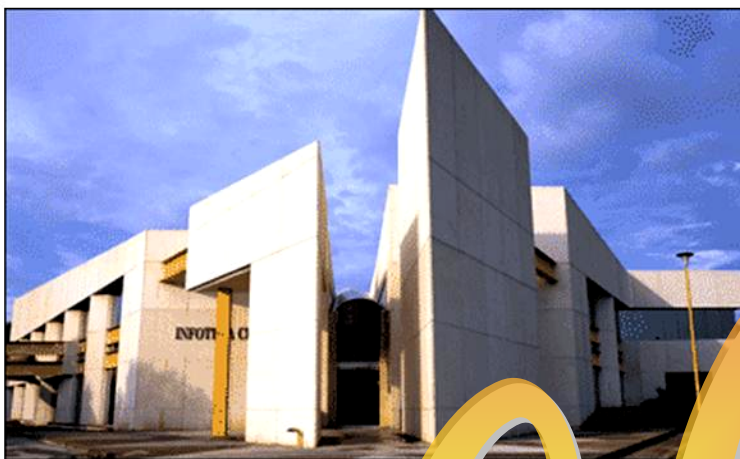




Infoteca's E-Journal



An Electronic Compilation of Scientific and Cultural Information by
Sistema de Infotecas Centrales, Universidad Autónoma de Coahuila

CONTENTS

A Deadly Quake in a Seismic Hot Zone	3
Physicists' Dreams and Worries in Era of the Big Collider	6
Biologists Wake Dormant Viruses and Uncover Mechanism for Survival	9
Neural Thermostat Keeps Brain Running Efficiently	11
Key Mechanism for the Proliferation of Epstein-Barr Virus Discovered	13
Parasitic Wasps' Genomes Provides New Insights Into Pest Control, Genetics	15
Climate Conditions in 2050 Crucial to Avoid Harmful Impacts in 2100	17
Heat and Moisture from Himalayas Could Be a Key Cause of the South Asian Monsoon	20
Discovery Highlights New Potential for Eventually Finding Earth-Mass Planets	21
Yoga Reduces Cytokine Levels Known to Promote Inflammation, Study Shows	23
Haiti Earthquake Occurred in Complex, Active Seismic Region	26
Toward a Less Expensive Version of the Anti-Flu Drug Tamiflu	28
From the Amazonian Indians: 'Biochar' as a Modern Weapon Against Global Warming	29
Environment Plays Key Role in Developing Reading Skills, Study Finds	30
Quantum Computer Calculates Exact Energy of Molecular Hydrogen	32
Giant Magnetic Loop Sweeps Through Space Between Stellar Pair	34
Thyme Oil Can Inhibit COX2 and Suppress Inflammation	36
Nuclear safety: When positive is negative	37
The dangers of a high-information diet	41
The Madness of Crowds and an Internet Delusion	44
Hunting Fossil Viruses in Human DNA	46
Report Links Vehicle Exhaust to Health Problems	49
Facing End-of-Life Talks, Doctors Choose to Wait	51
Denmark Leads the Way in Digital Care	53
Before You Quit Antidepressants ...	56
The Evolution of American Landscape Art	58
Making Art Out of an Encounter	60
When Fear Turns Graphic	67
Keepsakes, Domestic and Dark	71
Outsider Images in the Soviet Twilight	74
Time-Traveling With the Muses in Boston	76
Gritty Scene, Mostly Male and White	80
A Guided Tour in the Palm of Your Hand	82
For Expatriates in China, Creative Lives of Plenty	84
Managing Disasters With Small Steps	87
When Built-In Antifreeze Beats a Winter Coat	89
Scientists Find a Shared Gene in Dogs With Compulsive Behavior	91
Tipping Point? West Antarctic Ice Sheet Could Become Unstable as World Warms	94
Being Pear Shaped Protects Against Heart Disease	95
Scent of a Woman: Men's Testosterone Responses to Olfactory Ovulation Cues	97



More Evidence on Benefits of High Blood Pressure Drugs in Diabetic Eye Disease	98
Wilder Weather Stronger Influence on Biodiversity Than Steadily Changing Conditions	99
'Noisiest' Neurons Persist in the Adult Brain, Research Finds	101
Parks and Recreation Programs Declining as Obesity, Health Concerns Rise	103
Wild Crows Reveal Tool Skills	105
Composition of Red Giant Star With More Carbon Than Oxygen in Its Atmosphere	106
Search for an Artificial Blood Substitute	108
HIFI Resumes Quest for Water in Universe	110
Gender-Biased Heart Damage	112
Dual Role for Immune Cells in the Brain	113
How Music 'Moves' Us: Listeners' Brains Second-Guess the Composer	115
Excess DNA Damage Found in Cells of Patients With Friedreich's Ataxia	117
Regimens: Questioning Benefit of Diabetes Test Strips	118
Behavior: Too Much Sitting Shortens Lives, Study Suggests	119
Gravel 'traps Exxon Valdez oil'	120
Ancient Egypt's Toxic Makeup Fought Infection, Researchers Say	122
Evolution goes from foot to hand	124
Astrium develops space power idea	126
Buildings 'threaten carbon hope'	128
Nano device targets artery damage	130
Smear test 'bettered by HPV test'	132
Brain size governs 'game prowess'	134
Dye turns fabric into a battery	136
Genome Study Provides a Census of Early Humans	137
Narrowing an Eating Disorder	138
Birds 'breathe like alligators'	141
Stem cell transplant hopes lifted	143
Weaker wine 'may prevent cancers'	145
'Sufficient checks' on locum GP	147
'Raise antibiotic dose' for obese	149
Anti-malaria plant genes mapped	151
Light shed on fish gill mystery	153
Hydro scheme awarded major prize	155
'No such thing' as safe cocaine	157
Blood drug offers dementia hope	159
Green tea 'may block lung cancer'	161
Science explains the wrinkly dog	163
The solar cell that builds itself	165
Writing English as a Second Language	167
Movie Misquotations	174
Cold, Hard Facts About Saving Florida's Oranges	176
I See a Quake in Your Future. Sometime.	178
Measuring How Hard 'Old Growth' Takes it on the Chin	181
It's Like e-Harmony for Lab Rats	184
A Really Hard Test Really Helps Learning	187
Threats, Anxieties Ingredients of Conservatism	191
Little Stores and Fatter Kids	194
After the Aftermath	197



A Deadly Quake in a Seismic Hot Zone

By HENRY FOUNTAIN



To scientists who study seismic hazards in the Caribbean, there was no surprise in the magnitude 7 earthquake that devastated the Haitian capital, Port-au-Prince, two weeks ago.

Except, perhaps, in where on the island of Hispaniola it occurred.

“If I had had to make a bet, I would have bet that the first earthquake would have taken place in the northern Dominican Republic, not Haiti,” said Eric Calais, a geophysicist at Purdue University who has conducted research in the area for years.

The fault that ruptured violently on Jan. 12 had been building up strain since the last major earthquake in Port-au-Prince, 240 years ago. Dr. Calais and others had warned in 2008 that a quake could occur along that segment, part of what is called the Enriquillo-Plantain Garden fault zone, although they could not predict when.

But about 100 miles to the northeast is a long segment of a similar fault, the Septentrional, that has not had a quake in 800 years. Researchers have estimated that a rupture along that segment — and again, they have no idea when one might occur — could result in a magnitude 7.5 quake that could cause severe damage in the Dominican Republic’s second-largest city, Santiago, and the surrounding Cibao Valley, together home to several million people.

“You can imagine the strain that has accumulated there,” said Paul Mann, a senior research scientist at the University of Texas, referring to the Septentrional fault. “It’s been going on for longer and accumulating faster. Therefore it’s going to produce a stronger earthquake.”

The recent quake on the Enriquillo fault and the forecast for the Septentrional are bleak reminders that the Caribbean is an active seismic zone, one with many hazards. Major earthquakes have regularly devastated the region’s cities, including the Jamaican capital, Kingston, which was destroyed twice in three centuries. An eruption of Mount Pelée killed 30,000 people in Martinique in the Lesser Antilles in 1902, and it and other volcanoes are currently active along that island arc on the Caribbean’s north and eastern

reaches. Earthquakes and landslides along the Puerto Rico Trench, an undersea fault zone, have the potential to cause tsunamis.

The Haitian quake itself might have added to the risks, researchers say. Dr. Calais and colleagues and a team including Ross Stein of the United States Geological Survey in Menlo Park, Calif., have each calculated the stress changes on the Enriquillo fault that occurred when a 30-mile segment, centered in Léogâne about 18 miles west of Port-au-Prince, gave way this month. Although the results are preliminary, the work shows that stresses have increased just west of the segment and just east, within three miles of Port-au-Prince.

“This earthquake has increased the risk on other segments of that fault and perhaps on other faults as well,” Dr. Calais said. “The numbers are well within the range of stress changes that have triggered earthquakes on other faults.” But he said the quake probably did not increase the likelihood of a major tremor on the Septentrional fault.

The Haitian quake has produced a large number of aftershocks, about three times as many as quakes of similar magnitude in California and elsewhere, Dr. Stein said. But the intensity and frequency of those aftershocks have followed the patterns of other earthquakes, he said. Last Thursday, the geological survey issued a statement estimating that there was a 3 percent likelihood of a 7 magnitude aftershock in the next 30 days, and a 25 percent chance of one of magnitude 6. (On Wednesday, the area experienced a strong aftershock that was initially rated at 6.1 but was revised to 5.8.)

Of some concern, researchers said, was that none of the aftershocks have occurred in the area of increased stress nearer to Port-au-Prince, where ordinarily some might have been expected.

“One possibility is that these are simply calculations, and they may be wrong,” Dr. Stein said. “The other possibility is, O.K., this fault is fundamentally locked in some fashion, on pretty much all scales, and might be capable of popping off something large.”

In its statement, the geological survey cautioned that near the capital, “the fault still stores sufficient strain to be released as a large, damaging earthquake during the lifetime of structures built during the reconstruction effort.”

The region’s seismic activity is due to the movement of the Caribbean tectonic plate, which can be likened to a finger pushing its way against two larger plates, the North American and South American. Along the boundaries, the relative eastward movement of the Caribbean plate, at the rate of less than an inch a year, creates strike-slip faults, shallow fissures whose sides slide in relation to one another in an earthquake.

On the island of Hispaniola, which comprises the Dominican Republic and Haiti, the Caribbean-North American boundary stresses are expressed in numerous strike-slip faults, including the Enriquillo and Septentrional, which are relatively long and roughly parallel.

“It’s a bit unusual to have two parallel faults like that,” said Uri S. ten Brink, a geophysicist with the geological survey in Woods Hole, Mass. “It may simply be that for some reason there was already a weakened area further south.”

Dr. ten Brink’s main area of research is the Puerto Rico Trench, north of Puerto Rico and the United States Virgin Islands. This is a subduction zone — where the North American plate is sliding under the Caribbean, creating the potential for earthquakes and undersea landslides that can set off tsunamis.

“We’re trying to see if it’s a similar situation to the Sumatra fault,” Dr. ten Brink said, referring to the Indonesian subduction zone where a large earthquake in December 2004 created a tsunami that killed a

quarter of a million people. Scientists have not yet found evidence of large subduction earthquakes on the Puerto Rican Trench, he said, “but that’s the \$64,000 question.”

Because of the proximity of the trench to American territory, Dr. ten Brink and others have been able to obtain financing for their studies. But in other places around the Caribbean, research money has been hard to come by.

Haiti, for example, has no seismometers, meaning there has been no way to measure all the small tremors that might help characterize the Enriquillo fault. Researchers have relied on a network of 35 benchmarks to measure fault movement. Last week Dr. Calais, Dr. Mann and others were planning a trip to Haiti to make more accurate measurements for their stress calculations, and to install devices to monitor the fault zone continuously for a year or more.

Much of what is known about the seismic activity around Port-au-Prince has been gleaned from historical accounts of previous quakes. While far from precise, these accounts suggest a century-long, westward-marching sequence of quakes along the fault, beginning with one in 1751 in the Dominican Republic at the fault’s eastern end and including the 1770 earthquake that destroyed Port-au-Prince.

That raises the possibility that the Jan. 12 earthquake could be the beginning of a new sequence occurring over decades, with each successive quake redistributing stresses along the fault. “It’s certainly possible and it’s really something we’re very concerned about,” said Carol S. Prentice, a geologist with the geological survey in Menlo Park. Such sequences have been observed on other faults, including the North Anatolian in Turkey.

The Septentrional fault’s history is better known, largely because Dr. Prentice and others have done basic research on a segment in the Dominican Republic. The study involved digging trenches across the fault and looking for rupture lines in the sediments. By finding higher sediments that are unruptured, the dates of quakes can be determined.

Researchers said that more study was needed on the Septentrional and Enriquillo faults and elsewhere in the Caribbean, and that governments needed to prepare better for the inevitable.

There are already signs that the Haitian quake has prompted concern elsewhere in the region, at least among the general population. Dr. Mann said he was on Jamaican radio programs in the past two weeks to discuss the hazards.

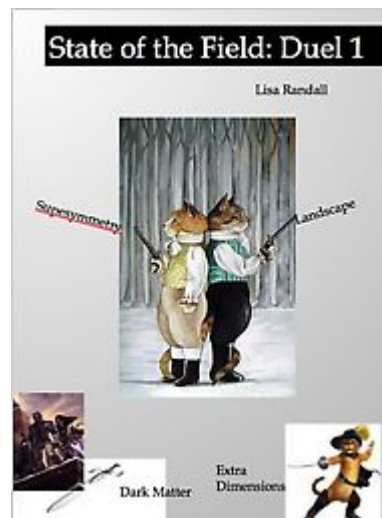
“They know they’ve been destroyed twice,” he said. “They know their construction is not the best. All those things have put the whole country on edge.

“The whole region is fearful.”

<http://www.nytimes.com/2010/01/26/science/26fault.html?ref=science>

Physicists' Dreams and Worries in Era of the Big Collider

By DENNIS OVERBYE



A few dozen scientists got together in Los Angeles for the weekend recently to talk about their craziest hopes and dreams for the universe.

At least that was the idea.

“I want to set out the questions for the next nine decades,” Maria Spiropulu said on the eve of the conference, called the Physics of the Universe Summit. She was hoping that the meeting, organized with the help of Joseph D. Lykken of the Fermi National Accelerator Laboratory and Gordon Kane of the University of Michigan, would replicate the success of a speech by the mathematician David Hilbert, who in 1900 laid out an agenda of 23 math questions to be solved in the 20th century.

Dr. Spiropulu is a professor at the California Institute of Technology and a senior scientist at CERN, outside Geneva. Next month, CERN’s Large Hadron Collider, the most powerful particle accelerator ever built, will begin colliding protons and generating sparks of primordial fire in an effort to recreate conditions that ruled the universe in the first trillionth of a second of time.

Physicists have been speculating for 30 years what they will see. Now it is almost Christmas morning.

Organized into “duels” of world views, round tables and “diatribes and polemics,” the conference was billed as a place where the physicists could let down their hair about what might come, avoid “groupthink” and “be daring (even at the expense of being wrong),” according to Dr. Spiropulu’s e-mailed instructions. “Tell us what is bugging you and what is inspiring you,” she added.

Adding to the air of looseness, the participants were housed in a Hollywood hotel known long ago as the “Riot Hyatt,” for the antics of rock stars who stayed there.

The eclectic cast included Larry Page, a co-founder of Google, who was handing out new Google phones to his friends; Elon Musk, the PayPal electric-car entrepreneur, who hosted the first day of the meeting at his SpaceX factory, where he is building rockets to ferry supplies and, perhaps, astronauts to the space station; and the filmmaker Jesse Dylan, who showed a new film about the collider. One afternoon, the magician David Blaine was sitting around the SpaceX cafeteria doing card tricks for the physicists.

This group proved to be at least as good at worrying as dreaming.

“We’re confused,” Dr. Lykken explained, “and we’re probably going to be confused for a long time.”

The first speaker of the day was Lisa Randall, a Harvard theorist who began her talk by quoting Galileo to the effect that physics progressed more by working on small problems than by talking about grand ones — an issue that she is taking on in a new book about science and the collider.

And so Dr. Randall emphasized the challenges ahead. Physicists have high expectations and elegant theories about what they will find, she said, but once they start looking in detail at these theories, “they’re not that pretty.”

For example, a major hope is some explanation for why gravity is so weak compared with the other forces of nature. How is it that a refrigerator magnet can hold itself up against the pull of the entire Earth? One popular solution is a hypothesized feature of nature known as supersymmetry, which would cause certain mathematical discrepancies in the calculations to cancel out, as well as produce a plethora of previously undiscovered particles — known collectively as wimps, for weakly interacting massive particles — and presumably a passel of Nobel prizes.

In what physicists call the “wimp miracle,” supersymmetry could also explain the mysterious dark matter that astronomers say makes up 25 percent of the universe. But no single supersymmetrical particle quite fits the bill all by itself, Dr. Randall reported, without some additional fiddling with its parameters.

Moreover, she added, it is worrying that supersymmetric effects have not already shown up as small deviations from the predictions of present-day physics, known as the Standard Model.

“A lot of stuff doesn’t happen,” Dr. Randall said. “We would have expected to see clues by now, but we haven’t.”

These are exciting times, she concluded, but the answers physicists seek might not come quickly or easily. They should prepare for surprises and trouble.

“I can’t help it,” Dr. Randall said. “I’m a worrier.”

Dr. Randall was followed by Dr. Kane, a self-proclaimed optimist who did try to provoke by claiming that physics was on the verge of seeing “the bottom of the iceberg.” The collider would soon discover supersymmetry, he said, allowing physicists to zero in on an explanation of almost everything about the physical world, or at least particle physics.

But he and other speakers were scolded for not being bold enough in the subsequent round-table discussion.

Where, asked Michael Turner of the University of Chicago, were the big ideas? The passion? Where, for that matter, was the universe? Dr. Kane’s hypothesized breakthrough did not include an explanation for the so-called dark energy that seems to be speeding up the expansion of the universe.

Dr. Kane grumbled that the proposed solutions to dark energy did not affect particle physics.

The worrying continued. Lawrence Krauss, a cosmologist from Arizona State, said that most theories were wrong.

“We get the notions they are right because we keep talking about them,” he said. Not only are most theories wrong, he said, but most data are also wrong — at first — subject to glaring uncertainties. The recent history of physics, he said, is full of promising discoveries that disappeared because they could not be repeated.

And so it went.

Maurizio Pierini, a young CERN physicist, pointed out that the tests for new physics were mostly designed to discover supersymmetry. “What if it’s not supersymmetry?” he asked.

Another assumption physicists have taken for granted — that dark matter is a simple particle rather than an entire spectrum of dark behaviors — might not be true, they were told. “Does nature really love simplicity?” Aaron Pierce of the University of Michigan asked.

Neal Weiner of New York University, who has suggested the existence of forces as well as particles on the dark side, said that until recently ideas about dark matter were driven by ideas about particle theory rather than data.

“Ultimately we learn that perhaps it has very little to do with us at all,” Dr. Weiner said. “Who knows what we will find in the dark sector?”

At one point, Mark Wise, a theoretical physicist at Caltech, felt compelled to remind the audience that this was not a depressing time for physics, listing the collider and other new experiments on heaven and on earth. “You cannot call this a depressing time,” he said.

Dr. Randall immediately chimed in. “I agree it’s a good time,” she said. “We’ll make progress by thinking about these little problems.”

On the second day, the discussion continued in an auditorium at Caltech and concluded with a showing of Mr. Dylan’s film and a history talk by Lyn Evans, the CERN scientist who has supervised the building of the Large Hadron Collider through its ups and downs over 15 years, including a disastrous explosion after it first started up in 2008.

Dr. Evans, looking relaxed, said: “It’s a beautiful machine. Now let the adventure of discovery begin.”

Dr. Spiropulu said it had already begun. Her detector, she said, recorded 50,000 proton collisions during the testing of the collider in December, recapitulating much of 20th-century particle physics.

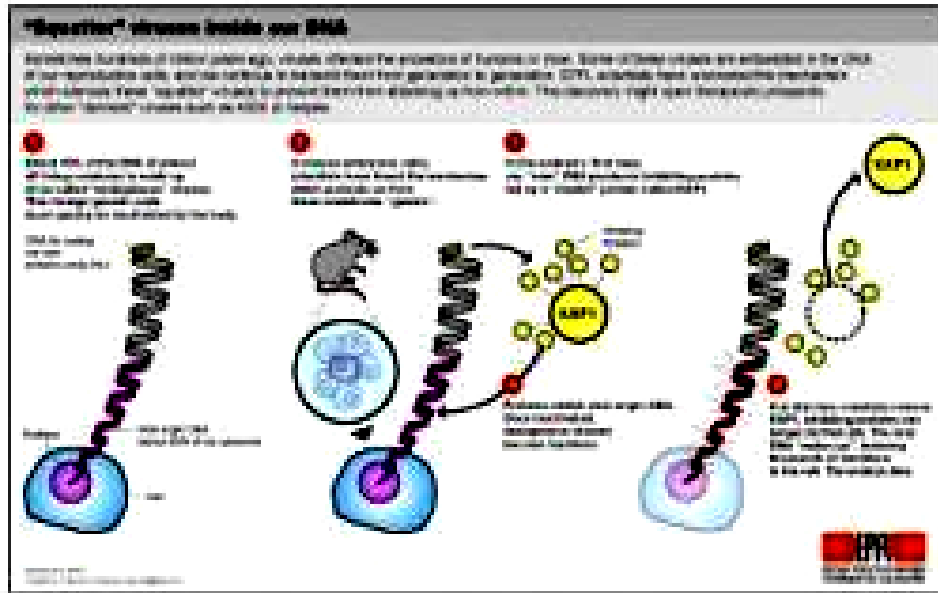
Now it is the 21st century, Dr. Spiropulu said, and “all that has been discussed these last few days will be needed immediately.”

Correction: January 25, 2010

An earlier version of this article misstated the affiliation of Aaron Pierce, a physicist. He is with the University of Michigan, not the California Institute of Technology.

<http://www.nytimes.com/2010/01/26/science/26essay.html?ref=science>

Biologists Wake Dormant Viruses and Uncover Mechanism for Survival



This shows the functioning of *Kap1* protein in mouse embryonic cells. (Credit: Pascal Coderey, pascal@salut.ch)

ScienceDaily (Jan. 15, 2010) — It is known that viral "squatters" comprise nearly half of our genetic code. These genomic invaders inserted their DNA into our own millions of years ago when they infected our ancestors. But just how we keep them quiet and prevent them from attack was more of a mystery until EPFL researchers revived them.

The reason we survive the presence of these endogenous retroviruses -- viruses that attack and are passed on through germ cells, the cells that give rise to eggs and sperm -- is because something keeps the killers silent. Now, publishing in the journal *Nature*, Didier Trono and his team from EPFL, in Switzerland, describe the mechanism. Their results provide insights into evolution and suggest potential new therapies in fighting another retrovirus -- HIV.

By analysing embryonic stem cells in mice within the first few days of life, Trono and team discovered that mouse DNA codes for an army of auxiliary proteins that recognize the numerous viral sequences littering the genome. The researchers also demonstrated that a master regulatory protein called KAP1 appears to orchestrate these inhibitory proteins in silencing would-be viruses. When KAP1 is removed, for example, the viral DNA "wakes up," multiplies, induces innumerable mutations, and the embryo soon dies.

Because retroviruses tend to mutate their host's DNA, they have an immense power and potential to alter genes. And during ancient pandemics, some individuals managed to silence the retrovirus involved and therefore survived to pass on the ability. Trono explains that the great waves of endogenous retrovirus appearance coincide with times when evolution seemed to leap ahead.



"In our genome we find traces of the last two major waves. The first took place 100 million years ago, at the time when mammals started to develop, and the second about fifty million years ago, just before the first anthropoid primates," he says.

The discovery of the KAP1 mechanism could be of interest in the search for new therapeutic approaches to combat AIDS. The virus that causes AIDS can lie dormant in the red blood cells it infects, keeping it hidden from potential treatments. Waking the virus up could expose it to attack.

Co-authors include Helen M. Rowe, School of Life Sciences, École Polytechnique Fédérale de Lausanne (EPFL), Switzerland; Johan Jakobsson, EPFL and Wallenberg Neuroscience Center, Department of Experimental Medical Sciences, Lund University, Sweden; Daniel Mesnard, EPFL; Jacques Rougemont, EPFL; Séverine Reynard, EPFL; Tugce Aktas, EMBL Heidelberg, Germany; Pierre V. Maillard, EPFL; Hillary Layard-Liesching, EPFL; Sonia Verp, EPFL; Julien Marquis, EPFL; François Spitz, EMBL Heidelberg, Germany; Daniel B. Constam, EPFL; and Didier Trono, EPFL.

Story Source:

Adapted from materials provided by Ecole Polytechnique Fédérale de Lausanne, via EurekAlert!, a service of AAAS.

<http://www.sciencedaily.com/releases/2010/01/100113131512.htm>

Neural Thermostat Keeps Brain Running Efficiently



A 'neuronal thermostat' keeps our energy-hungry brains operating reliably and efficiently while processing a flood of sensory information, new research has found. (Credit: iStockphoto)

ScienceDaily (Jan. 15, 2010) — Our energy-hungry brains operate reliably and efficiently while processing a flood of sensory information, thanks to a sort of neuronal thermostat that regulates activity in the visual cortex, Yale researchers have found.

The actions of inhibitory neurons allow the brain to save energy by suppressing non-essential visual stimuli and processing only key information, according to research published in the January 13 issue of the journal *Neuron*.

"It's called the iceberg phenomenon, where only the tip is sharply defined yet we are aware that there is a much larger portion underwater that we can not see," said David McCormick, the Doris McConnell Duberg Professor of Neurobiology at Yale School of Medicine, researcher of the Kavli Institute of Neuroscience and co-senior author of the study. "These inhibitory neurons set the water level and control how much of the iceberg we see. We don't need to see the entire iceberg to know that it is there."

The brain uses the highest percentage of the body's energy, so scientists have long wondered how it can operate both efficiently and reliably when processing a deluge of sensory information. Most studies of vision have concentrated on activity of excitatory neurons that fire when presented with simple stimuli, such as bright or dark bars. The Yale team wanted to measure what happens outside of the classical field of vision when the brain has to deal with more complex scenes in real life.

By studying brains of animals watching movies of natural scenes, the Yale team found that inhibitory cells in the visual cortex control how the excitatory cells interact with each other.



"We found that these inhibitory cells take a lead role in making the visual cortex operate in a sparse and reliable manner," McCormick said.

James Mazer was co-senior author of the paper with McCormick. Bilal Haider, a Yale graduate student, was lead author. Other Yale authors of the paper were Matthew R. Krause, Alvaro Duque, Yuguo Yu and Jonathan Touryan.

The work was funded by the National Eye Institute and the Kavli Foundation.

Story Source:

Adapted from materials provided by [Yale University](#).

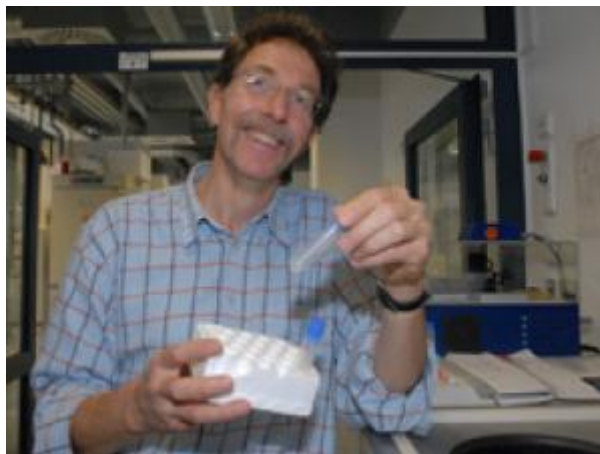
Journal Reference:

1. Bilal Haider, Matthew R. Krause, Alvaro Duque, Yuguo Yu, Jonathan Touryan, James A. Mazer, David A. McCormick. **Synaptic and Network Mechanisms of Sparse and Reliable Visual Cortical Activity during Nonclassical Receptive Field Stimulation.** *Neuron*, 2010; 65 (Issue 1): 107-121 DOI: [10.1016/j.neuron.2009.12.005](https://doi.org/10.1016/j.neuron.2009.12.005)

<http://www.sciencedaily.com/releases/2010/01/100113122255.htm>



Key Mechanism for the Proliferation of Epstein-Barr Virus Discovered



Prof. Wolfgang Hammerschmidt. (Credit: Ulla Baumgart)

ScienceDaily (Jan. 15, 2010) — Scientists of Helmholtz Zentrum München have elucidated a crucial mechanism in the lytic cycle of Epstein-Barr virus. A team of researchers led by Professor Wolfgang Hammerschmidt identified the function of a protein which plays a critical role in the proliferation of the virus. The Epstein-Barr virus can induce cancer.

The findings, published in the current issue of *Proceedings of the National Academy of Sciences*, represent a major step forward in understanding tumor development.

The Epstein-Barr virus (EBV), a virus of the herpes family, has two distinct life phases: After infecting a cell it first goes into a resting phase. Under certain circumstances the virus can become active -- and then induces tumor growth or promotes its synthesis in the cell. Especially in patients with weakened immune systems, EBV can cause its host cells to divide uncontrollably -- causing a tumor to develop.

The causes for the transition of EBV from the quiescent phase to an active mode -- particularly with respect to the responsible factors and to how the molecular mechanisms function -- have until now remained elusive. With their findings, the scientists at Helmholtz Zentrum München have discovered how the virus terminates latency and activates its synthesis in the infected cells.

Professor Wolfgang Hammerschmidt, head of the Department of Gene Vectors at Helmholtz Zentrum München, explained: "We have now identified the crucial function of the viral BZLF1 protein: It activates the genes of EBV, which are essential for the proliferation of virus particles." About 70 different genes are switched off during the latent phase because certain DNA segments are chemically modified: Some DNA building blocks carry methyl groups. They are a kind of stop signal for the cell apparatus, so that these genes cannot be converted into protein.

"BZLF1 can detect these methylation patterns in the DNA," said Markus Kalla, lead author of the study. With its DNA binding domain, the protein binds directly to the methylated DNA sequence. A second domain of BZLF1 is responsible for the reactivation of the gene. "Such a mechanism was not known before," Wolfgang Hammerschmidt said. Previous research assumed that the methyl groups had to be removed from the DNA building blocks before the transcription factors could bind to the regulatory DNA sequence and thus activate the gene.

The researchers' findings indicate that BZLF1 avoids this hurdle. Accordingly, BZLF1 appears to be essential for establishing and maintaining latency, but also for escaping from it.

During viral synthesis a large number of new particles are usually formed within the cell. To achieve this, viruses use large portions of the cell apparatus, in particular specific proteins and factors. After progeny synthesis the new viruses are released -- researchers speak of a lytic cycle. The disadvantage: the viruses thus attract the attention of the immune system, which then fights against the pathogen and destroys the cell supporting viral synthesis.

However, the Epstein-Barr virus uses another strategy. Instead of putting all of its energy into immediate synthesis of progeny in the infected cell, it goes into a resting phase following the infection and thus prevents a reaction of the immune system. The virus infects cells of the immune system -- the so-called B cells -- first inserting its DNA into their cell nucleus. Whereas most viruses immediately start their lytic proliferation cycle and thus use the cell apparatus to replicate the DNA and to generate important structural proteins from the genes, EBV drives transformation of merely a few genes from the cell into proteins. These so-called latent genes are important for the quiescent phase: They see to it that the DNA of the Epstein-Barr virus remains stable in the cell nucleus while the cell itself proliferates. This seemingly peaceful co-existence ends when the virus goes into the lytic phase or induces tumor growth.

These findings published in PNAS by Wolfgang Hammerschmidt and his colleagues constitute an important step for a better understanding of the role of EBV in tumor growth.

Story Source:

Adapted from materials provided by [Helmholtz Zentrum Muenchen - German Research Centre for Environmental Health](#).

Journal Reference:

1. Kalla, M, Schmeinck, A, Bergbauer, M, Pich, D, Hammerschmidt, W. **AP-1 homolog BZLF1 of Epstein-Barr virus has two essential functions dependent on the epigenetic state of the viral genome.** *Proceedings of the National Academy of Sciences*, 2010; 107 (2): 850 DOI: [10.1073/pnas.0911948107](https://doi.org/10.1073/pnas.0911948107)

<http://www.sciencedaily.com/releases/2010/01/100114081547.htm>

Parasitic Wasps' Genomes Provides New Insights Into Pest Control, Genetics



Chris Desjarding and Jack Werren compare parasitic wasps (tiny insects in upper tube) to their hosts flies (in the lower tube). (Credit: Image courtesy of University of Rochester)

ScienceDaily (Jan. 14, 2010) — Parasitic wasps kill pest insects, but their existence is largely unknown to the public. Now, scientists led by John H. Werren, professor of biology at the University of Rochester, and Stephen Richards at the Genome Sequencing Center at the Baylor College of Medicine have sequenced the genomes of three parasitoid wasp species, revealing many features that could be useful to pest control and medicine, and to enhance our understanding of genetics and evolution.

The study appears in the journal *Science*.

"Parasitic wasps attack and kill pest insects, but many of them are smaller than the head of a pin, so people don't even notice them or know of their important role in keeping pest numbers down," says Werren. "There are over 600,000 species of these amazing critters, and we owe them a lot. If it weren't for parasitoids and other natural enemies, we would be knee-deep in pest insects."

Parasitoid wasps are like "smart bombs" that seek out and kill only specific kinds of insects, says Werren. "Therefore, if we can harness their full potential, they would be vastly preferable to chemical pesticides, which broadly kill or poison many organisms in the environment, including us."

