fine nets. The tiny wriggling clear young eels can fetch up to £150 per kilogram on a market that sells them to Japan, where they're eaten as a delicacy. A dam with a barrage would kill or mangle a huge number of elvers even if some plans use turbines that could "minimize" the loss.

But these loss-of-species arguments involve a familiar cast of characters — people who worry about small animals, and people who shout them down. Climate change in this case is a trump card. If the world overheats, there may be no small animals to worry about. Malcolm Wicks, the U.K.'s energy minister, took this line in 2007 to criticize the Royal Society for the Protection of Birds and its resistance to the barrage on behalf of "thousands of birds, spawning salmon and other fish." Wicks told a committee of the Welsh parliament that the RSPB was "clearly not understanding that unless we are prepared to take some courageous action on climate change, the devastation of species will be truly enormous."

Ballard, though, thinks silt is the "elephant in the river" that everyone has chosen to ignore. "They're saying a barrage will last 120 years," he said. "Now, is that 120 years before the estuary completely clogs up and becomes a mire and the last milli-amp is squeezed out from the last trickle of water? The point is, if a barrage is built, and then whoever's building it agrees that it will have a finite life — can that be called renewable energy?"

The highway along the northern bank of the Severn is narrow and winds along green pastureland and the occasional stone-church village. The Severn Bore Inn, at Minsterworth, is a tavern with high-gabled farmhouse walls and brass lettering. I parked in a muddy yard at the rear of the inn, pulled on my neoprene boots and gloves, unstrapped the board and tromped across the frosted grass.

The inn itself hadn't opened, but soon whole vans of surfers unloaded in the lot. They wore wetsuits and boots. A few had soft, white, numbered helmets. One of these men stepped over a sodden fence to the river.

I said, "Is there a race?"

"Hey? No." He laughed.

I pointed to my head to indicate his helmet. "Just keeping track of yourselves."

"That's right."

They turned out to be members of a bore-riding club. They wore helmets to distinguish each other in videos.

I followed a muddy path along the top of the bank, beside the sprouting green tips of trees growing from the waterline. Here the bank was an overgrown cliff. I looked for a way down until I saw a man I recognized from the previous night at the inn. He was a large guy with youthful but graying hair, a neck swelling with middle-aged fat and a habit of putting what looked like a plastic cigarette filter in his mouth, as if he wanted to light a cigarette. But after a few minutes, the filter went back in his pocket. He talked knowledgeably about the bore, and he turned out to be Neil Law. He was holding a digital camera.

He pointed to a slick, narrow muddy chute running down to the water. The bank here was maybe 15 feet high.

"Forget your dignity," he said. "Everyone slides."

I shrugged and took two steps down the chute, stepping on slick weeds, then I lost my balance and slipped on my butt straight into the water. There was a graceless splash.

A handful of surfers congregated just downstream at a wide bend in the river. It was shallow enough to stand, but the mud under our boots had a slick oily feel. The river had green, thickly hedged banks on both sides, with trees overhanging the water. A few surfers in numbered helmets discussed whether the wave would hold its power around the bend. One or two others were new on the bore.

"Wipe the mud off your feet," someone said as he laid flat on his board to paddle. "Slippery."

One surfer named Paul floated downstream as far as the elbow of the river, then stood and waited. The sun shone over the damp grass and trees. Sheep were bleating in the distance.

From the pasture smells near the river I assumed the slickness of the mud was due to sheep and cow shit, but that was wrong. Shit is biodegradable. What's in the Severn, said Simon Haslett, the University of Wales professor, "is silt and clay from soil erosion. Twenty years' worth of sediment is held in suspension in the Severn Estuary, which would all fall out and be deposited in a very short time after the barrage construction, and would then be added to annually."

U.K. commissioners don't have ready answers for this problem. "There is a study in progress on siltation," said Bernard Bulkin, the commissioner for climate change at the SDC, who is otherwise well-versed on barrage economics. "It is a problem with dams, of course. Not all the silt problems of the Severn Estuary are well understood. My understanding is that the engineering view at the moment is that silt would be more of a problem for the Shoots barrage, or the smaller upstream barrages, rather than for the big barrage downstream. I'm not really the geo-technical expert who can comment on that ... but the view is that silt is not as big a problem further down."

He said a 120-year lifespan was the basis for all the government's calculations, including the number of nuclear power plants a barrage might replace. (Two nuclear plants, lasting about 60 years each, replaced once, equals four.) "That just says we don't know how long the lifetime is, but 120 years at least," Bulkin said. "And how we do the economics of something like that is an interesting question — how do you value long-lived infrastructure? That's one of the things the government is wrestling with. It's very pointed in the U.K., because we have infrastructure built by the Victorians which is still serving us very well."

But where did the 120-year estimate come from?

"Well, what we do know is that the one big barrage that's in operation at La Rance has been going for 40 years. It has routine maintenance done on the turbines, and so on, but it shows no sign of any decay. So there's no reason, based on that experience, to believe it would — you know, they use 120 years as their estimate."

So the 120-year assumption for the Severn barrage was derived from La Rance, which operates on a granite riverbed?

"Yes, it's drawn from their experience," Bulkin said.

"But the difference between the Severn and the Rance is that the Severn really is full of silt."

"Oh yeah. Absolutely," Bulkin said. "But these are geo-technical issues ... I think people who have studied this don't believe any of this is insurmountable. These are just things that have to be dealt with."

But Ballard argues that the barrage schemes made public so far don't consider the silt problem in any responsible way. He says the science used by the government to estimate deposit problems is already outdated. Dr. Graham Daborn, a Canadian expert on estuaries, has studied silt in the Petitcodiac to figure out why the causeway had failed so quickly. He found that the studies treated each particle of silt as a "non-adhesive grain," like a grain of sand. But silt in the Severn is sticky, and models of silt deposits haven't been updated.

"People are going, 'Yeah we'll solve it.' But they're not actually saying, 'What if we can't?'" Ballard said.

One thing he and Bulkin agree on is that the U.K. should make more use of something called "tidal-stream" technology, which involves individual turbines on the bed of a river like the Severn or on the ocean floor. Tidal-stream turbines are free-standing. "One way of looking at them is that they're like wind turbines, but capturing the energy of the flowing tide," Bulkin said. "And the U.K., because it has a big coastline, has a tremendous tidal stream resource."

Ballard would like to see tidal-stream turbines used instead of a barrage or any dam-like barrier. The turbines — which can be swapped out as technology advances — are more flexible than 10 miles of poured concrete. The difference from the government's point of view is that no single system of free-standing turbines will gin up as much energy as a single barrage, so no single "tidal stream" project has numbers impressive enough for a bureaucracy to peddle as a solution to a major climate change deadline.

"What I'm saying with Save Our Severn is, 'Let's do something better with the river,'" Ballard said, "'Let's leave it a future, not just sacrifice it to short-term policy like this 2020 (European Union) directive.'"

At the Severn Bore Inn, after the wave, the parking lot filled with about two dozen dripping, shivering river surfers, a possibly endangered species in Britain. Neil Law arrived with his camera, and we stood around to watch the replay, which included a group of men in silly numbered helmets.

"Somebody passed a fridge-freezer above Newnham," one surfer said.

"Oh, so that's where it is," Law said.

"Moves up and down, does it?" someone else asked.

"Yeah, every bore someone has a fridge-freezer sighting. It's been floating up and down for at least two years. Allegedly," he said. "Allegedly, somebody even rode it one year. He said he fell off his board and found this fridge-freezer floating next to him, so he climbed on it and rode it some way like a bodyboard. Allegedly."

I took this opportunity to mention dead sheep. At the very least, I thought, a concrete dam across the Severn might save a number of farm animals.

"Oh," Law said, shrugging. "I've heard that about sheep, too. But I've been following the bore for years, and I've never seen any dead livestock."

http://www.miller-mccune.com/science_environment/tilting-at-turbines-1096

Lessons From the Reverse Engineering of Nature

By: Shahid Naeem

On the Significance of Species

Beginning in the mid-1980s with evolutionary biologist and writer Stephen J. Gould, the University of Minnesota has invited world-renowned speakers to give public addresses in a lecture series named for the university's longtime president and Graduate School dean, Guy Stanton Ford. In 1994, I had just started as assistant professor in the department of ecology, evolution and behavior when I was thrilled to discover that the speaker for that year would be Richard Dawkins, another famous evolutionary biologist and writer. I joined the hundreds in the packed auditorium, and I think all of us were surprised when he began by showing a slide of a familiar religious illustration: a lion and a little girl sitting peacefully beside one another. The illustration portrayed the familiar Christian, Jewish and Islamic construct of Edenic peace, in which all species — including predator and prey — live in harmony. Dawkins used the tableau as an emblem of the irrational thought he had struggled against for most of his career. I saw something different, something I had not seen before. I saw the illustration as an example of humanity's struggle to understand the significance of species, including our own. What is the significance of the millions and millions of species that cohabit our world? What roles do lions, leopards, wolves or, for that matter, worms, beetles and bacteria play in nature? What is our own significance as a species? Are we privileged in ways others are not? Is our role on Earth fundamentally different from the roles other species play?

The question of the significance of species may seem esoteric and subjective, but the root causes of our most pressing environmental problems — and others far worse than what we've yet experienced — stem from our inability to answer that question definitively. Climate warming, emerging diseases, invasive species, food and energy shortages and many other environmental issues are all caused, in part, by the massive loss of plant, animal and microbial species that has occurred in the face of human economic development. Theoretically, such loss of biodiversity could even lead to a complete collapse of Earth. Had we known, in the last few centuries, the true significance of biological diversity, we would not find ourselves where we are today, at the crossroads of tremendous economic, political and environmental upheaval caused by man's domestication of much of the Earth's surface, and even its oceans.

It is perhaps not surprising that I saw humanity's struggle to comprehend the significance of species clearly for the first time when Dawkins showed the religious picture of the little girl sitting peaceably with a lion. That same year, my colleagues and I had published a highly controversial study demonstrating that biodiversity plays a significant role in regulating our environment. Over the ensuing 15 years, hundreds of scientific studies like ours have been published, including a five-year global study done by some 1,300 social and natural scientists from around the world — all of the studies unequivocally illustrating that biodiversity is critical to our world and to our future. These studies also provide a new perspective on our own significance and role as a species, a perspective possibly more inspirational than any humans have heretofore entertained.

The Lion and the Little Girl

The drawing in Dawkins' presentation showed a rosy-cheeked, blonde little girl sitting peacefully beside an enormous lion. It was a relatively realistic rendering, so I imagine some in the audience were anxious at the thought of a little girl in danger. Others probably thought the illustration was from a tale of fantasy, perhaps a children's story like C.S. Lewis' *The Lion, the Witch and the Wardrobe* in *The Chronicles of Narnia* series. Still others, however, quickly and correctly recognized it as a variation on the biblical idea of the Peaceable Kingdom, made famous by the American painter Edward Hicks (1780-1849). To my mind, the English painter William Strutt (1825-1915) captures the idea better in his painting, *A Little Child Shall Lead Them*.

The Peaceable Kingdom refers to a time when all manner of beast will one day live in a harmony with humans, as they once did in Eden. Many in the audience probably even knew the specific biblical passages from which the Peaceable Kingdom derived; Isaiah 11:6: "The wolf also shall dwell with the lamb, and the leopard shall lie down with the kid; and the calf and the young lion and the fatling together; and a little child shall lead them." Or the more enigmatic verse, Isaiah 65:25: "The wolf and the lamb shall feed together, and the lion shall eat straw like the bullock: and dust shall be the serpent's meat."

Dawkins found the image preposterous. He suggested that if we reverse engineered a lion, we would discover that neither the Peaceable Kingdom nor the Garden of Eden is a rational construct.

Reverse engineering, of course, is a process by which one uncovers what a thing is and how it works by dismantling it, examining its parts, working out how the parts relate to one another and reconstructing a working version of the thing. It would not take much effort, Dawkins argued, to discern by reverse engineering that claws, teeth, massive jaws and a digestive tract that lacks any capacity to digest dried grass tells us that the lion was never, nor would ever be, an eater of straw. Rather, the lion's design clearly indicated that it is an eater of lambs, bullocks and, for that matter, little girls. One comes to similar conclusions about wolves and leopards. Such species could only have been designed with one purpose — to kill and eat other species. If we were to reverse engineer ourselves, our teeth, digestive tract and the dietary need for vitamin B12, linoleic and alpha linoleic acid, zinc and essential amino acids that are rare in plants suggests we too have some capacity for carnivory, which should make the lamb, kid, calf, bullock and certainly whichever one is the fatling a bit nervous about a human in their midst, even a little girl.

Eden was a place without evolution and without ecology. There was not only an absence of carnivory but no predation of any kind (insectivory, piscivory or even omnivory); neither was there parasitism, competition, disease, famine, pollination, reproduction or mortality. It seems strange, then, to imagine that predators, parasites and other malentities would have all peacefully populated Eden — until Adam and Eve ate the forbidden fruit. Equally strange is the idea that Eden would be re-created, at some future joyous time, in the form of a Peaceable Kingdom in which lions, leopards and wolves would give up meat and eat straw.

But of course, Eden and the Peaceable Kingdom are ideas that serve to illustrate the ultimate power of the Creator; they serve as heuristic, philosophical and pedagogical devices for the people of Judeo, Christian and Islamic faiths. They are not, and probably never were meant to be, scientifically rational, but they do suggest that humanity has a deep-rooted desire to understand its place among the species.

Though used by Dawkins to talk about evolution, the illustration of the lion and the little girl did not arise from a question about origins. Rather, it speaks to the sense of biological disharmony and discord in our world, what Alfred Tennyson, the 19th-century British poet, famously described as "nature, red in tooth and claw" in his epic poem, *In Memoriam*. The illustration allows us to imagine that a Creator did not originally design the world as it is today, that our sin brought forth ecological and evolutionary processes, and that one day, should we prove to deserve it, our world will be made right again by the elimination of those processes.

Evolutionary theory may provide a scientifically rational explanation for the origin of species, but it does not address the question that motivates Edenic ideas: What function do lions, wolves, leopards, parasites and other species that seem, to humans, to be nasty, noxious, toxic, inedible and ugly serve in a world where the only species that we seem to be able to live harmoniously with are domesticated, edible plants and animals, and beneficial microorganisms like the bacteria in yogurt?

Does Biodiversity Matter?

In spite of widespread awareness that life on Earth is diverse, few people could explain the significance of biodiversity or why it matters. Estimates of the number of species evolution has generated on Earth range from 10 million to 100 million species. (I like to use the modest figure of 30 million.) If asked why it is that we could not live with just 1 million species, or perhaps several thousand, or just a few dozen, even scientists — natural historians, conservation biologists, zoologists, botanists and microbiologists, many of whom could explain the evolution of biodiversity — often cannot tell you what function, if any, so much diversity serves. In fact, it was not until 1992 that scientists formally attempted to address the question, doing so at a conference in Bayreuth, Germany, organized by Ernst-Detlef Schulze of the Max Planck Institute and Harold (Hal) Mooney of Stanford University.

In 1994, when I began at the University of Minnesota, many of my colleagues, inspired by the conference in Germany, had just begun asking what the significance of prairie grassland diversity might have been. Like most Americans, my vision of the prairie included bison, badgers, prairie dogs, elk and wildflowers, but Minnesota seemed to be little more than miles and miles of farms, urban and suburban areas, towns and malls. Ponds, lakes, wetlands and forests were more prevalent, but less than 1 percent of the original prairie remained.

Most people know that the world is rich in species, understand that biodiversity is disappearing and care about species and their loss. Books, magazines, radio, cinema, television and now the Internet show endless pictures of pandas, whales, sharks, big cats and other exotic wildlife, including flowering plants, butterflies and less charismatic species. Natural history museums, gardens, zoos, wildlife parks and nature reserves generally enjoy widespread public and private support. The popularity of the National Geographic Society, cable channels like Animal Planet and Discovery, and well-funded nongovernmental organizations that support conservation, including Greenpeace, The Nature Conservancy, the Audubon Society, the Royal Society for the Protection of Birds, the Wildlife Conservation Society and Conservation International, are all testaments to an enormous interest in diversity. In fact, Edward O. Wilson, another famous evolutionary biologist and writer, has argued in his book *Biophilia* that our fondness and fascination for biological diversity is innately human. Even the many fungal, bacterial and viral species fascinate in their own way and with their own pathogenic qualities.

But if you asked even the avid ecotourist, birder or insect collector the significance of all this biodiversity, he or she likely would not know. For most people, biodiversity is just an enigmatic feature of life on Earth; it's due to some process, evolutionary or other, but of no particular significance.

Significance, of course, is both subjective and contextual. But it is also a relational concept, a comparison of one thing to others. In a scientific sense, if we remove a part in a system, yet the system functions flawlessly as a whole, then we can deduce that the part we removed has no significance. If we remove a part and system function alters, then that part is of intermediate significance. If we remove a part and the system stops functioning, then this part is, by scientific definition, highly significant.

For reasons that will become apparent later, consider a bomber plane whose function is to deliver payloads of bombs on enemy targets. Its functioning is dependent on an intricate web of interacting parts, some mechanical, some electrical and some biological (e.g., its human pilot, co-pilot, navigator, gunner and bomber). Pull out a tiny part, such as a single rivet, and there is often no detectable change in function. As one pulls out more and more rivets, however, the system is increasingly likely to be compromised. Pull out the pilot, and the plane can still fly under the direction of the co-pilot. Pull out the rather obviously valuable propellers, fuel pumps or engines, and the system ceases to function altogether. Pull out the navigator, bomb releasing switches or firing pins on the bombs, and even though the plane can fly, it is no longer capable of performing its intended function.

Because there may be more than 100,000 parts in a large bomber, it would take an enormous effort to assess the significance of all of them. If we wanted to copy the bomber, knowing the significance of all those parts would be invaluable because we could dispense with the insignificant parts. In the absence of such knowledge, it would be best to reverse engineer and copy the bomber piece for piece, under the conservative assumption that every piece matters.

Species are like the hundreds of thousands of parts in a bomber plane, only their system, the biosphere, was not designed to serve a particular purpose. One can study the design of something, however, without having to assume it was designed by a sentient being or intended to serve some specific purpose.

If a bomber plane dropped its payload, had its crew bail out, then crashed in a country whose residents did not know the plane's purpose, the residents might still study its design as a flying machine. One can likewise study the design of a bird without having to assume it was designed by a sentient being and has some specific function other than the one that interests us — the fact that it can fly. One can reverse engineer a bird and marvel at its hollow bones; its remarkable respiratory system, which allows near continuous exchange of gasses in its lungs; its intricate feathers, made up of hooklets and barbules that branch off the rachis; and its remarkable vision. Through this study, one could better understand how a bird successfully flies, lands and navigates the skies. The evolutionary biologist might argue that natural selection favored the most efficient designs; a religious person might assume that the bird reflects the wisdom of a divine engineer. Neither assumption is necessary, however, for understanding the function of a bird.

Thus, the significance of species can be determined in much the same way we went about assessing the significance of parts in a bomber, though we need to identify what function the collective activities of the species on Earth represent. This function is the generation of Earth's environment — the physical, chemical and biological properties of the space that surrounds all living things on Earth. All species contribute to this biospheric function, and the significance of each species can be readily determined in exactly the way we would go about determining function and significance for any part in any system.

Gaia, Mother Earth and Nature

On Christmas Eve 1968, William A. Anders, a crew member on Apollo 8, took two pictures of Earth rising over the lunar landscape. The image has since become an icon for contemporary environmentalism. *Earthrise* showed our planet residing in the vacuum of space, far from any other habitable place. Contrasted against the moon, the image of a distant Earth also reminds us of how different the two landscapes are. We know of few places on Earth as barren as the Moon. In fact, even in seemingly desolate places — parts of Chile's Atacama Desert and certain ocean abysses, for example — there is still microbial life.

Life is visible from a very long way off in space as a dynamic, oscillating green that maximally colors the Northern Hemisphere in July and August and maximally colors the Southern Hemisphere in January and February. But from far away it is difficult to know what the significance of this green stuff is. If there were another planet of exactly the same dimensions and history, traveling in the same orbit, but lacking life, would such a planet be noticeably different, aside from lacking the oscillating green color?

During the 1960s, in anticipation of NASA's Viking mission to Mars, scientists were charged with figuring out how best to determine if there was life on the Red Planet. James Lovelock, an independent British scientist, worked as a consultant on this question. The Viking mission objectives were primarily to obtain high-resolution pictures of the planet's surface, but it also analyzed the chemical makeup of the Martian surface and atmosphere. Along with others, Lovelock realized that one did not have to land on Mars to know whether there was life on it. The high abundance of carbon dioxide (95 percent), virtual absence of oxygen (0.13 percent), scarcity of nitrogen (2.7 percent) and the relatively steady state of the concentrations of these compounds in the atmosphere suggested to him that there was no life on Mars, at least not as we define life. (This did not exclude the possibility that there might be some trace amounts of living matter on or under the surface whose impacts on the atmosphere were not detectable, which is why data being collected by the Mars Exploration Rovers, Spirit and Odyssey, are still under intense scrutiny by those still thinking about whether life is possible on Mars.)

Lovelock also reversed the question: What would the chemical fingerprint for life on Earth be? Using a chemical model of Earth in which there were no living processes such as photosynthesis or respiration, he estimated that atmospheric concentration of carbon dioxide would be 98 percent (it is currently 0.03 percent), oxygen would be barely detectable (it is currently 21 percent) and nitrogen (currently the dominant gas at 79 percent) would make up less than 2 percent of the atmosphere. Temperatures for such a lifeless Earth would hover at 290 degrees Celsius (554 F), and its atmospheric pressure would be 60 times what exists today. These estimates were in line with observations for our neighboring lifeless planets, Venus and Mars, and thus highly plausible.

Clearly, that is not what we have here. The fingerprint of life on Earth is its anomalous atmosphere: The concentration of carbon dioxide is too low (it should be the dominant gas) while the concentrations of oxygen and nitrogen are too high for a nonliving planet. Oxygen in particular — a highly reactive, even explosive gas — should chemically bind to a wide array of elements and compounds on Earth, leaving virtually none in the atmosphere. Yet, more than one-fifth of our atmosphere is made up of this highly reactive element, and its concentration remains relatively constant year after year. In fact, its concentration has been reasonably constant for nearly 60 million years.

Lovelock came away with a sense that there was something truly remarkable about Earth, a sort of meta-life or gigantic global biological system in which the sum of the parts — all the plants, animals and microorganisms — made Earth the habitable planet that it was. He speculated even further that it was an autopoietic system, meaning (roughly) that all its species actively contribute to the functioning of the biosphere in such a way as to ensure their growth and regeneration, which, in turn, is what governs biospheric functioning. This is a complex idea, but essentially he felt that life actively holds the conditions of Earth's surface within a range conducive to the persistence and perpetration of life, a homeostasis similar to our bodies' regulation of core temperature to a constant of around 37 C (98.6 F). Considering just temperature, for example, life works like a giant, somewhat imprecise thermostat. If Earth ever got too hot, perhaps because of a buildup of greenhouse gasses, life processes would shift in such a way that the temperature would come down, perhaps by sequestering and storing greenhouse gasses until the Earth cooled. If it got too cool, however, life would again shift, only this time to induce warming, perhaps by the production of greenhouse gasses.

Interestingly, Lovelock referred to this idea of self-regulation as the "Gaia Hypothesis," named after the Greek goddess of Earth, who herself was the daughter of Chaos, or the void. There is a tendency to think of Gaia as a nurturing goddess, a maternal figure, but in Greek mythology she was the mother, grandmother and great-grandmother of many gods, good and evil. Gaia gave birth to the gods of the sky, mountains and the sea, but she also gave birth to the Titans, the Cyclopes and three monsters (the Hecatonchires). She even provided her son with the sickle he used to castrate and kill her husband, Uranus, although this murder was to protect her offspring from the murderous husband. Gaia was the Earth Mother, but she gave birth to both stability and turmoil.

Through three and a half of the four and a half billion years of Earth's history, it has had life on its surface (though it consisted mostly of microorganisms). Earth formed at just the right time, at just the right

distance from the Sun, with just the right kind of axial tilt to generate seasons, with just the right kind of moon, and at just the right size to be geologically active, with volcanoes and drifting continents. Earth was also bombarded with just enough comets to have water and other materials important to life accumulate on its surface. In fact, how we got where we are today as a living planet requires so many singular, low-probability events that we should consider it miraculous we are here to think about it (which, of course, is what the anthropic principle says would have to be the view of a creature that could ponder its own existence).

Since the Earth became inhabited, it has had atmospheres of methane and no oxygen, periods in which it has been relatively ice free and periods when it was covered almost entirely with ice; it has been struck by giant asteroids, experienced enormous bouts of volcanic activity and seen vast swings in atmospheric greenhouse-gas concentrations and global temperature. Earth's environment has never run amok to produce an uninhabitable planet, but its history has been more dynamic than is often appreciated.

Through the lens of Lovelock's findings, the picture known as *Earthrise* suggests something that is not immediately apparent. The thin layer of atmosphere held to the planet by gravitational force shields us from harmful radiation, insulates us like a blanket and is relatively stable, yet it is also mutable. The small amount of carbon dioxide and other greenhouse gasses in the atmosphere is sufficient to warm the planet but has the potential to rise to levels that would ultimately sterilize Earth. The oxygen that serves the metabolic needs of most organisms, and is the basis of ozone production that shields us from harmful ultraviolet radiation, could completely transfer out of the atmosphere, suffocating most of life on the surface. Nitrogen gas —almost four-fifths of our atmosphere — is relatively inert, but it too could change, binding to other elements and dissolving into the seas. Earth is so massive, it is difficult to imagine any drastic change would occur quickly, but one is possible if biological processes were eliminated. Venus and Mars stand as visible reminders of sterile fates Earth could have.

The Gaia Hypothesis is frequently divided into two parts: The Weak Gaia Hypothesis states that life is critical to Earth's environment, and the Strong Gaia Hypothesis says that the biosphere is autopoietic. It would be convenient if Lovelock's Strong Gaia Hypothesis were right and the biosphere were self-regulating, self-healing and self-perpetuating. We would have a way of explaining three and a half billion years of a planet that has sustained an environment conducive to life.

Though the jury is still out, the bulk of the scientific evidence is against the Strong Gaia Hypothesis. One of its strongest critics is Dawkins, who sees no way that evolutionary or ecological processes can generate an autopoietic biosphere from a seemingly unstructured confederation of species whose fates are determined by their individual fitness and not the fitness or stability of the community, ecosystem or biosphere they reside in. Nevertheless, life is what makes Earth habitable, so the Weak Gaia Hypothesis is undeniable.

Reverse Engineering a Thousand-Billion-Ton Machine

Earth is a dynamic planet on which billions of tons of chemicals annually cycle between two basic states: complex molecules and the elemental constituents of those molecules. Geochemistry encompasses the composition of the gasses in our atmosphere, the chemical composition of the lithosphere or rocky portion of the Earth, and the chemistry of the water that covers much of the planet. Because biological processes influence this chemistry (as in the removal of carbon dioxide from the atmosphere by photosynthesis or the addition of carbon dioxide to the atmosphere by respiration), we refer to the dynamic chemical system of Earth as biogeochemical.

As Lovelock estimated, biological influences are clearly enormous, and life on Earth is massive, consisting of billions of tons of metabolically active organisms. Just how massive is not easy to quantify. Because most living things consist primarily of water, scientists prefer to estimate the mass of living things, or biomass, in terms of how much carbon they contain. If we were to weigh just the carbon of all the living material on Earth and ignore everything else, it would weigh about a thousand billion tons, divided roughly equally between microorganisms and plants. (The mass of animals on Earth is so small in

proportion to the mass of plants and microorganisms that it is often ignored in estimating the mass of the biosphere.)

Aside from this number being very big, it is admittedly hard to relate to what we commonly think of as mass. When I lift my cat, for example, as far as I am concerned its mass is about 5.4 kilograms (12 pounds). I wouldn't find it terribly informative if someone told me instead that its mass is roughly 1 kg C (or 2.4 pounds of carbon), but there's a good reason we should stick with this carbon-centric approach. Even though most of us are not used to thinking about the mass of life in terms of its carbon content, the total mass of life on Earth is almost impossible to derive. Species vary in water content, from more than 97 percent in some marine invertebrates to 70 percent in terrestrial animals, such as my cat, and 40 to 45 percent in trees. The only real universal, standard estimate of mass that allows us to compare a 50 kg jellyfish to a 50 kg human to a 50 kg plant is to focus on carbon content. Carbon also helps us gauge the influence of each species on the Earth's carbon cycle.