The three wasp genomes Werren and Richards sequenced are in the wasp genus *Nasonia*, which is considered the "lab rat" of parasitoid insects. Among the future applications of the *Nasonia* genomes that could be of use in pest control is identification of genes that determine which insects a parasitoid will attack, identification of dietary needs of parasitoids to assist in economical, large-scale rearing of parasitoids, and identification of parasitoid venoms that could be used in pest control. Because parasitoid venoms manipulate cell physiology in diverse ways, they also may provide an unexpected source for new drug development.

In addition to being useful for controlling pests and offering promising venoms, the wasps could act as a new genetic system with a number of unique advantages. Fruit flies have been the standard model for genetic studies for decades, largely because they are small, can be grown easily in a laboratory, and reproduce quickly. *Nasonia* share these traits, but male *Nasonia* have only one set of chromosomes, instead of two sets like fruit flies and people. "A single set of chromosomes, which is more commonly found in lower single-celled organisms such as yeast, is a handy genetic tool, particularly for studying how genes interact with each other," says Werren. Unlike fruit flies, these wasps also modify their DNA in ways similar to humans and other vertebrates -- a process called "methylation," which plays an important role in regulating how genes are turned on and off during development.

"In human genetics we are trying to understand the genetic basis for quantitative differences between people such as height, drug interactions and susceptibility to disease," says Richards. "These genome

sequences combined with haploid-diploid genetics of *Nasonia* allow us to cheaply and easily answer these important questions in an insect system, and then follow up any insights in humans."

The wasps have an additional advantage in that closely related species of *Nasonia* can be cross-bred, facilitating the identification of genes involved in species' differences.

"Because we have sequenced the genomes of three closely related species, we are able to study what changes have occurred during the divergence of these species from one another," says Werren. "One of the interesting findings is that DNA of mitochondria, a small organelle that 'powers' the cell in organisms as diverse as yeast and people, evolves very fast in *Nasonia*. Because of this, the genes of the cell's nucleus that encode proteins for the mitochondria must also evolve quickly to 'keep up.' "

It is these co-adapting gene sets that appear to cause problems in hybrids when the species mate with each other. Research groups are now busy trying to out what specific kinds of interactions go wrong in the hybrid offspring. Since mitochondria are involved in a number of human diseases, as well as fertility and aging, the rapidly evolving mitochondria of *Nasonia* and coadapting nuclear genes could be useful research tools to investigate these processes.

A second startling discovery is that *Nasonia* has been picking up and using genes from bacteria and Pox viruses (e.g. relatives of the human smallpox virus). "We don't yet know what these genes are doing in *Nasonia*," says Werren, "but the acquisition of genes from bacteria and viruses could be an important mechanism for evolutionary innovation in animals, and this is a striking potential example."

A companion paper to the Science study, published in *PLoS Genetics*, reports the first identification of the DNA responsible for a quantitative trait gene in *Nasonia*, and heralds *Nasonia* joining the ranks of model genetic systems. The study reveals that changes in "non-coding DNA," the portion that does not make proteins but can regulate expression of genes, causes a large developmental difference between closely related species of *Nasonia*. This finding relates to an important ongoing controversy in evolution -- whether differences between species are due mostly to protein changes or regulatory changes.

"Emerging from these genome studies are a lot of opportunities for exploiting *Nasonia* in topics ranging from pest control to medicine, genetics, and evolution," says Werren. "However, the community of scientists working on *Nasonia* is still relatively small. That is why we are hoping that more scientists will see the utility of these insects, and join in efforts to exploit their potential."

For more information on *Nasonia* and emerging studies, visit the Werren laboratory Web site on this topic at <http://www.rochester.edu/College/BIO/labs/WerrenLab/WerrenLab-NasoniaResearch.html>

Story Source:

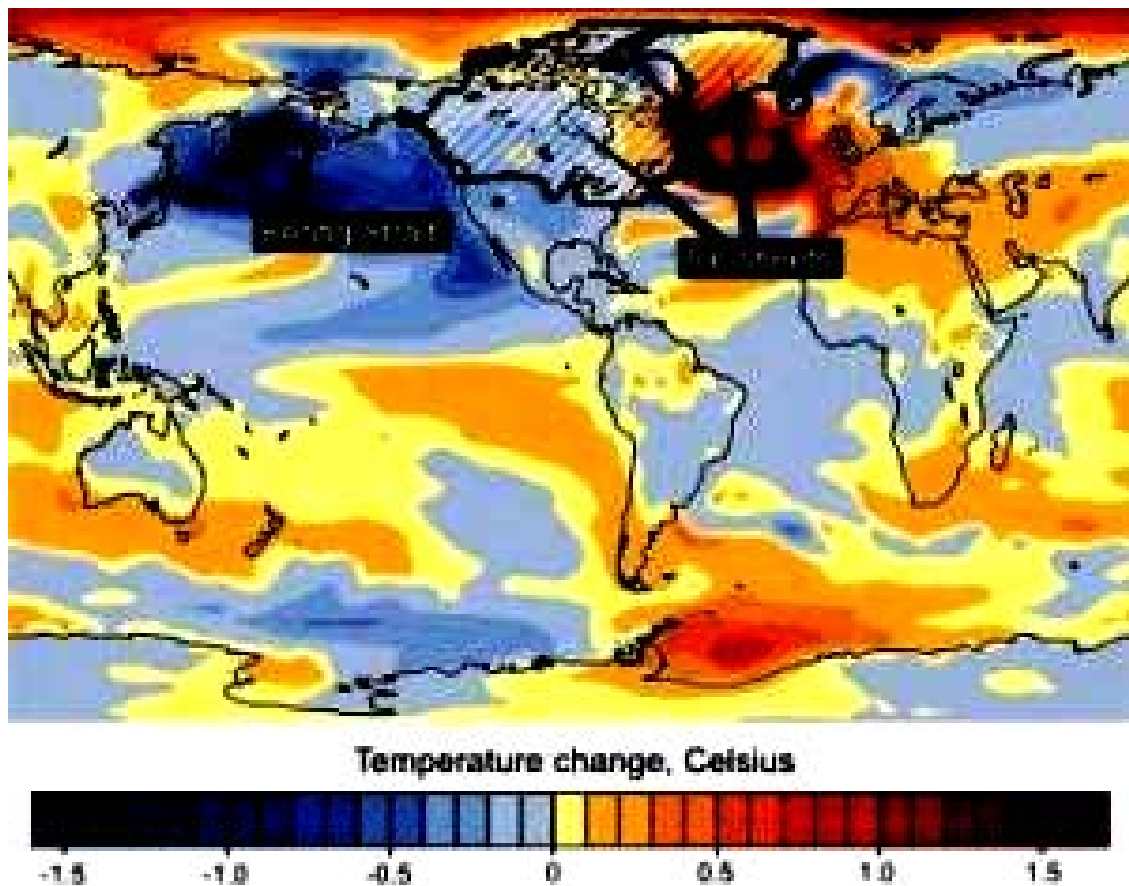
Adapted from materials provided by [University of Rochester](http://www.rochester.edu).

Journal Reference:

1. The *Nasonia* Genome Working Group. **Functional and Evolutionary Insights from the Genomes of Three Parasitoid *Nasonia* Species.** *Science*, 2010; 327 (5963): 343-348 DOI: [10.1126/science.1178028](https://doi.org/10.1126/science.1178028)

<http://www.sciencedaily.com/releases/2010/01/100114143016.htm>

Climate Conditions in 2050 Crucial to Avoid Harmful Impacts in 2100



Scientists are unraveling a chain of events that led to large-scale warmings and coolings across the Northern Hemisphere during past ice ages. As ice sheets expanded, water levels dropped in the narrow Bering Strait (left) and cut off the flow of relatively fresh water from the northern Pacific through the Arctic into the saltier Atlantic. This altered ocean currents, increasing the flow of Atlantic water northward from the tropics and producing warming in the north Atlantic (right, shown in dark red) that melted ice sheets and affected climate patterns and sea levels across much of the world. (Credit: Courtesy Nature, modified by UCAR)

ScienceDaily (Jan. 14, 2010) — While governments around the world continue to explore strategies for reducing greenhouse gas emissions, a new study suggests policymakers should focus on what needs to be achieved in the next 40 years in order to keep long-term options viable for avoiding dangerous levels of warming.

The study is the first of its kind to use a detailed energy system model to analyze the relationship between mid-century targets and the likelihood of achieving long-term outcomes.

"Setting mid-century targets can help preserve long-term policy options while managing the risks and costs that come with long-term goals," says co-lead author Brian O'Neill, a scientist at the National Center for Atmospheric Research (NCAR).

The study, conducted with co-authors at the International Institute for Applied Systems Analysis (IIASA) in Austria and the Energy Research Centre of the Netherlands, is being published in the *Proceedings of the National Academy of Sciences*. It was funded by IIASA, a European Young Investigator Award to O'Neill, and the National Science Foundation, NCAR's sponsor.

The researchers used a computer simulation known as an integrated assessment model to represent interactions between the energy sector and the climate system. They began with "business as usual" scenarios, developed for the Intergovernmental Panel on Climate Change's 2000 report, that project future greenhouse gas emissions in the absence of climate policy. They then analyzed the implications of restricting emissions in 2050, using a range of levels.

The team focused on how emissions levels in 2050 would affect the feasibility of meeting end-of-century temperature targets of either 2 or 3 degrees Celsius (about 3.5 degrees or 5.5 degrees Fahrenheit, respectively) above the pre-industrial average.

Mid-century thresholds

The study identifies critical mid-century thresholds that, if surpassed, would make particular long-term goals unachievable with current energy technologies.

For example, the scientists examined what would need to be done by 2050 in order to preserve the possibility of better-than-even odds of meeting the end-of-century temperature target of 2 degrees Celsius of warming advocated by many governments.

One "business as usual" scenario showed that global emissions would need to be reduced by about 20 percent below 2000 levels by mid-century to preserve the option of hitting the target. In a second case, in which demand for energy and land grow more rapidly, the reductions by 2050 would need to be much steeper: 50 percent. The researchers concluded that achieving such reductions is barely feasible with known energy sources.

"Our simulations show that in some cases, even if we do everything possible to reduce emissions between now and 2050, we'd only have even odds of hitting the 2 degree target-and then only if we also did everything possible over the second half of the century too," says co-author and IIASA scientist Keywan Riahi.

The research team made a number of assumptions about the energy sector, such as how quickly the world could switch to low- or zero-carbon sources to achieve emission targets. Only current technologies that have proven themselves at least in the demonstration stage, such as nuclear fission, biomass, wind power, and carbon capture and storage, were considered. Geoengineering, nuclear fusion, and other technologies that have not been demonstrated as viable ways to produce energy or reduce emissions were excluded from the study.

The 2-degree goal

Research shows that average global temperatures have warmed by close to 1 degree C (almost 1.8 degrees F) since the pre-industrial era. Much of the warming is due to increased emissions of greenhouse gases, predominantly carbon dioxide, due to human activities. Many governments have advocated limiting global temperature to no more than 1 additional degree Celsius in order to avoid more serious effects of climate change.

During the recent international negotiations in Copenhagen, many nations recognized the case for limiting long-term warming to 2 degrees Celsius above pre-industrial levels, but they did not agree to a mid-century emissions target.

"Even if you agree on a long-term goal, without limiting emissions sufficiently over the next several decades, you may find you're unable to achieve it. There's a risk that potentially desirable options will no longer be technologically feasible, or will be prohibitively expensive to achieve," O'Neill says.



On the other hand, "Our research suggests that, provided we adopt an effective long-term strategy, our emissions can be higher in 2050 than some proposals have advocated while still holding to 2 degrees Celsius in the long run," he adds.

Cautions

The researchers caution that this is just one study looking at the technological feasibility of mid- and end-of-century emissions targets. O'Neill says that more feasibility studies should be undertaken to start "bounding the problem" of emissions mitigation.

"We need to know whether our current and planned actions for the coming decades will produce long-term climate change we can live with," he says. "Mid-century targets are a good way to do that."

Story Source:

Adapted from materials provided by [National Center for Atmospheric Research](#), via [EurekAlert!](#), a service of AAAS.

<http://www.sciencedaily.com/releases/2010/01/100111154912.htm>



Heat and Moisture from Himalayas Could Be a Key Cause of the South Asian Monsoon

ScienceDaily (Jan. 14, 2010) — Harvard climate scientists suggest that the Tibetan Plateau -- thought to be the primary source of heat that drives the South Asian monsoon -- may have far less of an effect than the Himalayas and other surrounding mountains. As the monsoon brings needed rainfall and water to billions of people each year, understanding its proper origin, especially in the context of global climate change, is crucial for the future sustainability of the region.

The researchers say their findings, published in the January 14th issue of *Nature*, have broad implications for how the Asian climate may have responded to mountain uplift in the past, and for how it might respond to surface changes in the coming decades.

Often called the "roof of the world," the Tibetan Plateau is a vast area of 2.5 million square kilometers with an average elevation of more than 4,500 meters. Scientists have long theorized that the massive release of heat from the surface of the plateau -- with air being heated to higher temperatures over the plateau than air at the same height over lower-level surfaces nearby -- has been a major contributor to the strength of the monsoon.

"The South Asian monsoon supplies water to billions of people, many of whom live in developing nations and agricultural societies that are highly vulnerable to variations in this water supply," explains co-author Zhiming Kuang, Assistant Professor of Climate Science in Harvard's School of Engineering and Applied Sciences (SEAS) and Department of Earth and Planetary Sciences (EPS).

While the heating by the plateau does enhance rainfall along its southern edge, Kuang and his colleague William Boos, Daly Postdoctoral Fellow in EPS and an environmental fellow at the Harvard University Center for the Environment (HUCE), used an atmospheric circulation model to show that the large-scale South Asian summer monsoon circulation remains unaffected when the plateau is removed.

It turns out that the narrow geography of the Himalayas and other nearby mountain ranges can, in fact, produce an equally strong monsoon by insulating warm, moist air over continental India from the cold dry extratropics, the area between the subtropics and polar regions.

"Because heat from the plateau has been seen as the main contributor to the power of the monsoon, much attention has been given to changes in the plateau's albedo, or its reflectivity level of the sun's radiation," says Kuang. For example, a decrease in snow cover over the Tibetan Plateau resulting from an increase in global temperatures can affect reflectivity, and hence, the level of heat. The revised theory, emphasizing the important role the mountains play in trapping warm and moist air, suggests that climate scientists should pay as much attention to changes over the Indian subcontinent due to, for example, land use.

How the region's natural environment is modified through activities such as building, mining, and agriculture, Zhang explains, can influence albedo and moisture, thus altering the temperature/humidity of the boundary layer air. By considering the influence of both the plateau and the mountains on the strength of the monsoon, the Harvard researchers expect a clearer picture will emerge about the potential changes in the South Asian water supply in the coming decades.

"Ultimately, our revised view has implications for future projections of how the South Asian monsoon might be altered in a warmer world and can be used to infer aspects about the earth's climate history," says Boos.

Story Source:

Adapted from materials provided by [Harvard University](#), via [EurekAlert!](#), a service of AAAS.

<http://www.sciencedaily.com/releases/2010/01/100113131509.htm>

Second Smallest Exoplanet Spotted: Discovery Highlights New Potential for Eventually Finding Earth-Mass Planets



Astronomers have detected an extrasolar planet with a mass just four times that of Earth. (Credit: L. Calçada, ESO)

ScienceDaily (Jan. 14, 2010) — Astronomers from the California Institute of Technology (Caltech) and other institutions, using the highly sensitive 10-meter Keck I telescope atop Hawaii's Mauna Kea, have detected an extrasolar planet with a mass just four times that of Earth. The planet, which orbits its parent star HD156668 about once every four days, is the second-smallest world among the more than 400 exoplanets (planets located outside our solar system) that have been found to date. It is located approximately 80 light-years from Earth in the direction of the constellation Hercules.

The find, made possible through NASA's Eta-Earth Survey for Low-Mass Planets was announced at the 215th American Astronomical Society meeting held January 4-7, 2010, in Washington, D.C.

Dubbed HD 156668b, the planet -- a so-called "super Earth" that would glow with blast-furnace-like temperatures -- offers a tantalizing hint of discoveries yet to come. Astronomers hope those discoveries will include Earth-size planets located in the "habitable zone," the area roughly the distance from the earth to the sun, and thus potentially favorable to life.

HD 156668b was discovered with the radial velocity or wobble method, which relies on Keck's High Resolution Echelle Spectrometer (HIRES) to spread light collected from the telescope into its component wavelengths or colors, producing a spectrum. As the planet orbits the star, it causes the star to move back and forth along our line of sight, which causes the starlight to become redder and then bluer in a periodic fashion.

The color shifts give astronomers the mass of the planet and the characteristics of its orbit, such as how much time it takes to orbit the star. The majority of the exoplanets discovered have been found in this way.

The discovery of low-mass planets like HD 156668b has become possible due to the development of techniques to watch stars wobble with increasing clarity, and of software that can pluck the signals of increasingly smaller planets from amid the 'noise' made by their pulsating, wobbling parent stars.

"If the stars themselves have imperfections and are unstable, their wobbling would cause jumps in velocity that could mimic or hide the existence of a planet," says John A. Johnson, assistant professor of astronomy at Caltech and codiscoverer of the new planet along with Andrew Howard and Geoff Marcy of the University of California at Berkeley, Debra Fischer of Yale University, Jason Wright of Penn State University, and the members of the California Planet Survey collaboration.



"We have been doing simulations to understand the astrophysics of these imperfections, and how to distinguish them from the signals from a planet," says Johnson. "We hope to use these simulations to design even better observing strategies and data-analysis techniques."

The discovery of a planet that is comparable in size to Earth and found within the habitable zone, however, "will require a great deal of work," he says. "If we could build the best possible radial-velocity instrument tomorrow, we might have answers in three years, and a solid census of Earthlike planets within a decade. We'll need gigantic leaps in sensitivity to get there, and we're hot on the trail."

Johnson is also currently building a new camera for the 60-inch telescope at Caltech's Palomar Observatory. The camera will allow astronomers to search for the passages -- or transits -- of low-mass planets like HD156668 across the faces of their stars.

"If we catch the planet in transit, we can measure the planet's radius and density, and therefore address the question of whether the planet has a composition more like Earth, with a solid surface and thin atmosphere, or is a miniature version of Neptune, with a heavy gaseous atmosphere," he says.

The Keck I telescope is part of the Keck Observatory, a joint effort of Caltech and the University of California.

For more information about extrasolar planet discoveries, visit <http://exoplanets.org>.

Story Source:

Adapted from materials provided by [California Institute of Technology](http://www.caltech.edu).

<http://www.sciencedaily.com/releases/2010/01/100113122349.htm>



Yoga Reduces Cytokine Levels Known to Promote Inflammation, Study Shows



New research shows that regularly practicing yoga exercises may lower a number of compounds in the blood and reduce the level of inflammation that normally rises because of both normal aging and stress. (Credit: iStockphoto/Lee Pettet)

ScienceDaily (Jan. 14, 2010) — Regularly practicing yoga exercises may lower a number of compounds in the blood and reduce the level of inflammation that normally rises because of both normal aging and stress, a new study has shown.

The study, done by Ohio State University researchers and just reported in the journal *Psychosomatic Medicine*, showed that women who routinely practiced yoga had lower amounts of the cytokine interleukin-6 (IL-6) in their blood.

The women also showed smaller increases in IL-6 after stressful experiences than did women who were the same age and weight but who were not yoga practitioners.

IL-6 is an important part of the body's inflammatory response and has been implicated in heart disease, stroke, type-2 diabetes, arthritis and a host of other age-related debilitating diseases. Reducing inflammation may provide substantial short- and long-term health benefits, the researchers suggest.

"In addition to having lower levels of inflammation before they were stressed, we also saw lower inflammatory responses to stress among the expert yoga practitioners in the study," explained Janice Kiecolt-Glaser, professor of psychiatry and psychology and lead author of the study.

"Hopefully, this means that people can eventually learn to respond less strongly to stressors in their everyday lives by using yoga and other stress-reducing modalities."

For the study, the researchers assembled a group of 50 women, age 41 on average. They were divided into two groups -- "novices," who had either taken yoga classes or who practiced at home with yoga videos for no more than 6 to 12 sessions, and "experts," who had practiced yoga one or two times weekly for at least two years and at least twice weekly for the last year.

Each of the women was asked to attend three sessions in the university's Clinical Research Center at two-week intervals. Each session began with participants filling out questionnaires and completing several psychological tests to gauge mood and anxiety levels.

Each woman also was fitted with a catheter in one arm through which blood samples could be taken several times during the research tasks for later evaluation.

Participants then performed several tasks during each visit designed to increase their stress levels including immersing their foot into extremely cold water for a minute, after which they were asked to solve a series of successively more difficult mathematics problems without paper or pencil.

Following these "stressors," participants would either participate in a yoga session, walk on treadmill set at a slow pace (.5 miles per hour) designed to mirror the metabolic demands of the yoga session or watch neutral, rather boring videos. The treadmill and video tasks were designed as contrast conditions to the yoga session.

Once the blood samples were analyzed after the study, researchers saw that the women labeled as "novices" had levels of the pro-inflammatory cytokine IL-6 that were 41 percent higher than those in the study's "experts."

"In essence, the experts walked into the study with lower levels of inflammation than the novices, and the experts were also better able to limit their stress responses than were the novices," Kiecolt-Glaser explained.

The researchers did not find the differences they had expected between the novices and experts in their physiological responses to the yoga session.

Co-author Lisa Christian, an assistant professor of psychology, psychiatry and obstetrics and gynecology, suggested one possible reason:

"The yoga poses we used were chosen from those thought to be restorative or relaxing. We had to limit the movements to those novices could perform as well as experts.

"Part of the problem with sorting out exactly what makes yoga effective in reducing stress is that if you try to break it down into its components, like the movements or the breathing, it's hard to say what particular thing is causing the effect," said Christian, herself a yoga instructor. "That research simply hasn't been done yet."

Ron Glaser, a co-author and a professor of molecular virology, immunology and medical genetics, said that the study has some fairly clear implications for health.

"We know that inflammation plays a major role in many diseases. Yoga appears to be a simple and enjoyable way to add an intervention that might reduce risks for developing heart disease, diabetes and other age-related diseases" he said.

"This is an easy thing people can do to help reduce their risks of illness."

Bill Malarkey, an professor of internal medicine and co-author on the study, pointed to the inflexibility that routinely comes with aging.

"Muscles shorten and tighten over time, mainly because of inactivity," he said. "The stretching and exercise that comes with yoga actually increases a person's flexibility and that, in turn, allows relaxation which can lower stress."

Malarkey sees the people's adoption of yoga or other regular exercise as one of the key solutions to our current health care crisis. "People need to be educated about this. They need to be taking responsibility for their health and how they live. Doing yoga and similar activities can make a difference."

As a clinician, he says, "Much of my time is being spent simply trying to get people to slow down."

The researchers' next step is a clinical trial to see if yoga can improve the health and reduce inflammation that has been linked to debilitating fatigue among breast cancer survivors. They're seeking 200 women to volunteer for the study that's funded by the National Cancer Institute.

Researchers Heather Preston, Carrie Houts and Charles Emery were also part of the research team which was supported in part by a grant from the National Center for Complementary and Alternative Medicine, part of the National Institutes of Health.

Story Source:

Adapted from materials provided by [Ohio State University](#). Original article written by Earle Holland.

<http://www.sciencedaily.com/releases/2010/01/100111122643.htm>

Haiti Earthquake Occurred in Complex, Active Seismic Region



The Haiti earthquake epicenter is marked by the star along the displaced portion (shown in red) of the Enriquillo-Plantain Garden Fault. The 7.0 magnitude quake struck along about one-tenth of the 500-km-long strike-slip fault. The region sits on a complex seismic area made up of numerous faults and plates. The fault lines with small arrows denote a different kind of fault called thrust faults, where one plate dives under another. Strike-slip faults grind past one another. The dotted lines at bottom denote complex seafloor formations. (Credit: Jansma, P. and Mattioli, G., 2005, GPS results from Puerto Rico and the Virgin Islands: constraints on tectonic setting and rates of active faulting, *Geol. Soc. Amer. Spec. Paper* 385 (ed. Paul Mann), 13-30.)

ScienceDaily (Jan. 14, 2010) — The magnitude 7.0 earthquake that triggered disastrous destruction and mounting death tolls in Haiti this week occurred in a highly complex tangle of tectonic faults near the intersection of the Caribbean and North American crustal plates, according to a quake expert at the Woods Hole Oceanographic Institution (WHOI) who has studied faults in the region and throughout the world.

Jian Lin, a WHOI senior scientist in geology and geophysics, said that even though the quake was "large but not huge," there were three factors that made it particularly devastating: First, it was centered just 10 miles southwest of the capital city, Port au Prince; second, the quake was shallow -- only about 10-15 kilometers below the land's surface; third, and more importantly, many homes and buildings in the economically poor country were not built to withstand such a force and collapsed or crumbled.

All of these circumstances made the Jan. 12 earthquake a "worst-case scenario," Lin said. Preliminary estimates of the death toll ranged from thousands to hundreds of thousands. "It should be a wake-up call for the entire Caribbean," Lin said.

The quake struck on a 50-60-km stretch of the more than 500-km-long Enriquillo-Plantain Garden Fault, which runs generally east-west through Haiti, to the Dominican Republic to the east and Jamaica to the west.

It is a "strike-slip" fault, according to the U.S. Geological Survey, meaning the plates on either side of the fault line were sliding in opposite directions. In this case, the Caribbean Plate south of the fault line was sliding east and the smaller Gonvave Platelet north of the fault was sliding west.

But most of the time, the earth's plates do not slide smoothly past one another. They stick in one spot for perhaps years or hundreds of years, until enough pressure builds along the fault and the landmasses suddenly jerk forward to relieve the pressure, releasing massive amounts of energy throughout the surrounding area. A similar, more familiar, scenario exists along California's San Andreas Fault.

Such seismic areas "accumulate stresses all the time," says Lin, who has extensively studied a nearby, major fault, the Septentrional Fault, which runs east-west at the northern side of the Hispaniola island that makes up Haiti and Dominican Republic. In 1946, an 8.1 magnitude quake, more than 30 times more powerful than this week's quake, struck near the northeastern corner of the Hispaniola.

Compounding the problem, he says, is that in addition to the Caribbean and North American plates, a wide zone between the two plates is made up of a patchwork of smaller "block" plates, or "platelets" -- such as the Gonvave Platelet -- that make it difficult to assess the forces in the region and how they interact with one another. "If you live in adjacent areas, such as the Dominican Republic, Jamaica and Puerto Rico, you are surrounded by faults."

Residents of such areas, Lin says, should focus on ways to save their lives and the lives of their families in the event of an earthquake. "The answer lies in basic earthquake education," he says.

Those who can afford it should strengthen the construction and stability of their houses and buildings, he says. But in a place like Haiti, where even the Presidential Palace suffered severe damage, there may be more realistic solutions.

Some residents of earthquake zones know that after the quake's faster, but smaller, primary, or "p" wave hits, there is usually a few-second-to-one-minute wait until a larger, more powerful surface, or "s" wave strikes, Lin says. P waves come first but have smaller amplitudes and are less destructive; S waves, though slower, are larger in amplitude and, hence, more destructive.

"At least make sure you build a strong table somewhere in your house and school," said Lin. When a quake comes, "duck quickly under that table."

Lin said the Haiti quake did not trigger an extreme ocean wave such as a Tsunami, partly because it was large but not huge and was centered under land rather than the sea.

The geologist says that aftershocks, some of them significant, can be expected in the coming days, weeks, months, years, "even tens of years." But now that the stress has been relieved along that 50-60-km portion of the Enriquillo-Plantain Garden Fault, Lin says this particular fault patch should not experience another quake of equal or greater magnitude for perhaps 100 years.

However, the other nine-tenths of that fault and the myriad networks of faults throughout the Caribbean are, definitely, "active."

"A lot of people," Lin says, "forget [earthquakes] quickly and do not take the words of geologists seriously. But if your house is close to an active fault, it is best that you do not forget where you live."

Story Source:

Adapted from materials provided by [Woods Hole Oceanographic Institution](http://www.woods-hole.edu).

<http://www.sciencedaily.com/releases/2010/01/100114143321.htm>

Toward a Less Expensive Version of the Anti-Flu Drug Tamiflu

ScienceDaily (Jan. 14, 2010) — Scientists have developed an alternative method for producing the active ingredient in Tamiflu®, the mainstay for fighting H1N1 and other forms of influenza. The new process could expand availability of the drug by reducing its cost, which now retails for as about \$8 per dose.

Their study is in the American Chemical Society's *Organic Letters*, a bi-weekly journal.

Anqi Chen, Christina Chai and colleagues note that the global pandemic of H1N1 has resulted in millions of infected cases worldwide and nearly 10,000 deaths to date. Tamiflu®, also known as oseltamivir phosphate, remains the most widely used antiviral drug for the prevention and treatment of H1N1 infections as well as bird flu and seasonal influenzas. But growing demand for the drug has put pressure on the supply of shikimic acid, the raw material now used in making the drug. "As a result, chemists worldwide including ourselves have explored the possibility of using other alternative raw materials for the synthesis of the drug" said Chen and Chai, who led the research.

The scientists describe a new process for making the drug that does not use shikimic acid. They found that D-ribose, a naturally-occurring sugar produced by fermentation in large scales, potentially provides an inexpensive and abundant source of starting material for making the drug. D-ribose costs only about one-sixth as much as shikimic acid. In lab studies, the scientists demonstrated the potential use of D-ribose as an alternative source for the synthesis of Tamiflu®.

Story Source:

Adapted from materials provided by [American Chemical Society](#), via [EurekAlert!](#), a service of AAAS.

<http://www.sciencedaily.com/releases/2010/01/100113172256.htm>

From the Ancient Amazonian Indians: 'Biochar' as a Modern Weapon Against Global Warming



Unlike familiar charcoal briquettes, above, biochar is charcoal made from wood, grass and other organic matter, and has the potential to help slow climate change. (Credit: iStockphoto/Don Nichols)

ScienceDaily (Jan. 14, 2010) — Scientists are reporting that "biochar" -- a material that the Amazonian Indians used to enhance soil fertility centuries ago -- has potential in the modern world to help slow global climate change. Mass production of biochar could capture and sock away carbon that otherwise would wind up in the atmosphere as carbon dioxide, the main greenhouse gas.

Their report appears in ACS' *Environmental Science & Technology*, a bi-weekly journal.

Kelli Roberts and colleagues note that biochar is charcoal produced by heating wood, grass, cornstalks or other organic matter in the absence of oxygen. The heat drives off gases that can be collected and burned to produce energy. It leaves behind charcoal rich in carbon.

Amazonian Indians mixed a combination of charcoal and organic matter into the soil to improve soil fertility, a fact that got the scientists interested in studying biochar's modern potential.

The study involved a "life-cycle analysis" of biochar production, a comprehensive cradle-to-grave look at its potential in fighting global climate change and all the possible consequences of using the material. It concludes that several biochar production systems have the potential for being an economically viable way of sequestering carbon -- permanently storing it -- while producing renewable energy and enhancing soil fertility.

Story Source:

Adapted from materials provided by [American Chemical Society](#), via [EurekAlert!](#), a service of AAAS.

Journal Reference:

1. Roberts et al. **Life Cycle Assessment of Biochar Systems: Estimating the Energetic, Economic, and Climate Change Potential.** *Environmental Science & Technology*, 2010; 44 (2): 827
DOI: [10.1021/es902266r](https://doi.org/10.1021/es902266r)

<http://www.sciencedaily.com/releases/2010/01/100113172252.htm>

Environment Plays Key Role in Developing Reading Skills, Study Finds



A new study of twins is the first to demonstrate that environment plays an important role in reading growth over time. (Credit: iStockphoto/Ekaterina Monakhova)

ScienceDaily (Jan. 14, 2010) — While genetics play a key role in children's initial reading skills, a new study of twins is the first to demonstrate that environment plays an important role in reading growth over time.

The results give further evidence that children can make gains in reading during their early school years, above and beyond the important genetic factors that influence differences in reading, said Stephen Petrill, lead author of the study and professor of human development and family science at Ohio State University.

"We certainly have to take more seriously genetic influences on learning, but children who come into school with poor reading skills can make strides with proper instruction," Petrill said.

"The findings support the need for sustained efforts to promote reading development in children that take both genetic and environmental influences into account."

While other studies have shown that both genetics and environment influence reading skills, this is the first to show their relative roles in how quickly or slowly children's reading skills improve over time.

The study appears online in the *Journal of Child Psychology and Psychiatry*.

The study participants were 314 Ohio twins participating in the Western Reserve Reading Project. This study included 135 identical twins and 179 same-sex fraternal twins.

The twins began the study when they were in kindergarten or first grade and were assessed in their homes when they enrolled, and annually for the next two years.

At each home visit, the twins were given a 90-minute battery of reading-based measures. Among other things, the tests measured word and letter identification, the ability to sound out words, and the speed at which children could name a series of letters.

The researchers compared how twins scored on the tests and then used a statistical analysis to determine how much growth in their performance could be explained by genetics and how much by environmental factors.

Environmental factors include everything the children experience -- how they are cared for by their parents, how much they are read to, the neighborhood they live in, nutrition and their instruction in schools, among other factors.

The findings showed that when children start out reading, both genetics and environment play a role in readings skills, depending on the skills assessed. For word and letter identification, genetics explained about one-third of the test results, while environment explained two-thirds. For vocabulary and sound awareness, it was equally split between genetics and environment. For the speed tests, it was three-quarters genetic.

But when the researchers measured growth in reading skills, environment became much more important, Petrill said.

For reading skills that are taught, such as words and letters, the environment is almost completely responsible for growth. For awareness of sounds in reading, about 80 percent of growth was explained by the environment. Speed measures were the only ones where genetics still played a large role.

"Regardless of where children start as far as reading skills, and the impact that genetics and environment had on their initial skills, we found that their environment had an impact in how fast or how slowly those reading skills developed," Petrill said.

Petrill emphasized that a child's environment is much more than just the instruction he or she receives in school. However, instruction is likely a key part of how reading skills grow over time.

Petrill said much more research needs to be done examining the roles of genetics and the environment in shaping how children learn to read.

"We believe that both factors play a role in reading, which is very similar to what researchers find in health issues such as heart disease and obesity," Petrill said. "But we know a lot more about the relative impacts of genetics and environment on the biological systems that influence heart disease than we do in reading."

For example, people can change their environment to help lower their risk of heart disease, no matter their genetic susceptibility to the disease, he said.

Petrill said he hopes we can do the same to help children improve their reading. "Understanding the causes of why kids differ in reading skills, and the roles of genetics and environment, could help us understand how to teach them better," he said.

Story Source:

Adapted from materials provided by [Ohio State University](#). Original article written by Jeff Grabmeier.

Journal Reference:

1. Stephen A. Petrill, Sara A. Hart, Nicole Harlaar, Jessica Logan, Laura M. Justice, Christopher Schatschneider, Lee Thompson, Laura S. DeThorne, Kirby Deater-Deckard, Laurie Cutting. **Genetic and environmental influences on the growth of early reading skills.** *Journal of Child Psychology and Psychiatry*, 2010; DOI: [10.1111/j.1469-7610.2009.02204.x](https://doi.org/10.1111/j.1469-7610.2009.02204.x)

<http://www.sciencedaily.com/releases/2010/01/100111122647.htm>

Quantum Computer Calculates Exact Energy of Molecular Hydrogen

ScienceDaily (Jan. 14, 2010) — In an important first for a promising new technology, scientists have used a quantum computer to calculate the precise energy of molecular hydrogen. This groundbreaking approach to molecular simulations could have profound implications not just for quantum chemistry, but also for a range of fields from cryptography to materials science.

"One of the most important problems for many theoretical chemists is how to execute exact simulations of chemical systems," says author Alán Aspuru-Guzik, assistant professor of chemistry and chemical biology at Harvard University. "This is the first time that a quantum computer has been built to provide these precise calculations."

The work, described January 10 in *Nature Chemistry*, comes from a partnership between Aspuru-Guzik's team of theoretical chemists at Harvard and a group of experimental physicists led by Andrew White at the University of Queensland in Brisbane, Australia. Aspuru-Guzik's team coordinated experimental design and performed key calculations, while his partners in Australia assembled the physical "computer" and ran the experiments.

"We were the software guys," says Aspuru-Guzik, "and they were the hardware guys."

While modern supercomputers can perform approximate simulations of simple molecular systems, increasing the size of the system results in an exponential increase in computation time. Quantum computing has been heralded for its potential to solve certain types of problems that are impossible for conventional computers to crack.

Rather than using binary bits labeled as "zero" and "one" to encode data, as in a conventional computer, quantum computing stores information in qubits, which can represent both "zero" and "one" simultaneously. When a quantum computer is put to work on a problem, it considers all possible answers by simultaneously arranging its qubits into every combination of "zeroes" and "ones."

Since one sequence of qubits can represent many different numbers, a quantum computer would make far fewer computations than a conventional one in solving some problems. After the computer's work is done, a measurement of its qubits provides the answer.

"Because classical computers don't scale efficiently, if you simulate anything larger than four or five atoms -- for example, a chemical reaction, or even a moderately complex molecule -- it becomes an intractable problem very quickly," says author James Whitfield, research assistant in chemistry and chemical biology at Harvard. "Approximate computations of such systems are usually the best chemists can do."

Aspuru-Guzik and his colleagues confronted this problem with a conceptually elegant idea.

"If it is computationally too complex to simulate a quantum system using a classical computer," he says, "why not simulate quantum systems with another quantum system?"

Such an approach could, in theory, result in highly precise calculations while using a fraction the resources of conventional computing.

While a number of other physical systems could serve as a computer framework, Aspuru-Guzik's colleagues in Australia used the information encoded in two entangled photons to conduct their hydrogen molecule simulations. Each calculated energy level was the result of 20 such quantum measurements, resulting in a highly precise measurement of each geometric state of molecular hydrogen.



"This approach to computation represents an entirely new way of providing exact solutions to a range of problems for which the conventional wisdom is that approximation is the only possibility," says Aspuru-Guzik.

Ultimately, the same quantum computer that could transform Internet cryptography could also calculate the lowest energy conformations of molecules as complex as cholesterol.

Aspuru-Guzik and Whitfield's Harvard co-authors on the Nature Chemistry paper are Ivan Kassal, Jacob D. Biamonte, and Masoud Mohseni. Financial support was provided by the US Army Research Office and the Australian Research Council Federation Fellow and Centre of Excellence programs. Aspuru-Guzik recently received support from the DARPA Young Investigator Program, the Alfred P. Sloan Foundation, and the Camille and Henry Dreyfus Foundation to pursue research towards practical quantum simulators.

Story Source:

Adapted from materials provided by [Harvard University](#), via [EurekAlert!](#), a service of AAAS.

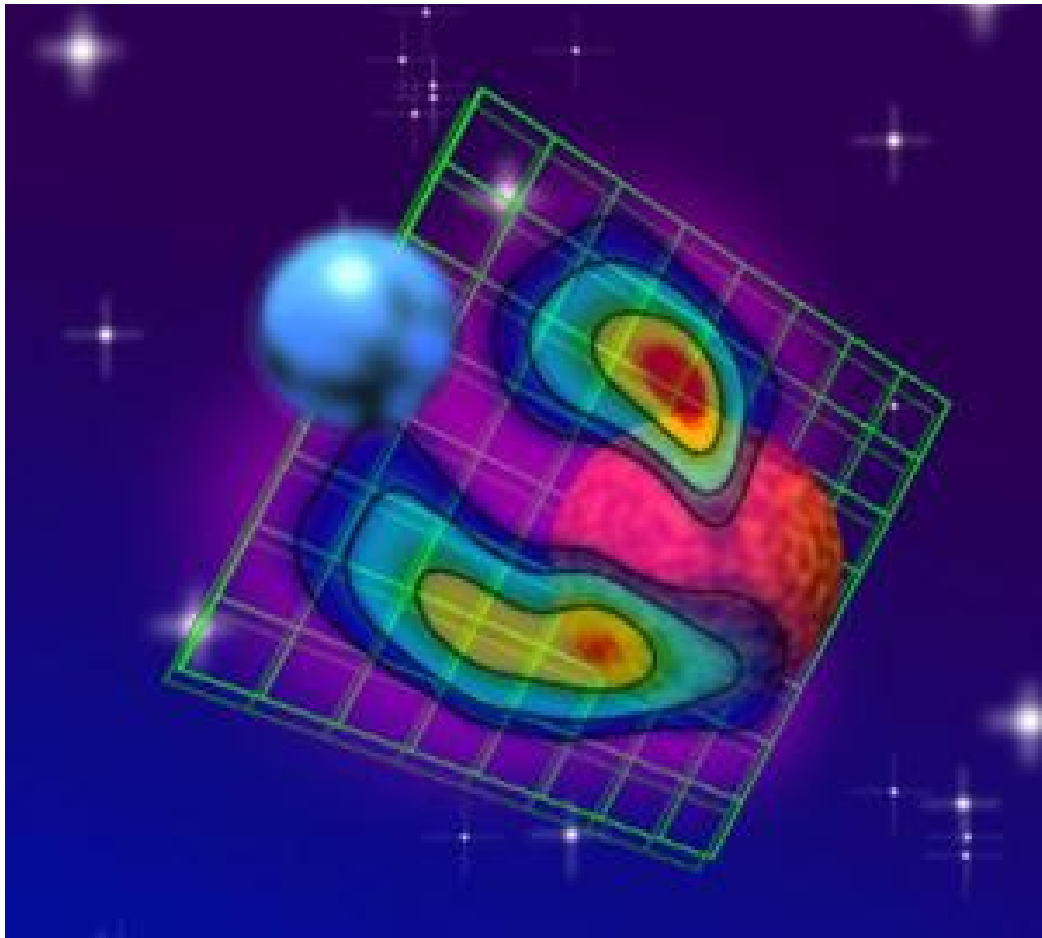
Journal Reference:

1. B. P. Lanyon, J. D. Whitfield, G. G. Gillett, M. E. Goggin, M. P. Almeida, I. Kassal, J. D. Biamonte, M. Mohseni, B. J. Powell, M. Barbieri, A. Aspuru-Guzik & A. G. White. **Towards quantum chemistry on a quantum computer**. *Nature Chemistry*, 2010; DOI: [10.1038/nchem.483](https://doi.org/10.1038/nchem.483)

<http://www.sciencedaily.com/releases/2010/01/100110151331.htm>



Giant Magnetic Loop Sweeps Through Space Between Stellar Pair



Artist's conception of Algol star system with radio image superimposed on grid. (Credit: Peterson et al., NRAO/AUI/NSF)

ScienceDaily (Jan. 14, 2010) — Astronomers have found a giant magnetic loop stretched outward from one of the stars making up the famous double-star system Algol. The scientists used an international collection of radio telescopes to discover the feature, which may help explain details of previous observations of the stellar system.

"This is the first time we've seen a feature like this in the magnetic field of any star other than the Sun," said William Peterson, of the University of Iowa.

The pair, 93 light-years from Earth, includes a star about 3 times more massive than the Sun and a less-massive companion, orbiting it at a distance of 5.8 million miles, only about six percent of the distance between Earth and the Sun. The newly-discovered magnetic loop emerges from the poles of the less-massive star and stretches outward in the direction of the primary star. As the secondary star orbits its companion, one side -- the side with the magnetic loop -- constantly faces the more-massive star, just as the same side of our Moon always faces the Earth.

The scientists detected the magnetic loop by making extremely detailed images of the system using an intercontinental set of radio telescopes, including the National Science Foundation's Very Long Baseline Array, Very Large Array, and Robert C. Byrd Green Bank Telescope, along with the Effelsberg radio telescope in Germany. These radio telescopes were used as a single observing system that offered both



great detail, or resolving power, and high sensitivity to detect very faint radio waves. When working together, these telescopes are known as the High Sensitivity Array.

Algol, in the constellation Perseus, is visible to the naked eye and well-known to amateur astronomers. As seen from Earth, the two stars regularly pass in front of each other, causing a notable change in brightness. The pair completes a cycle of such eclipses in less than three days, making it a popular object for amateur observers. The variability in brightness was discovered by an Italian astronomer in 1667, and the eclipsing-binary explanation was confirmed in 1889.

The newly-discovered magnetic loop helps explain phenomena seen in earlier observations of the Algol system at X-ray and radio wavelengths, the scientists said. In addition, they now believe there may be similar magnetic features in other double-star systems.

Peterson worked with Robert Mutel, also of the University of Iowa, Manuel Gudel of the Swiss Federal Institute of Technology, and Miller Goss of the National Radio Astronomy Observatory. The scientists reported their findings in the 14 January edition of the scientific journal *Nature*.

Story Source:

Adapted from materials provided by [National Radio Astronomy Observatory](http://www.nrao.edu).

<http://www.sciencedaily.com/releases/2010/01/100113131507.htm>



Thyme Oil Can Inhibit COX2 and Suppress Inflammation



Thyme growing. Researchers have found that six essential oils -from thyme, clove, rose, eucalyptus, fennel and bergamot -- can suppress the inflammatory COX-2 enzyme, in a manner similar to resveratrol, the chemical linked with the health benefits of red wine. (Credit: iStockphoto)

ScienceDaily (Jan. 14, 2010) — For those who do not drink, researchers have found that six essential oils -from thyme, clove, rose, eucalyptus, fennel and bergamot -- can suppress the inflammatory COX-2 enzyme, in a manner similar to resveratrol, the chemical linked with the health benefits of red wine. They also identified that the chemical carvacrol was primarily responsible for this suppressive activity.

These findings, appearing in the January issue of *Journal of Lipid Research*, provide more understanding of the health benefits of many botanical oils and provide a new avenue for anti-inflammatory drugs.

Essential oils from plants have long been a component of home remedies, and even today are used for their aromatherapy, analgesic (e.g. cough drops), or antibacterial properties. Of course, the exact way they work is not completely understood. However, Hiroyasu Inoue and colleagues in Japan believed that many essential oils might target COX-2 much like compounds in wine and tea.

So, they screened a wide range of commercially available oils and identified six (thyme, clove, rose, eucalyptus, fennel and bergamot) that reduced COX-2 expression in cells by at least 25%. Of these, thyme oil proved the most active, reducing COX-2 levels by almost 75%.

When Inoue and colleagues analyzed thyme oil, they found that the major component -carvacrol- was the primary active agent; in fact when they use pure carvacrol extracts in their tests COX-2 levels decreased by over 80%.

Story Source:

Adapted from materials provided by [American Society for Biochemistry and Molecular Biology](#), via [EurekAlert!](#), a service of AAAS.

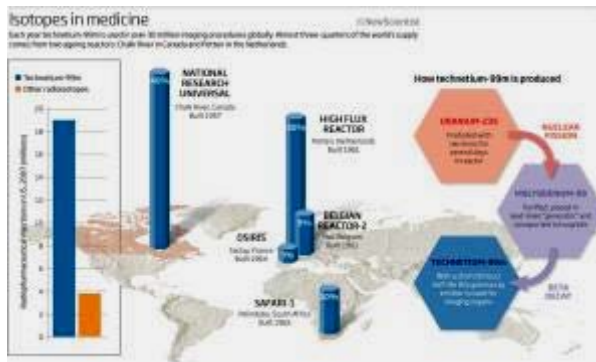
Journal Reference:

1. Mariko Hotta, Rieko Nakata, Michiko Katsukawa, Kazuyuki Hori, Saori Takahashi, and Hiroyasu Inoue. **Carvacrol, a component of thyme oil, activates PPAR-gamma and suppresses COX-2 expression.** *Journal of Lipid Research*, January, 2010

<http://www.sciencedaily.com/releases/2010/01/100113122306.htm>

Nuclear safety: When positive is negative

- 13 January 2010 by **Alison Motluk**
- Magazine issue 2743.



Isotopes in medicine

Enlarge image

WHEN news spread in December 2007 that an ageing nuclear reactor in Canada might shut down for much longer than its scheduled two weeks, the world caught its breath. The reactor, at Chalk River in Ontario, is the world's biggest supplier of radioactive isotopes for medical use, and diagnostic tests for cancer and heart disease were put on hold while radiologists scrambled to find alternative supplies. It was called a crisis. All the while, lay people couldn't help but wonder: did no one foresee this? Did no one think that this half-century-old reactor might someday need to be replaced?

As it happens, not only did someone think about it, they designed and built its successors right next door. Maple 1 and Maple 2 are two brand-new reactors, constructed at a combined cost of over C\$350 million (\$330 million) specifically to produce medical radioisotopes. A single Maple reactor can supply the world's total current needs; the second one is a back-up to keep the supply flowing during routine repairs.

But the sad truth is that the Maples have never been officially switched on, and the chances are they never will be. This has led to a furious row over who is to blame for this costly and embarrassing debacle. Many in the nuclear industry point the finger at Canada's nuclear regulator. The regulator's view is that the reactors' manufacturer failed to deliver a crucial safety feature that it had promised would underpin the design.

Others blame the Canadian government for killing off the project before crucial technical questions had been resolved; in May 2008 it announced, to everyone's surprise, that the Maples were being shuttered for good. "It makes absolutely no sense to me," says Jatin Nathwani, an engineer at the University of Waterloo, Ontario, who gave evidence to a parliamentary committee now looking into the affair. It's time the Canadian government reversed its decision, says Nathwani: "If the will was there, the Maples could be brought back in six to 18 months, with just one phone call from the prime minister."

Radioisotopes have a vital role to play in modern medicine. They are used in almost 40 million medical procedures each year, mostly for treating and diagnosing diseases such as cancer and heart disease. Over 80 per cent of the diagnostic procedures rely on technetium-99m, a short-lived isotope that is produced by bombarding uranium-235 with neutrons inside a reactor (see diagram).

Tell the safety story

In principle any old reactor can do the job, but getting the isotopes out without causing leaks or messing up the normal function of the reactor can be tricky. This generally means it is safer and more efficient to use purpose-built designs with slots that allow material to be slipped in and out of the core through protective shielding.

Today almost all of the world's supply of medical isotopes comes from just five reactors (see map). The National Research Universal reactor at Chalk River is the oldest and most important. Owned and operated by Atomic Energy of Canada Limited (AECL), it produces 40 per cent of the world's technetium-99m and 75 per cent of all cobalt-60, which is used for treating cancer. In the early 1990s it became clear that, due to growing demand, a new source for isotopes had to be found. So in 1996, Ottawa-based isotope wholesaler MDS Nordion hired AECL to design, construct and run two new reactors and a processing facility. AECL's engineers proposed a tiny 10-megawatt design that was dubbed "Maple" - the Multipurpose Applied Physics Lattice Experiment. The project to build two of these reactors was budgeted at C\$145 million (\$137 million).

So where did it all go wrong? For a nuclear reactor to be licensed in Canada its operators have to provide a "safety story" for the Canadian Nuclear Safety Commission (CNSC). That story sets out all the possible things that could go wrong and how the proposed design will cope with each of them. The Maples story included two separate shutdown systems. One was a set of shut-off rods. Another was a system for rapidly draining the heavy water from around the core. Both systems would extinguish the fission reaction by rapidly reducing the quantity of neutrons zipping around inside the reactor.

As another crucial part of the safety story, AECL also promised the reactors would have something called a "negative power coefficient of reactivity (PCR)" - basically a negative feedback loop which ensures that as the reactor's power output goes up, it becomes ever harder to squeeze still more power out of it. Negative PCR works like wind resistance does on your car: the harder you put your foot down, the more the wind impedes any further increase in your speed (see "It pays to be negative").

In itself, a positive PCR is no barrier to getting a licence. In fact, the workhorse in the AECL stable, the CANDU reactor, can under certain conditions have a positive PCR and it's not a problem.

The first hint of serious trouble for the Maples came in June 2003, when they had already been completed - behind schedule and with costs almost double the original budget - and were undergoing their commissioning tests. To everyone's surprise, as they powered up, instead of showing a negative PCR, the coefficient was positive. The analysis had predicted a PCR of -0.84, but it was measured at +0.28. "It was recognised that this was unexpected and undesired," says Fred Boyd, a nuclear physicist who has worked for AECL, the regulatory agency and as a policy-maker. "All the people involved were quite concerned."

Commissioning was halted as the regulator asked AECL to resolve the discrepancy. For almost three years, AECL went through its calculations, but nothing changed: if its model of how the reactor functioned was correct, the PCR should be negative. It even hired consultants from the US's Brookhaven and Idaho national laboratories, and from the Argentinian engineering company INVAP to go over the physics. "Nobody came up with a result that was significantly different from the original results," the parliamentary committee was told by Harold Smith, who not only helped to design the Maples but was also their commissioning supervisor. "From this we concluded there must be an unmodelled effect taking place." The regulator required that AECL come up with an explanation of what was causing the discrepancy, but it couldn't.

It was all the more puzzling because by then a 30-megawatt reactor called Hanaro, with the same basic design as the Maples, had been built in South Korea and was working just fine. Smith became convinced that the problem with the Maples lay in some detail of the way they were constructed. The South Korean reactor, for instance, had issues early on with its fuel containers bowing; stiffening them had solved the

problem. Smith asked for permission to run more tests on the Maples to see if something about their components was causing the positive PCR, and he began a series of three tests in spring 2008. But before they could be completed, the government, which owns AECL, pulled the plug.

Promises, promises

According to AECL, uncertainty about the cost of solving the PCR problem was a key factor in the project being scrapped. "I can confirm there are significant technical and regulatory hurdles that require, in the best-case scenario, at least five to six years of intensive research and analysis before we can even consider bringing the Maple reactors on line," the Maples project director, Jean-Pierre Labrie, wrote in an editorial last year in the Toronto-based newspaper the *National Post*. He calls the positive PCR a "potentially insurmountable hurdle".

But many in the nuclear industry vehemently disagree, and a number argue that the positive PCR is not in itself a big deal. Smith, for instance, believes it can be rectified. "The positive power coefficient of reactivity is not a mystery," he told the parliamentary committee. "It is not an unsolvable engineering problem. It is a small thermal mechanical effect in a prototype design that requires a simple engineering fix." Daniel Meneley, former chief engineer at AECL, doesn't even think it needs to be fixed, since a small positive value is fairly easy to manage using neutron-absorbing control rods. "It really doesn't matter if it's positive or negative as long as it's small," he says.

Smith, Meneley and other independent engineers say there is no sound technical reason why the Maples shouldn't be operational right now. The stalemate, they argue, is not due to AECL's failure to deliver the reactor that it promised, but rather the nuclear regulator's demand that AECL should be held to that promise.

Linda Keen was president of the CNSC from 2001 until she was sacked by the prime minister in January 2008 (*New Scientist*, 26 January 2008, p 6). Though not a physicist, she is no stranger to regulation, having worked in the role in the food and explosives industries. "I treated AECL like any other licensee," she says. Her stance of acting as a guarantor of public safety rather than a facilitator of the nuclear industry was breaking 50 years of tradition, she says. "In the past, regulators and the industry had a different relationship. They were buddies."

In the old days, the regulator would often deal with problems by trying to help iron things out, recalls Bill Garland, a professor emeritus of nuclear engineering at McMaster University in Hamilton, Ontario. "They knew what situations could cause grief, and would work with the company to make sure there was real safety - not just regulatory compliance." But with the introduction of the Nuclear Safety and Control Act in 2000, the the regulator's job changed. Keen is clear that the job of the CNSC is not to help out but to protect Canadian citizens. She points out that with the Maples, it was not the positive PCR itself that was the problem. "The CNSC didn't say that you can't have a positive power coefficient. We said: 'You promised. Your safety analysis was based on this. Tell us what your safety analysis is!'"

This goes to the heart of the issue, says nuclear engineer Jean Koclas at the École Polytechnique in Montreal. "It is not the fact that the coefficient is positive or negative that is a problem. The problem is that you cannot calculate it," he told the parliamentary committee. "When you find yourself in a situation where you cannot predict as simple a measure as the power coefficient, then can you be sure that the nuclear safety analyses, which are based on calculations, are correct?"

Small is difficult

Meneley, however, contests claims that the PCR is simple to calculate, especially in a small reactor like the Maple design. In a big reactor, leaving a few neutrons unaccounted for may not make a difference, but in a tiny reactor a very small difference in temperature or in the position of any of the many small

components can throw the numbers off. "It's almost incalculable," he says. "It was naive to think that such a sensitive coefficient could be calculated within such a high degree of accuracy."

Meanwhile in May 2009, the Chalk River reactor started leaking heavy water and was again shut down. Doctors and patients around the world now hope it can be fixed before March this year, when the world's other main source of isotopes, a reactor at Petten in the Netherlands, goes offline for six months of essential maintenance. Between them, these two reactors produce around 70 per cent of the world's supply of technetium-99m. Any extended shutdown could lead to a shortage, preventing diagnostic tests and delaying vital treatment for millions of patients.

The world's other main source of isotopes is due to go offline soon. Any extended shutdown could lead to a global shortage

With this shortage of medical isotopes looming worldwide, other countries have begun to act. In November, the US House of Representatives voted to spend \$163 million over five years to look into developing a domestic supply of medical isotopes, including the possibility of refitting an existing reactor at the University of Missouri. Later the same month, the Netherlands gave the go-ahead for a replacement for the aged Petten reactor to be built at the same site. Called Pallas, it is scheduled to be fully operational by 2016.

November also saw the publication of a report by an expert panel charged with investigating ways to secure Canada's supply of medical isotopes, technetium-99m in particular. Its recommendation? To construct a new multipurpose reactor costing C\$1.2 billion, built from scratch. The fate of the Maples appears to be sealed.

It pays to be negative

A fission reactor works by maintaining a controlled nuclear chain reaction. First, a neutron is absorbed by the nucleus of an atom of uranium fuel. This causes the uranium nucleus to split - undergo fission - which liberates heat and more neutrons. Some of these neutrons will be absorbed by other uranium nuclei, which will split in turn, resulting in yet more neutrons.

If this chain reaction is allowed to let rip, the result is a nuclear explosion. Reactors are designed to keep it at the desired, steady level, and this means knowing how many neutrons are being absorbed not only by the fuel, but by the coolant, the steel parts of the plant and innumerable other components.

The power coefficient of reactivity (PCR) is a measure of whether a particular reactor's nuclear neutron population will tend to increase or decrease after an increase in the reactor's power. If the number of neutrons increases, then the PCR is positive; if it decreases, PCR is negative.

Any sudden excess of neutrons will accelerate the fission reaction and increase the reactor's power output. This is where having a negative PCR is handy, because it automatically limits the number of neutrons flying through the reactor, so it damps itself down after a momentary power increase.

The Maples were designed to have a small negative PCR: this was billed as one of its safety features and the reactors were licensed on that basis. When they powered up, though, operators measured a positive PCR. It was the maker's continuing failure to explain why this happened that led to them being refused a licence.

Alison Motluk is a science writer based in Toronto, Canada

<http://www.newscientist.com/article/mg20527431.400-nuclear-safety-when-positive-is-negative.html?DCMP=NLC-nletter&nsref=mg20527431.400>

The dangers of a high-information diet

- 13 January 2010 by **Paul Parsons**
- Magazine issue [2743](#).

NO ONE ever tells you how dangerous this stuff can be: they just go on pumping it out, hour after hour, day after day. You're consuming it right now, without a clue about the possible consequences. The worst thing is, evolution has predisposed your brain to crave it as much as your body craves fat and sugar. And these days - as with fat and sugar - you can get it everywhere.

That's because we live in the information age - and the stuff that risks doing the damage is information itself. As certain scientists and philosophers see it, the discovery and dissemination of knowledge is far from being an unqualified boon. We might be in danger of knowing too much. "Information can potentially be extremely dangerous," says philosopher **Nick Bostrom**, director of the Future of Humanity Institute at the University of Oxford. "The effects arising from knowledge can be momentous."

Humans are uniquely at risk because we have always craved information. Anthropologist Robin Dunbar and his colleagues at the University of Oxford suggest that this trait has almost certainly been bred into us during our evolutionary history. Evidence for this idea comes from the observation that in birds and primates, brain size is correlated with the ability to reason, to develop new feeding strategies and to survive extinction. "Clearly, the capacity to discover novel facts about the environment has a very ancient basis," Dunbar says.

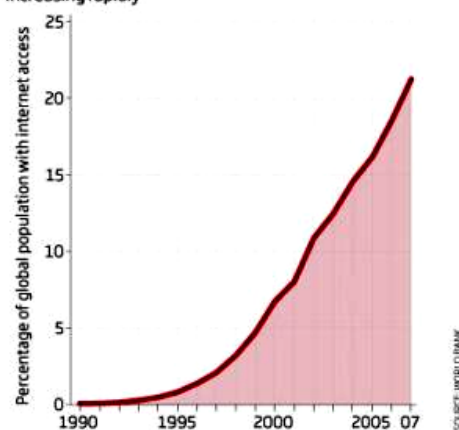
For humans, new information has in the past brought a clear evolutionary advantage. The invention of spiked clubs, triremes, longbows, gunpowder and all the other military technologies can be traced to the discovery of new information. Each one enabled its inventors to steal a march on the competition. The information embodied in the laws of thermodynamics led to the development of efficient steam engines and, in short order, all the prosperity and exploitation of the British empire.

The question now rearing its head is whether we now know too much. Does the recent explosion in available information, primarily thanks to the internet (see graphs), bring dangers we have not anticipated? Bostrom fears that it might. "Research and education have become like motherhood and apple pie: harmless, wholesome and completely unobjectionable," he says. "It behoves us to develop a more reflective and qualified view about the value of knowledge."

Statements like this come as a bit of a shock. After all, most of us take it as a given that the more we know - the more information we have at our disposal about the world around us - the better off we will be. As the philosopher Francis Bacon pointed out back in the 17th century, knowledge is power. The thing is, power can be put to bad uses as well as good. "Right now, for example, we're thinking about how to prevent the growing knowledge and power arising from biotechnology from being put to evil ends," Bostrom says.

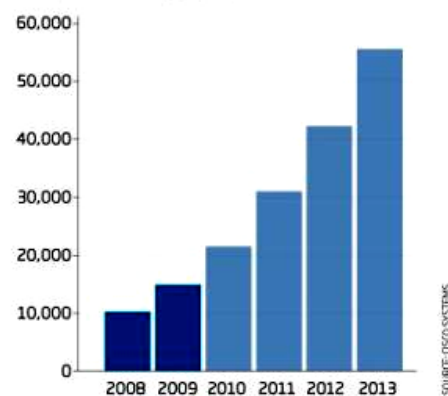
Who's online? ©NewScientist

The number of people with access to the internet is increasing rapidly



Too much information? ©NewScientist

Predicted global data traffic (petabytes) per month
(1 petabyte = 1 million gigabytes)



Bostrom has coined a term for the danger that arises from knowledge: he calls it "information hazard". A case in point relates to the influenza virus that spread around the world in 1918, killing more than 50 million people. Now its genome has been made publicly available in the online GenBank database, and anyone with the right tools and skills can reconstruct it.

In an article in *The New York Times* in 2005, futurologist Ray Kurzweil and computer scientist Bill Joy, the former chief technology officer of Sun Microsystems, condemned the publication of the genome as "extremely foolish". Recreating the virus from this information would be easier than building an atomic bomb, they claimed. And once that was done, releasing it could cause far greater devastation.

Not everyone takes this pessimistic view. Geoffrey Smith, a virologist at Imperial College London, opposes censorship of the kind Kurzweil and Joy appear to be advocating. Risks from biotechnology have been exaggerated, he says, pointing out that the security threat posed by biotechnology research is reviewed at numerous stages, from funding onwards. Data should always be published, Smith reckons. "That removes the feeling that there's something secret going on."

The human craving for information makes censorship a particularly problematic response to any perceived information hazard, and openness is often the preferred option. As swine flu started to spread last year, for example, governments and bodies such as the World Health Organization were quick to make the public aware of the risks. Bitter experience has taught us the dangers of allowing the suspicion to take hold that the authorities are withholding information. People's appetite for facts goes into overdrive and it gets easier for false notions to gain credence. "This happened in the UK with the MMR vaccine," says Ian Pearson, a futurologist at the Futurizon consultancy in Switzerland. "The government created a situation where one lone scientist was able to cause mass panic, which has resulted in many kids catching measles - and, of course, a few have died."

Out of control

The fear that information is being kept secret causes havoc in other areas too. A run on a bank can be caused if people feel they can no longer trust those who control the information about the bank's ability to meet its debts, and here, too, gauging the appropriate response is tricky. If governments guarantee deposits - something that the UK government did in 2008 after a rush of savers withdrawing their money threatened to bring down the Northern Rock bank - that can create a further information hazard. "Sometimes banks refuse government assistance as it could be interpreted as a sign of weakness, leading to a further loss of public confidence," Bostrom says.

An information hazard is also confronting the health insurance industry. The advent of companies that offer genome scans has allowed individuals to assess their likelihood of succumbing to various ailments over the course of their lifetime. This threatens to upset the risk-sharing that is the cornerstone of insurance. "The insurance market only functions where neither the individuals nor the company can tell for certain who will actually need the insurance," Bostrom says.

Pearson sees problems like this as unavoidable. Secrecy, censorship and curtailing of scientific research are dangerous options, fuelling distrust of the censors, and depriving society of potentially beneficial discoveries: such "cures" are likely to turn out to be worse than the disease, he reckons. And if external censorship is bad, expecting self-censorship from people who are naturally inclined to satisfy their every craving is just unrealistic. "I don't think there is much scope for people self-regulating their information consumption effectively," Pearson says. "There is no evidence that they can limit their consumption in other areas."

I don't think there is much scope for people self-regulating their information consumption

That leaves us with a problem - and the search for a solution is under way. "Information hazards will become an increasingly critical area of inquiry," says George Dvorsky, a director of the US-based Institute for Ethics and Emerging Technologies.

A little knowledge is said to be a dangerous thing, but a little knowledge about the power and importance of knowledge itself might be more dangerous still. "This is an area we neglect at our peril," Pearson says.

Bibliography

1. "Information Hazards: A typology of potential harms from knowledge", by Nick Bostrom (bit.ly/hHfhs); for a YouTube video of astronomer Martin Rees speaking at the 2008 TED conference in Monterey, California, see bit.ly/I7peH

Paul Parsons is a writer based in the UK, and the author of The Science of Doctor Who (Icon Books)

<http://www.newscientist.com/article/mg20527431.600-the-dangers-of-a-highinformation-diet.html?DCMP=NLC-nletter&nsref=mg20527431.600>

The Madness of Crowds and an Internet Delusion

By JOHN TIERNEY

When does the wisdom of crowds give way to the meanness of mobs?

In the 1990s, Jaron Lanier was one of the digital pioneers hailing the wonderful possibilities that would be realized once the Internet allowed musicians, artists, scientists and engineers around the world to instantly share their work. Now, like a lot of us, he is having second thoughts.

Mr. Lanier, a musician and avant-garde computer scientist — he popularized the term “virtual reality” — wonders if the Web’s structure and ideology are fostering nasty group dynamics and mediocre collaborations. His new book, “You Are Not a Gadget,” is a manifesto against “hive thinking” and “digital Maoism,” by which he means the glorification of open-source software, free information and collective work at the expense of individual creativity.