Because every species influences Earth's chemistry — sometimes in barely detectable ways, sometimes in major ways — every species can be said to have a function (though not in the sense of purpose). As in our example of the bomber plane, the best way to deduce what function a part plays in the ecosystem is to remove it and see what happens. This is standard practice in ecology, with University of Washington zoologist Robert Paine's experiment in the 1960s being perhaps the best known example.

Paine removed a single species of starfish (*Pisaster ochracues*) from an intertidal community in Mukkaw Bay, Wash., and found that its absence allowed a prolific species of mussel (*Mytilus californianus*) to grow and displace most of the other species in the ecosystem. The starfish functioned as a regulator of mussel density, something that could only make sense in the context of the intact ecosystem

Note that I did not explain the starfish function in terms of biogeochemistry. To do that would require measuring how the distribution of elements in Mukkaw Bay changes in the presence or absence of the starfish. This would be difficult to do; it would require removing every single starfish, and keeping all of them out, for a long enough period to detect the resulting biogeochemical changes. One could, however, count up all the starfish in the region, determine their respiration rate and estimate how much carbon dioxide they release into the water and atmosphere over a year. One could also determine how much carbon they consumed in food and how much they excreted as waste, and do the same for nitrogen, oxygen, sulfur, phosphorous and so on, until all likely influences of the starfish species on the ecosystem's geochemistry were determined.

As this exercise shows, to determine the functional significance, in terms of biogeochemistry, of even a single species is a daunting task. For this reason, there are relatively few species whose biogeochemical impacts are experimentally known. In most cases, as we did for the starfish, one estimates what their function is based on size, abundance, growth rates and other biological properties.

When one reverse engineers a human-designed system, there is a sense that every part was deliberately put there for the system to function. For example, consider a case involving real bomber planes: In 1944, three U.S. B-29 Superfortress long-range bombers made emergency landings in Vladivostok, Russia. The Russians confiscated and then reverse engineered them. The Russians used one plane to learn how it functioned, dismantled the others and copied almost every part to produce the Tupolev Tu-4 Bull, which became an important weapon during the Cold War. U.S. B-29s dropped the atom bombs on Hiroshima and Nagasaki in Japan in 1945; by 1947, the Russians flew their first Tu-4, and by 1951, a Tu-4 dropped a Russian atomic bomb. With more than 100,000 parts, the B-29 made for a daunting reverse-engineering task, but the value of a long-range bomber, especially during the Cold War, made it worthwhile.

In much the same way that Russian engineers dismantled the B-29 to replicate its function, ecologists began to reverse engineer ecosystems in the 1990s, but to understand, rather than replicate, them. One of the first examples of this approach was an experiment conducted in 1992 and 1993 by Lindsey Thompson, Sharon Lawler, Richard Woodfin and me, all junior research scientists at Imperial College of London's Centre for Population Biology at Silwood Park in Berkshire, England. Under the leadership of

Sir John Lawton, we conducted the largest experiment of its kind in a machine dubbed the Ecotron. The machine consisted of 16 integrated growth chambers in which every aspect of the environment could be tightly controlled by computers, from relative humidity and temperature to the timing and quantity of rain, generation of breezes and even the shift in red light that typically occurs at dawn and dusk.

The system we sought to replicate was a weedy meadow typical of Berkshire County, England. A meadow is vastly more complex than a B-29 bomber, but much simpler to replicate because its parts (its species) are readily available and, as reproductive entities, they did us the favor of making as many copies of themselves as we needed. To build an ecosystem, we started with sterile soil that we inoculated with microbial species extracted from a uniform muddy slurry taken from neighboring meadows. We then added more than 30 species of plants and animals to the containers. We used earthworms, soil invertebrates, snails to feed on the decomposing leaf litter, herbivores (aphids, whiteflies and slugs) to feed on living plant tissues, and small predatory insects to prey upon the aphids and whiteflies. Had the Ecotron been bigger (each chamber was a cube, two meters to a side), we might have added mice, rabbits, foxes, moles, sparrows, hawks and larger animals. But we knew that so long as we had soil, soil microorganisms, soil fauna, plants, herbivores and predators, we would have working models of real ecosystems.

Unlike the Russian engineers who replicated the B-29, we deliberately engineered our ecosystems to be different from a real ecosystem in one specific detail: All our meadows were identical except for the amount of biodiversity each had. Six of the chambers contained ecosystems with 31 species of plants and animals inside; four contained only 16 of the original 31 species; and another four chambers had just 10. Everything else was the same — the same volume of soil, same amount of light, same amount of water added each day, same breeze, same timing of dusk and dawn.

What we found was quite surprising. The amount of carbon dioxide absorbed by the communities, the amount of biomass they produced, the fertility of the soil and the amount of water retained by the ecosystems differed. Because everything was held constant among the ecosystems except for their biodiversity, the only conclusion we could come to was that our monkeying with the number of species was sufficient to drastically change the way the ecosystem functioned. Most important, there was a clear pattern that related how many species were in the ecosystem with how much carbon dioxide it absorbed: More diversity led to greater absorption of carbon dioxide.

In 1994, we published the Ecotron study in the journal *Nature*; it soon became one of the most cited papers in global change research. We were all surprised at how much attention our study garnered. There was no doubt that ecosystems were critical to processes such as the cycling of carbon dioxide between the atmosphere and biosphere and the cycling of nutrients between soil, water and the atmosphere, and that these processes were an integral part of global environmental processes. The Weak Gaia Hypothesis already told us this. There was also no doubt that some species had strong impacts on an ecosystem while others — such as Paine's starfish in Mukkow Bay — had weak impacts. But no one had experimentally tested the idea that simply reducing the number of species would change ecosystem function.

Since then, there have been numerous studies that have been variations on the same theme — hold as many factors constant as possible, vary biodiversity, then see what happens to the functioning of an ecosystem. Researchers have manipulated the diversity of plants planted in flower pots, the diversity of plants planted in the field, the diversity of microorganisms grown in Petri dishes, the diversity of marine invertebrates living on tiles suspended in sea water, the diversity of seaweed species in pools, the diversity of stream insects in artificial streams, and the diversity of pond species grown in artificial pools.

These experiments found that some species, when left out, had no detectable effect on biogeochemistry, while in others, if left out, had dramatic effects. But, on average, the removal of species caused changes in ecosystem functioning, and the more species one removed, on average, the stronger these changes became.

Though relatively straightforward in premise, these experiments have been incredibly difficult to conduct because of a mathematical reality: Even when the number of species in a re-created ecosystem is relatively small, the number of possible combinations of those species is enormous.

A concrete example will drive home the combinatorial nature of biodiversity. At the University of Minnesota, under the leadership of David Tilman and Peter Reich, dozens of researchers (including me) and hundreds of students have manipulated the composition of prairie grassland species in hundreds of replicate plots in a series of experiments that have been running for more than a decade. These studies have become some of the most influential of their kind, yet even the most ambitious used only 32 species of prairie plants, while other experiments typically limited themselves to just 16. Several hundred possible combinations of plant species were used in the experiments, but large though this may seem, there were 4,294,967,295 possible combinations, meaning that most were never explored. The area devoted to these experiments takes up roughly 600 by 300 meters (or about 38 acres), making them among the largest experimental series of their kind.

In spite of the limited number of species and tiny numbers of combinations involved, these studies have been stunningly successful at demonstrating that greater diversity means more biomass, more production, greater retention of nutrients, greater resistance to invasive species, greater resistance to the spread of plant pathogens and greater stability.

In 2006, Bradford Cardinale of the University of California, Santa Barbara and several colleagues reviewed all the reverse ecological engineering studies they could find. The studies included bacteria, fungi, plants and animals in ecosystems that ranged from lakes to streams to oceanic coastal habitat to temperate grasslands and even to forests. They found that 88 percent of the studies demonstrated that declining biodiversity generally led to a reduction in the amount of biomass in the ecosystem, not just of plants but of microorganisms and animals, too. Not surprisingly, if there is less biomass, there is usually (but not always) less in the way of biological processes to influence geochemical processes, and the majority (77 percent) of these studies found that, as one would predict, nutrient stocks were affected by biodiversity loss. That same year, Boris Worm of Dalhousie University in Halifax, Canada, and colleagues reviewed studies of the importance of biodiversity in aquatic ecosystems, particularly marine systems, and came to the same conclusion — the loss of biodiversity dramatically and adversely impacts marine biomass and marine ecosystem processes.

Biodiversity loss can affect ecosystem functioning for many reasons, but two keep emerging from the research. First, the more species one removes, the greater the probability that an extraordinarily important species will be lost. But there is a second reason that biodiversity loss reduces ecosystem function: complementarity. The more species you have, the more ways they make use of limited resources such as light, water, nutrients and space.

Complementarity effects can be significant. The classic example involves deep- and shallow-rooted plants; if you have only one of these forms, some of the nutrients and water in the soil are never used because no roots reach them. Likewise, an ecosystem with both drought-tolerant and flood-tolerant species will do better over many years of floods and drought than an ecosystem with only one or the other species.

In most studies, sampling and complementarity effects occur simultaneously, and it is very difficult to tease them apart. But the hundreds of ecological reverse engineering studies published in the last 15 years are rich in detail, involving all sorts of species in all sorts of ecosystems. How scientists have interpreted their findings varies enormously, and there is incessant discussion over the best explanation. In spite of these debates, the basic conclusion is that no matter what ecosystem you look at and no matter what organisms you look at, if biodiversity declines, there will be changes in the amount of biomass in an ecosystem and changes in how that biomass influences the geochemistry in the region.

This complex research, with its many interpretations, helped to shape the findings of the U.N.-commissioned Millennium Ecosystem Assessment, a five-year international endeavor to assess the state

of the planet; the assessment's findings were published in 2005 and 2006. This assessment has become the standard reference for the state of the biosphere, much the way the Intergovernmental Panel on Climate Change has become the most widely accepted standard reference for climate change. The assessment places biodiversity squarely at the center of all the environmental processes that affect human wellbeing. Whether the environmental problem is the spread of emerging diseases, control of invasive species, food security or climate regulation, and whether we are talking about human health, poverty, education or even freedom itself, almost all aspects of human well-being and prosperity trace back to biodiversity for their foundation.

Losing Biodiversity

At the outset, it might have seemed that reverse engineering a thousand-billion-ton, three-and-a-half-billion-year-old biological system made up of some 30 million different parts distributed over 510 million square kilometers is simply impossible. But in 15 years, enough progress has been made that we have come to a revolutionary understanding of the significance of species. Every species influences the chemical composition of our seas, land surfaces and atmosphere. Collectively, the metabolic activities of species are responsible for the low carbon dioxide and high nitrogen and oxygen content of our atmosphere. Without their influence, Earth's surface conditions would likely be somewhere between that of Mars and Venus, and entirely inhospitable to life. The extent of this biological influence over our global environment can be estimated by the mass of life on Earth. But we now know through hundreds of scientific studies on reverse engineered ecosystems that the diversity of species making up this mass is equally important. If we lose biodiversity, ecosystems can change dramatically in the way they function, especially if we lose species that play significant roles in ecosystem function.

Biodiversity loss is the single most prevalent feature of our changing world, but this fact is often missed because it is conflated with the extinction of species or the global extinction of species. Species extinctions are serious, to be sure. The latest and most widely respected estimates of the number of species threatened with extinction are compiled by the International Union for the Conservation of Nature (the IUCN Red Lists) and include some 16,928 species, or more than a third of the species this watchdog nongovernmental organization has examined. The actual number of documented extinctions, however, is fairly small — about 700 since the 1600s. The number is small because most species are small, rare and yet to be cataloged; meanwhile, extinction, or the death of the last individual of a species, is usually a private, quiet event, witnessed by no one.

Conservation International, an NGO that aggressively seeks to save as many species as possible, estimates that one species goes extinct every nine to 44 minutes because of habitat destruction and climate change. The group's extinction clock is based on some rather limited scientific evidence but does draw attention to the issue. Estimating the magnitude of global extinction based on just the few hundred that have been observed over several centuries severely underestimates what is widely recognized as a fact: The Earth is undergoing the sixth major mass extinction of life it has faced in its long history.

Biodiversity loss, however, is less about global extinction than the homogenization of life on the Earth's surface. Imagine a square kilometer of Earth's surface, then count up how many species exist, from the top of the atmosphere down to the rocky surface of the lithosphere. In some places, such as the tops of tall mountains, you would encounter very few species; in others, such as the Amazon, you would encounter hundreds or possibly thousands of species. If you did this repeatedly, you would come up with an average for the total number of species per square kilometer. If we shoved all our wild species — not domesticated ones like wheat, corn, cattle, horses, pigs, chickens and the like — into wildlife refuges, national parks and other protected areas, the total number of species on Earth would not change. If you repeated the species census again, however, you would find that the average number of species per square mile had plummeted. Biotic impoverishment would be widespread, even though not one species was lost to global extinction.

Because a species cannot recover from global extinction (short of the fantasies of cloning extinct species from DNA), it is by far the major focus of conservation organizations. Even in the United States, the Endangered Species Act has enjoyed more than 30 years of support in spite of wide swings in

administrative positions on the environment. The California condor, the whooping crane and the panda are widely known examples of tremendous efforts to stop global extinction.

While conservation efforts to prevent global extinction are laudable and should receive greater support than they currently do, they are a diversion from the much larger problem of biodiversity loss. The more we relegate wild species to parks, zoos, gardens and seed banks, and the more we place domestic species in their stead, the more homogenized the world becomes. Even without the loss of a single species, with increasing homogenization biodiversity declines. Consider that only 1 percent of the American prairie remains, most of its hundreds of species of plants, birds, mammals and reptiles and thousands of species of insects replaced by a few species of domesticated plants, such as corn, wheat and soybean, and domesticated animals, such as cattle, pigs and sheep. Even if every species seen by the settlers and American Indians lives in reserves, 99 percent of the land is much poorer in species than it was in the past

When it comes to the functioning of the ecosystems and the biosphere, it hardly matters if millions of species are hanging on by threads in protected areas while virtually the whole of the Earth is biotically homogenized. As the average number of species found in each square of Earth's surface declines, so too will its biomass, its biogeochemistry and its contribution to a stable, life-supporting biosphere.

The Paragon of Species and the Equitable Kingdom

I imagine that any species endowed with our psyche would ponder its own significance. Religion provides a variety of options for us to express that significance, sometimes to good effect (art and charity), sometimes in ways we come to regret (the Spanish Inquisition), but always with a sense that our existence and our actions matter in some profound way. Ideas of our significance derived from science frequently fail to inspire the general public. Physics tells us the universe will one day collapse upon itself or expand into nothingness; chemistry sees us as a collection of atoms; and evolution and ecology appear to marginalize humans by placing us in the context of millions of species that have roamed the Earth. Scientifically speaking, at home or in the universe at large, we seem small, insignificant, a blip among millions of blips on the evolutionary tree of life and aside from our intellect, less well endowed than many of our fellow species.

But we humans are not likely to accept any view that marginalizes us. A line from Hamlet sums up nicely humanity's self-perception:

What a piece of work is man! how noble in reason! how infinite in faculty! in form and moving how express and admirable! in action how like an angel! in apprehension how like a god! the beauty of the world — the paragon of animals!

Whether this perception is accurate hardly matters; it is what we want for ourselves. (Hamlet is not particularly impressed with humans, for he continues, "And yet, to me, what is this quintessence of dust? Man delights not me...") So in light of the knowledge science has conveyed to us, the question is: How do we identify our significance and shape our role so we become the paragon of animals — or the paragon of species — that we want to be?

I believe that the reverse engineering of ecosystems has revolutionized our scientific understanding of the natural world, suggesting not only a better way to understand the significance of species, but our own very human significance as well. Whether one sees the hand of a divine creator in the exquisite design of the biosphere or one simply marvels at its beauty independent of the question of creation, true understanding emerges from knowing the function of each species and how the various species relate to each other in the grand biogeochemical cycles of life that make Earth the wondrous place we see in *Earthrise*.

The appeal of the ancient idea of a Peaceable Kingdom is rooted in a fear of nature and a world that is "red in tooth and claw." The Peaceable Kingdom is also a world where humans have special status, one where we are not the accident of ecology and evolution. It is a tame world, a domesticated world, one

where pet cats replace lions, pet dogs replace wolves, edible plants replace inedible or toxic ones, and where helpful microbes replace pathogens.

There are two ways of achieving such a Peaceable Kingdom without waiting for divine intervention. First, we could extirpate or exile all species that are harmful to ourselves or harmful to those species we value. Because many feel that extirpation or extinction is morally reprehensible, exiling species to zoos, gardens, seed banks and wildlife sanctuaries seems to solve this problem.

The second route is to domesticate every species, if not by breeding then by genetic engineering. We could convert all plants to edible species, all animals to herbivores and all microorganisms to beneficial species. Though it will be a long time before we could possibly breed or engineer lions such that they could live off of straw, our successes in plant and animal breeding and genetic engineering show much promise. If we follow one or both routes, we could completely transform our current world to a tame, domesticated one, a world shaped by neither the joint processes of evolution and ecology nor the hands of a divine creator.

This would not be the Peaceable Kingdom as described by Isaiah, but it would be a Domesticated Kingdom, one that achieves the same desired ends — nature no longer feared and the dominance or special status of humanity unequivocally established.

In fact, we have been following these two paths for thousands of years. Peter Kareiva, lead scientist for the Nature Conservancy, and several colleagues recently argued that the Domesticated Kingdom is already here. Humans have extirpated most predators from the wild, suppressed wildfires, built jetties and seawalls to prevent storm surges, and now store water for hydroelectric power, drinking, irrigation and flood control totaling six times what is contained in the world's rivers. They further argue that only 17 percent of the terrestrial surface is free of human influence, and 50 percent of land has been converted to agriculture and domestic livestock grazing. It is hard to measure human influence over the oceans, but here too it seems we have exerted dominion. Nearly a third of major marine fish stocks are down to 10 percent of their recorded maxima, and more than a quarter of the ocean's primary production is currently consumed by humans.

The Domestic Kingdom may have its appeal, but it lacks sensible integration into the biosphere. If we were to reverse engineer the Domesticated Kingdom the way we did the natural world, we would find a bizarre system. Compared to the original thousand-billion-ton, 30-million-species biosphere, the Domesticated Kingdom has less mass and continues to shrink (large stretches of rainforests have been replaced by agro-ecosystems and major fish stocks have collapsed); its biodiversity is less than half what it used to be (half of terrestrial ecosystems now have the low diversity associated with croplands, farms, plantations and heavily grazed lands); and its web of life, now dominated by domestic species consumed ultimately by a single consumer, has no particular structure. Grasslands once made up of largely inedible plant species have been replaced by agro-ecosystems made up of highly edible plants, and where farming proves intractable, we convert inedible plants by feeding them to livestock we then feed on. Forests — once filled with a variety of species, many of which supplied neither edible nor usable forest products — are similarly replaced by monoculture tree farms that supply us with food, lumber and other desired forest products. Oceans once fished heavily are seeing increasing amounts of aquaculture. The few species we would encounter in the most productive landscapes — rice, corn, wheat, soybean, sugar cane, cattle, pigs, sheep, goats and chickens, and in marine systems, farmed oysters, mussels, seaweed and salmon — are no longer part of an intricate web of millions of interacting species structured by ecological and evolutionary principles.

The Domesticated Kingdom is governed by economics and politics rather than ecology and evolution, and constitutes a relatively new and untested design for a thousand-billion-ton biosphere. Over the last 10,000 years, our world has shifted its function from one of sustaining life on Earth to channeling bio-materials and biofuels to a single species: *Homo sapiens*. The shift has been overwhelming and fundamental.

Consider: Terrestrial ecosystems remove an estimated 65.5 billion tons of carbon from the atmosphere each year, producing plant material that acts as biofuel for all of the biogeochemistry done by these ecosystems. Humans, however, appropriate about 24 percent of this biofuel, or almost 16 billion tons. Thus, one species out of 30 million appropriates almost of a quarter of plant production on land. The Domesticated Kingdom is strongly regulated by the cost of fertilizer, the availability of farm labor or machinery, the cost of transportation of goods, the state of infrastructure within and among nations, the regulation of trade, tariffs, war, famine and other social, political and economic forces. It is not entirely independent of the ecological and evolutionary processes — climate change is a contemporary example of the remaining dependence — but is predominantly a socially governed, rather than an ecologically or evolutionarily driven world.

Reverse engineering humans would not be best done by examining their teeth, jaws and digestive tract, as with the lion, but by looking at their impact on biogeochemical systems. And if we examine our species' significance as ecologists have done with plant, animal and microbial species over the last 15 years, we would find our functional significance to be enormous. Never in the long history of life has any species achieved the unprecedented, massive biogeochemical influence our species has.

Because the Domesticated Kingdom is designed to channel resources to humans, our kingdom is one in which all other species serve at the pleasure of ours. This is a biotic feudal kingdom in which we harbor and protect those species that serve us.

The biosphere was differently structured. It was an Equitable Realm, where every species functioned as part of a single system. It was not a kingdom because it had no single dominant species. It is endlessly fascinating to consider that this Equitable Realm was structured and governed solely by ecological and evolutionary principles and worked excellently as a thousand-billion-ton biogeochemical machine. There is no evidence or reason to believe, however, that it worked in any well-ordered fashion. It was not a super-organism shaped by evolution; it was not autopoietic; it had no rulers, no controllers, no stewards. It was robust, even to asteroid impacts, but imprecise. It wandered freely within environmental tolerances that sustain life, but it had no homeostatic mechanism that adheres strictly to one set point.

The pre-human Equitable Realm of the biosphere, however, is now the Domesticated Kingdom. The business of biogeochemical regulation of Earth's environment has been left to the vanishing remnants of the original biosphere. This is not sustainable; at some point the environmental functioning of the biosphere has to be either restored or assumed by the dominant species. Given that humanity has transformed half the land surface of the world and consumes a quarter of the Earth's biological production, restoring the original biosphere — returning to the Equitable Realm — is not an option most humans would accept.

But humans can assume responsibility for the regulation of the environment.

In assuming the responsibility for biogeochemical regulation, humans become the most significant species in a new Equitable Kingdom. As in the original biosphere, in the Equitable Kingdom each species fulfills its function in the complex web of life that governs ecosystem and biospheric functioning. But the Equitable Kingdom is different from the Domesticated Kingdom; it is structured and governed not just by human social processes such as politics and economics, but also by ecological and evolutionary requirements. Rather than functioning solely to feed and fuel humanity, the social, political and economic processes of the Equitable Kingdom are designed to ensure the proper biogeochemical functioning of the biosphere.

The Equitable Kingdom is admittedly a hard sell. It is not utopian in its vision, like the Peaceable or Domesticated kingdoms, but it is the one kingdom that ensures the long-term sustainability of our environment.

In the Equitable Kingdom, a child will not be safe in the immediate presence of a lion, leopard or wolf, but in the distance these predators will regulate the herbivores that regulate the vegetation that regulates the composition of our atmosphere that determines the state of our environment. In the Equitable Kingdom, if a nation has a forest that sequesters and stores carbon during a time when global warming threatens life on Earth, the international community recognizes this nation as rich and powerful. In the Equitable Kingdom, Brazil would not seek to emulate the American Midwest but would be rewarded for serving as the world's carbon bank. Similarly, in an Equitable Kingdom, the American Midwest would receive financial rewards for preserving and restoring the natural biogeochemical capacity of its landscape so it approximates that of its original prairies.

A New Environmentalism

For decades now, environmentalists have propounded a litany of humanity's crimes against nature, but the list has always been misguided, suggesting that the march toward a Domesticated Kingdom was wrong, but seldom offering an alternative that was realistic. The science of the last 15 years calls for a new environmentalism driven along a new path by the modern fields of sustainability science, environmental engineering, global change biology, restoration ecology, conservation biology, conservation medicine, biodiversity and ecosystem functioning, ecoinformatics and remote sensing. We have already started on this path with international treaties such as the Convention on Biological Diversity and the U.N. Convention on Climate Change and its Kyoto Accords, activities like the Millennium Ecosystem Assessment and new programs in sustainable development around the globe. Carbon trading, environmental certification of products such as wood, seafood and coffee, and new funding in American environmental science — including the U.S. commitment of more than $200 million for a National Earth Observatory Network that will gather real-time data on biodiversity and ecosystem processes and provide it to scientists, industry, businesses and citizens — are a few examples of first steps toward an Equitable Kingdom.

But the Equitable Kingdom is not just a new form of environmental activism; it is a new way of ordering the world, one that reveals the extraordinary significance of our species — a significance we always believed we had but couldn't envision clearly. We saw ourselves as the paragon species in Eden and the Peaceable Kingdom as a matter of divine ordination, but such beliefs are not scientifically tenable and swayed only those who subscribed to the faiths that promoted them. To become the paragon of species in an Equitable Kingdom — a kingdom in which biodiversity serves as the foundation for environmental sustainability — is not only an achievable goal but a critical one if humans are to reform and in many ways dismantle a Domesticated Kingdom that has no inherent ability to ensure environmental equanimity. The biosphere lacked any central organizing force, leadership or stewards. By assuming the responsibilities of the paragon position it has always yearned for as a species, humanity can become the steward the Earth has never had.

http://www.miller-mccune.com/science_environment/reverse-engineering-of-nature-1100

Study in Contrepreneurship

By: Vince Beiser

With a last, anxious glance at the notes in his hand, Mike Nagle launches into his pitch. "Hi, I'm the owner and founder of Amp Welding Service, where we fit it right and weld it tight," begins the tall, muscular Nagle, his weight shifting from foot to foot. "We're a welding company serving the oil and natural gas industry."

Nagle barrels along into a breakdown of the business' revenue model as Catherine Rohr, looking every inch the corporate professional in her perfectly creased pinstriped pants and white shirt, takes careful notes. The presentation — which aims to get investment for Nagle's business and comes complete with detailed profit-and-loss projections and market analysis — sounds like a lot of pitches Rohr has heard in corporate meeting rooms from New York City to Silicon Valley.

But this one is a little different. It's taking place inside a Texas prison, and the prospective entrepreneur is serving four years for sticking up a stranger in a parking lot.

Rohr, a slender 31-year-old with glossy, shoulder-length auburn hair, used to be a high-flying executive in the venture capital industry, advising wealthy investors on which businesses to support. Now she offers her expertise to a much less likely group of entrepreneurs.

Rohr left her old life four years ago to start the Prison Entrepreneurship Program, a nonprofit that teaches incarcerated would-be Horatio Algers to apply their talents to the legitimate marketplace. After all, assessing risk, handling cash flow and managing distribution networks are as important to succeeding on a drug corner as they are in a corporate corner office.

"These men aren't locked up because they were bad businessmen," she says. "They're locked up because they lacked moral values."

So far, the program has put 440 male inmates through four months of classes in which volunteer executives and MBA students from the likes of Harvard and Stanford help them develop business plans.

Applicants are carefully screened. They must be within a year of their release, renounce gang affiliations and submit to several tests and interviews. Only about 1 in 7 is accepted. Nearly half are kicked out over the course of the program for infractions ranging from cheating on tests to maintaining gang ties.

PEP also provides crucial support after release. Staff members pick up each graduate at the prison gate and help him find a place to stay. At the organization's headquarters in a north Houston office park, program grads choose suits from a room full of donated business clothes. Post-release classes and mentoring opportunities are available. Rohr and her husband even take the men out to the beach or the movies sometimes and organize holiday parties for them.

By the organization's count, almost all of the program's graduates have found jobs after their release, and 57 have started their own businesses, ranging from landscaping to dog training. Just shy of 9 percent have so far wound up behind bars again — an impressive statistic in a state with a recidivism rate of around 30 percent. "No question, it's an innovative model with a lot of promise," says Amy Solomon, a researcher at the Urban Institute specializing in prisoner re-entry issues.

That record is bringing the program major support. The Texas Department of Criminal Justice gave it an award for being the state's "most innovative" volunteer program in 2007. The group's budget, donated by individuals and foundations (including a recent $750,000 grant from the Harry and Jeanette Weinberg Foundation), swelled from nothing in 2004 to $2.5 million last year. PEP now has 26 employees, many of them program graduates.

PEP is one of a handful of initiatives that have sprung up around the country in recent years to teach inmates business skills as a way to boost their chances for success after release. The need is certainly there. The number of prisoners in the United States stands at a record high of nearly 2.3 million — more than any other country on Earth. Every year, 650,000 of those convicts are released. But within three years, studies show that upward of half wind up back behind bars. Rohr thinks that if more of them knew how to make money legally, more of them would stay on the outside.

Rohr grew up comfortably in Northern California, the daughter of a Stanford engineering professor and a stay-at-home mom. But she's hardly a shrinking violet; as a teenager, she was a state wrestling champ and later won a national jujitsu competition.

After earning a business degree from the University of California, Berkeley, she dove into the demanding world of venture capitalism. "She was unusually focused for someone her age," says Peter Chung, a managing partner at the Palo Alto firm Summit Partners, who hired her right out of college. Rohr's goals in those days were straightforward. "My life was all about me, making more money and getting a bigger house," she says.