He blames the Web’s tradition of “drive-by anonymity” for fostering vicious pack behavior on blogs, forums and social networks. He acknowledges the examples of generous collaboration, like Wikipedia, but argues that the mantras of “open culture” and “information wants to be free” have produced a destructive new social contract. “The basic idea of this contract,” he writes, “is that authors, journalists, musicians and artists are encouraged to treat the fruits of their intellects and imaginations as fragments to be given without pay to the hive mind. Reciprocity takes the form of self-promotion. Culture is to become precisely nothing but advertising.”

I find his critique intriguing, partly because Mr. Lanier isn’t your ordinary Luddite crank, and partly because I’ve felt the same kind of disappointment with the Web. In the 1990s, when I was writing paens to the dawning spirit of digital collaboration, it didn’t occur to me that the Web’s “gift culture,” as anthropologists called it, could turn into a mandatory potlatch for so many professions — including my own.

So I have selfish reasons for appreciating Mr. Lanier’s complaints about masses of “digital peasants” being forced to provide free material to a few “lords of the clouds” like Google and YouTube. But I’m not sure Mr. Lanier has correctly diagnosed the causes of our discontent, particularly when he blames software design for leading to what he calls exploitative monopolies on the Web like Google.

He argues that old — and bad — digital systems tend to get locked in place because it’s too difficult and expensive for everyone to switch to a new one. That basic problem, known to economists as lock-in, has long been blamed for stifling the rise of superior technologies like the Dvorak typewriter keyboard and Betamax videotapes, and for perpetuating duds like the Windows operating system. It can sound plausible enough in theory — particularly if your Windows computer has just crashed. In practice, though, better products win out, according to the economists Stan Liebowitz and Stephen Margolis. After reviewing battles like Dvorak-qwerty and Betamax-VHS, they concluded that consumers had good reasons for preferring qwerty keyboards and VHS tapes, and that sellers of superior technologies generally don’t get locked out. “Although software is often brought up as locking in people,” Dr. Liebowitz told me, “we have made a careful examination of that issue and find that the winning products are almost always the ones thought to be better by reviewers.” When a better new product appears, he said, the challenger can take over the software market relatively quickly by comparison with other industries.

Dr. Liebowitz, a professor at the University of Texas at Dallas, said the problem on the Web today has less to do with monopolies or software design than with intellectual piracy, which he has also studied extensively. In fact, Dr. Liebowitz used to be a favorite of the “information-wants-to-be-free” faction.

In the 1980s he asserted that photocopying actually helped copyright owners by exposing more people to their work, and he later reported that audio and video taping technologies offered large benefits to consumers without causing much harm to copyright owners in Hollywood and the music and television industries.

But when Napster and other music-sharing Web sites started becoming popular, Dr. Liebowitz correctly predicted that the music industry would be seriously hurt because it was so cheap and easy to make perfect copies and distribute them. Today he sees similar harm to other industries like publishing and television (and he is serving as a paid adviser to Viacom in its lawsuit seeking damages from Google for allowing Viacom’s videos to be posted on YouTube).

Trying to charge for songs and other digital content is sometimes dismissed as a losing cause because hackers can crack any copy-protection technology. But as Mr. Lanier notes in his book, any lock on a car or a home can be broken, yet few people do so — or condone break-ins.

“An intelligent person feels guilty for downloading music without paying the musician, but they use this free-open-culture ideology to cover it,” Mr. Lanier told me. In the book he disputes the assertion that there’s no harm in copying a digital music file because you haven’t damaged the original file.

“The same thing could be said if you hacked into a bank and just added money to your online account,” he writes. “The problem in each case is not that you stole from a specific person but that you undermined the artificial scarcities that allow the economy to function.”

Mr. Lanier was once an advocate himself for piracy, arguing that his fellow musicians would make up for the lost revenue in other ways. Sure enough, some musicians have done well selling T-shirts and concert tickets, but it is striking how many of the top-grossing acts began in the predigital era, and how much of today’s music is a mash-up of the old. “It’s as if culture froze just before it became digitally open, and all we can do now is mine the past like salvagers picking over a garbage dump,” Mr. Lanier writes. Or, to use another of his grim metaphors: “Creative people — the new peasants — come to resemble animals converging on shrinking oases of old media in a depleted desert.”

To save those endangered species, Mr. Lanier proposes rethinking the Web’s ideology, revising its software structure and introducing innovations like a universal system of micropayments. (To debate reforms, go to Tierney Lab at nytimes.com/tierneylab.)

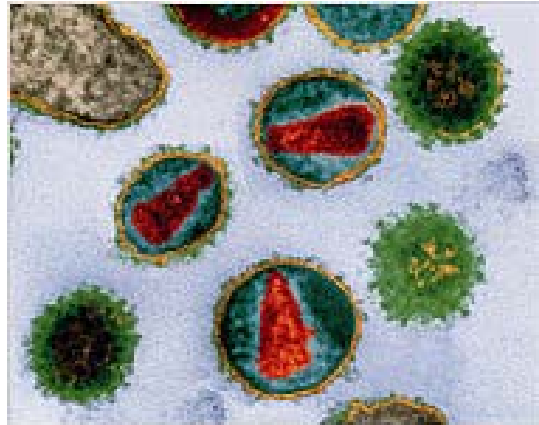
Dr. Liebowitz suggests a more traditional reform for cyberspace: punishing thieves. The big difference between Web piracy and house burglary, he says, is that the penalties for piracy are tiny and rarely enforced. He expects people to keep pilfering (and rationalizing their thefts) as long as the benefits of piracy greatly exceed the costs. In theory, public officials could deter piracy by stiffening the penalties, but they’re aware of another crucial distinction between online piracy and house burglary: There are a lot more homeowners than burglars, but there are a lot more consumers of digital content than producers of it.

The result is a problem a bit like trying to stop a mob of looters. When the majority of people feel entitled to someone’s property, who’s going to stand in their way?

<http://www.nytimes.com/2010/01/12/science/12tier.html>

Hunting Fossil Viruses in Human DNA

By CARL ZIMMER



The borna virus is at once obscure and grotesque. It can infect mammals and birds, but scientists know little about its effects on its victims. In some species it seems to be harmless, but it can drive horses into wild fits. The horses sometimes kill themselves by smashing in their skulls. In other cases, they starve themselves to death. Some scientists have even claimed that borna viruses alter human behavior, playing a role in schizophrenia and bipolar disorder, although others say there is no solid evidence of a link.

The virus now turns out to have an intimate bond with every person on Earth. In the latest issue of *Nature*, a team of Japanese and American scientists report that the human genome contains borna virus genes. The virus infected our monkey-like ancestors 40 million years ago, and its genes have been passed down ever since.

Borna viruses are not the only viruses lurking in our genome. Scientists have found about 100,000 elements of human DNA that probably came from viruses. But the borna virus belongs to a kind of virus that has never been found in the human genome before. Its discovery raises the possibility that many more viruses are left to be found.

Scientists who hunt for these viruses think of themselves as paleontologists searching for fossils. Just as animals get buried in rock, these viruses become trapped in the genomes of their hosts. While their free-living relatives continue to evolve, fossil viruses are effectively frozen in time.

“We can really dig fossils out of the genome and literally put them back together,” said Cédric Feschotte, a genome biologist at the University of Texas, Arlington. “It’s like putting a hominid back together and asking it if it can walk upright.”

When scientists sequenced the human genome in 2001, they noticed many segments that bore a striking resemblance to genes in retroviruses, a class of viruses that includes H.I.V.

Retroviruses carry their genetic material in a single-stranded version of DNA, called RNA. To make new viruses, they make DNA versions of their genes, which are inserted into a host cell’s genome. The cell then reads the retrovirus’s genes as if they were its own, and manufactures new retroviruses.

Scientists speculated that every now and then a retrovirus inserted itself into a host cell and then failed to turn it into a virus factory. If the trapped retrovirus happened to be in sperm or egg cells, its DNA might be passed down to the host’s descendants. From generation to generation, the virus’s DNA would mutate. It would lose its ability to produce normal viruses. For a while it might be able to make new viruses that could re-infect the same cell, but over enough time, the viruses would become disabled.

In recent years, scientists have found several lines of evidence to support this idea. . Koala retroviruses, for example, appear to be in the middle of the journey. The viruses can move from one koala to another. But in some populations of koalas, the virus's DNA is permanently lodged in their genomes.

Thierry Heidmann of the Gustave Roussy Institute in France and his colleagues put the fossil virus hypothesis to a spectacular test: they tried to resurrect a dead retrovirus. They first identified a number of copies of the same virus-like stretch of DNA in the human genome. Each version had its own set of mutations that it acquired after the virus had invaded our ancestors.

By comparing the copies, Dr. Heidmann and his colleagues were able to figure out what the original sequence of the virus's genes had been. When they synthesized the genes from scratch and injected the genetic material into cells, the cells produced new viruses.

“It was a tour-de-force of an experiment,” said John Coffin, an expert on fossil viruses at Tufts University.

Now fossil virus hunters are moving beyond the human genome. They're taking advantage of the growing number of mammal genomes piling up in online databases and helping to flesh out the evolutionary history of viruses, reaching back tens of millions of years. Aris Katzourakis, an evolutionary biologist at the University of Oxford, and his colleagues recently went on a hunt for fossils of foamy viruses in mammals. Foamy viruses infect some mammals, including monkeys and apes. Primate foamy viruses can infect humans harmlessly, but researchers fear they may evolve to become dangerous. Dr. Katzourakis and his colleagues discovered hundreds of foamy virus copies in the DNA of the two-toed sloth. They then found the same virus lurking in the genome of the three-toed sloth. Before Dr. Katzourakis's fossil hunt, scientists had never found a foamy virus infecting any sloths, or any of their relatives like armadillos and anteaters.

Sloths and their relatives branched off from all other placental mammals about 100 million years ago. Dr. Katzourakis's discovery thus reveals the great antiquity of foamy viruses. They were already infecting the common ancestor of all placental mammals back when dinosaurs ruled the Earth.

These fossils are also offering clues to how viruses evolved. Dr. Katzourakis and his colleagues have found fossil viruses that are helping shed light on the deep history of H.I.V., for example.

H.I.V. evolved about a century ago from a chimpanzee virus known as simian immunodeficiency virus, or S.I.V. Many apes and monkeys carry their own strain of S.I.V, but it's not clear how long the viruses have been infecting primates.

In 2008, Dr. Katzourakis and his colleagues discovered fossil S.I.V. in the genome of the gray lemur, a primate that lives in Madagascar. Last May, Dr. Feschotte and his colleagues reported that they had found the same fossil virus in the fat-tailed lemur.

Scientists had never before found S.I.V. in lemurs, which branched off from all other living primates some 50 million years ago. The fossil virus is also missing one of the genes found in all other forms of S.I.V. and H.I.V. It may be a transitional form of the virus, akin to the fossils paleontologists have found of feathered dinosaurs that couldn't fly.

Fossil viruses are also illuminating human evolution. Scientists estimate that 8.3 percent of the human genome can be traced back to retrovirus infections. To put that in perspective, that's seven times more DNA than is found in all the 20,000 protein-coding genes in the human genome.

But that figure may be too low, according to Dr. Katzourakis. “The measurable diversity of viruses may go up, and the true diversity may be much higher,” he said.

For one thing, some viruses may be too well hidden for scientists to see. The discovery of borna viruses in the human genome is another reason to wonder if we're actually more viral than we know. All fossil viruses discovered until now have been retroviruses, but borna viruses are not.

Unlike retroviruses, borna viruses do not insert themselves into host genomes. Instead, they take up residence inside the nucleus, the chamber that holds our DNA. There, they manipulate the cell's proteins to make new copies of themselves.

Keizo Tomonaga, a virologist at Osaka University, discovered the borna virus DNA by accident. He had been comparing the virus genes with human genes to see if the virus might have evolved to mimic our own proteins. Instead, he discovered four segments of human DNA that clearly had descended from a borna virus gene. "I was surprised when I found them," Dr. Tomonaga said.

He and his colleagues found the same borna virus DNA in apes and monkeys. In other words, borna virus first invaded the common ancestor of humans, apes and monkeys about 40 million years ago. But primates were not the only targets for borna viruses. Dr. Tomonaga and his colleagues have found independent invasions in other mammals, including ground squirrels, guinea pigs and elephants.

Dr. Tomonaga and his colleagues suspect that borna viruses didn't actually invade mammal genomes. Instead, the genomes kidnapped them.

Mammal genomes contain thousands of stretches of DNA called LINES. LINES sometimes make copies of themselves that get reinserted back into the genome. Dr. Tomonaga's research indicates that LINES grabbed the genes of borna viruses and pulled them into their genome.

The discovery raises the possibility that LINES have kidnapped other viruses floating near their host's DNA, like flu viruses. Two of the four copies of the borna virus gene carry crippling mutations. It's impossible for our cells to make proteins from them. But the other two genes look remarkably intact, perhaps suggesting that our bodies use them for our own benefit. Exactly what they do isn't clear though.

Studies on other captive viruses have revealed that some help ward off viral invasions. One virus protein, syncytin, is essential for our being born at all.

"The only place it's expressed is in the placenta," Dr. Heidmann said. To understand its function, he and his colleagues disabled the gene in mice. Without syncytin, mice developed deformed placentas, and their embryos died.

Syncytin started as a surface protein on retroviruses that fused them to cells. When mammals captured the gene, they used it in the placenta to create a layer of fused cells through which mothers can send nutrients to their embryos.

Dr. Heidmann and his colleagues have discovered that over the past 100 million years, mammals have repeatedly harnessed viruses to make syncytin. "Wherever we search for them, we find them," Dr. Heidmann said.

But the syncytin genes we use today may have actually replaced an ancestral one that a virus bequeathed to the very first placental mammals. In fact, that infection may have made the placenta possible in the first place. "It was a major event for animal evolution," Dr. Heidmann said.

<http://www.nytimes.com/2010/01/12/science/12paleo.html?ref=science>

Report Links Vehicle Exhaust to Health Problems

By MATTHEW L. WALD



Exhaust from cars and trucks exacerbates asthma in children and may cause new cases as well as other respiratory illnesses and heart problems resulting in deaths, an independent institute that focuses on vehicle-related air pollution has concluded.

The report, to be issued on Wednesday by the nonprofit Health Effects Institute, analyzed 700 peer-reviewed studies conducted around the world on varying aspects of motor vehicle emissions and health. It found “evidence of a causal relationship,” but not proof of one, between pollution from vehicles and impaired lung function and accelerated hardening of the arteries.

It said there was “strong evidence” that exposure to traffic helped cause variations in heart rate and other heart ailments that result in deaths. But among the many studies that evaluated death from heart problems, some did not separate stress and noise from air pollution as a cause, it said.

The institute, based in Boston, is jointly financed by the Environmental Protection Agency and the auto industry to help assure its independence. Its reports are peer-reviewed but are not published in a scientific journal.

The researchers noted that proving that air pollution from vehicles caused illness was difficult. The pollutants studied often come from sources like industry in addition to cars and trucks, they said, and many of the studies failed to rule out factors like income levels that could contribute to the illnesses studied.

Many people who live near major roads fall into lower-income categories. Vibration and noise rather than air pollution could also cause some health damage, the report said.

Nonetheless, “we see a strong signal that says traffic exposure seems to be causing effects,” said Dan Greenbaum, the president of the institute.

The study found that the biggest effects occurred among people who lived within 300 to 500 meters — about two-tenths to three-tenths of a mile — from highways and major roads. That applies to 30 percent to 45 percent of the population of North America, the authors said.

The pollutants studied in the report do not include ozone, the chemical for which the Environmental Protection Agency proposed new regulations last week. Ozone is more prevalent in places distant from highways.

For many categories of health effects, the authors concluded that the studies completed so far suggested that air pollution from vehicles was the cause, without establishing that as fact.

Contacted for comment, the environmental agency said it welcomed the study. The agency added that it was taking steps to cut toxic materials in gasoline and that the federal recovery act included \$300 million for cleaning up diesel engines.

Outside experts briefed on the study had mixed reactions.

“Like the issue of second-hand smoke, it’s very difficult to understand the exact mechanisms that make it bad — but it’s easy to understand that it is in fact bad,” said Rich Kassel, an expert on diesel engines at the Natural Resources Defense Council, an environmental group. “This study underscores that difficulty.”

“Despite 40 years of building ever-cleaner vehicles, we still have a vehicle pollution problem in this country,” Mr. Kassel said.

Howard J. Feldman, the director of regulatory and scientific affairs at the American Petroleum Institute, noted that the evidence of a causal factor was inconclusive for some ailments.

“The only conclusive thing that was found was with the asthma,” Mr. Feldman said. “Nothing else was found to be conclusive, which to me was interesting in itself.”

“These are epidemiological studies, which by definition reflect past exposures with past fuels,” he added.

As emissions from traffic decline, Mr. Feldman predicted, exposures from other sources will become more important.

<http://www.nytimes.com/2010/01/13/health/research/13exhaust.html?ref=science>



Facing End-of-Life Talks, Doctors Choose to Wait

By DENISE GRADY

It's a conversation that most people dread, doctors and patients alike. The cancer is terminal, time is short, and tough decisions loom — about accepting treatment or rejecting it, and choosing where and how to die.

When is the right time — if there is one — to bring up these painful issues with someone who is terminally ill?

Guidelines for doctors say the discussion should begin when a patient has a year or less to live. That way, patients and their families can plan whether they want to do everything possible to stay alive, or to avoid respirators, resuscitation, additional chemotherapy and the web of tubes, needles, pumps and other machines that often accompany death in the hospital.

But many doctors, especially older ones and specialists, say they would postpone those conversations, according to a study published online Monday in the journal *Cancer*.

It's not entirely clear whether these doctors are remiss for not speaking up — or whether the guidelines are unrealistic. Advice that sounds good on paper may be no match for the emotions on both sides when it comes to facing patients and their families and admitting that it will soon be over, that all medicine can offer is a bit of comfort while the patient waits to die. Dr. Nancy L. Keating, the first author of the study and an associate professor of medicine and health care policy at Harvard, said not much was known about how, when or even if doctors were having these difficult talks with dying patients. But she said that her research team suspected that communication was falling short, because studies have shown that even though most people want to die at home, most wind up dying in the hospital.

The researchers surveyed 4,074 doctors who took care of cancer patients, instructing them to imagine one who had only four to six months left, but was still feeling well. Then the doctors were asked when they would discuss the prognosis, whether the patient wanted resuscitation or hospice care, and where he or she wanted to die.

The results came as a surprise: the doctors were even more reluctant to ask certain questions than the researchers had expected. Although 65 percent said they would talk about the prognosis “now,” far fewer would discuss the other issues at the same time: resuscitation, 44 percent; hospice, 26 percent; site of death, 21 percent. Instead, most of the doctors said they would rather wait until the patients felt worse or there were no more cancer treatments to offer.

They were not asked for their reasoning, but Dr. Keating offered several possibilities. One is that doctors may disagree with the guidelines, which are based on expert opinion rather than data. “Or they may not be comfortable discussing it,” she said. “These conversations are time-consuming and difficult. Some doctors may feel patients will lose hope. It's easier to say, ‘Let's try another round of chemotherapy,’ instead of having a heart-to-heart discussion.” Training may also be a factor, Dr. Keating said. Medical schools spend more time on end-of-life issues than they did in the past, and the greater willingness of younger doctors to broach the subject may reflect that change.

Dr. Daniel Laheru, an associate professor at the Kimmel Cancer Center at Johns Hopkins and a specialist in pancreatic and colorectal cancers, said he was not surprised by the study. “The natural tendency is not to provide more information about this than you have to,” he said. “It's such an uncomfortable conversation and it takes such a long time to do it right.”

He added, “People come to us with hope, and if you kind of yank that away from them right away, it's very unsettling.”



A terminal diagnosis plus the grim details of “do not resuscitate” orders and hospice care may be too much for a patient to hear in one day. Dr. Laheru said he tried to prepare patients on their first visit for the idea that during later visits they would discuss different possible outcomes.

“They don’t always hear that part,” he said. Dr. John Boockvar, a neurosurgeon at New York-Presbyterian/Weill Cornell Medical Center who treats many patients with malignant brain tumors, said he favored postponing such discussions until the end was drawing close. During his own late father’s illness with leukemia, he said, his family was upset by an oncologist who brought up end-of-life issues early.

“As a patient and a family member, I don’t know if I would have wanted to hear a doctor say, ‘In 18 months we’ll be dealing with hospice or end-of-life discussions — do you want to have that discussion now?’ ” Dr. Boockvar said. “I don’t know what the emotional benefit is to the family. I don’t think it’s been studied.” As a doctor treating patients who are terminally ill, he went on, he did not hesitate to discuss end-of-life issues. But he said, “As the time approaches, there’s usually ample time.”

But Dr. David R. Hilden, an internist at Hennepin County Medical Center in Minneapolis and an assistant professor of medicine at the University of Minnesota, is not so sure.

“I think many of us wait until there’s just a few weeks left and then you have no choice,” he said. “It’s going to happen in a week or two, and they’re in the hospital and they’re on their last legs. The time to talk is much earlier.” Without planning, Dr. Hilden said, dying patients may wind up in exactly the situation they dreaded most, tethered to machines in a hospital instead of being kept comfortable at home in their own beds.

“This last week, I had a patient with prostate cancer and end-stage heart disease, who probably has less than a year,” he said. “I talked to him and his wife. ‘How do you want your remaining days to be? How much do you want us to do?’ He and his wife were very receptive. Many patients appreciate it. We had a good conversation. It’s easier when the patient is older and it’s not entirely unexpected. He’s 86.”

The patient said he did not want tubes or machines, but just wanted to be comfortable for his last few months. “They were at peace with it,” Dr. Hilden said, adding that many patients who get aggressive treatment for advanced cancer might in retrospect have made a different choice.

“They might say: ‘After that last three or four months of radiation and chemotherapy, I’m sick, I’m nauseated, my hair fell out and it didn’t extend my life. I might not have done it if I’d known, if I had had the chance.’ ”

Dr. Keating agreed, saying she thought that often when terminally ill patients choose to continue chemotherapy, they don’t understand its limits.

“They say, ‘I want to do everything,’ and they mean ‘everything to cure me,’ ” she said. “They don’t understand it’s not curative.”

Despite the difficulties, she went on, doctors should level with their patients.

“When you know someone’s going to die of their disease, it’s only fair to the patients to help them understand that,” Dr. Keating said. “But these conversations are very challenging. Figuring out how to do it well — it’s so tricky. It’s definitely not something everybody believes in.”

<http://www.nytimes.com/2010/01/12/health/12seco.html?ref=science>

Denmark Leads the Way in Digital Care

By SINDYA N. BHANOO



COPENHAGEN — Jens Danstrup, a 77-year-old retired architect, used to bike all around town. But years of smoking have weakened his lungs, and these days he finds it difficult to walk down his front steps and hail a taxi for a doctor's appointment.

Now, however, he can go to the doctor without leaving home, using some simple medical devices and a notebook computer with a Web camera. He takes his own weekly medical readings, which are sent to his doctor via a Bluetooth connection and automatically logged into an electronic record.

"You see how easy it is for me?" Mr. Danstrup said, sitting at his desk while video chatting with his nurse at Frederiksberg University Hospital, a mile away. "Instead of wasting the day at the hospital?"

He clipped an electronic pulse reader to his finger. It logged his reading and sent it to his doctor. Mr. Danstrup can also look up his personal health record online. His prescriptions are paperless — his doctors enter them electronically, and any pharmacy in the country can pull them up. Any time he wants to get in touch with his primary care doctor, he sends an e-mail message.

All of this is possible because Mr. Danstrup lives in Denmark, a country that began embracing electronic health records and other health care information technology a decade ago. Today, virtually all primary care physicians and nearly half of the hospitals use electronic records, and officials are trying to encourage more "telemedicine" projects like the one started at Frederiksberg by Dr. Klaus Phanareth, a physician there.

Several studies, including one to be published later this month by the Commonwealth Fund, conclude that the Danish information system is the most efficient in the world, saving doctors an average of 50 minutes a day in administrative work. And a 2008 report from the Healthcare Information and Management Systems Society estimated that electronic record keeping saved Denmark's health system as much as \$120 million a year.

Now policy makers in the United States are studying Denmark's system to see whether its successes can be replicated as part of the overhaul of the health system making its way through Congress. Dr. David Blumenthal, a professor of health care policy at Harvard Medical School who was named by President

Obama as national coordinator of health information technology, has said the United States is “well behind” Denmark and its Scandinavian neighbors, Sweden and Norway, in the use of electronic health records.

Denmark’s success has much to do with its small size, its homogeneous population and its regulated health care system — on all counts, very different from the United States. As in much of Europe, health care in Denmark is financed by taxes, and most services are free.

“It was a natural progression for us,” said Otto Larsen, director of the agency that regulates the system. “We believe in taking care of our people, and we had believed this was the right way to go.”

He and others acknowledged that the system is hardly perfect. It faces budget constraints, and the country is still refining common standards for electronic health records.

“We’re trying to streamline now,” Mr. Larsen said. “There are too many systems out there.”

And he is pushing to use still more information technology and to encourage more initiatives like the telemedicine project at Fredriksberg Hospital.

At Thy-Mors Hospital in the rural region of North Jutland, doctors are using I.B.M. software that pulls data from a patient’s electronic health record and superimposes it on a three-dimensional image of a human body, allowing doctors to quickly get an overview of the person’s medical history. The doctor can rotate the image, zoom in and click on ailments to get more information.

The ambulances have access to electronic medical records, so medical technicians can update them for the doctors even as patients are on their way to the emergency room.

Kurt Nielsen, the hospital’s director, says that while the doctors are not particularly adept at information technology, they have gradually embraced it. And it helps that the staff was involved in developing the innovations.

“My staff at the hospital is very, very satisfied,” he said. “We build these systems in an incremental way, and seek their input throughout.”

It remains an open question what lessons from Denmark, a nation of six million people, can be transferred to the United States.

“Denmark is probably the most advanced country in the world that I have seen,” said Denis J. Protti, a professor of health information technology at the University of Victoria in British Columbia and an author of the Commonwealth Fund study. “Of course, it’s the same size as some of your states.”

Culturally, Danes are also different. Mr. Larsen, of Denmark’s health information agency, says his countrymen have few objections to the national patient registry — perhaps because they have different priorities from Americans when it comes to medical privacy.

“As long you are a healthy man, you fear for your privacy,” he said. “It is when you are sick that you wish people knew what your problem was.”

Still, Dr. Protti and other experts say the Danish experience shows that using electronic health records is efficient, cost-effective — and doable, with a little work.

Dr. John D. Halamka, another adviser to the Obama administration on electronic health records, says Denmark offers the United States a peek into the future, with some logistical variations.



Dr. Halamka, the chief information officer at Harvard Medical School, doubts that the United States will ever have a national patient registry, but he thinks that electronic medical records can succeed as long as patients have control over their own records.

Beth Israel Deaconess Hospital in Boston, where Dr. Halamka is a practicing emergency room physician, was one of the first hospitals in the nation to adopt electronic health records, a decade ago. It remains in a minority — about 10 percent of American hospitals and about 17 percent of American doctors use electronic records, according to studies published in The New England Journal of Medicine.

Two of the nation's most robust users of electronic health records are the Department of Veterans' Affairs and the Kaiser Permanente health system. Last week, the two jointly announced that with patient authorization, electronic health records can now be shared between the systems.

At Beth Israel, patients can choose to store their electronic health records using several kinds of programs — Google Health, Microsoft Healthvault or the hospital's own software — and they control access to their records. In the veterans' system and at Kaiser Permanente, patients have access to their own health records.

Another challenge is the United States' sheer size, with 50 state governments and a multiplicity of privacy laws.

Dr. Halamka is vice chairman of a federal advisory panel that has established national standards for electronic health records, meant to help states, hospitals, doctors and patients using various types of software to store their records to share information.

"The standards have been set for parties to communicate," he said. "There's hope, and we're on the right trajectory."

In Denmark, meanwhile, advocates of information technology are eager to share advice — and enthusiasm.

Mr. Nielsen, of Thy-Mors Hospital, said the transition must be gradual.

"It was done throughout some years," he said. "It is important to know that it did not happen instantly."

Back at the 150-year-old Frederiksberg University Hospital in Copenhagen, a nurse, Steffen Hogg Christensen, was preparing medical information kits like the one Mr. Danstrup uses.

Health information technology is no easy task, Mr. Christensen said. Training colleagues and elderly patients can be daunting and time-consuming.

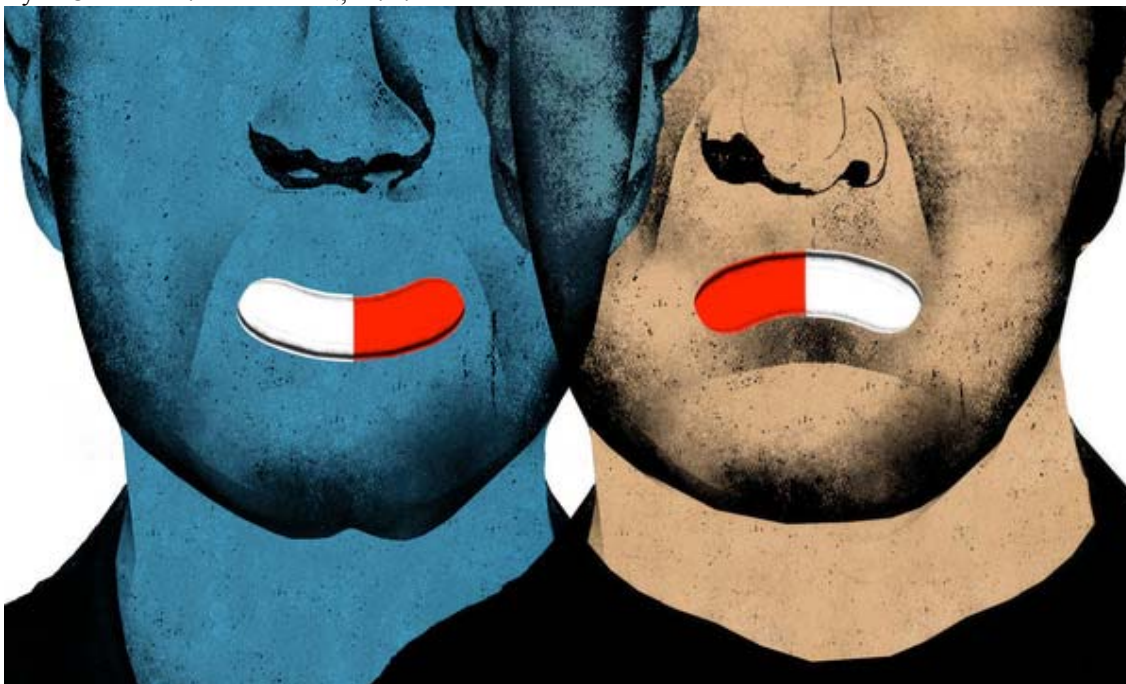
"But isn't it amazing, how innovative we can be?" he said, smiling broadly. "And all in these old walls."

<http://www.nytimes.com/2010/01/12/health/12denmark.html?ref=science>



Before You Quit Antidepressants ...

By RICHARD A. FRIEDMAN, M.D.



Last week, The Journal of the American Medical Association published a study questioning the effectiveness of antidepressant drugs. The drugs are useful in cases of severe depression, it said. But for most patients, those with mild to moderate cases, the most commonly used antidepressants are generally no better than a placebo.

For the millions of people who take these drugs, and the doctors who prescribe them, this provocative claim had to be confusing, if not alarming. It contradicted literally hundreds of well-designed trials, not to mention considerable clinical experience, showing antidepressants to be effective for a wide array of depressed patients.

But on close inspection, the new study does not stand up to that mountain of earlier evidence. To understand why, it helps to look at the way it was conducted.

The study is a so-called meta-analysis — not a fresh clinical trial, but a combined analysis of previous studies. A common reason for doing this kind of analysis is to discover potential drug effects that might have been missed in smaller studies. By aggregating the data from many studies, researchers gain the statistical power to detect broad patterns that may not have been evident before.

But meta-analyses can be tricky. First, they are only as good as the smaller studies they analyze. And when there are hundreds of studies out there, how to decide which ones to include?

For the recent analysis in the journal, the authors identified 23 studies (out of several hundred clinical trials) that met their criteria for inclusion. Of those 23, they could get access to data on only 6, with a total of 718 subjects. Three trials tested the antidepressant Paxil (a selective serotonin reuptake inhibitor, in the same class as Prozac) and three used an older drug, imipramine, in the class known as tricyclics.

That is not many studies if your goal is to answer a broad question about the efficacy of antidepressants as a class. Indeed, as Robert J. DeRubeis, a professor of psychology at the University of Pennsylvania who

is one of the new paper's authors, told me, "Of course, we can't know that these results generalize to other medications."

Admittedly, it is not easy to find studies that include large numbers of people with mild to moderate depression; most trials focus on severely ill patients. But the authors of the new analysis gave themselves an additional handicap: they decided to exclude a whole class of studies, those that tried to correct for the so-called placebo response.

Researchers argue all the time about which patients to include in a study. Antidepressant studies come to such different conclusions partly because patient characteristics vary so widely.

Many patients with depression — as many as 50 percent, in some studies — get better with no drug at all, just a placebo pill and attentive treatment by a therapist. For that reason, researchers often design their studies to exclude such people, to determine whether the drugs are working independent of any placebo response.

An analysis that eliminates such studies is bound to show a comparatively small average difference between drug treatment and placebo treatment. Not surprisingly, this is just what happened in the recent analysis. But in randomized clinical trials that try to correct, or wash out, the placebo effect, patients with mild to moderate depression respond to antidepressants at rates nearly identical to patients with severe depression (who tend to have a much lower response to placebos).

Another drawback of the study is that its conclusions are based on studies that included only two antidepressants — when there are 25 or so on the market. By contrast, when the Food and Drug Administration wanted to investigate the safety of antidepressants, it analyzed data from some 300 clinical trials, with nearly 80,000 patients, involving about a dozen antidepressants.

Antidepressants are not interchangeable; studies show that a patient who fails to respond to one has about a 30 percent chance of responding to another.

Still, antidepressants are not panaceas, and their advocates have sometimes been overly optimistic about their efficacy. Only about 35 percent of depressed patients will achieve remission with the first antidepressant they receive. But with sequential treatments, most can expect to feel a lot better.

And the real test of an antidepressant is not just whether it can lift someone out of depression; it is whether it can keep depression from returning. For a vast majority of people with depression, the illness is chronic. Relapses and low-level symptoms between episodes are common.

Scores of studies show that antidepressants are highly effective in preventing relapse; on average, the risk of relapse in patients who continue on an antidepressant is one-half to one-third of those who are switched to a placebo.

Every once in a while, a landmark study comes along and overturns everyone's cherished ideas about a particular treatment. But the current study is not one of them. So it would be a shame if it discouraged depressed patients from taking antidepressants.

Experts may disagree about what constitutes the best treatment for depression, and for whom. But there is no question that the safety and efficacy of antidepressants rest on solid scientific evidence.

Dr. Richard A. Friedman is a professor of psychiatry at Weill Cornell Medical College.

<http://www.nytimes.com/2010/01/12/health/12mind.html?ref=science>

The Evolution of American Landscape Art

By BENJAMIN GENOCCHIO



So great are the expectations surrounding exhibitions of works from the Metropolitan Museum of Art that it is hard not to be slightly disappointed with the small show of Hudson River paintings at the New Britain Museum of American Art. But in spite of its modest size — a mere seven paintings from the Metropolitan — the overall quality of the works is exceptional.

The museum has installed the paintings in its permanent collection galleries. This makes identification of the borrowed pictures a little difficult, but has the virtue of allowing them to be seen in the context of the museum's own considerable holdings of Hudson River School works. Together they tell an engaging story of the evolution of 19th-century American landscape art.

The Hudson River School emerged out of a sense of disenchantment with the unchecked growth of crowded, dirty industrial cities in the Northeast. Artists traveled up the Hudson in search of pristine wilderness, documenting the remnants of a natural world that was fast disappearing. In their pictures they sought to memorialize the grandeur and beauty of the American landscape.

An Englishman, Thomas Cole (1801-1848), spearheaded the movement, but its core practitioners were American. Chief among them was Frederic Edwin Church (1826-1900), whose early works are indebted to Cole, his teacher and mentor. Showing here is “The Parthenon” (1871), a six-foot-wide painting produced after Church visited Greece. Cole, too, loved to paint ruins.

Cole's influence can also be detected in “West Rock, New Haven” (1849), an early painting by Church in the collection of the New Britain Museum of American Art. Hanging opposite “The Parthenon,” it reveals the evolution of Church's style from the exacting realism of his earliest years, when his paintings were filled with minutely rendered vegetation and terrain, to the more confident, even expressive brushwork and complex treatment of light characterizing his later work.

More typical of Hudson River School painting is “High Point: Shandaken Mountains” (1853), a panorama from the Met by Asher Brown Durand (1796-1886). It depicts a mountain landscape near

Kingston, a historic town abutting the Hudson River. In the foreground are animals and figures amid a bucolic rural setting, suggesting the encroachment of man.

Painted a decade later, “Delaware Water Gap” (1861), by George Inness (1825-1894), also from the Met, is a characteristic Hudson River School work. Depicting the dramatic sky as a storm retreats over the Delaware River, viewed from the Pennsylvania side, it is a celebration of the mystical power and force of nature.

John Frederick Kensett (1816-1872) was born in Cheshire, Conn., but traveled throughout his life, painting the landscape around him. Three of his works are showing here, from two phases of his career, beginning with “Hudson River Scene” (1857), a landscape view looking north up the Hudson River. The treatment of light in this painting is especially subtle and masterly.

The two other paintings in the exhibition by Kensett, “Eaton’s Neck, Long Island” (1872) and “Sunset on the Sea” (1872), are both soothing, simple seascapes. Both of them were produced in the last year of the artist’s life, during which he created a number of terrific works.

Though unfinished, “Eaton’s Neck, Long Island” ranks among his loveliest paintings. “Sunset on the Sea” is a strange painting, or at least strange for Kensett, in that it depicts nothing but sky and land. One contemporary observer, Samuel Osgood, described it as “pure light and water,” a description that I find hard to improve upon. Because it shows the sun setting, it is also quite melancholy, suggesting a sense of finality and closure — an intimation of impending death.

Though Winslow Homer (1836-1910) was not a Hudson River School artist, “Harvest Scene” (about 1873), on loan from the Met, depicts life on a farm and is contemporaneous with other pictures in the show, hence its inclusion. The glowing tranquillity of the scene is also in keeping with the mystical quality of many Hudson River School works.

Although it is disappointing that the Met did not send some of its really great Hudson River School masterpieces to New Britain, specifically Church’s “The Heart of the Andes” (1859), a colossal, dazzling work, this is a beautiful, thoughtful and ultimately satisfying little show with much to recommend it.

“Hudson River Paintings From the Metropolitan Museum of Art,” New Britain Museum of American Art, 56 Lexington Street, New Britain, through September. (860) 229-0257; nbmaa.org.

<http://www.nytimes.com/2010/01/10/nyregion/10artct.html?ref=design>

Making Art Out of an Encounter

By ARTHUR LUBOW



I first encountered Tino Sehgal's work under ideal conditions: total ignorance. Happening to be in Berlin in 2006 at the time of the city's art biennial, I heard from an art-dealer friend that there was one exhibition not to miss. "I won't tell you anything more," he said, as he walked me to the site and bid me farewell. I trod up a creaking staircase in a building from the turn of the last century and entered a decayed ballroom, its ornate moldings and gilt mirrors testifying to a more glorious past. Lying on the floor, a man and a woman, fully dressed, were embracing languidly. There was no one else in the room. My presence went unacknowledged. In a state of mounting confusion and embarrassment, I stayed until I could stand it no longer, and then I retreated down the staircase. Out on the street, I sighed with relief, because I once again knew where I was.

Had I remained longer, I might have recognized that the two were re-enacting the curved-arm caressing gesture of Rodin's marble statue "The Kiss," as well as poses from other osculatory works, some less widely known but in their own way iconic, like [Jeff Koons's](#) ceramic sculpture series "Made in Heaven." And eventually I would have heard one member of the intertwined couple speak these words: "Tino Sehgal. 'Kiss.' 2002." But I didn't need that information for the piece to linger in my memory and arouse my curiosity.

I knew the name of the artist, and I watched for him. Although Sehgal was very busy, thriving in the incubation culture of art fairs and international exhibitions, he did not surface in New York until his inaugural show at the Marian Goodman Gallery in November 2007. This time when I walked into the exhibition space, I had more of an idea of what to expect, but once again I was knocked off-balance. "Welcome to this situation," a group of six people said in unison to greet me, ending with the auditory flourish of a sharp intake of breath; then they slowly backed off, all the while facing me, and froze into unnatural positions. At which point one of the group recited a quotation: "In 1958, somebody said, 'The income that men derive producing things of slight consequence is of great consequence.'" Jumping off from that statement, the conversationalists — Sehgal refers to them as "interpreters" — began a lively back and forth. Occasionally one of the six might turn to a gallery visitor and utter a compliment or say, "Or what do you think?" and then incorporate that person's comment into the exchange of words. Mostly they seemed content to natter at high velocity among themselves. It all continued until the moment when a new visitor arrived, an event that acted as a sort of rewind button. "Welcome to this situation," they



chanted again, breathing in and backing off as they had done before and then assuming another stylized stance. A new quotation was dropped and another discussion commenced. Just as in Berlin, I felt a battleground developing in my mind, between a fascinated desire to stay and a disquieted urge to flee.

If you are not a devotee of the cult of contemporary art, especially its Conceptualist cadre, you may feel a whirring sensation beneath your eyelids starting up right about now. Your skepticism isn't, or shouldn't be, a matter of "Is this art?" Almost a century has elapsed since Marcel Duchamp acted that one by attaching titles to everyday objects (a urinal, a bicycle wheel) and demonstrating that anything can be art if the artist says it is. Nevertheless, the ineffaceable critical question remains: "Is it good art?" Later this month, when Sehgal's one-man show takes over the Guggenheim Museum's rotunda for a six-week run, thousands of noninitiates, many no doubt having come to see the Frank Lloyd Wright building without any advance notification of what art exhibitions are on, will be able to decide for themselves.

If the overall response to "This Situation" at the Marian Goodman Gallery is any guide, even some who expect to hate Sehgal's work will leave enthralled. "I often see shows I don't like, but this was the only show I've ever seen that didn't like me," wrote New York magazine's art critic, Jerry Saltz, judging "This Situation" to be the best exhibition he encountered in 2008. Unlike so much of contemporary art, Sehgal's art evokes passionate reactions among the unschooled as well as the cognoscenti. Anyone who has seen the onlookers trudging passively through an art museum (all too often the Guggenheim ramp resembles the humane cattle slaughterhouses designed by Temple Grandin) can appreciate the achievement. What fascinates me about Sehgal is that working only with human clay, he can call forth thoughtful and visceral responses from people who remain unmoved by more conventional paintings and sculptures. When I expressed this to him, he laughed at me. "I'm more ambitious than that," he said. "That's too little of a game."

At any time of day, Sehgal, who is 33, looks as if he has just tumbled out of bed. His tousled hair is innocent of exposure to a brush. His overcoat long ago parted company with its lining. In the six months since we first met, I have usually seen him in the same black jeans, black one-button pullover and white sneakers. My initial impression was that this was a man who was completely careless about his appearance, but I eventually concluded that the scrupulous inattention to wardrobe and grooming was of a piece with his refusal to fly on airplanes (visiting America from his home in Berlin, he travels by ship) or to carry a cellphone. More to the point, this conspicuous avoidance of unnecessary consumption conforms to the credo that underlies his work. Sehgal makes art that does not require the transformation of any materials. He refuses to add objects to a society that he says is overly encumbered with them.

It's his rigorous devotion to an art that vanishes instantly that Sehgal and his curators emphasize. "There's a purity to his approach," says Catherine Wood, the curator of contemporary art and performance at the Tate Modern in London. "There are a few artists who are making live action that is based in sculpture, but what sets him apart is his purist insistence on the immateriality — or ephemeral materiality — of the work, so it crystallizes and disperses again, so there is no trace left at all." Fifty years ago, Yves Klein sold empty spaces in Paris in return for gold; the buyers received a certificate of ownership. In the conceptual art that flowered in the late 1960s and early '70s, artists like Bruce Nauman, Dan Graham, Vito Acconci, Joan Jonas and Lynda Benglis performed before a camera; the videotape documented that action and became a commodity that could be sold by an art dealer. Around the same time, Michael Asher and Daniel Buren were staging interventions in art museums, removing panels from the building facade or paintings from the wall and calling attention to the change; if you are interested, you can check out the installation photographs. Then and now, the gallery that represents Ian Wilson will sell you the right to have a discussion with the artist; once it has occurred, the conversation is commemorated with a certificate that belongs to you. In their flight from the object-based art market, these Conceptualist and post-Minimalist artists left behind them, like bread crumbs, objects that provided a path back in.

In contrast, Sehgal is an absolutist. He does not allow his pieces to be photographed. They are not explained by wall labels or accompanied by catalogs. No press releases herald the openings of his exhibitions; indeed, there are no official openings, just unceremonious start dates. All of this can engender skepticism, but the aspect of Sehgal's work that his detractors find most irritating is the way the



art is sold. First of all, there is the fact that it is sold, just as if it were made of, say, cast bronze: in editions of four to six (with Sehgal retaining an additional “artist’s proof”) at prices between \$85,000 and \$145,000 apiece. Unlike some of his Conceptualist predecessors, Sehgal is totally unapologetic about the fact that his work is commercially traded. “The market is something you can’t be outside of and you can’t want to be outside of, if you are doing anything specialized,” he told an audience last May at the Museum of Modern Art, which bought “Kiss” in 2008 in a transaction that the museum’s director, Glenn Lowry, deemed “one of the most elaborate and difficult acquisitions we have ever made.”

As far as money goes, at a museum-discount price of \$70,000 it was a minor MoMA purchase; but Lowry was not overstating the cost of time and energy. Since there can be no written contract, the sale of a Sehgal piece must be conducted orally, with a lawyer or a notary public on hand to witness it. The work is described; the right to install it for an unspecified number of times under the supervision of Sehgal or one of his representatives is stipulated; and the price is stated. The buyer agrees to certain restrictions, perhaps the most important being the ban on future documentation, which extends to any subsequent transfers of ownership. “If the work gets resold, it has to be done in the same way it was acquired originally,” says Jan Mot, who is Sehgal’s dealer in Brussels. “If it is not done according to the conditions of the first sale, one could debate whether it was an authentic sale. It’s like making a false Tino Sehgal, if you start making documentation and a certificate.”

The act of going to a logical extreme can have illuminating results. Yasmil Raymond, who worked at the Walker Art Center in Minneapolis for five years before becoming a curator at the Dia Art Foundation in New York, says that the Walker’s acquisition of a Sehgal work, “This Objective of That Object,” was the most contentious in her time there. In the piece, five interpreters surround a visitor, turn their backs to her and declaim, “The objective of this work is to become the object of a discussion.” If the visitor says nothing, the interpreters will eventually crumple to the floor; but a response will reanimate them, and one of them will cry, “A comment, a comment, we have a comment!” And at that, with the visitor’s comment as a starting point, a conversation begins. What is curious is that the purchase of the work generated its own passionate discussion. “At the Walker, they have six board meetings a year, and this was the most difficult one I ever was at,” Raymond says. “It was the only time someone on the acquisitions committee voted against an acquisition. There was a small insurrection. Three people abstained, and one voted against it. It was a polemical reaction. Then all the other board members had to defend and insist on why they were voting for this. They were really articulate on why the Walker had to acquire the work, about supporting unsafe ideas, on the risk of creativity and artistic practice.” It was exactly the kind of conversation Sehgal hopes to provoke.

Over the course of a career barely a decade long, Sehgal has produced two kinds of art. The earliest works, like “Kiss,” are silent and sculptural: a viewer encounters a piece in a museum or gallery just as if it were a marble statue. Sehgal is adamant that he is producing a work of art, not theater: unlike a performance, a Sehgal is on display for the entire time the institution is open, and the human actors are identified no more precisely than as if they were bronze or marble. (They are, however, paid.) But because the piece is formed of people, not of metal or stone, the viewer is aware that, regardless of how absorbed the models seem to be in their activity, at any moment they have the capability of turning their gaze on him — as, indeed, they periodically do in “Kiss.” That potential for interaction is explored extensively in Sehgal’s second line of work, the “constructed situations” (like “This Situation”), in which the visitor is drawn in and becomes a participant.

Residing in the ether of spoken instructions and ephemeral enactment, these pieces can misleadingly appear to be slapdash or freely improvisatory. In fact, Sehgal supervises his work with painstaking care, in the unremitting state of anxiety of a control freak who has opted to work in an uncontrollable milieu. “These pieces are very delicate,” Raymond observes. “The human being is such an explosive material. You have to treat it delicately and sometimes put pressure on it. We’re dealing with the most fragile of all material — the human mind.”

In the Guggenheim show, “Kiss” will be on view on the ground floor, but the main work is a constructed situation that dates from 2006 and has been installed twice in Europe. At Sehgal’s insistence, and for the

sake of allowing a visitor to experience the piece with something like the Edenic innocence in which I fell upon “Kiss,” I won’t divulge what happens other than to say that on the spiral ramp of the rotunda, each individual or group will be engaged in conversation by several different interpreters of very different ages. To install the work, Sehgal must enlist the interpreters, train them and, finally, cajole them into showing up regularly and keeping up their enthusiasm.

First comes the recruitment. For older candidates, many of whom are college instructors, Sehgal relied on recommendations and then held lengthy personal interviews during the past year. The younger ones he and his team had to find in casting calls. If you regard Sehgal as a 21st-century sculptor who abjures digging stone out of a ravaged earth, then the interviews that he conducted of grade-school children and teenage college students throughout the city were the ecologically informed equivalent of the scouting missions that Michelangelo made to the marble quarries of Carrara. The small children he sought were between ages 8 and 12, while the teenagers were typically college freshmen. Like the older interpreters, the teenagers would be required to converse in an interesting and intelligent way, but the children had to be able chiefly to encapsulate what they were told in a summary form. They also needed to be outgoing enough to chat readily with strangers. In November, I watched Sehgal, accompanied by a Guggenheim assistant curator and professionals from a New York-based casting agency, interview groups of little kids and teenagers, usually eight at a time.

One sample of children came mostly from St. Ann’s School, a private school in Brooklyn. “I’m just going to ask what your name is and how old you are and what you like doing, and then after we’re going to play a little game,” Sehgal announced, as he would say in pretty much precisely those words at every audition of children. An 8-year-old boy with a piping voice and charming self-possession said, “The last thing I’ve done is create a litmus solution.” An 8-year-old girl favored musical comedy. The others had equally enriching extracurricular activities to report.

Then it was time for the game, which Sehgal explained would begin simply and become more difficult. The game consisted of listening to the answer to a question and then repeating what was said. Taking suggestions for a question from the children, he chose, “What is a stool?”

A young woman from the casting agency said: “A stool is a piece of furniture that has four legs and usually is taller than a chair. You can sit on a stool, and sometimes you can climb on a stool to get something.”

The children raised their hands to offer their recaps. Like the blind men around the elephant, they would get different parts of it. Sehgal listened. From those who did not volunteer, he tried to coax a response.

The game escalated to “What is a computer?” and then “What is a democracy?”

“A democracy is a system of government where the citizens of the country elect their leader,” said another casting agent. “The United States is a democracy. The hope is that in electing a leader, the voice of the people will be heard through that representative. The opposite of a democracy is a dictatorship, where one person has all the say and all the power.”

Now we were in deeper waters. Most of the children had trouble pronouncing the word “democracy,” and their capacity to recall and regurgitate the disjointed bits of information varied appreciably. With the final question — “What is an abstraction?” — things became more challenging still. Forget about pronunciation or any comprehension of the term. What they came back with was a mixture of things they remembered and things they made up. Those whose recollections outdistanced their imaginations were the preferred ones, so long as they were not incapacitated by shyness.

Afterward Sehgal reviewed the young contestants with his associates, each of whom had written down ratings. He compared the students with ones they had recently seen at the Thurgood Marshall Academy in

Harlem, where he found a higher proportion of promising candidates adept at reciting back what they heard.

“The thing about these St. Ann’s kids is they’re socially very able,” he told me. “The Thurgood Marshall kids are put in the world to receive — they are there to pay attention. It’s not that the St. Ann’s kids are not intelligent. They are. They are already in the mind-set of ‘What can I bring into the world out of myself?’ ”

For the Guggenheim exhibition, such qualities would be more appropriate in the teenage interpreters. The artist’s quarrying continued.

As a youth, Sehgal was attracted to the study of dance (how people move) and political economy (how society works). His father, now retired, was an I.B.M. manager from India, his mother a German native and homemaker. Sehgal was born in London and raised primarily in Dusseldorf, Paris and a town close to Stuttgart; he has a younger sister, who grew up to become a philosopher specializing in Alfred North Whitehead. Their father talked with them in English, their mother in German. Sehgal speaks fluent English with a faint German inflection.

When he was an adolescent, Sehgal says, a direct encounter with the political process disenchanted him permanently from parliamentary politics. Friends asked him to speak at a hearing in favor of a transportation initiative in Stuttgart. “I remember seeing the minister of transportation dive and dodge,” he says. “All he could do was administer what the public opinion was, or else he would be voted out in the next election.” If electoral politics could not produce fundamental change, why bother with it? “It’s much more interesting to change the values,” he says. “I was never interested again in parliamentary politics. I became interested in culture.”

This political awakening strengthened his attraction to dance. Aside from its physical appeal, dance, in his eyes, had the virtue of creating something that disappeared at the moment it was produced. “My work comes out of my experiment with myself,” he says. “As a person in the first world, you’re quite heavy as a person in what you use up. Can I actually solve this for myself? Can I have something to do, keep myself interested and not be somebody who is situated outside society, and can I do this without transforming lots of material?” He moved at age 18 to Berlin, where he studied political economy and dance. After a few years he relocated to Essen, again taking classes in both subjects.

Through friends in Berlin, he became friendly with the experimental choreographer Xavier Le Roy and later with another avant-garde dance artist, Jérôme Bel, who were challenging the preconceptions that audiences brought to dance performances. In 1999, he took a job in Ghent, Belgium, at Les Ballets C. de la B. dance collective. At the same time, he was developing his own work. His first noteworthy piece was called “Twenty Minutes for the Twentieth Century,” in which he performed by himself, naked, on a stage decorated with only a work light, calling up signature movements in 20 styles: Nijinsky, Balanchine, Merce Cunningham, Trisha Brown, down to Xavier Le Roy. (Notwithstanding its title, the piece was approximately 55 minutes long.)

He presented “Twenty Minutes” in a festival at the Moderna Museet in Stockholm, where one appreciative spectator was a curator of about the same age, Jens Hoffmann. “Afterward I told him it was like a museum of dance,” Hoffmann recalls. “He said, ‘This is exactly what I was trying to do.’ ” Sehgal was more of a conceptual artist than a choreographer. “I always felt closer to Marcel Broodthaers than I did to Martha Graham,” he says. He loves the intellectual discourse that surrounds contemporary art; it’s absent from dance criticism. (He carries these preferences into his private life. His partner, Dorothea von Hantelmann, is an art historian who has written extensively about “performativity” in visual art; they have a 2-year-old son, Nalin.) Hoffmann encouraged him to present his work in art venues, not dance theaters.

As a curator of the Manifesta biennial art exhibition in Frankfurt in 2003, Hoffmann brought “Instead of Allowing Some Thing to Rise Up to Your Face Dancing Bruce and Dan and Other Things” (2000), a

piece that Sehgal had devised specifically for a contemporary art museum, the S.M.A.K. in Ghent. As its unwieldy title indicates to those in the know, it is a gloss on pieces of conceptual art of the early '70s by Bruce Nauman and Dan Graham. In those earlier works, the artist or a friend of the artist performs a series of stipulated movements, which are captured on a videotape for display in a gallery or museum. Sehgal selected 16 gestural moments from those videos and asked a performer to stitch them together with slowed-down, unaccented motions. He got the S.M.A.K. to agree to show the work nonstop during museum hours for a week; as one performer's shift was ending, a successor would appear and writhe alongside him for about half a minute, and then the first one would depart. In a blatant way, human beings were filling the role that sculptures occupy in a museum.

"When I saw the visitors' reaction, I was clear that this was it," Sehgal says. "Their reactions were so much stronger than I expected. They couldn't believe it was a person. They thought it had to be a robot or a puppet. There was such an expectation that in a museum something must be an object."

Once he decided to transform choreographic material into sculpture, Sehgal needed to find a way to keep a piece going continuously. The silent interpreters in the early works perform in a loop, and the only visible connecting hinge occurs at a shift change, when one actor relieves another. That was relatively simple.

With "This Is Good" (2001), the first of his constructed situations, each new arrival of a visitor triggers an activity of limited duration; it is as if the piece were a kinetic sculpture powered by a push button. When someone enters the gallery, a guard begins windmilling his arms and hopping from one leg to the other and then says: "Tino Sehgal. 'This Is Good.' 2001." Calling attention to the usually unnoticed employees in a museum, the piece plays off Sehgal's mission to make people, not objects, the material of his work. But the payoff is limited. Things got more interesting with "This Is Exchange" (2003), in which the visitor is enlisted as a co-producer of the piece. At the entrance to the museum, a ticket taker asks the visitor to engage in a conversation about the market economy; after five minutes, if a ticket buyer who agreed to the request is still gamely playing along, she receives a partial refund of the admission fee. For many visitors, especially those who argued that they detested the market economy, it came as an unsettling surprise to receive this reminder that whatever their opinion of it, they were nonetheless immersed in it. Which, of course, was one of Sehgal's aims.

Although Sehgal sells pieces to private collectors, his work seems to function best in a museum or a gallery, where its subtraction of a material object is made visible by the institutional surroundings that give shape to his void. "My work definitely needs this framing as art, and the stronger this framing is," he says, "the more works of mine are possible." Because the activity in his work is so close to the routines of everyday life, he has found ways to emphasize its artificiality. One signature device is the removal of all emphases in movement; his interpreters proceed in a slow trancelike state. "The most important thing is you don't see an accent," he said at a "Kiss" rehearsal I attended. "In everyday life, basically, in whatever we do there is an accent. Here, there is a continuous flow."

Eliminating the object has opened a seemingly limitless number of possibilities for Sehgal. At the C.C.A. Wattis Institute for Contemporary Arts in San Francisco, Jens Hoffmann, who became the director in 2006, has been presenting an ongoing series of Sehgal pieces. Usually visitors to this small contemporary art museum realize fairly soon that they are in the presence of a Sehgal work. But not always. In one piece, a visitor would arrive to find the museum apparently empty of all people. "Once when a person thought there were no guards around, he started stealing catalogs," Hoffmann recalls. "The guard came up and said: 'Would you please put the books back? This is a piece by Tino Sehgal.'"

Is it possible to be both playful and profound? Sehgal is wagering yes. The moral earnestness that underlies his work would be ponderous if unleavened by humor; the games would be just child's sport if they did not illuminate serious matters. The mixture can confuse people. At a meeting that Sehgal, on one of his human-quarrying forays, held last May with the administrators of a Harlem after-school program, he was pressed to explain what he aimed to accomplish in the Guggenheim piece. "The real deal is what happens there," he said. "The real deal is the conversation." For an educator who was trying to wean

children from the cycle of poverty, this was palpably an unsatisfactory answer. He asked Sehgal again what was his goal. "It's a structure to have a conversation about people's values," Sehgal said.

A little later in the discussion, the man returned to his theme. "So I guess you're saying your ambition is to change perception," he said. "Is that correct?" And this time, Sehgal took the bait.

"That's a very simple way of saying what I'm doing," he said. "For the last two or three hundred years in human society, we have been very focused on the earth. We have been transforming the materials of the earth, and the museum has developed also over the last two or three hundred years as a temple of objects made from the earth. I'm the guy who comes in and says: 'I'm bored with that. I don't think it's that interesting, and it's not sustainable.' Inside this temple of objects, I refocus attention to human relations."

This time the man nodded in understanding, with an expression I recognized. He was seeing things from another perspective, as he participated in a conversation within a framework constructed by Tino Sehgal.

Arthur Lubow is a contributing writer for the magazine. His last article was about the preservation of modern dance.

<http://www.nytimes.com/2010/01/17/magazine/17seghal-t.html?th&emc=th>

When Fear Turns Graphic

By MICHAEL KIMMELMAN

ZURICH



SWITZERLAND stunned many Europeans, including not a few Swiss, when near the end of last year the country, by referendum, banned the building of minarets. Much predictable tut-tutting ensued about Swiss xenophobia, even though surveys showed similar plebiscites would get pretty much the same results elsewhere.

A poster was widely cited as having galvanized votes for the Swiss measure but was also blamed for exacerbating hostility toward immigrants and instigating a media and legal circus. “We make posters, the other side goes to the judge,” is how Alexander Segert put it when we met here the other day. “I love it when they do that.”

He designed the poster in question. As manager of Goal, the public relations firm for the Swiss People’s Party, Mr. Segert has overseen various campaign posters. This one, for the referendum, used minarets rising from the Swiss flag like missiles (“mushrooms,” Mr. Segert demurred, implausibly). Beside the missiles a woman glowers from inside a niqab. “Stop” is written below in big, black letters.

The obvious message: Minarets lead to Sharia law. Never mind that there are only four minarets in Switzerland to begin with, and that Muslims, some 340,000 of them, or 4 percent of the population, mostly from the Balkans and Turkey, have never been notably zealous.

In this heavily immigrant country the ultranationalist Swiss People’s Party is now the leading political party, aided at the polls by incidents like the New Year’s Day attack by a Somali Muslim immigrant in Denmark on Kurt Westergaard, the artist whose caricature of the Prophet Mohammad with a bomb in his turban was among the cartoons published in 2005 in a Danish newspaper that provoked violent protests around the world. All across Europe populist parties are growing, capitalizing, to an extent unknown across the Atlantic, on a very old-fashioned brand of propaganda art. The dominance in America today of the 24-hour cable news networks and the Internet, the sheer size of the country, the basic conventions of public discourse, not to mention that the only two major parties have, or at least feign having, a desire to court the political center, all tend to mitigate against the sort of propaganda that one can now find in Europe.

It manages, if often just barely, to skirt racism laws. In Italy, where attacks on immigrant workers in the Calabrian town of Rosarno this month incited the country's worst riots in years, the Lega Nord, part of Prime Minister Silvio Berlusconi's ruling coalition, has circulated various anti-immigrant posters. One, mimicked by Jean-Marie Le Pen's far-right National Front Party in France, showed an American Indian to make the point that immigrants will soon turn Europeans into embattled minorities stuck on reservations.

The National Front also distributed a poster of Charles de Gaulle alongside a remark he once made (in the context of the Algerian occupation) to suggest that true Gaullists today would vote for Le Pen. "It is good that there are yellow Frenchmen and black Frenchmen and brown Frenchmen," de Gaulle is quoted as saying. "They prove that France is open to all races," adding, "on the condition that they remain a small minority. Otherwise, France will no longer be France."

In Austria the far-right Freedom Party has come up with a poster bearing the slangy slogan: "Daham Statt Islam, Wir Für Euch" (roughly, Home Instead of Islam, or Islam Go Home, We Are for You). And Britain's neo-Nazi National Party, which, to the great embarrassment of the country's political leaders, lately won two seats on the European Parliament, swiped the minaret poster by switching the Swiss flag for a Union Jack. Mr. Segert and the Swiss People's Party weren't too pleased, populists being one thing, neo-Nazis, another.

It may be hard for Americans to grasp the role these images can play here. In subways and on the streets in America, posters and billboards are eye-catching if sexy or stylish, like Calvin Klein's advertisements, or if modish and outrageous, like Benetton's, but they're basically background noise. By contrast, they're treated more seriously here, as news, at least when they're political Molotov cocktails. Cheap to produce compared with television commercials and easy to spread in small countries like Switzerland, where referendums are catnip to populists, they have the capacity to rise above the general noise.

Mr. Segert is the de facto reigning minister of such propaganda. He has used red rats to caricature Swiss leftists. He came up with an image of black and brown hands riffling through a stack of Swiss passports. And (until the minaret poster, this one caused the biggest kerfuffle) he cooked up the idea of three fluffy white sheep kicking a black sheep off the Swiss flag. "For More Security" was the accompanying slogan.

Cries of racism, occasional legal proceedings — none of which ended up in fines against him, Mr. Segert hastens to point out — and even bans on their display in left-leaning cities like Basel and Geneva, have only increased the reproduction of the images. All of which, as Mr. Segert said, suits him and his bosses just fine.

"If what we do stirs up controversy, then we've already won the election," he told me, a thought echoed when I met with Marc Bühlmann, a political scientist here. "All these right-wing populist parties have learned to get TV and newspapers to show these posters over and over with the excuse of asking, 'Should we allow such images?' " Mr. Bühlmann said. "The aim in making the posters is to be as racist as possible, so then when critics complain, the populists can say elites don't want ordinary people to know the truth. And the media fall for it every time."

Mr. Segert wouldn't disagree. Crude, cleverly exploiting the ancient power of a still picture over moving ones to fix an image in a viewer's mind, the posters share a calculated homeliness and violence that is in its own way artful. I showed a variety of them to Jacques Séguéla, chief creative officer for France's second-largest advertising agency, who ran François Mitterrand's presidential campaign.

"Fifty percent Stalin, 50 percent Norman Rockwell," was his assessment. "The images are aggressive, not funny, without charm, straight to the point, clear and" — he was speaking aesthetically here — "in no way radical. They're the opposite of most advertising today. They aim just at their target audience."

And that's all they need to do. Marcus Stricker, creative director of NetprinZ, which handles advertising for Switzerland's Free Democratic Party, a competitor of Mr. Segert's, credits the minaret poster with employing a bygone graphic style that conjures up "good old Switzerland, when everything was safe, clean and growing." Like Mr. Bühlmann he blames the news media for providing, as he put it, "effectively millions of dollars in free advertising." It went without saying that my own interest in the poster brouhaha multiplied the problem.

He was nevertheless reluctant to give Mr. Segert too much credit for swinging the vote. Local issues did more to sway public opinion, he said. We met in a crowded bar above the Zurich train station, and before parting he unfurled a poster by a human rights organization called the Society for Swiss Minorities, distributed by the Swiss Council of Religions, showing a mosque, a synagogue, two churches and a Buddhist temple beneath a broad, pale blue sky, with the slogan "Der Himmel über der Schweiz ist gross genug" ("the sky over Switzerland is big enough") in discreet lettering across the top.

It was made to compete with Mr. Segert's work. Two can play that game, Mr. Stricker wanted me to know. Except that the image, tasteful and vague, stressing elegance over incitement, actually suggested the opposite.

Mr. Segert knows why. A 46-year-old German (yes, an immigrant himself in Switzerland), he is the father of two adopted children from North Africa, although he declined to talk about his personal life. He was happy, on the other hand, to discuss work, which he volunteered he would gladly do for the Green Party or Social Democrats, if they hired him. "For me it's an intellectual exercise," he said, as if cynicism were a point of professional pride.

In the next room young, clean-cut associates brooded over drawing boards and computer screens. Clients must "do their homework," Mr. Segert said, by way of explaining how a design evolves. "It sounds easy, but most political parties don't know their own message." That's the problem for centrist and many left-leaning parties.