Things began to change when she was 25, she says. She and her husband, Steve Rohr, a lawyer, started attending the River Church, a Bay Area house of worship with an emphasis on social justice work. Rohr's Catholic upbringing had never meant much to her, but her new pastor convinced her to start "living a life of loving God," as Rohr puts it.

That year, she and Steve volunteered on a church-sponsored trip to work with HIV-infected orphans in Romania. "It was the first time I had been away from my Blackberry and all the other comforts of my life. And it was the first time I'd had injustice really in my face like that," she says. Something in her responded deeply. She began looking for a way to help others full time.

Soon afterward, the couple moved to Manhattan where Rohr took a new job with American Securities Capital Partners. In her spare time, she studied philanthropy at New York University.

In April 2004, a friend invited her to tour some Texas penitentiaries with the ministry of former Watergate conspirator Chuck Colson. Rohr had never been in a prison or met a prisoner in her life but had strong opinions about them. "I was totally the 'lock 'em up and throw away the key' type," she says.

But the trip changed her outlook and ultimately her life. To her surprise, the men she encountered inside were polite, well-behaved and often highly intelligent. "I thought I was going to see caged animals, but instead I saw other human beings," she says. "I was really ashamed of how ugly and closed my heart had been. I realized I didn't believe these guys were worth redemption."

Her other big surprise was learning how businesslike criminal gangs are, complete with the equivalent of management teams, pricing strategies and bookkeepers. "These guys had the exact profile of the entrepreneurs I pursued in venture capital," Rohr says. "It's just that their business had been illegal. So I thought, 'What if we equipped them to use their skills for good?'"

Rohr went home, worked her Rolodex and returned a month later. This time she brought along a volunteer group of executives who delivered a two-hour business training seminar at the Carol Vance Unit, a low-security facility Rohr had visited on her tour. Fifty-five inmates showed up. She followed up by designing a competition for prisoners who had created business plans. A few months later, she and Steve quit their jobs, cashed out their 401(k)s and moved to Texas so Rohr could devote herself full time to launching PEP.

"I was highly surprised," says Glenn Kaufman, her former boss at American Securities. Rohr was making six figures at the time. "When someone tells you they want to leave their career and where they live to go do something like that, you can say either, 'You're crazy' or 'You're talented, so there must be something to this.' My reaction was, 'Wow. Tell me about it.'" Kaufman now serves on PEP's advisory board.

Rohr and her husband worked together at first, but he later took a job at a local law firm; his income, along with Catherine's modest salary, allowed them to move into a stately brick home near a golf course. But it wasn't easy getting started. The Rohrs first rolled into Houston at 1 a.m. in a rented minivan filled with of all their belongings. Too tired to unload, they left the van parked on the street. By daylight, everything had been stolen.

The program had to be built from scratch, with volunteer labor, in the face of skeptical prison officials and constant personal disappointments for Rohr. Several students borrowed money from her and then vanished, or stole things outright. More than a few have slipped back into addiction, crime and incarceration.

"The last four years have been the most difficult, gut-wrenching, tear-jerking of my life," Rohr says. "I might have chickened out if I knew what was coming, but I never miss my old life. I'm crazy about what I get to do every day now."

The Prison Entrepreneurship Program is housed in the Cleveland Correctional Center, a low, gray cinderblock complex surrounded by a concertina wire-topped fence in the pine woods an hour north of Houston. These days, Rohr spends most of her time traveling, meeting with donors and recruiting new inmates in scores of other Texas lockups. But she comes back to lead the course a day or two each week.

On a morning last July, the 39 men in the program's current class file in from their austere cellblocks to a carpeted meeting room. They're mostly in their 20s and 30s, all in prison-issue blue sweatpants and T-shirts. Heavily tattooed, their skin is white, black or brown — normally iron dividing lines in prison. But in here, they all greet each other with warm, vigorous hugs.
Rohr cues up some thumping dance music. "Prissy!" she calls. "Bambi!" In response, one by one, each prisoner shimmies and shakes up to the front of the room to the cheers and hollers of the rest. Every one of the drug dealers, armed robbers and murderers in the program gets one of these deliberately effeminate nicknames. It's one of several tactics aimed at getting them to drop their tough-guy facades and bond with one another. Amazingly, the ploy actually works.

"Holding up that front in prison gets so tiresome. It's a relief to be able to be stupid and silly, to be the kid you never were," says Bruce Stubbs, a 25-year-old former methamphetamine dealer who was released last summer after completing the program. He's now doing clerical work at a law firm while taking classes at

a Houston college. "Ms. Rohr gave up everything to get this program off the ground. You can see her sincerity. That's what lets her break down those barriers."

After much trial and failure, Rohr has learned that the inmates need more than just legitimate business skills to make it in the free world. Many have serious psychological and substance-abuse issues that will trip them up again as soon as they walk out the prison gate. So in addition to classes on accounting and brand management, the program provides training in "life skills" — everything from opening a bank account to politely avoiding old drug buddies.

Through a 14-hour day of classes and discussion, Rohr never stops radiating good cheer, smiling sunnily and leavening her lectures with jokes and teasing digs at the students, the staff and herself. Standing at her podium or prowling the room, she's a combination teacher, revival minister and motivational speaker, exhorting the men to believe they can succeed, while still holding them to account for their past mistakes.

For all her warmth, she can also be a stern, even self-righteous judge — especially considering she has no formal training in this sort of counseling. The most common pitfall, Rohr tells the men, is getting involved with the wrong women. "When you first get out, you guys latch onto the first woman you see because you're so needy for female companionship," she lectures. "You have nothing to offer, and you go after these girls with nothing, who are trying to feed five kids — it's pathetic! Where's your manhood in that?

"You guys think you're on a low, scummy level because you're in here. But you're not. You're great men. And if you'd just believe that, and carry yourselves that way, you'd attract great women."

Later in the day, Rohr gathers the men in a circle. They spend a couple of hours discussing their family troubles and hopes for the future, like a bunch of Oprah guests. One man talks about his rage and depression over his wife getting pregnant by another man while he's been locked up. Another wonders how he can convince his teenage son to listen to his advice when he feels like such a dismal role model. "To see other guys bare themselves this way is really moving," says Daniel Ingle, 26, in for six years on a burglary charge. "This program is about learning how to live and how to think right."

From New York to Oregon, at least half a dozen programs are trying to turn inmates into entrepreneurs. "Research suggests many individuals with criminal records possess high entrepreneurial aptitude, especially those convicted of drug dealing, and share common traits ascribed to successful entrepreneurs," notes Nicole Lindahl, assistant director of the Prisoner Reentry Institute at The John Jay College of Criminal Justice, in a recent monograph. A study by University of California, Santa Cruz economist Robert Fairlie, for instance, found that young people who dealt drugs were more likely than their non-dealer peers to choose legitimate self-employment later in life.

Starting a business can in fact be an easier way to make a living than finding a traditional job, Lindahl notes, since ex-convicts are barred in many states from working in a range of occupations, from financial services to child care. And most prospective employers aren't exactly thrilled to see a felony record on a résumé.

Certainly, self-employment isn't for every ex-con; many of them can barely read or do basic math, let alone manipulate a spreadsheet. Still, Lindahl writes, "even if only a tiny fraction of the vast number of people returning home from prison pursued self-employment, it could make a significant impact. If between 1 and 7 percent of people leaving state or federal prison next year started their own businesses ... 6,500 to 45,000 new businesses would be created in the United States."

The theory sounds good. Solid data, however, are still in very short supply. These programs are only a few years old and include, at most, only a few hundred participants each — which means the whole movement is still too new and small to yield reliable information on its long-term success.

"Starting and running a business is very difficult. Most people with business backgrounds don't succeed at it," notes Richard Greenwald, a senior fellow specializing in prisoner post-release issues at the Manhattan Institute. There are extra obstacles for ex-cons, Greenwald notes: "If you have to report to your parole officer at certain hours, that gets in the way of hustling for business." Indeed, of the 57 businesses launched by Prison Entrepreneurship Program grads, 25 have already closed down.

But the biggest questions around programs like PEP is the extent to which they can get career criminals to permanently change their ways. The program's 9 percent recidivism rate looks great, but it includes some former inmates who have only been free for a few months. The same goes for a similar program run since 2004 by the Oklahoma Department of Corrections; of 317 inmates who have completed the training, only 5 percent have wound up back behind bars — so far.

Michael Cevallos is a perfect example of the promise and the pitfalls of these programs. Last summer, I met him on a baking-hot day in Houston for a quick lunch at Jack in the Box. His moving company was so swamped with customers that he'd had to rent an extra truck and hire three guys to help haul furniture. A compact, energetic man wearing a sweat-stained polo shirt and a neatly barbered brush of gelled-up hair, Cevallos had launched the business just two months earlier, upon his most recent release from prison, where he's spent a total of 23 of his 40 years on a series of burglary and drug offenses. "I started smoking weed at 8, and I was selling dope with my old man at 12," he said with a toothy grin. "I've been an entrepreneur for a long time."

It was PEP that inspired him to go legit. "Ms. Rohr is an extraordinary teacher, bro," he says. "She loves us unconditionally. She makes us want to do the best we can."

That, however, isn't always enough. A few months after I met him, Cevallos was arrested for cocaine possession and shipped back to the penitentiary for eight months. It was a PEP staff member who told Cevallos' parole officer that he had fallen off the wagon. That's Rohr's policy. "Drug offenders are dangerous. They rob, they steal and they need to be taken off streets," she says. "I believe in redemption and grace. But until people are rehabilitated, they shouldn't be released back to society."

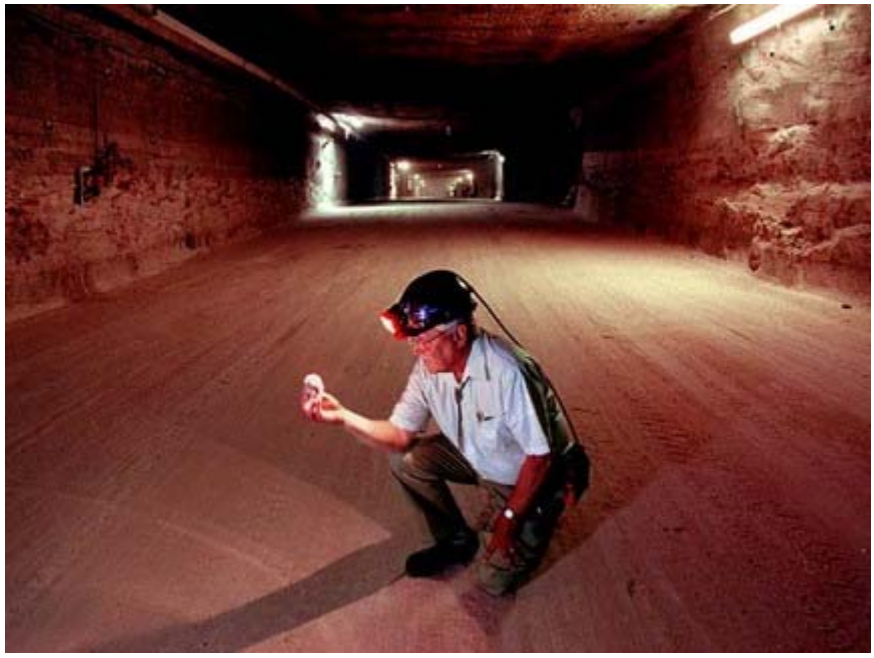
Stories like Cevallos' are a disappointment, but they're still a small minority among PEP graduates. And they haven't changed Rohr's mind about what she's doing. "People ask, 'Why put all these resources into helping people who have done wrong?'" Rohr says. "Well, everyone has done wrong. I always ask our critics, 'What's the worst thing you ever did? And what if you had to write that on a job application?'

"These men have been takers their whole lives. We want them to become taxpayers and donors and philanthropists."

http://www.miller-mccune.com/culture_society/study-in-contrepreneurship-1098

The Salt Mine Solution

By: Matt Palmquist



The "nice" elevator is right out of a luxury hotel with a smooth ride and room for 75 people. It has six degrees of safety redundancy, which means that if one cable were to snap, several others, plus an emergency brake or two, would prevent the six of us from hurtling to our deaths. But just as I'm adjusting the self-rescuer respirator on my utility belt, we get the news: There's a problem with the "nice" elevator. We have to take the salt shaft.

The "other" elevator is really a glorified cage pulled along a single cable through a vertical salt shaft; it has one level of redundancy and clatters up and down the shaft like an old roller coaster. "You're going to feel the floor drop from under you," says our tour leader, Roger Nelson, as the cage doors rattle closed and the elevator begins a creaky, 2,150-foot descent. Within seconds, everything goes pitch black. Nelson mentions that now would be a good time to focus the lamps in our miner's helmets, and a few switch on, small points of light playing off shaft walls that are speeding past outside the cage. "Everybody's gotten real quiet," Nelson says, as the air grows cool. "Praying?"

After five minutes that feel like 20, the ride ends and we step out of the cage into a long corridor with gray walls, shot through with red streaks. The first sign we see says: "Welcome to the WIPP Underground. You have just entered an environment committed to SAFETY." The next sign we see says: "STOP! If it's not safe, don't do it."

There are reasons for the warnings. Here, a half-mile below the southern New Mexico desert, we are entering the only operating deep geologic nuclear waste disposal site in the world. The Department of Energy's Waste Isolation Pilot Plant has been disposing of nuclear waste since 1999; its trucks have logged more than 7 million miles across the United States, bringing both low- and high-grade radioactive waste to the facility. In its decade of operation, WIPP has disposed of 95,000 loaded waste containers, the equivalent of 250,000 55-gallon drums, with no toxic releases to the environment or contaminated personnel. Although WIPP has received startlingly little media attention in light of the Obama administration's decision to abandon plans to store waste in Nevada's Yucca Mountain, experts say the

facility and its surrounding area have the capacity to store all of the nuclear waste humans could create in the next 10,000 years.

Unfortunately, there's a bureaucratic hitch: Under President Carter, the United States decided in 1977 not to reprocess spent nuclear fuel from commercial power plants to create plutonium and other fissile materials that could fuel more power plants. But the government ruled that spent fuel rods should be stored in a way that would allow them to be retrieved for reprocessing.