By contrast, "everyone knows what the Swiss People's Party stands for," he said. "It's against the European Union, for neutrality, lower taxes, no illegal aliens. You can hate it or love it, but the message is clear." That message must then be refined. "Maybe 80 to 90 percent of people are not interested in elections. So our job is to tell them: Be interested in what doesn't interest you, make a decision about something you don't care about, then act on it, vote. That's a lot for a poster to accomplish. We're successful because we know how to reduce information to the lowest level, so people respond without thinking."

This was essential, he stressed: "The message must go straight to the stomach, not to the brain, and connect with specific emotions involving fear, health, money, safety. We can focus just on our target audience so we can speak in a special language and speak to a feeling these people already have. We can't move anyone who doesn't already have this feeling. In our case the target audience is low income, with little schooling. They have the same right to vote as people who support the Green Party and read 3 newspapers and 10 magazines."

I asked whether special language applied to red rats, which can conjure up Nazi propaganda. Mr. Segert brushed off the comparison. As a public-relations man he has "no taboos," he said. "We don't begin by thinking what we can't do. When I chose to show rats, I didn't ask whether it's politically correct. I couldn't do my job if I did that. I only wanted to know whether it serves our purpose, and if we have a problem with the law. My party already deals with taboos like Islam and immigration, so our job is just to think about how to make the strongest image, then let the lawyers tell us whether it's racist."

He recounted the making of the minarets design. There were some early all-text trials, he recalled, which looked too wordy. One version showed missiles without the woman, another, the woman in a burqa, without eyes. "That was too impersonal," Mr. Segert said. He and his colleagues, adding eyes, then

debated what should be behind them. “Should they look sexy, not sexy?” he said. “To me the look we decided on is less aggressive than helpless.”

It can also be read the other way around. Mr. Segert added that, instead of the Swiss flag, the Matterhorn was tried, but the mix of minarets with the woman in a niqab and the mountain created confusion. Without the mountain, he said, the image, “could have been Istanbul or Dubai.”

“There was nothing wrong,” he continued, “nothing to disturb the view.”

But a flag solved that. “Minarets and the Swiss flag sent the message we wanted because they don’t fit together. A person looks and thinks, ‘This must be changed.’ ”

A certain person, anyway. The final poster, though heavy-handed, performs a complex task. The image of minarets beside the woman in the niqab stirs up a negative feeling among target voters. “No, I don’t want minarets because I will find myself living under Sharia law,” the viewer decides. But the referendum to ban minarets required a yes vote. “It’s always easier to do a campaign for a no vote,” Mr. Segert noted, “because people instinctively want to maintain the status quo. It’s what they already know. With a yes vote you need some positive symbol. But we had only this negative one, of minarets and Sharia.

“So we needed some bridge, some transition from no to yes.”

The designers experimented with the word “Verbieten,” meaning to forbid, but this turned out to look too complicated. The obvious solution, arrived at after a few false starts, was simply, “stop.”

The word performs a double role, emphasizing the initial message (stop minarets) then causing a viewer, when arriving at the word, mentally to stop, be free to switch gears and register “yes,” written just below “stop.” That is, vote yes.

“So there are three steps to the image,” Mr. Segert concluded. “Minarets lead to Sharia. No to minarets. Yes to the referendum.”

“It looks simple,” he said, staring at the finished image.

“But that’s the art of it.”

He smiled.

<http://www.nytimes.com/2010/01/17/arts/design/17abroad.html?ref=design>

Keepsakes, Domestic and Dark

By RANDY KENNEDY



“SEE, you too can do this,” the artist Ida Applebroog said, showing a recent visitor to her SoHo studio a box of Crayola Model Magic, the kind of clay that children use, and then opening a glass cabinet filled with what she had made from it: small, doughy white figures that at first glance seemed like grade-school leftovers but upon closer inspection took on the complexity and creepiness of Giacometti by way of Wes Craven.

Much of the unsettling work that has made Ms. Applebroog a revered, quietly influential figure in the art world over the last three decades has looked this way: deceptively simple, like the trademark cartoonish storyboards she began making in the 1970s; funny in a way that skews toward weird without losing the ha-ha; and ominous, carrying the brutal honesty of one of her early influences, Samuel Beckett, into the nooks and crannies of domestic life. “As others take in vagrant cats,” the critic Max Kozloff once wrote, “Ida Applebroog’s pictures keep home for family alarms and little butcheries.”

In other words, even if you could do it too, as Ms. Applebroog suggests (and you can’t), you probably wouldn’t want to.

As she gets older — she turns 81 this year — her work has become only more uncompromising. And so it seems to delight her no end that much of an installation that she will present in her inaugural exhibition at the new Upper East Side outpost of the gallery Hauser & Wirth on Tuesday cannot be reproduced legibly in a family newspaper, and, in fact, takes a little delicacy even to describe in such a newspaper. That the images forming the installation are now four decades old makes all this even better, in her estimation.

In 1969 Ms. Applebroog, then known by her married name, Ida Horowitz, was a mother of four, a native New Yorker living unhappily in San Diego, where her husband had moved the family to accept an academic position. Ms. Applebroog had been struggling to make a name for herself as an artist and struggling with depression. Her only sanctuary in her chaotic household came at night, when she shut herself in the bathroom and climbed into the tub.

Over a period of several weeks just before her 40th birthday, she took a sketch pad into the bathroom with her too and perched in front of a full-length mirror, making obsessive self-portraits, more than 150 in all, but portraits focused exclusively on her naked crotch. The drawings — like a long series of practice sketches for Courbet’s “Origin of the World,” except in this instance made by the owner of the crotch — were done in India ink with a crow-quill pen, each one an elegant variation, depending on her mood or the state of her body. (When asked recently what was going through her mind as she was making these drawings, she just flashed a defiant smile and wagged a finger at her questioner.)

The drawings were never meant to be shown, and Ms. Applebroog, who moved back to New York in 1974, had long assumed that they were lost. But early last year, at the urging of her friend Barry Rosen, an art adviser, she began trying to unearth some of her older work. Rummaging around in the basement of the building where she lives and works near Broome Street, she and her assistants opened a box. And inside, along with jars of San Diego beach sand and air that her children had saved, was a blue 69-cent Strathmore Alexis drawing pad full of her bathroom sketches.

Some of the pages were water-stained, “but they were beautiful,” said Ms. Applebroog, a small, intensely friendly woman with close-cropped gray hair and little round Freudian glasses. “With all the umber and the staining that happened as a result, they look like something out of the Renaissance.”

The sketches, later scanned into a computer, manipulated and enlarged on Japanese gampi paper, have been transformed by Ms. Applebroog for the show into translucent, skinlike panels that will function not just as drawings but also as architecture, forming the walls of a small house built inside the gallery.

Viewers will be unable to enter the house. As with Marcel Duchamp’s “Étant Donnés,” however, they can walk up to it and, making themselves active voyeurs, peer inside through gaps between the drawings to see more drawings — and an amorphous portrait of a figure that Ms. Applebroog calls Monalisa, based on one of her ungainly clay figurines. The front of the house will be adorned with another portrait derived from the figurines, this one of a nightmarish-looking male character she invented whom she calls Brian.

“I think of him as a kind of a Mafia figure,” she explained.

The whole installation, titled “Monalisa,” conveys, in imposing and distilled form, the kind of just-completed or about-to-happen menace that hovers over much of Ms. Applebroog’s work. In one of her late 1970s cartoonlike works, which she called stagings, a simple scene is repeated over and over of a man beginning to take off his coat, standing over a woman lying on a bed. The words at the bottom of the scene (whether they are spoken by the man or the woman is unclear) are “I threw it away” and then “Sure I’m sure.”

In later works, which are sometimes based on news articles or photographs cut out of newspapers or magazines, the specter of violence or horror is more explicit: a red-hooded Klan figure, a woman gingerly holding a gun, a man swinging an ax like a golf club, a violinist playing while wearing a gas mask (based on accounts of Isaac Stern wearing one at a rehearsal in Israel during the gulf war).

In an essay accompanying the new exhibition, Julia Bryan-Wilson, an art historian at the University of California, Irvine, whose first profound art experience came when she was a teenager and saw an Applebroog exhibition in Houston, writes that “in the ‘Monalisa’ project, as in Applebroog’s past work, the home is not a stable location but an unfixed nexus of sexist violence, perversion and thwarted safety, as well as tenderness, secret stolen moments, bodily pleasure and honest labor.”

Sitting recently in her studio while her assistants, Robert MacDonald, Emily Poole and Andrew Coppola, prepared the frame of the small house and its translucent anatomical shingles to be trucked uptown to the gallery, Ms. Applebroog said: “I don’t see my work as particularly tough. But we live in a world that’s tough, and this is what happens. It just comes out of my head, and it’s here.”

For many years her world was quite tough itself. She was raised in an ultra-Orthodox Jewish family in the South Bronx, the daughter of a furrier, whom she says “all of us were always afraid of.” Against his wishes she pursued an education and studied graphic design, using her training to get a job at an advertising agency, where she was the only woman in the creative bullpen.

“It was horrible,” she said, describing routine ridicule and aggressive sexual harassment. “I dreaded even getting up out of bed every morning. I didn’t last a year.”

When she and her husband, Gideon Horowitz, who had been high school sweethearts, moved to Chicago so he could earn his doctorate, she attended classes at the Art Institute of Chicago, to which she earned a fellowship. But she was so desperate to earn a college degree that she enrolled in a television correspondence school.

“I was so unknowledgeable,” she added. “You have no idea.”

She commandeered the family’s Chicago basement as her studio, making jewelry that her husband and children would sell at art fairs. (“I never went,” she said. “For many years I just wasn’t capable of being in the world.”) In San Diego she found a space in a former Chinese market and began to show her work for the first time.

But even upon her return to New York her lack of confidence was so acute that she quietly destroyed much of her early work (it was soft sculpture that she felt looked too much like that of Eva Hesse) and participated in the art world only at a great remove, making her first booklets of the serial storyboards and mailing them out to art-world people, most of whom she had never met. “I still have a big file of the correspondence I got back,” she said, laughing impishly. “Some people loved it, and some people wrote back: ‘Don’t you ever put that poison in my mailbox again.’ ”

But she began to find her voice, partly in the feminist movement, joining the influential art and publishing collective Heresies and slowly reinvented herself, changing her name to Applebroog, a fairy-tale-like coinage based on her maiden name, Applebaum. (She and her husband, who is retired and sometimes lends a hand in the studio’s finances, remain married. “I’m not going to tell you about all of our ups and downs,” she said. “But we’re still together.”)

Decades later, with honors like a MacArthur Foundation “genius” grant to her credit, a group of collectors (including a celebrity or two, like the U2 bassist Adam Clayton) devoted to her work and the courage to delve deeply into her past for the first time, there is little Ms. Applebroog has to prove, to herself or others.

At one point she handed a visitor a stack of old hardback notebooks that she began after moving back to New York, pages in which she first created the strange disembodied voices that she later mined for her work.

Scrawled in one, as if Ms. Applebroog was trying to convince herself that she would become the artist she has become, were lines that now seem comically prophetic:

“Oh what a teacher I’ll make.”

“I’ll be better than Moses.”

“I’ll teach them everything.”

“They’ll know.”

<http://www.nytimes.com/2010/01/17/arts/design/17ida.html?ref=design>

Outsider Images in the Soviet TwilightBy BENJAMIN GENOCCHIO

American visitors to “Four Perspectives Through the Lens: Soviet Art Photography in the 1970s-1980s,” an exhibition at the Jane Voorhees Zimmerli Art Museum, may be surprised to discover that photography was not officially considered art in the former Soviet Union. It was regarded as a documentary tool at the service of Communist Party propaganda.

Oddly, because of its outsider status, photography remained largely unregulated and uncensored, or at least less so than painting and sculpture. Soviet nonconformist artists made extremely clever, inventive use of the medium, crafting images that were formally experimental and socially aware.

The Zimmerli exhibition, organized by Julia Tulovsky, presents a selection of about 70 images by four important artists working in photography, among other media, in the two decades before the fall of Communism. They come from the museum’s Norton and Nancy Dodge Collection of Nonconformist Art From the Soviet Union (1956-1986), one of the largest and best such holdings in the world.

The four photographers, Francisco Infante, Vladimir Kupriyanov, Boris Mikhailov and Alexander Slyusarev, have very little in common. Each displays a different approach to the medium, ranging from straightforward art photography to more manipulated imagery. It is both instructive and fascinating to compare and contrast these different formal approaches.

Mr. Slyusarev, born in 1944 in Moscow, took up photography in 1959 but earned his living for decades as a translator and an interpreter. His photographs capture everyday subjects, often in shadow and taken from unusual angles to make them seem unfamiliar. They are beautiful, mysterious and sometimes even mesmerizing.

Showing here are about two dozen of Mr. Slyusarev’s black-and-white photographs from the 1970s, most of which are untitled. Small, simple, square images, they have not been manipulated in any way. From a distance, they look like abstract patterns made of shadows and light; not until you get close to them can you begin to make out the content.

Like Mr. Kupriyanov, Mr. Mikhailov was a pioneer of Soviet conceptual photography. Born in 1938 in Kharkov, in Ukraine, he was educated as an engineer and worked in a factory. He began photography as a hobby, taking pictures of fellow workers and friends, and was fired from the factory after being charged with pornography for taking nude photographs of his wife. He subsequently eked out a living as a private photographer.



Mr. Mikhailov is interested in people, especially those whose lives embody or convey wider historical or socioeconomic conditions. He is probably best known for his “Case History” (1999) series, which consists of more than 500 images documenting the human cost of the dissolution of the Soviet Union.

None of those photographs are showing here. Instead, Ms. Tulovsky has sought to include lesser-known earlier works, among them untitled pictures from the “Nalozhenia (Superimpositions)” series, done in the 1970s, in which Mr. Mikhailov superimposes one negative onto another in the darkroom to play around with the context and meaning. In one image, for instance, we see an affluent young couple juxtaposed against a seething crowd, perhaps to suggest inequality in Soviet society.

Also on display is a selection of Mr. Mikhailov’s wonderfully eccentric and fascinating photographs from the series “Berdyansk Beach” (1981), showing bathers in a seaside Ukrainian city. The tone is both critical and yet slightly comic — an ambiguity reflected in an image of an overweight, grumpy old man in a singlet and trousers yelling at someone.

Mr. Kupriyanov, born in 1954 in Moscow, is a theater director by training, and he takes a far more conceptual approach to documentary. He questions the idea of photographic documentation as objective truth by experimenting with various formal strategies, including repetition, use of text on the image, scratching of the transparency and the alteration of printing paper.

Mr. Kupriyanov is not a photographer in the strict sense, but more an artist who uses photography as a starting point. In the series “Belgorodskaya Region” (1983-85), he juxtaposes images of the landscape as diptychs, with one image frequently informing the other. In an untitled work, he places an image of a child next to another of an old woman holding a blanket, the second image photographed from a low point as if from the child’s perspective.

Mr. Infante, born in 1943 in Vasilievka, in the Saratov region in southwestern Russia, is primarily a kinetic and land artist who uses physical landscapes to create his projects and photography to document them. On display here are eight images from the late 1970s through the ’80s showing geometric objects, monumental in scale and often covered with reflective foil, acting as mirrors, installed in nature. They look like sets for a science fiction film.

It is hard to know how to interpret these ghostly and unsettling images. The period they represent is the eve of the Soviet Union’s fall, and the future is as uncertain as the cloudy horizons in the pictures. For me, anyway, they read as eerily prescient symbols of an empire about to collapse.

“Four Perspectives Through the Lens: Soviet Art Photography in the 1970s-1980s,” through March 28, Jane Voorhees Zimmerli Art Museum, 71 Hamilton Street, New Brunswick; (732) 932-7237 or zimmerlimuseum.rutgers.edu.

<http://www.nytimes.com/2010/01/17/nyregion/17artsnj.html?ref=design>



Time-Traveling With the Muses in Boston

By HOLLAND COTTER



BOSTON — You love art. When and where did that start? In school? At home? In books? For me it began when I was a kid in the 1950s and '60s, before and during my teens. The primal scene was divided between two Boston museums where I spent a lot of time. I visited both again last week to check memory against reality and got a surprise: sometimes they match up.

I come from an art-loving family. Midwinter Saturdays, slushy and short in New England, were museum days. Our mainstays were the Museum of Fine Arts, Boston, and the Isabella Stewart Gardner Museum, close to each other on the Fenway, a bayou-like tract of Olmsted parkland. There were early hopes that the area would attract rich residents, become chic, but it didn't and the museums were a bit marooned there.

That was O.K. It meant they were quiet. In the preblockbuster 1950s foot traffic was light and the number of guards small. I knew them, they knew me. And I knew my way around. I could spend a day more or less on my own there, and I'd be fine.

Looking at art in a sustained, serious way is a funny thing — odd, not bad — for a young person to do. It entails a certain amount of simply staying still, maybe an appetite for language given art's exotic names and terms, and a readerly knack for imaginative projection, for participating in stories rather than just receiving them.

That said, I think I first got hooked on museums the way many kids do, through the thrills and chills of Egyptian art.

Why? For one thing, the Museum of Fine Arts had a ton of it, the largest collection outside Cairo. In 1905 the museum had teamed up with Harvard on archaeological digs in Giza, after striking a divide-the-spoils deal with Egypt: half of what was excavated would stay in that country, the rest would go to Boston.

Treasures came, and they look as magnetic now, and in some of the same ways, as they did when I was 10. Of all ancient art Egyptian feels particularly modern, even futuristic, or so I thought. With their neat figures and confident smiles, the Old Kingdom ruler Mycerinus and his queen, in a renowned carved portrait, looked like friends of my parents arriving for cocktails, straight from a spaceship.



The doll-size wooden models of everyday scenes stockpiled in tombs made it seem as if, for the Egyptians, eternity was an endless game of playing house. (You'll find nearly a hundred of these miniature sculptures, all belonging to the museum and all on view for the first time, in a special show called "The Secrets of Tomb 10A: Egypt 2000 B.C.")

And then there were mummies, laid out, just as I remembered, in a cryptlike space. They're probably the real reason for preteen Egyptomania. They aren't art, they aren't objects: they're bodies, and for many children they give a riveting first brush with the physical fact of death. They did that for me, and it took years before I could get beyond it to see Egyptian art as, above all, about the irrepressible hunger for life.

The Egyptian galleries were an immersive environment, but they weren't the only ones. There was also the chapel-like enclosure for the display of 12th-century frescoes from the apse of a Catalonian church.

The main image, a giant Jesus with a doleful face and bizarrely long fingers, appeared to change shape and dimension before my eyes, swelling into the dome, floating free of it, flattening out and tipping forward as if to crash into the room. How, I wondered as a kid, did artists get such effects from plaster and paint? I don't know, but the effects work; the paint — protected with a solution of lime and Parmesan cheese when the frescoes arrived from Spain in 1919 — still looks fresh.

For me individual paintings were the worlds within worlds that really mattered, which is why I loved them so much so early. Rogier van der Weyden's mid-15th-century "St. Luke Drawing the Virgin and Child" was a favorite. I looked at it inexhaustibly, not because of the subject but because every detail was concrete and complete: the main figures in a neat tight room with a hint of adjacent rooms and beyond that a garden, the turreted town, a canal or river running to the horizon.

This picture taught me what perspective was. And it taught me what art, and specifically painting, was or could be: an embodiment of order, a universe that you could, just though looking, move into and inhabit, where you could set up a life, live an ideal.

Art also held uneasy mysteries, the seeds of a moral and sentimental education. I remember looking again and again at Velasquez's "Don Baltasar Carlos With a Dwarf." The blond baby prince in the gold-stitched gown commands the picture, but more interesting to me was the second child, who wasn't a child — or was he? — with his bristly hair, white apron and slack, cautious sideways glance. What was this pairing about? I didn't know, but there was sadness.

I was attracted to psychological drama. But I was simultaneously pulled in the opposite direction, which is why I so often ended up in the Japanese Buddhist Hall, a kind of minitemple lined with sculptures. I would claim the time spent there as my formative Asian experience (I later studied Asian art in graduate school), except that the idea of Asia was always so much in the air in Boston, a port city with an 18th-century history in the China trade and 19th-century links to Japan.

Although I didn't know it, I was sharing the Japanese galleries with venerable spirits, Bostonian Asiaphiles all.

There was Edward Sylvester Morse, a zoologist who went to Japan in 1862 to study brachiopods and ended up amassing ceramics. And the art historian Ernest Fenollosa who, while teaching political economy in Tokyo, snapped up art that the Japanese, in a modernizing frenzy, were throwing away. And William Sturgis Bigelow, a Boston Brahmin on a spiritual quest, who helped buy many of the monumental Buddhas that surrounded me.

You'll find the names of these men on labels in the Asian galleries, along with those of the collectors and scholars Charles Goddard Weld, Denman Waldo Ross and Okakura Kakuzo. I know about them now and about their continuing local resonance. Boston has a tenacious cultural memory. To a degree that would



surprise and perplex New Yorkers, the Victorian age lives on in the city and its art institutions, even after decades of change and update.

The Museum of Fine Arts has been through plenty of both and is in the midst of a big change now, which may be why I found it somewhat discombobulated last week (though part of that may have been me trying to sort out old from new). In November the museum will inaugurate a wing devoted to contemporary art and to the Art of the Americas. In the 1950s, and even in the '60s, the contemporary holdings were, as far as I was aware, pretty meager. No more. The Art of the Americas, as a multicultural category, didn't exist in the late Victorian-to-Gilded Age museum of my youth.

Do I miss that museum? Most of what I remember is still there, even the quietude; I had the Buddhas and the mummies to myself. But now there's more.

In any case, if late Victorian-to-Gilded Age is what you're after, the Isabella Stewart Gardner Museum is a five-minute walk away, an inviolate time capsule of a period and a personality, and conceived as such. The details of its building at the turn of the 20th century are oft told. Isabella Gardner was a New York City-born Bostonian with a decent fortune, shrewd advisers (Bernard Berenson chief among them), eclectic tastes, personal chutzpah and a belief in more is more.

So equipped, she patched together the museum, which was also her home, from countless architectural fragments to create an inside-out Venetian palazzo. She then packed it to the ceilings with Renaissance paintings, Roman sculptures, rococo furniture, modern drawings, medieval whats-its and Asian doodads, each as exactly placed as a piece of mosaic.

Talk about walk-in environments. This was an exercise in installation art before the term was invented, postmodern before postmodernism, a minutely customized total work of art. And it was designed to remain so. Gardner's will — she died in 1924 — stipulated that if a single object were removed or so much as relocated, the whole pile would go to auction.

It's easy to forget, given the museum that survives, how exciting its creation must have been, with new pieces constantly arriving, sending ripples, fresh harmonies and ever more intricate cross-references through the ensemble. You still get an impression of fluidity and growth from the grand central courtyard, with its glass roof and seasonal plantings. The first sight of it and scent of damp earth instantly takes me back to a moment, decades ago, when I came in from the cold Fenway to the sight of nasturtium spilling from courtyard balconies.

I was a teenager. I already knew the museum, had walked its rooms. To me it was a wonder cabinet, exciting exactly for its untrammled mix of images and styles, for an abundance so relentless that no single piece ever came fully into focus, everything was more or less on a par with everything else.

The art object was less important than the art experience.

That experience starts the minute you see the courtyard and intensifies as you walk up the stairs to the Early Italian Room. There it's hard to miss Piero della Francesca's painting of Hercules, looking as buff and blank-eyed as a male model. Somewhere — but not in the gallery, for there are no labels — you might have learned that this is the only fresco by the artist in the United States and that it came from a wall in his home. Why did he paint it? No one knows. And why did Gardner put it in a gallery with Simone Martini's chaste, dressed-in-layers saints? No one knows that either, though the play of flesh-versus-spirit, Classical-versus-Gothic feels subtle and smart.

Lighting is a problem here, a frustrating mix of dimness and glare. But that was the way Gardner wanted it; these galleries were not wired for electricity during her lifetime.



Not all her paintings, I've come to learn, are fabulous. Some are better cast in shade. When she had a winner, though, she knew what to do. She installed it near a window, even if this put the painting out of sight, as in the case of Fra Angelico's "Death and Assumption of the Virgin," a little concerto in blue and gold, hung around a corner beside a fireplace.

Once you find it there, it's yours, your secret. The whole place is like that, a path of discoveries, and habitués have their own mental maps. When I was 15 or so, mine included a pair of bronze Han dynasty bears (Gardner, who knew all the Boston Buddhists, has a small Asian collection), a Michelangelo drawing, Bartolomé Bermejo's painting of St. Engracia and a Matisse.

Certain things weren't on such personal charts because everyone knew they were great, like Titian's "Rape of Europa." I wasn't initially clear about what was going in it (large lady, putti, spooked bull); I learned later. The Gardner, as if to finesse any confusion, now uses the title "Europa." I preferred a painting nearby, the more modest "Christ Carrying the Cross," even though its attribution slipped from Giorgione to a follower of Bellini.

At normal museums such a demotion would likely put a painting on ice. In the context of the Gardner its status hasn't much changed because, like other pieces in the collection, this one has a personal story. The picture came to Gardner just before her husband died, and she made it a shrine to his memory, always keeping a cup of fresh flowers — violets in season — in front of it.

They're still there.

I've come to take this painting as a positive lesson in the politics of charisma. I've also learned that time can be rough on enchantment. On my visit last week, sections of the museum filled with unidentified, feebly lighted objects seemed more attic than palazzo. (Berenson's wife, Mary, once compared it to a junk shop.) The so-called Dutch Room looked especially forlorn, hung with empty frames awaiting the return of paintings — "The Concert" by Vermeer, Rembrandt's "Storm on the Sea of Galilee" — stolen 20 years ago.

But as you turn from the empty frames and head for the stairs you see another Rembrandt, an early self-portrait, an image of a pasty-faced, uncool guy who, with the help of puffy hat and some backlighting, has made himself a V.I.P. It's a wonderful picture, and doubly wonderful being where it is, in this kooky house full of saints, and rickety chairs, and John Singer Sargents.

When I was a very young, I thought the Gardner was the most glamorous place there was. Now I see that it's as funky as it is elegant. And, on the wishes of its founder, it is pressed between the pages of history, like a dried flower. This may not be so bad. In New York — capital of the cosmetic enhancement — it would be. Boston is different, though even here there is pressure to keep on the move, which in a peripheral way the Gardner is doing: a new wing, designed by Renzo Piano, is under way.

But unless someone goes to court and undoes the will, the museum I first saw half a century ago is the same one I'd see if I were around half a century from now. I won't be, but some kid will, wandering in on a winter afternoon, seeing the light, smelling the earth, and looking — really looking — with love in his eyes.

<http://www.nytimes.com/2010/01/15/arts/design/15museums.html?ref=design>



Gritty Scene, Mostly Male and White

By MARTHA SCHWENDENER



What would the proverbial alien, beamed into the Grey Art Gallery for a viewing of “Downtown Pix: Mining the Fales Archives, 1961-1991,” discern about New York toward the end of the last millennium? Maybe this: That it was very gritty, very gay and very Caucasian. Organized by Philip Gfelter, a former picture editor for The New York Times, the exhibition includes more than 300 photographs and serves as a kind of sequel to “The Downtown Show: The New York Art Scene, 1974-1984” from 2006. Like that display, this one reminds us what the arts scene in the East Village, SoHo and TriBeCa was like at the height of the AIDS epidemic, before gentrification and before the downtown ethos and aesthetic were packaged into family viewing spectacles like “Rent” or those by Blue Man Group.

This was the downtown of experimental art, music, film, theater and dance — often mashed up and delivered simultaneously. An idea of how it was received might be gleaned from a quotation from a review by the New York Times critic Frank Rich printed on a wall label next to a photograph documenting a 1984 performance of Franz Xaver Kroetz’s “Through the Leaves,” by the avant-garde company Mabou Mines. The work “is not pleasant,” he wrote, “but it sticks like a splinter in the mind.”

There are plenty of splinters here. A series of photographs by David Wojnarowicz documents the death of his mentor and lover, the photographer Peter Hujar, from AIDS in a hospital; nearby is a matter-of-fact letter to Hujar from his doctor describing his dire medical condition. “Heroin,” a three-minute movie shot in 1981 on Super 8 film, shows Wojnarowicz’s semicomatose friends crashed out in various lofts and bathrooms. The film wasn’t made to celebrate drug use, but out of concern for the rampant addiction the artist witnessed around him. New York’s grittiness was compared frequently to that of 19th-century Paris, with its bohemians afflicted by poverty and consumption, and its reverence for poetry, a form that has been largely eclipsed in subsequent decades. There are portraits of real poets, like David Trinidad, [Allen Ginsberg](#), Peter Orlovsky and John Giorno, and fake ones: Tom Verlaine dressed up as Theresa Stern, a fictive poet invented by Mr. Verlaine and Richard Hell, founders of the band [Television](#) (foreshadowing a more recent art world fictional character, Reena Spaulings).

Wojnarowicz’s series “Rimbaud in New York” features young men posing in diners or decrepit interiors, each wearing a mask with the image of the 19th-century poet Arthur Rimbaud, while a Jimmy De Sana photo captures [Andy Warhol](#) hanging out with the fashion designer Halston’s Colombian boyfriend, who went by the name Victor Hugo. Poetry was also featured as a tragic-romantic motif in projects like Kathy Acker and [Richard Foreman](#)’s opera “The Birth of the Poet” from 1984 or a video of [John Kelly](#) singing “Love of a Poet,” based on a Robert Schumann song cycle from the 1840s.

Women aren't particularly well represented — except as perfunctory documentarians of the scene (the Fales Library, New York University's rare-book and manuscript collection, has actually acknowledged this weakness in the archives) — and neither are minorities. There are portraits of the punk-folk priestess Patti Smith, the punk-appropriation author Ms. Acker and the downtown dance pioneer Trisha Brown, as well as a video of Carolee Schneemann's "Meat Joy" from 1964, an absurdist Dionysian performance in which nearly nude participants rub themselves with paint, plastic and raw meat.

And despite the extraordinary influence of black and Hispanic art forms, like graffiti and hip-hop — noted cursorily in ephemera-filled vitrines and in Polaroids by Martin Wong — one of the few images of a black man is Robert Mapplethorpe's 1983 photograph of the muscle-ripped Derrick Cross. You can see why images like this — taken from behind, with his head out of the frame — published in "The Black Book" (1986), incensed artists like Glenn Ligon, whose "Notes on the Margin of the Black Book" (1991-93), took Mapplethorpe to task for his objectification and sexual stereotyping of black men.

Also included in "Downtown Pix" are a couple of portraits of Alvin Ailey taken by Robert Alexander, a photographer for SoHo Weekly News, who documented dance.

You wonder how much the show is a product of Mr. Gefter's curatorial vision and how much he was limited by the Fales Archives, even though it holds more than 5,000 images. There is a strong black-and-white, art-photography flavor to the show; at times it feels anachronistic for a period when artists were making the switch to color photography. Mr. Gefter is also the author of "Photography After Frank" (2009), a collection of writings whose title nods to Robert Frank, whose artfully bleak and blurry images serve almost like a template for the show's aesthetic.

A splash of color comes in a grid of 42 snapshots made by Mr. Trinidad, the poet, who is an avid collector of Barbie paraphernalia. Mr. Trinidad photographed his dolls in their plastic habitats, creating a tongue-in-cheek archive that also calls to mind Laurie Simmons's more self-consciously arty photographs. Accompanying the photos is a sestina by Mr. Trinidad called "Playing With Dolls," in which his mother defends his doll habit ("He's a creative boy"), and his father calls him a sissy.

A few other decisions about how to present downtown art are interesting, like the one to marginalize Warhol, who gets his own section of Polaroids in the basement. Likewise, Keith Haring and Jean-Michel Basquiat, who have overwhelmed many downtown '80s histories, are virtually absent.

There are some amazing inclusions, however, like the film "Beehive" from 1985, a delirious pastiche that feels like a postmodern mix of Looney Tunes, "Pee-wee's Playhouse" and Balanchine. Juxtaposed with a black-and-white video of a 1972 performance by Grand Union, an Yvonne Rainer offshoot, you get the full range of downtown's development, from serious, hermetic and formalist to zany, hallucinogenic and ironic.

Like "The Downtown Show" or "The Pictures Generation, 1974-1984" at the Metropolitan Museum of Art last year, this exhibition is essentially another preliminary history of art in the '70s and '80s. The Fales Library has become the biggest repository of downtown archives, which is paradoxical, since New York University is often seen as the biggest institutional gentrifier of the East Village and its environs. What that means, however, is that "Downtown Pix" is probably just one iteration of a show and a history that will continue to be presented, tweaked and re-presented over time.

"Downtown Pix: Mining the Fales Archives, 1961-1991" continues through April 3 at the Grey Art Gallery, 100 Washington Square East, Greenwich Village; (212) 998-6780, nyu.edu/greyart.

<http://www.nytimes.com/2010/01/15/arts/design/15downtown.html?ref=design>

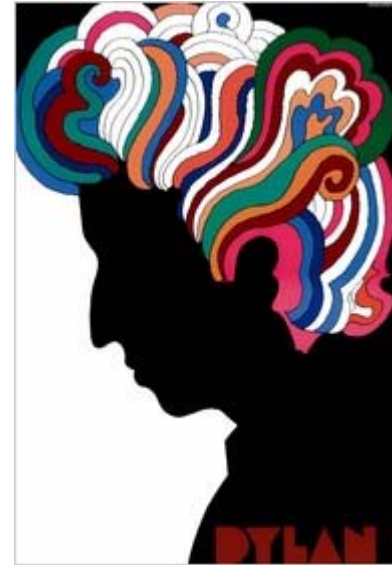
A Guided Tour in the Palm of Your Hand

By ROBERTA SMITH

“Design USA: Contemporary Innovation” at the Cooper-Hewitt, National Design Museum is less an exhibition than an extra-large design seminar in your head.