So the U.S. divided nuclear waste into two general groups: Commercial waste from power plants was to go to the Yucca Mountain disposal site in Nevada, from which it could be extracted if necessary; and defense waste, collected from military sites and naval yards around the country, was consigned to WIPP. But now, after decades of political and technical controversy, it seems likely Yucca Mountain will never be finished. And even though WIPP — located within the Salado salt formation, a massive bedded salt deposit so tight that 230-million-year-old sea water from the Permian Age can still be seen, trapped within its crystals — is storing waste exactly as planned, it still cannot be used for the spent fuel America's commercial nuclear power plants produce.

The virtues of the Salado formation are legion: The salt emits almost none of its own radiation, and a half-mile deep in the earth, the deposit is well-isolated, but soft and easy to mine. Also, the salt is "plastic," moving a few inches per year, creeping into WIPP's caverns of nuclear waste to eventually seal them. Once the salt walls close in around the barrels and drums, fractures and openings will shut, leaving no pathway for water or waste to get in or out.

In 15 years, the DOE estimates, the underground facility will be completely closed and impermeable for tens of thousands of years. Everything you're looking at is salt," says Jim Conca, who is no sooner out of the elevator cage than he's kneeling by a wall with a pick-axe in hand, prying loose a crystalline chunk of 225-million-year-old, 99-percent-pure salt. "This is the stuff that's great for margaritas." Eager and affable and sporting a small earring, Conca is the director of New Mexico State University's Carlsbad Environmental Monitoring and Research Center, which has the lowest radiochemical detection limits of any facility in the world and, for the past 13 years, has been checking the air, water, soil and people in a 100-mile radius around WIPP. "Working here," he says, citing WIPP's spotless record, "is safer than working at Toys R Us."

The chief scientist at WIPP, Nelson, is more circumspect than the exuberant Conca, but he still grins and sticks out his thumb as we wait for a jeep to arrive. Once behind the wheel, Nelson explains that the mine — named New Mexico's safest for 21 straight years — has everything its workers need underground: vehicle maintenance shops, lunch rooms (or "dinner holes," as the miners call them), even dedicated ambulance and fire services. In a series of small alcoves dug into the salt walls of the main hallway sit vintage ambulances and fire trucks, still fully operational, their miniature frames perfectly suited to squeeze through the narrow tunnels and one-way traffic of the salt mine. WIPP's mile-wide underground area includes a series of corridors that occasionally meet at cavernous intersections; whenever Nelson reaches a crossroads, he slows and gives several quick bursts of the horn as a warning to other vehicles. The dusty floors are littered with discarded ear plugs; danger signs and emergency telephones dot the jagged walls, which have occasional strips of red where ancient dirt is trapped in the salt. Many of the hallways are separated by airlocks, with swinging doors that *whoosh* open and closed to prevent the air from adjacent rooms mixing. The airtight doors are controlled by green and red cords that dangle from the ceilings and are easy to reach from a vehicle: Red closes the door behind; green opens the one in front. "Even us federal employees can figure that out," Nelson cracks.

Controlled air flows through the underground facility from one end to the other, monitored continuously by a variety of sensors until it exits through an exhaust shaft, never to re-circulate in the mine. The temperature drops the farther we progress, and as I run my tongue over my lips, which have cracked in the mine's 1 percent humidity, all I taste is salt. "When we turn the corner," Nelson's voice echoes in the deep, "you'll see the nuclear legacy of the Cold War over the past 60 years between the East and the West."

Around the bend is a 100-yard-deep cavern, about 10 yards wide and 5 yards tall, filled to its outer edge and ceiling with black barrels, all bearing the telltale yellow hazard symbol for radioactivity. The barrels, three layers high and six columns wide, are taped together in groups of five, and 10,000 drums can fit in each hangar. When fully excavated, WIPP will consist of nearly 60 such hangars. "We probably shouldn't go any closer," says Nelson when our group is about 20 feet away from the barrels. "They don't have the RadRope up to block it off." I sneak a glance at the dosimeter clipped to my lapel, and sure enough, it shows no radioactive reading. The heavily insulated drums before me are all filled with transuranic waste (meaning the waste contains elements above uranium on the periodic table, mainly plutonium); much of the material inside the gigantic drums and barrels is contaminated detritus like chair legs, rags or rusted tools. "There's so much robustness in this design, it's unbelievable," Nelson says. "This looks like everyone's concept of high-level disposal." In fact, government officials from France recently went "down hole" to examine WIPP.We clamber back into the jeep and drive headlong into the intake air, a fierce wind in our faces, past empty caverns still awaiting their first shipments of waste. And they could be waiting a while: Although the United States generates 20 percent of its power from nuclear sources, only 2,000 tons of nuclear waste are generated each year, about half a railroad car's worth. (As Conca points out, coal-burning power plants actually produce more radioactive waste each year).

Back above ground, Nelson shows us the Hot Cell, a room specially designed to handle highly radioactive waste before it is sent, by underground railroad, into the salt mine; he notes with an air of disappointment that it could be dealing with materials 100 times more radioactive, if not for decades-old Environmental Protection Agency regulations. It's guarded by a 4-foot-thick orange door, which takes an hour to open or close, prompting Conca to observe: "Everything's so wonderfully brute-force around here." There's another purpose to the Hot Cell, however: Because the operators of WIPP are required to assume there will be future human interest (or even intrusion) in the site, the Hot Cell will remain standing long after the mine is closed and the rest of the facility's above-ground buildings have been torn down. The DOE consulted with panels of linguists, anthropologists and other scientists while studying potential intrusion scenarios, and hieroglyphics, geometric symbols and writing in seven languages will cover the exterior of the Hot Cell and surrounding monuments, explaining to visitors thousands of years in the future why the salt deposits thousands of feet below should not be disturbed.Conca, who in previous decades worked both on NASA's doomed Challenger program and the now-sidelined Yucca Mountain project (which he calls "unnecessary ... and a bad place to put it"), is adamant that WIPP represents the United States' best —and perhaps last — chance to seize the reins of the world's energy crisis. He spent the first part of 2009 pitching Obama administration officials in the State Department, along with policymakers at Berkeley and Lawrence Livermore Labs in California, on the promise of nuclear energy. It is so much safer than coal, he stresses, and so much more efficient than the myriad green technologies that are still decades away from having a real impact on the world's energy markets. In Conca's mind, WIPP counters many of the objections to nuclear power: Proliferation becomes a nonissue if the United States would agree to store other countries' waste ("and we wouldn't even notice it," Conca says), and costs would significantly decrease as new generations of reactors are built. In a world where 2.5 billion people still burn wood or manure as their primary sources of energy, Conca's calculations tell him that a switch to nuclear power is not only necessary but the only safe and ethical path to pursue.

"This," says Conca, waving his arm toward the cluster of nondescript beige buildings in the gusty New Mexico desert that are WIPP, "is the best thing we can do. Nuclear waste disposal should not be the hurdle that keeps nuclear power from getting to the levels we need. The alternatives would be devastating economically and environmentally." He sighs.
"You can make it an issue if you want to, but it's all political."

Western Civ checks in on intellectual life and policy solutions in the far American reaches west of the Hudson and Potomac. E-mail: matt.palmquist@miller-mccune.com

http://www.miller-mccune.com/science_environment/the-salt-mine-solution-1092

Benefits of the Daddy Brain

By: Susan Kuchinskas

Ask any new parent: Taking care of a newborn is a physical and emotional marathon — and the pace only begins to slacken with kindergarten. It may not be so surprising that the hormonal surges of pregnancy and childbirth endow mothers with some extra oomph to help them through. Studies have shown that their senses become sharper, and they're more resilient and more motivated. These changes in the brain take place because many hormones — testosterone, estrogen and prolactin among them — also act in the brain to regulate its functions and help it react to change in the environment.

New research on mice, rats, monkeys and humans shows that, while men don't endure the pangs of childbirth, they get some of the same cognitive and physical benefits. Loving a woman and fathering her children changes a man's body and brain in ways that make him more canny and resourceful, while improving his ability to handle stress. At the same time, living with the woman he loves alters a man's hormones and neurochemistry to make him a better mate.

But to take full advantage of the biochemistry of fatherhood, society may need to change both its parental leave laws and its stereotypes about fathers who nurture.

Craig Kinsley and Kelly Lambert led research into the positive changes in the brains of female rats who were pregnant or recent mothers; their findings were documented in Katherine Ellison's 2005 book, *The Mommy Brain*. Now they've turned their attention to daddies and found that rats that father litters also get smarter at finding food and less stressed in new situations.

Lambert, chair of the psychology department at Randolph-Macon College, is using a National Science Foundation grant to study the paternal circuits in the brain of the male California deer mouse. Lambert calls this monogamous and highly paternal creature "Mr. Mom." Once a male mates, he hangs around the nest whenever he's not out foraging to feed the family, grooming the babies and keeping a close eye on them.

It makes sense that pregnancy could remodel a female's brain; Lambert wants to understand what drives similar changes in the male's. Lambert tests for paternal behavior by placing a baby mouse under a plastic cup and then placing a male in the cage with it. The more paternal a mouse is, the harder he'll try to rescue the pup. Deer mice that had fathered litters were a lot more persistent than the bachelors.

"We looked at their brains, and there was more activation in the problem-solving areas in the good dads, as if they were more engaged in actively trying to solve the problem of getting the pups out," Lambert says. Similar changes in a man's brain could improve job performance (as well as make it easier to set up the Wii).

But these changes aren't automatic. Lambert has found that simply exposing a male deer mouse to baby mice — even if they're not his own — is enough to trigger growth in the parts of his brain involved in

motivation and problem solving. Lambert's theory is that there are circuits in the brains of paternal species that are activated by the sight and sounds of wriggly pups.

"There's some brain circuit there for parental behavior," Lambert says. "Layers of the brain are activated when they're drawn or motivated to care for another animal."

Approximately 3 percent of male mammals provide what's known as biparental care — that is, both father and mother cooperate in raising offspring. Many go through hormonal changes that seem to facilitate the switch from swinger to clinger. Male marmosets gain weight during their mates' pregnancy, and 15 percent or more of human males experience symptoms of pregnancy along with their partners in what's known as couvade.

According to ongoing research on monkeys, Mr. Mom syndrome could be the result of the male brain becoming more sensitive to vasopressin, a neurochemical whose activity is enhanced by testosterone. Vasopressin is important in a male's bond with his mate, and it also plays a role in alertness and aggression.

"I think of vasopressin as something that promotes the animal being active, brave and investigating things," says Karen Bales of the University of California, Davis. Bales has found changes in the brains of male titi monkeys after they mate that are similar to those charted by Lambert and Kinsley. Titis are a highly monogamous species, and couples spend most of their days side by side, tails twined together, with their offspring clinging to the male.

Bales has found significant differences in the areas of the titi brain thought to be responsible for motivation, reward and sexual response before and after they mate. She also saw changes in the supraoptic nucleus of the hypothalamus, the part of the brain that produces vasopressin. Activation of these parts of the brain in titis, as in mice, adds up to increased motivation and better problem solving.

Vasopressin is also a physical tonic. In a recent paper, Bales and her colleague, Michael Jarcho, report that vasopressin mellows out the stress response. In male titi monkeys — and likely in human males, as well — vasopressin is released during sex. So the regular sex that comes with marriage might keep a man from suffering stress-related ills like high blood pressure. At the same time, it helps him power through his daily challenges.

Testosterone is another piece of the puzzle that we could call "the daddy brain." Peter Gray, a professor of anthropology at the University of Nevada, has been working with an international team of scientists to understand how a man's neurochemistry changes as he mates and settles down. His studies have found that married men have lower levels of testosterone, the hormone that makes them randy and roaming. Another study of human couples, pre- and postnatal, found that men had higher levels of prolactin and lower levels of sex steroids after the baby was born. Prolactin is known as the hormone of lactation, but it also seems to influence a new father's responsiveness to his baby's cries, while dads with lower levels of testosterone are more sympathetic to their babies and more motivated to respond to them.

This hormonal shift also makes it more likely that a father will be around to help out with the kids, Gray posits. When a man is trying to find a mate, testosterone gives him the drive to go after a woman he fancies, as well as to hold his own if he has to compete with others for her attention. But once he's won her, this same fire would make it harder for him to settle down.

"Mate seeking and parenting are a trade-off," Gray says.

But these hormone changes don't necessarily mean that married sex has to be cooler. While the monogamous and highly paternal tamarind monkey shows a drop in testosterone when its mate gives birth, it's as enthusiastic about sex as ever. Moreover, women can pick out high-testosterone guys just by looking at photos — and they rate them as poor husband material.

The testosterone drop could be triggered by the odor of a man's children — not the smell of dirty diapers but minute amounts of hormones on the skin or breath of the newborn. When scientists at the Wisconsin National Primate Research Center separated marmoset dads from their families and then gave them a whiff of scent from their babies' genital areas, their testosterone levels dropped within 20 minutes.

Understanding how fatherly nurturing of the young gets triggered should provide some encouragement to new dads who take one look at their squalling bundles of red and say, "Eeou." Fatherly love may take time to grow. After all, mom's body and brain have enjoyed a nine-months-long stew of hormones to prepare her for this role, while the overhaul of dad's brain seems to begin only at the appearance of the child.

As Lambert says, "We may be more predisposed to fathering than some species, but there still is a learning curve."

To maximize the physical changes that support parenting, the best thing a prospective father can do is take an active role in birth preparations and be physically close to his partner and their child when the baby is born, snuggling close and inhaling that unique baby smell. Research by Jay Fagan, a professor of social work at Temple University, shows that fathers who get involved in pregnancy seem more committed to their partner and the child after it's born.

But society makes it hard for both parents to share child care, especially in this time of economic turmoil. The Family and Medical Leave Act provides mothers and fathers up to 12 weeks off work to care for a newborn. This is far from a universal benefit, however. The act covers public agencies, schools and companies with more than 50 employees; in 2000, only 42.2 percent of male workers were eligible, according to the U.S. Department of Labor. Moreover, the act provides for unpaid leave, making it nearly impossible for dual-income and low-income families to take much time off.

"Men tend to make more money than women do. When push comes to shove, if anybody is going to stay home at all, it's the person with lower income," Fagan says.

The evolutionary strategy of co-parental care of offspring increases their chances of survival: One parent forages while the other protects nest, den or cave. Even today, there's a societal benefit to two-person households. According to the U.S. Census Bureau, children in homes without a father are five times more likely to be poor than those whose fathers live with them; fatherless kids are also more likely to be injured in a serious accident. All told, the National Fatherhood Initiative estimates the annual public costs of U.S. fathers' absence from their families at $100 billion.

Change may be on the horizon. California, New Jersey and Washington already mandate paid leave, and federal workers recently won four paid FMLA weeks off. Several bills that were working their way through Congress at the end of the Bush administration sought to provide some paid leave, and during his 2008 presidential campaign, Barack Obama promised to expand FMLA coverage while helping fund state programs.

Paid family leave is only part of the prescription for taking full advantage of the Mr. Mom phenomenon. Fagan's research has shown that to excel in fatherhood, fathers need education in childbirth, newborn care, early child development and the role of the father, starting before birth and lasting into the first three years of the child's life.

For fathers to reach their potential, sexual stereotypes — the male as breadwinner and the female as sole nurturer — also have to change so stay-at-home dads aren't seen as unmanly Mr. Moms but virile Super Dads.

http://www.miller-mccune.com/health/benefits-of-the-daddy-brain-1097

Most Distant Detection Of Water In The Universe

The image is made from HST data and shows the four lensed images of the dusty red quasar, connected by a gravitational arc of the quasar host galaxy. The lensing galaxy is seen in the centre, between the four lensed images. (Credit: John McKean/HST Archive data)

ScienceDaily (Apr. 26, 2009) — Astronomers have found the most distant signs of water in the Universe to date. The water vapour is thought to be contained in a jet ejected from a supermassive black hole at the centre of a galaxy, named MG J0414+0534

Dr John McKean of the Netherlands Institute for Radio Astronomy (ASTRON) will be presenting the discovery at the European Week of Astronomy and Space Science in Hatfield on Wednesday 22nd April.

The water emission is seen as a maser, where molecules in the gas amplify and emit beams of microwave radiation in much the same way as a laser emits beams of light. The faint signal is only detectable by using a technique called gravitational lensing, where the gravity of a massive galaxy in the foreground acts as a cosmic telescope, bending and magnifying light from the distant galaxy to make a clover-leaf pattern of four images of MG J0414+0534. The water maser was only detectable in the brightest two of these images.

Dr McKean said, "We have been observing the water maser every month since the detection and seen a steady signal with no apparent change in the velocity of the water vapour in the data we've obtained so far. This backs up our prediction that the water is found in the jet from the supermassive black hole, rather than the rotating disc of gas that surrounds it."

The radiation from the water maser was emitted when the Universe was only about 2.5 billion years old, a fifth of its current age.

"The radiation that we detected has taken 11.1 billion years to reach the Earth. However, because the Universe has expanded like an inflating balloon in that time, stretching out the distances between points, the galaxy in which the water was detected is about 19.8 billion light years away," explained Dr McKean.

Although since the initial discovery the team has looked at five more systems that have not had water masers, they believe that it is likely that there are many more similar systems in the early Universe. Surveys of nearby galaxies have found that only about 5% have powerful water masers associated with active galactic nuclei. In addition, studies show that very powerful water masers are extremely rare compared to their less luminous counterparts. The water maser in MG J0414+0534 is about 10 000 times the luminosity of the Sun, which means that if water masers were equally rare in the early Universe, the chances of making this discovery would be improbably slight.

"We found a signal from a really powerful water maser in the first system that we looked at using the gravitational lensing technique. From what we know about the abundance of water masers locally, we could calculate the probability of finding a water maser as powerful as the one in MG J0414+0534 to be one in a million from a single observation. This means that the abundance of powerful water masers must be much higher in the distant Universe than found locally because I'm sure we are just not that lucky!" said Dr McKean.

The discovery of the water maser was made by a team led by Dr Violette Impellizzeri using the 100-metre Effelsberg radio telescope in Germany during July to September 2007. The discovery was confirmed by observations with the Expanded Very Large Array in the USA in September and October 2007. The team included Alan Roy, Christian Henkel and Andreas Brunthaler, from the Max Planck Institute for Radio Astronomy, Paola Castangia from Cagliari Observatory and Olaf Wucknitz from the Argelander Institute for Astronomy at Bonn University. The findings were published in *Nature* in December 2008.

The team is now analysing high-resolution data to find out how close the water maser lies to the supermassive black hole, which will give them new insights into the structure at the centre of active galaxies in the early Universe.

"This detection of water in the early Universe may mean that there is a higher abundance of dust and gas around the super-massive black hole at these epochs, or it may be because the black holes are more active, leading to the emission of more powerful jets that can stimulate the emission of water masers. We certainly know that the water vapour must be very hot and dense for us to observe a maser, so right now we are trying to establish what mechanism caused the gas to be so dense," said Dr McKean.

Journal reference:

1. C.M. Violette Impellizzeri, John P. McKean, Paola Castangia, Alan L. Roy, Christian Henkel, Andreas Brunthaler, & Olaf Wucknitz. **A gravitationally lensed water maser in the early Universe**. *Nature*, 2008; 456 (7224): 927 DOI: 10.1038/nature07544

Adapted from materials provided by Royal Astronomical Society (RAS). Original article written by Anita Heward.
http://www.sciencedaily.com/releases/2009/04/090422085756.htm

Closing In On Goat Scrapie

ARS geneticist Stephen White studies goats with a version of the prion gene that might confer resistance to scrapie. (Credit: Photo by Peggy Greb)

ScienceDaily (Apr. 26, 2009) — Goats are tough, spirited animals, but they're no match for scrapie, a form of transmissible spongiform encephalopathy. Now, with a "helping hand" from science, the animals' plight could take a turn for the better.

Toward that end, Agricultural Research Service (ARS) scientists and their collaborators have developed a live-animal test to detect scrapie in goats. Called the rectal mucosa biopsy test (RMBT) or rectal biopsy, the new method involves snipping a tiny piece of lymphoid tissue from the lining of an afflicted animal's rectum. A dab of local anesthetic eases the animal's discomfort, notes microbiologist Katherine O'Rourke with the ARS Animal Diseases Research Unit in Pullman, Wash.

Lymphoid tissue is used because it collects malformed proteins called prions, which are thought to cause scrapie, adds O'Rourke. She's a member of a scrapie research team that includes Washington State University, Colorado State University, the Animal and Plant Health Inspection Service (APHIS), the National Park Service and the Canadian Food Inspection Agency.

Advantages of using the rectal biopsy test method include speed, easier methodology and its generation of a high number of repeat samples from individual animals.

On a related front, ARS Pullman geneticist Stephen White is leading studies to characterize the prion protein gene of goats and identify differences between individual animals and breeds harboring the gene. His team has so far examined the sequences and distribution of alleles—alternative forms of genes—from 446 goats representing 10 breeds, including Alpine, Angora, Boer and Nubian.

The ARS Pullman lab also is collaborating with APHIS to formulate a strategy aimed at helping the U.S. goat industry eliminate scrapie from its herd, which numbers four million head. Hardships imposed by scrapie on America's goat and sheep producers include the physical loss of animals, costs of disposal of carcasses and offal, trade restrictions and diminished domestic and international markets for breeding stock, semen and embryos.

Adapted from materials provided by USDA/Agricultural Research Service.
http://www.sciencedaily.com/releases/2009/04/090419201836.htm

The Price Of Pain And The Value Of Suffering

ScienceDaily (Apr. 26, 2009) — During these trying financial times, the cost of healthcare and how much we are willing to pay for it is at the top of our economic concerns. The financial value of pain has a wide ranging influence, affecting drug prices and injury compensation. But what about on an individual level — is it possible to place a value on our health, to prevent pain and suffering?

University College London psychologists Ivo Vlaev and Nick Chater, and neuroscientists Ben Seymour and Raymond J. Dolan were interested in just how much money volunteers were willing to pay to avoid pain and discomfort.

Study participants were given money, with the understanding that they could keep for themselves whatever cash remained. They experienced one pulse of electric shock and then had to indicate how much money they would pay in order to avoid receiving 15 more shocks of the same intensity.

Then, a computer program would determine how much the volunteers would actually have to pay. The program would randomly select a dollar amount — if that amount was higher than what the participants were willing to pay, then the participants would be shocked. However, if the computer's price was lower than the participant's price, then they would pay the computer's price and avoid the pain.

The volunteers were informed that the computer selection would be completely random, so it was really in their best interest to select a price that accurately reflected how they value the pain from the electric shock. For each volunteer, this process was repeated a number of times, with differing intensities of shocks.

The results, described in *Psychological Science*, a journal of the Association for Psychological Science, reveal that demand for pain relief is almost completely dependent on pain experienced in the recent past and the available cash on hand. That is, the participants were willing to pay more money to avoid pain if that pain was more intense compared to previous trials. In addition, the price they were willing to pay was based on what they were given (money-in-the-pocket) rather than on their overall wealth.

These findings suggest that the value we place on relief from suffering is flexible and that activity of health markets cannot be predicted by the behavior of individuals. This is the first scientific study showing that our reaction towards pain is a relative judgment, based on our previous experience with that pain. The authors conclude that pain is a major health issue and with around $60 billion spent on painkillers worldwide each year, they note that these findings "are likely to have substantial economic implications."

Journal reference:

1. Ivo Vlaev, Ben Seymour, Raymond J. Dolan, Nick Chater. **The Price of Pain and the Value of Suffering**. *Psychological Science*, 2009; 20 (3): 309 DOI: 10.1111/j.1467-9280.2009.02304.x

Adapted from materials provided by Association for Psychological Science.
http://www.sciencedaily.com/releases/2009/04/090422175334.htm

Blood Testing, Mosquito Style: Electronic Device Lets Diabetics Test Glucose Painlessly

Grad student Geoffrey Thomas and Martin Mintchev, director of the Low Frequency Instrumentaion Lab, work on the prototype of the Electronic Mosquito. (Credit: Ken Bendiktsen)

ScienceDaily (Apr. 25, 2009) — A skin patch could one day provide a less-invasive alternative for diabetics who need to take regular samples of their own blood to keep glucose levels in check. The common method of drawing blood from fingertips and using glucose testing strips and metres can be painful, inconvenient and time-consuming.

Electrical engineers at the Schulich School of Engineering at the University of Calgary have patented a device called the Electronic Mosquito. The patch is approximately the size of a deck of cards and contains four micro-needles that "bite" sequentially at programmed intervals. The needles are electronically controlled to penetrate the skin deep enough to draw blood from a capillary, but not deep enough to hit a nerve. This means patients would experience little or no pain. The patch could be worn anywhere on the body where it could obtain accurate readings of capillary blood.

A sensor in each cell of the e-Mosquito measures sugar levels in the blood. This data can then be sent wirelessly to a remote device such a computer or a monitoring instrument worn on the wrist. The system could even be connected to an alarm to alert patients or doctors when blood sugar levels enter the danger zone.

"This is a dramatic improvement over manual poking, particularly for children and elderly patients," says Martin Mintchev, director of the Low Frequency Instrumentation Lab at the Schulich School of

Engineering. "Our approach is radically different and offers a reliable, repeatable solution with the minor inconvenience of wearing something similar to an adhesive bandage."

Mintchev spent three years designing the e-Mosquito along with Karan Kaler, director of the Schulich School's Bio-Micro Electromechanical Systems (MEMS) Laboratory. Their next step is to make the components of the e-Mosquito smaller to fit more needles on the patch. Currently, there are four needles, so the patch would need to be changed at least once a day. Adding more needles would allow patients to wear the patch for longer periods of time or test their blood more frequently, even while they're asleep.

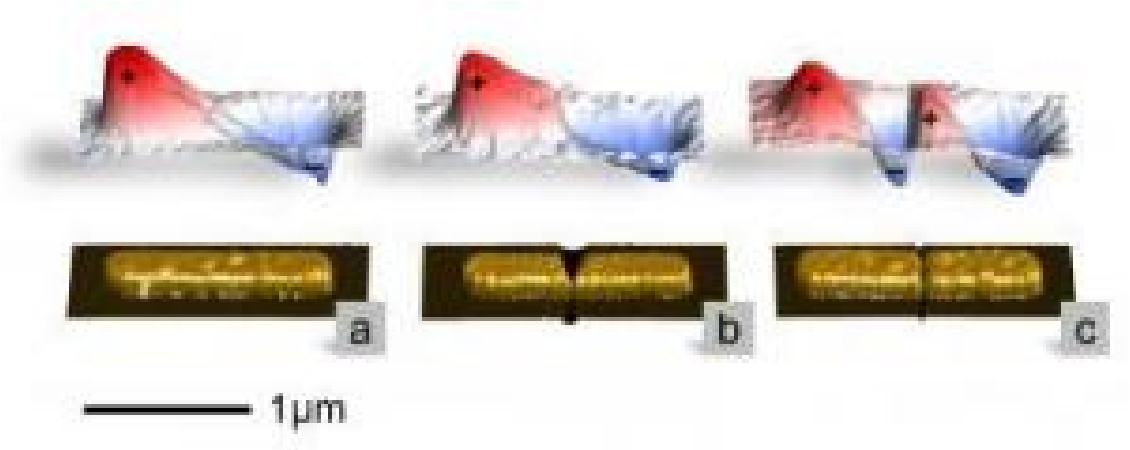
Eventually, Mintchev and Kaler hope to integrate a pump system so insulin injections can also become autonomous based on data from the e-Mosquito, thus converting the device into an external artificial pancreas.

"It's important to find an industry partner for this project," says David Reese, project manager with University Technologies International, the university's technology transfer, commercialization and incubation centre that works with U of C researchers to commercialize their technologies. "Industry has the resources and expertise to speed up the process of product development and bring this technology to market for the benefit of patients."

Diabetes has been described as a global epidemic. Approximately 246 million people around the world are affected by the disease. More than two million Canadians have diabetes, a number that is increasing because of the aging population and rising obesity rates, according to the Canadian Diabetes Association.

Adapted from materials provided by University of Calgary.
http://www.sciencedaily.com/releases/2009/04/090424114218.htm

Bridging The Gap In Nanoantennas



The bottom line depicts the topography, whereas the upper line plots the scanned near-field images. Figure a shows a metal nanorod that can be considered the most simple dipole antenna. The near-field image clearly shows the dipolar oscillation mode with positive fields in red and negative fields in blue color. By introducing a narrow gap at the center of the nanorod thus altering the "antenna load" (Figure c), two dipolar-like modes are obtained. When the gap is connected with a small metal bridge (Figure b), the dipole oscillation mode of Figure a can be restored as the near-field image clearly reveals. (Credit: Martin Schnell/Copyright CIC nanoGUNE)

ScienceDaily (Apr. 25, 2009) — In a recent publication in Nature Photonics, a joint team of researchers at CIC nanoGUNE, Donostia International Physics Center DIPC, Centro de Física de Materiales of CSIC/UPV-EHU in San Sebastian (Spain), Harvard University (USA) and the Max Planck Institute of Biochemistry in Munich (Germany) reports an innovative method for controlling light on the nanoscale by adopting tuning concepts from radio-frequency technology.