The show offers an array of objects and oddities, from household appliances to models for the sets of the musical “Hairspray,” punctuated by screens showing Web sites in action, among them one that locates pickup basketball games in New York. A few screens are actually interactive: an archive of the Target chain’s design commissions since 1999, for example, or the online graphic accompaniments to coverage by The New York Times of Hurricane Katrina and the 2008 presidential election.

But the bulk of the exhibition takes place in the palm of your hand, on a specially programmed iPod Touch, the nonphone (but wireless-enabled) version of the iPhone. Apple has lent the museum a hundred of the devices in what is either a brilliant promotional move or — given the Cooper-Hewitt’s design-minded demographic — a case of pushing to the converted. They provide access to a wealth of interviews, slide shows and snippets of performances, all related to the 78 architects and designers represented in the show. Available free, this device sends the traditional audio guide the way of the one-horse buggy.



It also turns the museum into your own private rabbit hole. The guide may be coming soon to an art exhibition near you, where it could be a fatal distraction from the art on view. But it works seamlessly in a show that is design through and through.

“Design USA” is unusual in other ways. It displays work by the recipients of the National Design Awards, established by the White House Millennium Council in 2000 and presented annually to winners chosen by a jury selected anew each year by the Cooper-Hewitt. The awards are given in various categories, including architecture, product design, fashion, interior design, landscape design, corporate achievement, lifetime achievement and “design mind” (for writers and curators as well as designers).

All these factors make “Design USA” less curator- or theme-driven than most exhibitions, and more like a reel of trailers from the last decade of Oscar winners in the big categories. There are wild swings between the essential and the frivolous, the familiar and the esoteric. There’s a dress by Ralph Rucci covered in matte sequins, then there’s a flat-screen monitor (Apple) on which the indispensable Google shows off some Google tricks.

But back to the iPod guide. Don’t even think about not using it because then you won’t truly see the show. Some of the videos and most of the Web sites appear on fixed flat screens, but without the guide, you’ll mostly find yourself skimming across most of the nondigital displays: building-material samples, architectural models and objects from cutlery to office chairs.

Even with it, you may feel oppressed by the relentless white metal shelving that holds most of this real-world stuff or the frequent text and photo panels. But this system organizes the show’s sprawling content, playing skeleton to its iPod brain. Both were designed by 2x4, a New York studio that won the 2006 award for communication.

At times the combination of digital and physical meshes beautifully. On the guide, Jay Meschter, director of the Innovation Kitchen, a Nike product design lab, recounts how he and his team whittled away at the

traditional track shoe until they came up with the feather-light Zoom Victory Spike for the Beijing Olympics. A transparent model of the shoe spins on the tiny screen, showing how it adapts the principle of suspension bridges. The actual shoe is on display in a vitrine, whole and dissected.

Sometimes the iPod segment is much more illuminating than the gallery display. You'll get a much stronger sense of the work of the stage designer Robert Wilson (lifetime achievement, 2001) from the guide's six minutes of a revival of the opera "Einstein on the Beach," which Mr. Wilson designed and directed, than from his two insipid drawings from a production of "King Lear."

Sometimes the physical objects are self-sufficient. You can have a quasi-religious experience seeing the first, rather bulky commercial laptop computer, designed in the early 1980s by Bill Moggridge, the Cooper-Hewitt's incoming director and the 2009 lifetime-achievement honoree. Next to it, Mr. Moggridge's nifty bright red space heater from 1973, which resembles a vertical file lying on its side, seems to bow in veneration. (Even so, Mr. Moggridge's turn on the iPod is extremely interesting.)

And occasionally there's not much on either side of the divide. Four photo panels of the unfortunate, art-killing East Building of the National Gallery of Art in Washington represent I. M. Pei (lifetime achievement, 2003); the guide adds only a few photographs of his latest work, the Museum of Islamic Art in Qatar.

The intelligence of some of the recipients is inspiring: tune into Walter Hood (landscape design, 2009). But sometimes they outtalk their work. The architects Billie Tsien and Tod Williams (architecture, 2003) are eloquent regarding their American Folk Art Museum, and much of what they say about its materials, details and varying perspectives is true. Still, that doesn't stop its exterior from being too starkly at odds with its interior, or its details from eating up that interior, leaving little space for art.

The show — overseen by Jeannie Kim, National Design Awards manager, and Floramae McCarron-Cates, an associate curator at the Cooper-Hewitt — opens with a gallery devoted to the lifetime-achievement recipients, whose iPod videos can be especially affecting. The graphic designer Milton Glaser (2004) — who has already given us Pop-style posters like the one for Bob Dylan here, as well as the "I ♥ New York" logo — shares decades of wisdom about the role of design, and art, in society.

Then there's the great midcentury designer Eva Zeisel (lifetime achievement, 2005), now 103. Hunched over and unable to walk, she is shown working in finely tuned rapport with her assistant, Olivia Barry. Ms. Zeisel is doing just fine in the new century, as seen here in an exuberant teapot and other recent designs.

The show closes with the design-mind recipients. On the flat screens there's a bittersweet short documentary about Robert Venturi and Denise Scott Brown (2007), who together got the postmodern-architecture ball rolling. Its reminder that Mr. Venturi received the lion's share of credit (and the Pritzker Prize) for their joint ideas can set off a slow boil. Many designers, architects and corporations make environmental responsibility a top priority. The biggest thinker in this regard is Amory B. Lovins, last year's design mind, a former physicist turned environmentalist and writer who advocates what he calls natural capitalism: an approach that sees the welfare of people and nature as essential to the survival of the system.

Design, Mr. Lovins says in a video commentary, "literally shapes our world, creates most of its problems and can profitably solve them instead." Here's hoping that he turns out to be right.

"Design USA: Contemporary Innovation" is on view through April 4 at the Cooper-Hewitt National Design Museum, 2 East 91st Street, Manhattan; (212) 849-8400, cooperhewitt.org.

<http://www.nytimes.com/2010/01/15/arts/design/15design.html?ref=design>

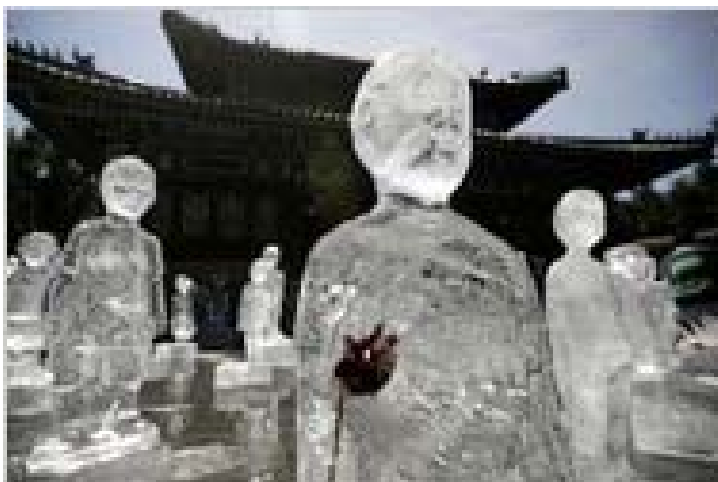
For Expatriates in China, Creative Lives of Plenty

By DAN LEVIN

BEIJING

THERE was a chill in the morning air in 2005 when dozens of artists from China, Europe and North America emerged from their red-brick studios here to find the police blocking the gates to Suojiacun, their compound on the city's outskirts. They were told that the village of about 100 illegally built structures was to be demolished, and were given two hours to pack.

By noon bulldozers were smashing the walls of several studios, revealing ripped-apart canvases and half-glazed clay vases lying in the rubble. But then the machines ceased their pulverizing, and the police dispersed, leaving most of the buildings unscathed. It was not the first time the authorities had threatened to evict these artists, nor would it be the last. But it was still frightening.



“I had invested everything in my studio,” said Alessandro Rolandi, a sculptor and performance artist originally from Italy who had removed his belongings before the destruction commenced. “I was really worried about my work being destroyed.” He eventually left Suojiacun, but he has remained in China. Like the artists' colony, the country offers challenges, but expatriates here say that the rewards outweigh the hardships. Mr. Rolandi is one of many artists (five are profiled here) who have left the United States and Europe for China, seeking respite from tiny apartments, an insular art world and nagging doubts about whether it's best to forgo art for a reliable office job. They have discovered a land of vast creative possibility, where scale is virtually limitless and costs are comically low. They can rent airy studios, hire assistants, experiment in costly mediums like bronze and fiberglass.

“Today China has become one of the most important places to create and invent,” said Jérôme Sans, director of the Ullens Center for Contemporary Art in Beijing. “A lot of Western artists are coming here to live the dynamism and make especially crazy work they could never do anywhere else in the world.”

Rania Ho

A major challenge for foreigners, no matter how fluent or familiar with life here, is that even if they look like locals, it is virtually impossible to feel truly of this culture. For seven years Rania Ho, the daughter of Chinese immigrants born and raised in San Francisco, has lived in Beijing, where she runs a small gallery in a hutong, or alley, near one of the city's main temples. “Being Chinese-American makes it easier to be an observer of what's really happening because I'm camouflaged,” she said. “But it doesn't mean I understand any more what people are thinking.”

Still, Ms. Ho, 40, revels in her role as outsider in a society that she says is blindly enthusiastic about remaking itself. She creates and exhibits work by both foreign and Chinese artists that often plays with China's fetishization of mechanized modernity. Because she lives so close to military parades and futuristic architecture, she said that her own pieces — like a water fountain gushing on the roof of her gallery and a cardboard table that levitates a Ping-Pong ball — chuckle at the “hypnotic properties of unceasing labor.” She said they are futile responses to the absurd experiences she shares with her

neighbors, who are constantly seeing their world transform before their eyes. “Being in China forces one to reassess everything,” she said, “which is at times difficult and exhausting, but for a majority of the time it’s all very amusing and enlightening.”

Joseph Ellis

When Joseph Ellis, 25, arrived from New York in 2005 to begin his studies at the Central Academy of Fine Arts, there was no car to meet him, nor a place to stay. He spoke no Chinese. For months his teachers ignored him. But last spring Mr. Ellis became the only Westerner to graduate from the prestigious school’s sculpture program, winning the award for best thesis. “Chinese university is full of politics and lots of teachers are Communist Party members,” so his triumph irked them, he said, standing in his 10,760-square-foot studio, for which he pays \$245 a month.

To succeed, Mr. Ellis “became totally Chinese,” becoming fluent in Mandarin and dutifully mastering *guanxi*, or connections. He poured tea for his professors, carried their luggage and gave the right gifts. “In exchange they gave me work and respect,” he said. In 2008 he earned \$70,000, making sculptures for Chinese collectors and corporations like Bank of America and Chevron. Greenpeace commissioned him to make 100 life-size ice sculptures of children, which were left to melt in a Beijing park to raise awareness of global warming. (Above left, his 30-foot-tall tree for a Beijing hotel made of 2,000 ceramic teapots.)

Mr. Ellis works in a range of mediums, including large sculpture, ceramic ware and printmaking. He is obsessed with the tactile process of creating art, literally getting his hands dirty with materials that come from China’s physical landscape.

“America taught me how to think, but China taught me how to make,” Mr. Ellis said, adding that he had no immediate plans to return to the United States. He creates much of his sculpture and ceramics in Jingdezhen, a city in south China. Houses are made of clay, and shops sell a rainbow of glazes. “It’s the land of Willy Wonka for clay artists,” he said.

Alessandro Rolandi

The freshness of contemporary art and the ease with which it is manufactured here is a powerful draw for Western artists. “It’s the closest thing to a Renaissance workshop, but sort of postmodern,” Alessandro Rolandi yelled over the clangs of men hammering steel at a factory outside Beijing, where he now stores many of his pieces. A native of Milan who has lived in France and Spain, Mr. Rolandi, 38, arrived in China during the SARS epidemic of 2003 with only the phone number of a Chinese artist given to him by a friend. He soon built friendships with many Chinese artists, who helped him gain a foothold in the Chinese art world.

Since his arrival he has seen much of his adopted city razed and rebuilt. It is this ephemeral aspect of life in Beijing that emerges in his sculptures and performances, which he said give him “the opportunity to transform the energy of a place, for a while, into something different.”

Mr. Rolandi has performed poetry and experimental theater pieces at Chinese galleries and art fairs in order to reclaim creative expression from what he calls “the artist-market sphere” and has also made some socially conscious works, including a reverse question mark written in flour on a wall in his neighborhood, a symbol of doubt in society seduced by modernization.

China has given Mr. Rolandi the chance to hone a creative *chutzpah* unfettered by the distraction of aggressively marketing himself. “I’m humble, which is limiting in the West,” he said. “I don’t go to every opening and attack every curator.” But to create art in Beijing “you need courage,” he added. “If I go back to work in the West, it will be because of what I learned and dared to do in China.”

Helen Couchman

China popped onto Helen Couchman's radar around 2000, when, she said, she "first saw gorgeous little tidbits of something far away": glossy photos in British magazines of ice palaces in the northern city of Harbin and sweeping tales of the country's frenetic experiment with modernization. In 2006 she stepped off the Trans-Siberian Railway and into the chaos of Beijing's main train station, and after three days of wandering around she knew she wanted to live here.

As a photographer she found the manic pace of Olympic construction irresistible, along with the cost of living as compared with London, her home for 15 years. "A £4 tube ticket would buy my dinner here," she said. Ms. Couchman, 36, who is British, moved to Beijing a year later, and though she sells most of her work in Europe, she said, the "shapes and designs here have completely saturated my work."

In her most recent work, at right, she poses naked behind a large fan, a traditional Chinese accessory that serves as an emblem of the camera, behind which she is frequently shielded.

She is more than a documentarian. Her book "Workers" illustrates her personal engagement with China. In December 2007 she slipped behind the screens surrounding the construction of the Olympic park and shot portraits of 146 migrant laborers. She returned the next day with two sets of prints, giving each subject a copy to keep and having workers write their name and hometown on the other, which she compiled for the book. "Their families couldn't afford to come to Beijing and see their role in history," she said. "Now they have this document, like I would have a graduation or wedding photo."

Alfredo Martinez

While some expat artists find fame in China, others seek anonymity. One afternoon in August 2007 the Beijing police burst into Alfredo Martinez's hotel room, which was filled with drawings of guns and bombs, and demanded to know if he was a terrorist. The maid had found the sketches, which looked very much like blueprints, and the hotel alerted the authorities.

Mr. Martinez, a 6-foot-2-inch, 300-pound Brooklyn native, stood his ground. "You idiots," he said. "I'm an artist. Either arrest me or get out." The men in uniform left, but Mr. Martinez, 43, did not. Today he remains in Beijing, spending much time at a 24-hour Internet café and squatting at a friend's countryside hut that he calls "my little Ted Kaczynski setup." There he assembles models of assault rifles and draws weapons on paper.

China may seem an unlikely destination for Mr. Martinez, who spent 21 months in a United States federal prison for forging drawings by Jean-Michel Basquiat. But survival is easier in Beijing than in gentrified SoHo, where he used to live, and while his stint behind bars made him notorious, his creativity was suffocating. "In New York I felt like I was making forgeries of my own work," he said.

Mr. Martinez often collaborates with Byron Hawes, 30, a Canadian who arrived in Beijing three years ago after a job with the United Nations. Together they have rejuvenated Mr. Martinez's style, transforming his renderings from the facsimiles of his early years into abstract graffiti collages, top. Even his guns approach fantasy — toys more G.I. Joe than Blackwater.

Mr. Martinez appears to have found his element. "In China there's a certain kind of lawlessness," he said, fingering the barrel of a mock assault rifle he built from parts bought at Beijing flea markets. "The whole country's on the hustle. It's like New York in the '70s. I fit in here."

<http://www.nytimes.com/2010/01/10/arts/design/10expatsweb.html>

Managing Disasters With Small Steps

By HENRY FOUNTAIN

A week ago, Elizabeth Sheehan, the founder of Containers to Clinics, a nonprofit organization in Dover, Mass., was preparing to deploy the group's first medical clinic overseas. Made from two shipping containers, it was to be sent to the Dominican Republic, where it would begin to fulfill the group's long-term goal of building health care infrastructure in developing countries through networks of small container clinics in rural areas.

Then, last Tuesday, a magnitude 7 earthquake struck the Dominican Republic's neighbor, Haiti. Hospitals in the capital, Port-au-Prince, were destroyed or damaged, and basic medical care was practically nonexistent. Ms. Sheehan said her donors immediately started calling her. "They all said, 'Why don't you send it there?'" she said.

Now, the group may dispatch the clinic, which has two examining rooms, a laboratory and a pharmacy, to Port-au-Prince if a medical team and supplies can be arranged.

"It can be used in this disaster situation," Ms. Sheehan said, and then left in Haiti or sent on to Bani, on the Dominican Republic's south coast, to fulfill the original mission. "We are committed to long-term primary health care for women and children."

Containers to Clinics is one of many innovative approaches to building or rebuilding infrastructure in developing countries, to help forestall disasters or, as in Haiti, recover from one. Among them are new ideas and projects to supply quality housing, clean water, proper waste treatment and affordable energy, in addition to health care.

Their promoters share a belief that while the conventional top-down approach, by governments and large relief agencies coming in with large projects, works for initial relief and recovery, long-term reconstruction — "building back better," in the parlance of redevelopment specialists — requires more involvement of local people.

"You can't just sweep in from outside and drop something in and say, 'This is exactly what you need,'" said Laura Sampath, manager of the International Development Initiative at the Massachusetts Institute of Technology. "It has to be almost driven from the community."

The M.I.T. effort includes the D-Lab, whose instructors and students work on low-tech solutions to infrastructure problems and spend time in the field implementing them. Among the projects are ones to manufacture ceramic water filters in Ghana; install chlorine dispensers to treat drinking water in Kenya; and develop a bicilavadora, a pedal-powered washing machine, in Peru.

"We're graduating engineers who realize it's important to talk to people first," Ms. Sampath said.

Ms. Sheehan said converting old shipping containers into clinics was just a first step; her group must find doctors and nurses to staff them, as well as drugs and supplies. "We're committed to putting in the human system as well," she said. So partnerships with local health groups are crucial.

At the Appropriate Infrastructure Development Group, a small nonprofit organization in San Francisco, projects are also developed from the ground up by providing support to local entrepreneurs, said Peter Haas, its founder.

Mr. Haas spoke while traveling to Haiti, where, before the earthquake, his group had been set to announce a competition for local entrepreneurs to develop plans for infrastructure projects. The competition has been delayed, and the group has added a new category: earthquake-resistant housing.

In Haiti, Mr. Haas's group has already been helping Coopen, a business cooperative in Cap Haitien that will collect organic waste and human waste from public toilets and convert it to biogas, a fuel, for cooking. And in Guatemala, the group has aided a small company, XelaTeco, that builds hydroelectric projects for rural villages.

"We're really not trying to dump some new expert solution on the population," Mr. Haas said. Working through local businesses, he said, ensures that ideas that do not work do not stay around. "If a business fails and the market doesn't accept the product, it disappears," he said.

Malcolm G. Anderson, a professor in the School of Geophysical Sciences at the University of Bristol in England, said: "With a bit of support, the poorest people can provide infrastructure, they can do things. The fundamental thing is to change people's behavior" by involving them in the effort.

With help from the World Bank, Dr. Anderson has undertaken projects in St. Lucia and elsewhere in the Caribbean to reduce disaster risk in hilly shantytowns. These unplanned urban areas typically have no drainage infrastructure, and heavy rains can saturate the ground, leading to mudslides.

Dr. Anderson's solution is to help local people understand the drainage problem, work with them to design a solution (usually involving a simple network of drains to move rainwater off risky slopes) and hire them to build it. "People have a really good understanding of the fundamentals of what's going on," he said.

Many of these infrastructure projects are small in scale, dwarfed by the scope of disasters like the earthquake in Haiti. But some redevelopment specialists say that by training government and relief agency officials in their bottom-up methods, the efforts can be scaled up.

After studying reconstruction work in western India following a 2001 earthquake that killed more than 20,000 people, Elizabeth A. Hausler, an engineer, founded Build Change to help communities build earthquake-resistant housing. In India, she found that the top-down approach did not work. "Homeowners were not really involved," she said. "Contractors would swoop in and build a bunch of houses for people and leave."

Those houses were often not appropriate for the culture or the climate, she said. For example, they might have the main door on the street, when homeowners wanted it on the courtyard. "If a door is in the wrong place, then the homeowner is going to knock a hole in the wall — and that's not good for the structure," she said.

Dr. Hausler's approach, carried out in Indonesia after the 2004 earthquake and tsunami and in China after the 2008 Sichuan quake, has been to involve homeowners in the design and building process, modifying traditional designs to improve earthquake resistance. Along the way she has trained aid officials and worked with local governments to enforce building standards. "That was a good way of reaching more homeowners," she said.

Her organization is now developing a plan to help rebuild homes in Haiti, where many of the destroyed buildings were made of concrete block, without adequate reinforcement against shaking. "I imagine we'll have the same kind of program in Haiti," she said.

She said she was convinced that the bottom-up method was best for rebuilding after that kind of disaster: "Really, you'd have to have your head in the sand to not buy into this approach."

<http://www.nytimes.com/2010/01/19/science/19reli.html?ref=science>

When Built-In Antifreeze Beats a Winter Coat

By Sean B. Carroll

In the bleak midwinter
 Frosty wind made moan,
 Earth stood hard as iron,
 Water like a stone;
 Snow had fallen, snow on snow,
 Snow on snow,
 In the bleak midwinter
 Long ago.



— Christina Rossetti (1872)

As the mercury plunges to its annual lows, those of us at higher latitudes retreat to cozy shelters. We might sympathize with the birds and the squirrels that endure the subfreezing cold outside and fill some feeders, but we don't give any thought to smaller, less appealing creatures — the insects and spiders, for instance, that inhabited the backyard or woods in the summer.

They will re-emerge in the spring, so somehow they must make it through the bitter cold. How do these animals survive the deep freeze without the benefit of fur or feathers?

The threat to life at low temperatures is not really cold, but ice. With cells and bodies composed mostly of water, ice is potentially lethal because its formation disrupts the balance between the fluids outside and inside of cells, which leads to their shrinkage and irreversible damage to tissues.

Insects have therefore evolved all sorts of ways to avoid freezing. One strategy is to escape winter altogether. Butterflies like the monarch migrate south. A great solution, but this is a relatively rare capability. Most insects remain in their local habitat and must find some other way to avoid freezing. They evade the ice by crawling into holes or burrows below the snow cover and frost line, or, as some insect larvae do, by overwintering on the bottoms of lakes and ponds that do not completely freeze.

But many insects, and other animals, defend themselves against direct exposure to subfreezing temperatures through biochemical ingenuity, by producing antifreeze. In [a previous column](#), I explained how different animal species defend themselves against predators with the same molecule acquired from their environment. By contrast, the story of defense against the cold is one of widespread and diverse innovations.

The first animal antifreezes were identified several decades ago in the blood plasma of Antarctic fish by Arthur DeVries, now at the [University of Illinois](#), and his colleagues. The ocean around Antarctica is very cold, about 29 degrees Fahrenheit. It is salty enough to stay liquid several degrees below the freezing temperature of fresh water. The abundant ice particles floating in these waters are a hazard to fish because, if ingested, they can initiate ice formation in the gut and then — bang, you have frozen fish sticks. Unless something prevents the ice crystals from growing.

That is what the fish antifreeze proteins do. The tissues and bloodstream of about 120 species of fish belonging to the Notothenioidei family are full of antifreeze. These proteins have an unusual repeating structure that allows them to bind to ice crystals and to lower the minimum temperature at which the crystals can grow to about 28 degrees. That is just a bit below the minimum temperature of the Southern Ocean and about two full degrees lower than the freezing point of fish plasma that does not have antifreeze. This small margin of protection has had profound consequences. Antifreeze-bearing fish now dominate Antarctic waters.

The ability to survive and thrive in frigid water is impressive, but insects must survive much colder temperatures on land. Some, like the snow flea, are active even in winter and can be found hopping about on snow banks when the temperature is as low as 20 degrees. These bugs are not really fleas, but springtails, a primitive wingless insect that can leap long distances using its tail. Laurie Graham and Peter Davies at Queen's University in Kingston, Ontario, isolated antifreeze proteins from snow fleas and discovered that they also had a simple repeating structure that bound to ice and prevented crystal growth.

The snow flea antifreeze proteins have an entirely different composition from those of antifreezes that have been isolated from other insects, like the fire colored beetle, which has antifreeze proteins that are in turn different from those of the spruce budworm caterpillar. And all of these insect antifreezes are distinct from the kind that keeps Antarctic fish alive. Each animal's antifreeze is a separate evolutionary invention.

But insect innovation goes beyond antifreeze. Biologists have discovered another strategy for coping with extreme cold: some bugs just tolerate freezing. In the most northern climates, like the interior of Alaska, midwinter temperatures fall as low as minus 60 degrees Fahrenheit, and snow cover and subzero temperatures can last until May. At these extreme temperatures, most insects are bugsicles. The Alaskan Upis beetle, for example, freezes at around minus 19 degrees. But, remarkably, it can survive exposure to temperatures as low as about minus 100 degrees.

To tolerate freezing, it is crucial that insects minimize the damage that freezing (and thawing) would normally cause. Insects have evolved a variety of cryoprotective substances. As winter approaches, many freeze-tolerant insects produce high concentrations of glycerol and other kinds of alcohol molecules. These substances don't prevent freezing, but they slow ice formation and allow the fluids surrounding cells to freeze in a more controlled manner while the contents of the cells remain unfrozen.

For maximum protection, some Arctic insects use a combination of such cryoprotectants and antifreezes to control ice formation, to protect cells and to prevent refreezing as they thaw. Indeed, a new kind of antifreeze was recently discovered in the Upis beetle by a team of researchers from the University of Notre Dame and the University of Alaska-Fairbanks. Unlike the protein antifreezes of other beetles, snow fleas and moths, the Upis antifreeze is a complex sugar called xylomannan that is as effective at suppressing ice growth as the most active insect protein antifreezes.

The necessity of avoiding freezing has truly been the mother of a great number of evolutionary inventions. This new finding raises the likelihood that there are more chemical tricks to discover about how insects cope with extreme cold.

This is not merely a matter of esoteric Arctic entomology. A long-standing challenge in human organ preservation has been precisely the problem that these insects have solved — how tissues can be frozen for a long time and then thawed out successfully. Research teams are now exploring how to apply insights from the animal world to the operating room.

Sean B. Carroll, a molecular biologist and geneticist, is the author of "Remarkable Creatures: Epic Adventures in the Search for the Origin of Species."

<http://www.nytimes.com/2010/01/19/science/19creatures.html?ref=science>

Scientists Find a Shared Gene in Dogs With Compulsive Behavior

By MARK DERR



Scientists have linked a gene to compulsive behavior — in dogs.

Researchers studied Doberman pinschers that curled up into balls, sucking their flanks for hours at a time, and found that the afflicted dogs shared a gene. They describe their findings — the first such gene identified in dogs — in a [short report this month in *Molecular Psychiatry*](#).

Dr. Nicholas Dodman, director of the animal behavior clinic at the Cummings School of Veterinary Medicine at [Tufts University](#), in North Grafton, Mass., and the lead author of the report, said the findings had broad implications for compulsive disorders in people and animals.

Estimates have [obsessive-compulsive disorder](#) afflicting anywhere from 2.5 percent to 8 percent of the human population. It shows up in behavior like excessive hand washing, repetitive checking of stoves, locks and lights, and damaging actions like pulling one's hair out by the roots and self-mutilation.

The disorder has been used in popular movies and television shows to define characters like the reclusive writer Melvin Udall, played by [Jack Nicholson](#), in “As Good as It Gets” and Adrian Monk, played by Tony Shaloub, in the television series “Monk.”

Similar disorders are known in dogs, particularly in certain breeds, including Dobermans.

Dr. Dodman and his collaborators searched for a genetic source for this behavior by scanning and comparing the genomes of 94 Doberman pinschers that sucked their flanks, sucked on blankets or engaged in both behaviors with those of 73 Dobermans that did neither. They also studied the pedigrees of all the dogs for complex patterns of inheritance. The researchers identified a spot on canine chromosome 7 that contains the gene CDH2 (Cadherin 2), which showed variation in the genetic code when the sucking and nonsucking dogs were compared.

The statistical association led to further investigation to determine for which protein the gene contained instructions. It did for one of the proteins called cadherins, which are found throughout the animal kingdom and are apparently involved in cell alignment, adhesion and signaling.

Cadherins have also been recently associated with autism spectrum disorder, which includes repetitive and compulsive behaviors, said Dr. Edward I. Ginns, senior author of the report in Molecular Psychiatry and director of the Molecular Diagnostics Laboratory at the University of Massachusetts Medical School.

Dr. Dennis Murphy, a psychiatrist who was not associated with the study, said the results had the potential to advance understanding of obsessive-compulsive disorder. Dr. Murphy, also chief of the Laboratory of Clinical Science in the National Institutes of Mental Health's Division of Intramural Research Program, is now working on finding and sequencing the CDH2 gene in humans to see whether it is linked to obsessive-compulsive behavior.

People with obsessive-compulsive disorder often engage in normal behavior that has become extreme, ritualized, repetitive and time-consuming, and suffer from anxiety and obsessive thinking.

Because the disorder involves obsessive thoughts and because of the difficulty of understanding animal cognition, the same kinds of behavior in animals has commonly been referred to simply as compulsive disorder.

As scientists learn more about the underlying molecular causes of this condition, they increasingly use "obsessive-compulsive disorder" to apply to animals and people.

Recent rough estimates by Dr. Karen L. Overall, a veterinarian specializing in animal behavior at the University of Pennsylvania School of Medicine, suggest that up to 8 percent of dogs in America — five million to six million animals — exhibit compulsive behaviors, like fence-running, pacing, spinning, tail-chasing, snapping at imaginary flies, licking, chewing, barking and staring. Males with the problem outnumber females three to one in dogs, she found, whereas in cats the ratio is reversed.

Dr. Overall said dogs usually developed compulsive behavior between ages 1 and 4. Some of the Dobermans in Dr. Dodman's group began earlier, with blanket sucking at around 5 months and flank sucking at 9 months.

Dogs can be treated, but if they are not, compulsive behavior is one of the main reasons that people give them up for adoption or euthanasia, according to veterinary behaviorists.

Dr. Overall said in an earlier paper that environmental causes might outweigh genetic factors in development of compulsive behaviors in some cases.

She said the practice of "hanging" a dog up by its choke collar, a form of discipline advocated by some trainers, produced compulsive behaviors. Dogs from puppy mills or shelters, rescue dogs and those that are confined and bored dogs or anxious also seem prone to compulsive behavior, she said.

Other domestic animals, notably cats and horses, as well as some of the animals at zoos, exhibit compulsive behaviors, including wool-sucking in Siamese cats, and locomotion disorders like stall walking and weaving in confined horses and pacing in captive polar bears, tigers and other carnivores used to ranging across large territories.

Although antidepressants, particularly selective serotonin reuptake inhibitors and clomipramine, a tricyclic antidepressant, and behavior modification have proved effective at controlling compulsive behavior in dogs and people, they do not appear to correct underlying pathologies or causes, Dr. Ginns said. Those causes are likely to be as varied as the compulsive behaviors and as complex as the interplay of multiple genes and the environment.

“Stress and anxiety, as well as physical trauma and illness, can trigger repetitive behavior that then takes on a life of its own,” Dr. Ginns said.

But he believes that in many cases there is an underlying genetic predisposition that responds to environmental stimuli in such a way that once-normal behavior turns into something pathological. Those genetic dispositions may differ markedly between different behaviors.

Some geneticists say that because of their detailed pedigree and the similarity of their genes to those of humans, dogs make an ideal model for studying human behaviors and pathologies, especially those involving complex patterns of inheritance. Few humans keep detailed genealogies for themselves, but they are diligent in recording every detail in the ancestry of their purebred animals.

“Nick and I share an interest in pedigrees,” Dr. Ginns said in explaining how he and Dr. Dodman became collaborators with Kerstin Lindblad-Toh and her gene sequencers at the Broad Institute of M.I.T. and Harvard, the same group that sequenced the dog genome now proving so valuable to both human and canine geneticists.

<http://www.nytimes.com/2010/01/19/science/19dogs.html?ref=science>

Tipping Point? West Antarctic Ice Sheet Could Become Unstable as World Warms



Airborne view of the Pine Island glacier, Antarctica. (Credit: NASA/Jane Peterson)

ScienceDaily (Jan. 18, 2010) — A new study examines how ice sheets, such as the West Antarctic Ice Sheet, could become unstable as the world warms. The team from Oxford University and Cambridge University developed a model to explore how changes in the 'grounding line' -- where an ice sheet floats free from its base of rock or sediment -- could lead to the disintegration of ice sheets and result in a significant rise in global sea level.

'The volume of ice locked up in the West Antarctic Ice Sheet is equivalent to a sea level rise of around 3.3 metres,' said Dr Richard Katz of Oxford University's Department of Earth Sciences, an author of the report. 'Our model shows how instability in the grounding line, caused by gradual climatic changes, has the potential to reach a 'tipping point' where disintegration of the ice sheet could occur.' At the moment the model -- that uniquely takes into account the three dimensional shape of ice sheets -- is still fairly simple, but the researchers hope to eventually include more detail on how ice sheets interact with their base slopes and show the behaviour of individual ice streams.