The method opens the door for targeted design of antenna-based applications including highly sensitive biosensors and extremely fast photodetectors, which could play an important role in future biomedical diagnostics and information processing.

An antenna is a device designed to transmit or receive electromagnetic waves. Radio frequency antennas find wide use in systems such as radio and television broadcasting, point-to-point radio communication, wireless LAN, radar, and space exploration. In turn, an optical antenna is a device which acts as an effective receiver and transmitter of visible or infrared light. It has the ability to concentrate (focus) light to tiny spots of nanometer-scale dimensions, which is several orders of magnitude smaller than what conventional lenses can achieve. Tiny objects such as molecules or semiconductors that are placed into these so-called "hot spots" of the antenna can efficiently interact with light. Therefore optical antennas boost single molecule spectroscopy or signal-to-noise in detector applications.

In their experiments the researchers studied a special type of infrared antennas, featuring a very narrow gap at the center. These so called gap-antennas generate a very intense "hot spot" inside the gap, allowing for highly efficient nano-focusing of light. To study how the presence of matter inside the gap (the "load") affects the antenna behavior, the researchers fabricated small metal bridges inside the gap (Figure b). They mapped the near-field oscillations of the different antennas with a modified version of the scattering-type near-field microscope that the Max Planck and nanoGUNE researchers had pioneered over the last decade.

For this work, they chose dielectric tips and operated in transmission mode, allowing for imaging local antenna fields in details as small as 50 nm without disturbing the antenna. "By monitoring the near-field oscillations of the different antennas with our novel near-field microscope, we were able to directly

visualize how matter inside the gap affects the antenna response. The effect could find interesting applications for tuning of optical antennas" says Rainer Hillenbrand leader of the Nanooptics group at the newly established research institute CIC nanoGUNE Consolider.

The nanooptics group from DIPC and CSIC-UPV/EHU led by Javier Aizpurua in San Sebastián fully confirmed and helped to understand the experimental results by means of full electrodynamic calculations. The calculated maps of the antenna fields are in good agreement with the experimentally observed images. The simulations add deep insights into the dependence of the antenna modes on the bridging, thus confirming the validity and robustness of the "loading" concept to manipulate and control nanoscale local fields in optics.

Furthermore, the researchers applied the well developed radio–frequency antenna design concepts to visible and infrared frequencies, and explained the behavior of the loaded antennas within the framework of optical circuit theory. A simple circuit model showed remarkable agreement with the results of the numerical calculations of the optical resonances. "By extending circuit theory to visible and infrared frequencies, the design of novel photonic devices and detectors will become more efficient. This bridges the gap between these two disciplines" says Javier Aizpurua.

With this work, the researches provide first experimental evidence that the local antenna fields can be controlled by gap-loading. This opens the door for designing near-field patterns in the nanoscale by load manipulation, without the need to change antenna length, which could be highly valuable for the development of compact and integrated nanophotonic devices.

Journal reference:

1. M. Schnell, A. Garcia-Etxarri, A. J. Huber, K. Crozier, J. Aizpurua and R. Hillenbrand. **Controlling the near-field oscillations of loaded plasmonic nanoantennas**. *Nature Photon*, online 19 April 2009 DOI: 10.1038/NPHOTON.2009.46

Adapted from materials provided by Basque Research, via EurekAlert!, a service of AAAS.
http://www.sciencedaily.com/releases/2009/04/090419184753.htm

Stubbornly Practicing His Principles of Photography

By RANDY KENNEDY

"LISTEN, do I have time to feed my pig?" the photographer Danny Lyon asked, picking up the telephone one morning at his home in rural New Mexico. "It will only take about 10 minutes. I'll call you back," he said, adding: "That way I can start the day with a clean conscience."

Among a group of revolutionaries whose work rose to prominence in the late 1960s and '70s and transformed the nature of documentary photography — a group that includes friends and colleagues of Mr. Lyon's like Mary Ellen Mark and Larry Clark — the idea of conscience has been imbedded more deeply in Mr. Lyon's photographs than in those of all but a few of his contemporaries.

At a time when picture magazines were still a holy grail for young photographers, Mr. Lyon, self-taught, began his career as the first staff photographer for the Student Nonviolent Coordinating Committee. A week after hitchhiking south in 1962 at the age of 20 he was in jail with other protesters in Albany, Ga., next to the cell of the Rev. Dr. Martin Luther King Jr. And Mr. Lyon's first book, the classic "Bikeriders," made after spending more than two years as a member of the Outlaws motorcycle gang, was not just a pioneering example of New Journalism but, as he later described it, an attempt "to destroy Life magazine" and what he saw as its anodyne vision of American life.

His newest book, "Memories of Myself," published this month by Phaidon Press, seems on its face to be the kind of comfortable, coffee-table retrospective that a revered 67-year-old artist receives at this point in his life. It is a selection of self-assigned — and largely unpublished — photo essays that he made while wandering from Chicago to Galveston, Tex., to Brooklyn to Port-au-Prince, Haiti, over almost four decades. But even this book is a product of political calculus, as Mr. Lyon described it. He has been traveling for many years to photograph a remote, impoverished region of China with a book in mind but with little idea of who would be interested in it.

"It's not always easy to get these things published," he said. "I'm pretty uncompromising and not very commercial." So when Phaidon approached him a few years ago with the idea of a career survey, he offered a deal. "I basically said, 'If you do the China book, you can do the retrospective.' " (Phaidon,

which does not comment on its negotiations with authors, would say only that it plans to publish two books by Mr. Lyon, in addition to "Memories of Myself," calling him a "great photographer.")
It is the kind of bargain Mr. Lyon has been striking his whole life, especially during years when he was supporting a family of four while insisting on making the kind of work he wanted to make, a stubborn vision that has probably contributed to his photographs and independent films not being better known. Even now, with his work in important museum collections around the country, a survivor's hustle remains and sometimes still comes in handy: a few weeks ago, at his dentist's office in Albuquerque, he traded a nice print for a root canal. "The market has taken a body blow, and I needed the dental work," he explained, adding, "I was so happy to do it."
Like Mr. Clark, who blurred the line between observer and participant and wanted to confront middle-class viewers with the American underclass, Mr. Lyon has made a peripatetic attempt to photograph people who are generally unseen or unwanted, even hated, and he has never been able to approach it with a journalist's distance. When he began his motorcycle work in the mid-1960s while at the University of Chicago, he writes in the new book, "I was a bike rider, a photographer and a history student, probably in that order."
When he became involved in what many critics consider his most powerful work, "Conversations With the Dead," based on more than a year photographing inside the Texas prison system in the late 1960s, he developed deep bonds with several inmates, including one who had been convicted of rape. Another, James Ray Renton, a talented escape artist who was later convicted of killing an Arkansas police officer, became an unlikely friend and devoted correspondent for more than 30 years. (In "Like a Thief's Dream," Mr. Lyon's book about their relationship, he describes testifying as a character witness for Mr. Renton at his murder trial in 1979 and, in addition to his testimony, offering Mr. Renton some marijuana during a courtroom recess. Mr. Renton declined.)
"To some, he's idealizing people who really are not good people at all — they're just criminals," said Larry McMurtry, who was teaching at Rice University in Houston in the 1960s and befriended Mr. Lyon while he was there working on the prison book. "But to Danny maybe they're good people who just never had a chance."
"He hasn't really changed his principles any at all since he was young, when I first met him," Mr. McMurtry added. "He's an idealist, to a large extent."
In a long, animated, tangent-filled telephone interview after he went to feed his pig (which turned out to be not his but a neighbor's, borrowed to entertain Mr. Lyon's visiting granddaughter), Mr. Lyon more or less agreed with Mr. McMurtry and asked: "Is there something wrong with me because of that? I don't know."
Raised in Kew Gardens, Queens, where his father, Ernst, an immigrant from Germany, was a doctor (one of his patients in New York was Alfred Stieglitz), Mr. Lyon ached to flee the conformity of an upper-middle-class life. He discovered "Let Us Now Praise Famous Men" at a formative age and was fired by the intensity of James Agee's prose even more than by Walker Evans's pictures.
"Agee was a stone realist, and that had a huge impact on me," he said. One of the new book's more lyrical essays is a series of portraits Mr. Lyon took after driving to Knoxville, Tenn., in the late 1960s simply because he wanted to see Agee's birthplace.
But a more important influence on Mr. Lyon's work was Hugh Edwards, a pioneering but still underappreciated curator at the Art Institute of Chicago who gave Robert Frank — later to be a mentor and friend of Mr. Lyon's — his first solo museum show and guided the careers of many young photographers. Mr. Edwards was an intensely private man, but Mr. Lyon once managed to tape record a late-night conversation with him. A partial transcript included in the new book, forming an intermission between photo essays, at times casts an interesting light on the tension between art and ideology in photography, a tension that exists in much of Mr. Lyon's work.
"People who purvey ideas in pictures are nothing anymore than propagandists of one kind or another," Edwards told him in the 1972 conversation. "A great picture is something that awakens a very different reaction from each person who looks at it."
Mr. Lyon, who has been awarded two Guggenheim fellowships, one for his film work, has called his work advocacy journalism and does not deny that it purveys ideas — if only the idea that everyone should be more aware of the pain and struggle around them in a consumerist, media-saturated world that tends to encourage isolation and apathy. "I think I try to hide it," he said of his worldview in his work. "But I'm a highly politicized person, and it's in my blood."

"If I work in China, it's because I want to humanize the Chinese, whom we tend to demonize," he said, adding with an emphatic laugh, "I'm trying to pump up the humanity."
But Mr. Lyon's approach has never been straightforward, and he said he felt a greater affinity with intensely personal photographers like Mr. Clark than he did with, for example, war photographers or photographers like Eugene Richards, a fellow former member of the Magnum collective whose searing work has focused on mental institutions, emergency rooms, wrenching poverty, AIDS and drug abuse.
"I wanted to change history and preserve humanity," he writes in the new book's introduction. "But in the process I changed myself and preserved my own."
The essays in Mr. Lyon's new book are often accompanied by diary entries or transcripts of taped interviews from the periods in which he was working, lending a Beat-inflected, often darkly funny sense of verité that can make the photos feel less documentary and more impressionistic.
Passages written in Galveston in 1967, where he spent time photographing transvestites, can sound like something from Denis Johnson's ragged short stories. One follows an existential discussion at a bar called the Gizmo: "Joe had been arguing with the bar's owner, Dixie, about whether or not he would ever break into the place and steal her money. It seems he did try, but was not able to get inside. Joe was extremely hurt that Dixie, an old friend, would think Joe would steal from her. Dixie was hurt that they'd ruined her door trying to break in."
Though Mr. Lyon's drive has diminished little throughout his career, he said it has finally begun to slow. He fishes quite a bit these days, in the Chama Valley in New Mexico and in Maine, where he has a cabin. He still turns down nearly every paying assignment that comes his way, though few do anymore because he makes himself hard to find. An Italian shoe company, he said, once paid someone $1,000 to track him down in New Mexico to see if he would do a fashion shoot, to which he agreed mostly because of the company's tenacity. He paces himself more between the jobs he assigns himself.
"I think it is a kind of performance on my part," he said of shooting. "It's more like athleticism or something. I wouldn't go near a war. But I function like that, and then when I do it, it's very intense for me."
He said he is quite happy with the new book, which he labored over despite its beginning as a kind of barter piece, adding, "There were a lot of sleepless nights over this." As always, he said, he wished he could excise at least one photo the second it became too late. This particular one, taken around the demolition-derby scene in upstate New York, seems like a decent shot, a skinny, mulletted kid being hugged by a girl next to a gaping car hood, the kid seeming not to hug the girl back, maybe because his hands were greasy.
"I hated that guy," Mr. Lyon said. "That guy was so creepy. I didn't like him. I didn't like his car."
He laughed. "You put a camera in my hand, I want to get close to people," he said. "Not just physically close, emotionally close, all of it. It's part of the process.
"It's a very weird thing being a photographer."

http://www.nytimes.com/2009/04/26/arts/design/26kenn.html?_r=1&th&emc=th

Statins link to healthy prostate

Taking cholesterol-lowering statins may be an effective way to keep the prostate healthy, research suggests.

One study found statins were linked to reduced risk of prostate cancer, and enlargement of the organ, which can cause urinary problems.

And a second study suggested the drugs may hinder the growth of prostate cancer by reducing inflammation.

The studies were presented to a conference of the American Urological Association.

" **It is too soon to say if the results of these studies could lead to a potential breakthrough in the use of statins** "
John Neate Prostate Cancer Charity

Statins are currently used to lower cholesterol and help prevent heart attacks and strokes.

However, there is growing evidence that the drugs also prevent cancer cells from dividing, and may even cause some cancer cells to die.

Worldwide, prostate cancer is the second leading cause of cancer death.

The US Mayo Clinic followed 2,447 men aged 40 to 79 for nearly two decades.

They found men who took statins were three times less likely to develop prostate cancer than men who did not take the drugs.

They also found statin users were 57% less likely to develop an enlarge prostate.

Erectile dysfunction

The Mayo study also produced evidence that statins may protect men against erectile dysfunction.

This is likely to be side effect of controlling blood fats and cholesterol, high levels of which are known to increase the risk of problems getting an erection.

Researcher Dr Jennifer St Sauver said: "If you are taking a statin for a heart condition or to lower cholesterol, these studies suggest that statins could have other benefits.

"However, it is very clear we need more information before men are advised to start taking statins for their urological health."

The second study, by Duke University in North Carolina, examined tumour samples from 254 men who had their prostate removed because of cancer.

They found inflammation levels among the samples were 72% lower in men who had been taking statins.

It is thought that inflammation may fuel the growth of prostate cancer, and so lower levels may slow the speed of tumour development.

Researcher Dr Lionel Banez said: "Previous studies have shown that men taking statins seem to have a lower incidence of advanced prostate cancer, but the mechanisms by which statins might be affecting the prostate remained largely unknown.

"We found men who were on statins had a 72% reduction in risk for tumour inflammation, and we believe this might play a role in the connection between prostate cancer and statin use."

John Neate, chief executive of The Prostate Cancer Charity, said the studies were interesting, but preliminary, and more work was required before firm conclusions could be drawn.

"It is too soon to say if the results of these studies could lead to a potential breakthrough in the use of statins to reduce the risk of prostate cancer or to slow its development.

"However, the results of the studies are certainly welcome and promising enough for research to continue."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/8016006.stm

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