When the team applied their theoretical and mathematical model to the West Antarctic Ice Sheet they found that, contrary to earlier assessments, a scenario which would see instability grow as the grounding line recedes was likely. In the case of the Pine Island Glacier it may already be occurring. 'Global climate models often assume that, as the world warms, ice sheets will melt at a steady rate, leading to gradual rises in sea level -- but ice sheets are much more complex structures than this,' said Dr Katz. 'We need to do a lot more work to build better models of how ice sheets behave in the real world. Only then can we start to predict how this behaviour might change in the future as the climate changes.'

A report of the research, 'Stability of ice sheet grounding lines', is published in *Proceedings of the Royal Society A*. The research was conducted by Dr Richard Katz of Oxford University's Department of Earth Sciences and Professor M Grae Worster of Cambridge University's Institute of Theoretical Geophysics.

Story Source:

Adapted from materials provided by [University of Oxford](#).

<http://www.sciencedaily.com/releases/2010/01/100116103350.htm>

Being Pear Shaped Protects Against Heart Disease

If you're prone to worrying whether your 'bum looks big in this', particularly after the Christmas period, you can take comfort that there may be health benefits. (Credit: iStockphoto/Jez Gunnell)

ScienceDaily (Jan. 18, 2010) — If you're prone to worrying whether your 'bum looks big in this', particularly after the Christmas period, you can take comfort that there may be health benefits.

Oxford University scientists -- who have looked at all the evidence on the health effects of storing more fat on the hips, thighs and bum, rather than around the waist -- show that having a 'pear shape' is not just less bad for you than an 'apple shape', but actively protects against diabetes and heart disease.

The team from the Oxford Centre for Diabetes, Endocrinology, and Metabolism (OCDEM) have published their summary of the latest research in the *International Journal of Obesity*.

'The idea that body fat distribution is important to health has been known for some time,' says Dr Konstantinos Manolopoulos, one of the paper's authors along with Dr Fredrik Karpe and Professor Keith Frayn.

'However, it is only very recently that thigh fat and a larger hip circumference have been shown to promote health, that lower body fat is protective by itself.'

He adds: 'This protective effect is independent of weight. However, if you put on weight, thigh circumference will increase but your waist circumference will also increase, which over-rides the protective effect.'

'Control of body weight is still the best way to stay healthy, and the advice remains the same: it is important to eat less and exercise more.'

The Oxford researchers explain that the body uses its fat tissues to store energy in the form of fatty acids, which can be released when needed, for example after heavy exercise or a period of starvation. Both tummy and thigh fat handle this process, but fat around the waist is much more active in storing and releasing fatty acids in response to need throughout the day. Thigh fat is used for much longer term storage.



More waist or abdominal fat tends to lead to more fatty acids floating around the body where it can get deposited in other organs like the liver and muscle, and cause harm. This is associated with conditions like diabetes, insulin resistance and heart disease.

Thigh fat on the other hand, traps the fatty acids long term, so they can't get deposited and cause harm.

The scientists also review evidence that abdominal fat and thigh fat release different levels of hormones. Waist fat is known to release molecules called pro-inflammatory cytokines, and inflammation is a process linked to diabetes and heart disease.

Thigh fat might also secrete more beneficial hormones like leptin and adiponectin, Dr Manolopoulos says, although this is unclear at the moment.

Dr Manolopoulos says the typical difference in male and female body shapes, with men more likely to have fat around the waist and women have more fat on their thighs and hips, neatly illustrates the health effects of different body shapes.

'If you looked at a man and woman of the same weight and aged around 40, they would have different weight distributions, and it would be the man that was at higher risk of diabetes and heart disease,' he says.

'However, when women go through menopause, as well as changes in their hormones they tend to see a change in body shape. They lose body fat and move to a more 'male' fat distribution. They then have the same risk of heart disease and diabetes as men.'

It may be possible to use these findings in the future to reduce people's health risks but that is a long way off, cautions Dr Manolopoulos.

'We don't really know how the body decides where to store fat. At the moment we need to understand more about the mechanisms the body uses. Only then will we be able to take the next step and try to influence this.'

'In principle, this should be possible. There is a class of anti-diabetic drugs that is known to redistribute fat in the body from internal organs to fat stored subcutaneously under the skin. This improves symptoms in diabetes,' he says.

The team at OCDEM, funded by the Wellcome Trust, is working to understand the way the body stores and turns over fat. They recently pinpointed two genes that are associated with differences in people's body fat distribution and may be important during embryo development.

'They are weak effects, but this is just a beginning,' says Dr Karpe, one of the research group heads. 'Obesity is a big problem, but it may be that the characteristics of that obesity are more important.'

Story Source:

Adapted from materials provided by [University of Oxford](#).

<http://www.sciencedaily.com/releases/2010/01/100116104535.htm>

Scent of a Woman: Men's Testosterone Responses to Olfactory Ovulation Cues



Women around the world spend billions of dollars each year on exotic smelling perfumes and lotions in the hopes of attracting a mate. However, according to a new study, going "au natural" may be the best way to capture a potential mate's attention. (Credit: iStockphoto/Catalin Plesa)

ScienceDaily (Jan. 18, 2010) — Women around the world spend billions of dollars each year on exotic smelling perfumes and lotions in the hopes of attracting a mate. However, according to a new study in *Psychological Science*, a journal of the Association for Psychological Science, going "au natural" may be the best way to capture a potential mate's attention.

Smells are known to be critical to animal mating habits: Animal studies have shown that male testosterone levels are influenced by odor signals emitted by females, particularly when they are ovulating (that is, when they are the most fertile). Psychological scientists Saul L. Miller and Jon K. Maner from Florida State University wanted to see if a similar response occurs in humans. In two studies, women wore tee shirts for 3 nights during various phases of their menstrual cycles. Male volunteers smelled one of the tee shirts that had been worn by a female participant. In addition, some of the male volunteers smelled control tee shirts that had not been worn by anyone. Saliva samples for testosterone analysis were collected before and after the men smelled the shirts.

Results revealed that men who smelled tee shirts of ovulating women subsequently had higher levels of testosterone than men who smelled tee shirts worn by non-ovulating women or men who smelled the control shirts. In addition, after smelling the shirts, the men rated the odors on pleasantness and rated the shirts worn by ovulating women as the most pleasant smelling. The authors note that "the present research is the first to provide direct evidence that olfactory cues to female ovulation influence biological responses in men." In other words, this study suggests that testosterone levels may be responsive to smells indicating when a woman is fertile. The authors conclude that this biological response may promote mating-related behavior by males.

Story Source:

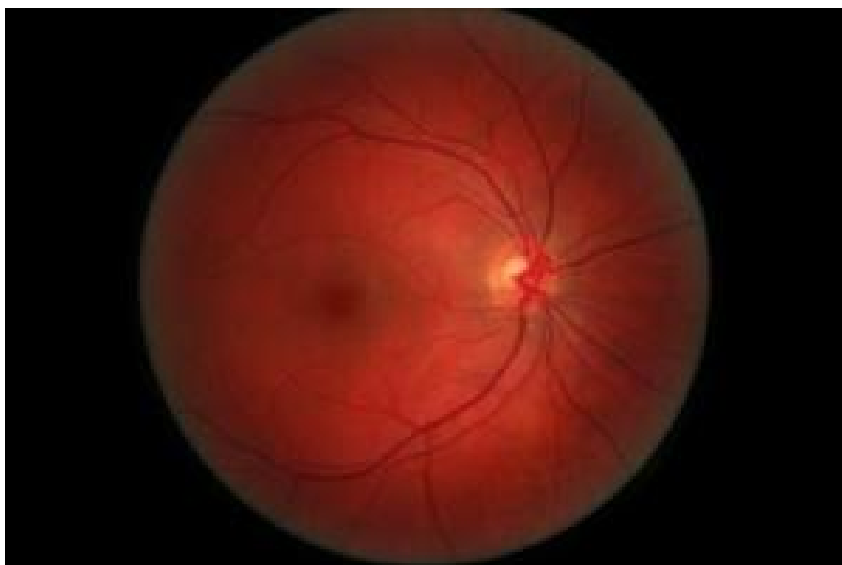
Adapted from materials provided by [Association for Psychological Science](#).

Journal Reference:

1. Miller et al. **Scent of a Woman: Men's Testosterone Responses to Olfactory Ovulation Cues.** *Psychological Science*, 2009; DOI: [10.1177/0956797609357733](https://doi.org/10.1177/0956797609357733)

<http://www.sciencedaily.com/releases/2010/01/100113122514.htm>

More Evidence on Benefits of High Blood Pressure Drugs in Diabetic Eye Disease



The largest study to date of proteins in the retina, above, indicate that high blood pressure drugs may be useful in preventing diabetic eye disease. (Credit: Wikimedia Commons, Danny Hope)

ScienceDaily (Jan. 18, 2010) — Scientists in Massachusetts are reporting new evidence that certain high blood pressure drugs may be useful in preventing and treating diabetic retinopathy, the leading cause of vision loss in people with diabetes. The study, the largest to date on proteins in the retina, could lead to new ways to prevent or treat the sight-threatening disease, they say. The findings are in ACS' *Journal of Proteome Research*, a monthly publication.

Edward Feener and colleagues point out that diabetic retinopathy is a common complication of diabetes, which affects millions of people worldwide. It involves damage to blood vessels in the retina, the light sensitive tissue in the back of the eye. Previous studies suggested that drugs used to treat high blood pressure, including ACE inhibitors and angiotensin receptor blockers (ARBs), may help prevent the condition.

The scientists analyzed proteins from the retinas laboratory mice with normal blood pressure and diabetes and compared them to those of non-diabetic mice. They identified 65 abnormal proteins in the diabetic mice out of more than 1,700 proteins in the study. Treatment with the ARB medication, candesartan, prevented the abnormal changes in more than 70 percent of the proteins.

Story Source:

Adapted from materials provided by [American Chemical Society](#).

Journal Reference:

1. Gao et al. **Angiotensin AT1 Receptor Antagonism Ameliorates Murine Retinal Proteome Changes Induced by Diabetes**. *Journal of Proteome Research*, 2009; 8 (12): 5541 DOI: [10.1021/pr9006415](https://doi.org/10.1021/pr9006415)

<http://www.sciencedaily.com/releases/2010/01/100106193322.htm>

Wilder Weather Exerts a Stronger Influence on Biodiversity Than Steadily Changing Conditions



Diaptomus nudus, a species of zooplankton found in freshwater lakes. (Credit: Danusia Dolecki)

ScienceDaily (Jan. 17, 2010) — An increase in the variability of local conditions could do more to harm biodiversity than slower shifts in climate, a new study has found.

Climate scientists predict more frequent storms, droughts, floods and heat waves as the Earth warms. Although extreme weather would seem to challenge ecosystems, the effect of fluctuating conditions on biodiversity actually could go either way. Species able to tolerate only a narrow range of temperatures, for example, may be eliminated, but instability in the environment can also prevent dominant species from squeezing out competitors.

"Imagine species that have different optimal temperatures for growth. In a fluctuating world, neither can get the upper hand and the two coexist," said Jonathan Shurin, an ecologist at the University of California, San Diego who led the project. Ecologists have observed similar positive effects on populations of organisms as different as herbaceous plants, desert rodents, and microscopic animals called zooplankton.

Now a study of zooplankton found in dozens of freshwater lakes over decades of time has revealed both effects. Shurin and colleagues found fewer species in lakes with the most variable water chemistry. But lakes with the greatest temperature variations harbored a greater variety of zooplankton, they report in the journal *Ecology Letters* January 21.

Their study considered data from nine separate long-term ecological studies that included a total of 53 lakes in North America and Europe. In addition to sampling zooplankton, scientists had also taken physical measurements repeatedly each season for periods ranging from 3 to 44 years.

From these data, they calculated the variability of 10 physical properties, including pH and the levels of nutrients such as organic carbon, phosphorous and nitrogen. Temperatures and the amount of oxygen dissolved in the water at both the surface and bottom of each lake were also included. The authors also teased apart variation based on the pace of change with year-to-year changes considered separately from changes that occurred from season-to-season or on more rapid timescales.

Zooplankton populations respond quickly to changes because they reproduce so fast. "In a summer, you're sampling dozens of generations," Shurin said. "For mammals or annual plants, you would have to watch for hundreds or thousands of years to see the same population turnover."

At every time scale the pattern held: Ecologists found fewer species of zooplankton in lakes with fluctuating water chemistry and greater numbers of species in those with varying temperatures. The authors noted that the temperature variations they observed remained within normal ranges for these

lakes. But some chemical measures, particularly pH and levels of phosphorous, strayed beyond normal limits due to pollution and acid rain.

Environmental variability through time could either promote or reduce biodiversity depending on the pace and range of fluctuations, the authors suggested.

"It may depend on the predictability of the environment. If you have a lot of violent changes through time, species may not be able to program their life cycles to be active when conditions are right. They need the ability to read the cues, to hatch out at the right time," Shurin said. "If the environment is very unpredictable, that may be bad for diversity, because many species just won't be able to match their lifecycles to that."

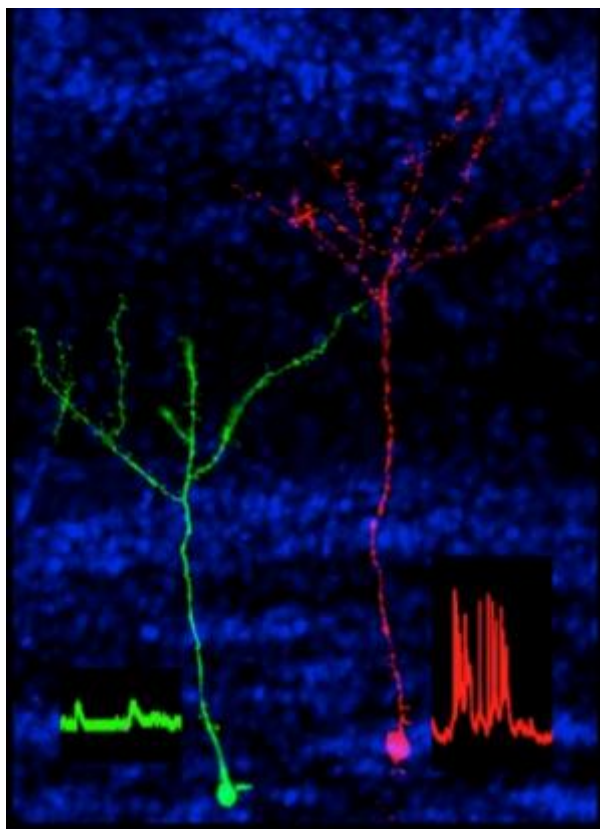
Shurin's 10 co-authors include scientists from environmental agencies in Canada, and universities and research institutes in Canada, Germany, Switzerland and the United States. The Natural Sciences and Engineering Research Council of Canada supported Shurin's work on this study.

Story Source:

Adapted from materials provided by University of California - San Diego. Original article written by Susan Brown.

<http://www.sciencedaily.com/releases/2010/01/100115182629.htm>

'Noisiest' Neurons Persist in the Adult Brain, Research Finds



Neurons genetically rendered hyperactive (red) survive better than normal neurons (green). Traces at bottom of the image show the electrical activity of genetically-manipulated neurons (red trace) and normal neurons (green trace). (Credit: Image courtesy of Carlos Lois)

ScienceDaily (Jan. 17, 2010) — MIT neuroscientists have discovered that when it comes to new neurons in the adult brain, the squeakiest wheels get the grease.

"Before, scientists believed the cells with the most accurate performance were selected and the others were rejected," said Picower Institute for Learning and Memory researcher Carlos Lois. "Our study shows that it doesn't matter what the cells are doing, as long as they are doing something, even if it is wrong. It's like musicians being chosen in an audition based not on how well they play, but how loudly."

Neuronal survival is a key component to the success of cell replacement therapies in the brain. Current therapies have hit a roadblock because the vast majority of grafted cells do not survive and do not integrate into adult brain circuits. "Our discovery of a survival-determining mechanism in new neurons is likely to have a significant influence on such treatments," said Lois, Edward J. Poitras Assistant Professor in Human Biology and Experimental Medicine at the Picower Institute.

In addition, the observation that the "noisiest" neurons have a survival advantage helps explain the prevalence of epilepsy, in which some neurons become hyperactive and fire in an uncontrollable fashion. "Our work suggests that any perturbation that increases the activity of neurons will enhance the likelihood of their survival. Thus, during childhood, when many neurons are still being added to the brain, it is likely that neurons that become pathologically hyperactive will be preferentially selected for survival, and these abnormal neurons will be the trigger for epilepsy," Lois said.



To investigate whether activity levels -- and the source and pattern of activity -- are crucial in governing whether an individual new neuron survives or dies, the researchers used new technology to genetically enhance or dampen the electrical excitability of single adult-generated neurons. An important technological advance, the methods used in this study allow for single-cell genetic manipulation of electrical activity in living animals.

Investigating the molecular signals launched by neuronal activity will potentially lead to new drugs that bolster the survival of new neurons. These drugs could be used to increase the efficacy of treatments that depend on grafting stem cell-derived neurons into the adult brain to treat neurological diseases such as Parkinson's and Alzheimer's.

Story Source:

Adapted from materials provided by [Massachusetts Institute of Technology](#).

Journal Reference:

1. Chiawei Lin, Shuyin Sim, Masayoshi Okada, Alice Ainsworth, Wolfgang Kelsch and Carlos Lois. **Genetically increased cell-intrinsic excitability enhances neuronal integration into adult brain circuits.** *Neuron*, Jan. 14, 2010

<http://www.sciencedaily.com/releases/2010/01/100113122257.htm>



Parks and Recreation Programs Declining as Obesity, Health Concerns Rise



The Astoria Riverwalk near Astoria, Ore., offers local residents a convenient place to walk, jog, bike, skate, or view birds and wildlife along the Columbia River. It's the type of exercise option that can help make a difference in community health, according to researchers at Oregon State University. (Credit: Photo courtesy of Oregon State University)

ScienceDaily (Jan. 17, 2010) — One way to help address the epidemic of obesity in the United States is improved access to pleasant hiking trails and an ambitious parks and recreation program, a recent study suggests, but programs such as this are increasingly being reduced in many states due to budget shortfalls.

The analysis, done by researchers in Oregon, found that some of the health issues that plague overweight and obese people can be aided by a stronger commitment to recreational opportunities. Cutting such programs to save money may be counterproductive to community health, scientists said.

"Research is now showing there's a close correlation between public health and recreational opportunities, both close to home and in state parks," said Randy Rosenberger, an associate professor in the Department of Forest Ecosystems and Society at Oregon State University. "And it's not just about losing weight. It's been found that active obese individuals have lower morbidity and mortality than normal weight individuals who are sedentary."

What's badly needed, the researchers said, are more recreation facilities and non-motorized trails, with information about them made readily available to the public, and more education about the value of physical activity. But even as more findings about these issues are being made, parks and recreation budgets are often under attack.

"The health aspects of outdoor recreational opportunities are poorly appreciated, and often these programs end up getting funded only if there's money left over after they take care of everything else," Rosenberger said. "However, Oregon is faring better than their neighbors due to the allocation of lottery funds to state parks and conservation, renewable in 2014.

"Washington has cut 49 percent of its state parks budget and may close 40 parks," Rosenberger said. "California was facing a 21 percent cut in its parks budget. Even here in Oregon we have a \$39 million backlog in state parks maintenance."

Of some interest, the researchers said, is that the recreational problem is not necessarily a rural-urban divide. Living in a city doesn't necessarily predict less physical activity.

Oregon's larger metropolitan areas sometimes have recreational opportunities and levels of public physical activity that exceed those of people living in more rural, less populated or coastal counties. The recent study identified 11 of Oregon's 36 counties as having inadequate levels of current and projected physical activities -- Baker, Columbia, Crook, Douglas, Harney, Hood River, Josephine, Morrow, Tillamook, Umatilla, and Wallowa County. These areas are considered "at risk" in terms of recreational options and could most benefit from increased opportunities, the scientists said.

"The results suggest that park and recreation providers in Oregon can play a significant role in the health and well-being of Oregon's residents by providing outdoor recreation infrastructure such as trails and sports facilities," the researchers wrote in their report.

Rosenberger said he's seen the effects that more opportunities can have when he was doing research in West Virginia, a state with the unenviable reputation for having some of the nation's highest levels of obesity and sedentary citizens.

"In one town in West Virginia, there were very few sidewalks, no biking or hiking trails, no convenient way for people to exercise locally," he said. "So they converted an abandoned rail line into a new hiking trail; and research found that 25 percent of the people who used it were previously sedentary -- the people who really needed it the most."

Even moderate levels of activity can have a significant impact on health and longevity, even if it doesn't result in weight loss, research is showing. It can affect everything from cardiovascular health, diabetes and cancer to reduced levels of depression, increased energy and vigor, and increases in self-esteem. Informational programs should focus more on health and less on weight loss, the scientists said, and even physicians need to be more conscious of this in their recommendations to patients.

It's necessary for state and local policy makers who are dealing with competing budgetary demands to become more informed about the health benefits of outdoor recreational opportunities and consider them in their allocations of scarce resources, the researchers said in their study, which was published last fall in the Journal of Park and Recreation Administration.

The study was conducted by scientists from OSU, the Oregon Parks and Recreation Department and the Pacific Northwest Research Station of the USDA Forest Service. It was one part of the 2008-12 Oregon Statewide Comprehensive Outdoor Recreation Plan.

"Getting sedentary people physically active will lead to health benefits for them and reduction in the health care burden on society," the scientists wrote in their conclusion. "Gaps in recreation supply are not simply the lack of facilities, although this is important, but also their location, accessibility and diversity of opportunities."

Story Source:

Adapted from materials provided by [Oregon State University](http://www.oregonstate.edu).

<http://www.sciencedaily.com/releases/2010/01/100115112121.htm>

Wild Crows Reveal Tool Skills

A new study using motion sensitive video cameras has revealed how New Caledonian crows use tools in the wild. (Credit: Copyright University of Oxford)

ScienceDaily (Jan. 17, 2010) — A new study using motion sensitive video cameras has revealed how New Caledonian crows use tools in the wild.

Previous work has shown the sophisticated ways in which crows can use tools in the laboratory, but now a team of scientists from Oxford University and the University of Birmingham have investigated tool use in its full ecological context. The researchers recorded almost 1,800 hours of video footage for the study and published their findings in *Proceedings of the Royal Society B*.



In the wild, New Caledonian crows use tools for many purposes, including 'fishing out' large beetle larvae from holes in dead wood. In the new study, the team was able to show for the first time that more larvae were extracted by crows using tools than with their beaks.

They also discovered that adult crows appeared to be much more skilled at obtaining larvae than juvenile crows, suggesting that considerable learning -- possibly from copying more experienced 'larvae fishers' -- is required for crows to become competent at this task.

Aside from recording the video footage the team also collected a large sample of tools that crows had left inserted into larvae burrows. By comparing the length of the tools to the burrows, they found that, on average, longer tools are found in deeper burrows -- suggesting that wild crows, like their cousins in the laboratory, are able to match the 'right' tool to the task. The collection also showed that wild crows do not select tools randomly, from debris on the forest floor, but are more likely to choose leaf-stems than twigs, and are more likely to use tools of a certain size range. The research team included Dr Lucas Bluff, Dr Christian Rutz, Dr Alex Weir and Professor Alex Kacelnik from Oxford University's Department of Zoology, and Jolyon Troschianko from the University of Birmingham.

The work was funded by the UK's Biotechnology and Biological Sciences Research Council (BBSRC).

Story Source:

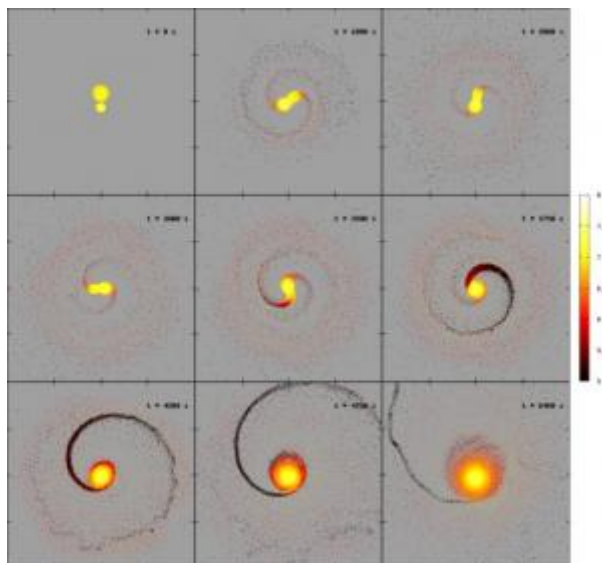
Adapted from materials provided by [University of Oxford](#).

Journal Reference:

1. Bluff et al. **Tool use by wild New Caledonian crows *Corvus moneduloides* at natural foraging sites.** *Proceedings of The Royal Society B Biological Sciences*, 2010; DOI: [10.1098/rspb.2009.1953](https://doi.org/10.1098/rspb.2009.1953)

<http://www.sciencedaily.com/releases/2010/01/100116105504.htm>

Chemical Composition of Red Giant Star With More Carbon Than Oxygen in Its Atmosphere



The attached figure represents the temporary hydrodynamic development (projection in the X-Y plan) of the binary system made up of a helium white dwarf and the core of a red giant, from the zero instant until their complete fusion, in a time of about 6,400 seconds. Every box has an estimated size of about the radius of the Sun. The colours are proportional to the logarithm of density (black is less dense, white is denser). (Credit: Image courtesy of University of Granada)

ScienceDaily (Jan. 17, 2010) — What are the peculiar type-R stars made? Where does the carbon present in their shell come from? These are the questions to be solved by a research work conducted by scientists of the department of Theoretical and Cosmos Physics of the University of Granada (Spain), where they have analysed the chemical composition and the evolutionary state of spectral type R carbon stars to try to explain the origin of the carbon enrichment present in its atmosphere.

Up to now, there had hardly been performed chemical analysis for this type of star. Type-R stars are peculiar red giant stars, as they show a higher presence of carbon than oxygen in their atmosphere (the usual composition in the Universe is exactly the opposite). They can be classified in hot-R stars and cold-R stars, depending on their effective temperature.

In the case of R-cold stars, this is the first chemical analysis of these characteristics carried out worldwide, whereas for R-hot stars, the existing chemical analyses were very old (more than 25 years) and with a lower spectral resolution than that of the UGR study.

The research has been conducted by Olga Zamora Sánchez and supervised by professors Carlos Abia and Inmaculada Domínguez. The scientists of the University of Granada have also studied the essential observational features of type-R stars (distribution in the Milky Way, kinematics, luminosity, etc.) .

A 23-star sample

This research work has determined the chemical composition of a 23 type-R star sample (both hot and cold), using spectrums in the optics with high-spectral resolution, in order to obtain information about the origin of this type of stars. To this end, the scientists performed observations with a 2.2-metre in diameter telescope placed in Calar Alto (Almeria), and carried out a chemical analysis of elements such as carbon, oxygen, nitrogen, lithium and other heavy metals, such as technetium, strontium, barium or lanthanum.



Thus, the scientists have concluded that R-cold stars are identical to type-N stars (or normal carbon stars) originated in the AGB phase, whereas R-hot stars are different. About 40% of the R-hot stars of the sample were erroneously classified up now, and therefore the portion of these stars with regard to red giant stars could be considerably reduced regarding previous estimations thanks to this work.

The most comprehensive analysis

The analysis of the University of Granada is the most complete conducted worldwide up to now (from an observational and theoretical approach) about type-R spectral stars. Besides, the scientists have carried out a numeric simulation for the first time of the most favourable scene for the formation of a R-hot star: the fusion of a helium white dwarf with a red giant. In the end, this scene has turned out to be unviable, and therefore the explanation of the origin of R-hot stars keeps representing a challenge for present star and nucleosynthesis development models.

Although the UGR scientists warn that this type of study has not immediate applications, the information obtained could be very valuable in the future as carbon, as everybody knows, is very important for the possible development of life in the Universe. Therefore, they say, explaining the origin of this element in the stars will be useful to study the production of one of the basic ingredients of life that we know.

The results of this research work will be sent for its publication in the near future in the journal *Astronomy & Astrophysics*.

Story Source:

Adapted from materials provided by [University of Granada](#).

<http://www.sciencedaily.com/releases/2010/01/100114081712.htm>

Search for an Artificial Blood Substitute



Professor Chris Cooper showing the changes in blood color. (Credit: Image courtesy of University of Essex)

ScienceDaily (Jan. 17, 2010) — If the current wave of vampire stories is to be believed, humans can peacefully co-exist with vampires.

The *Twilight* book trilogy has 'vegetarian' vampires living on animal blood, and in the TV series *True Blood*, Japanese scientists have developed a synthetic blood substitute. However, in the most recent blockbuster movie *Daybreakers*, vampires suffer a horrific fate when attempting to drink their blood substitute.

Back in the real world, the hunt for a blood substitute could not be truer. In fact, the quest to create artificial blood is big business, with more than one billion pounds being spent over the last 20 years in an attempt to create a true alternative to blood.

Among those around the globe seeking a viable blood alternative are scientists at the University of Essex who have just submitted a worldwide patent for their engineered hemoglobin.

Over 75 million units of donated blood are given to people worldwide for use in hospitals. However, there are growing concerns about its use in routine operations.



A true blood substitute would be very useful as it could have a long shelf life, be stored away from hospitals, need not be matched for blood group and be guaranteed free of contamination by any present or future viruses.

The starting materials for blood substitutes have included chemicals used to help make atom bombs, cow blood and blood grown in bacteria. However, to date the world's scientists have failed to produce a safe alternative to blood. The real world is more *Daybreakers* than *True Blood*.

The reason for this failure, according to Professor Chris Cooper, a biochemist and blood substitute expert at the University of Essex, lies in hemoglobin, the red molecule inside blood cells that carries oxygen around the body. Outside the protective environment of the red cell, hemoglobin can be toxic.

Hemoglobin normally changes color from red to claret as it transfers oxygen around the body. However, when it is damaged the iron in hemoglobin is oxidized (like a car rusting) to produce dysfunctional brown and green products.

"Basically, hemoglobin produces free radicals that can damage the heart and kidneys," explained Professor Cooper. "The trick with artificial blood is to modify the molecule to be less toxic, but still perform the vital role of carrying oxygen around the body. No one has managed this yet."

What makes Professor Cooper's group engineered hemoglobin so special is that it is less toxic.

Daybreakers envisages a race against time to produce an artificial blood substitute to save vampires and the human race from extinction. In the world of science, the consequences are not so dramatic, but the race is well and truly on.

Professor Cooper's work on blood substitutes is funded by UK government research councils in Biotechnology and Biological Sciences (BBSRC) and Engineering and Physical Sciences (EPSRC).

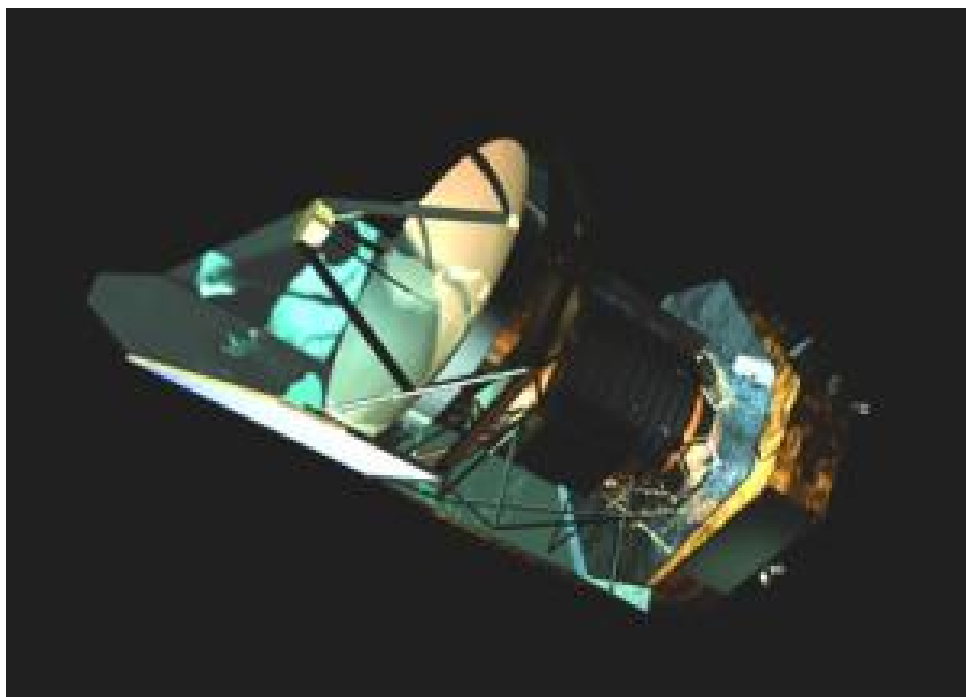
Story Source:

Adapted from materials provided by [University of Essex](http://www.science.org).

<http://www.sciencedaily.com/releases/2010/01/100115204727.htm>



HIFI Resumes Quest for Water in Universe



In the daily communications with Herschel/HIFI strange readings had been received. HIFI was in a state that was not described in the manuals. (Credit: Image courtesy of SRON Netherlands Institute for Space Research)

ScienceDaily (Jan. 17, 2010) — The back up system of HIFI, the state of the art Dutch space instrument on ESA's Herschel space telescope, has been switched on successfully. Due to an unexpected voltage peak in the electronic system HIFI has been inactive for more than 160 days, but on Thursday evening 14 January Mission Control in Darmstadt confirmed that HIFI is now fully capable of performing groundbreaking observations in space again.

The coming three years HIFI, built under the supervision of SRON Netherlands Institute for Space Research, will investigate the physics and chemistry of interstellar clouds of gas and dust. The infrared spectrometer will chart the amount of carbon and water in these gas clouds, which is expected to shed new light on the birth and early development of stars and planets.

Finally, after months of tension and hard work, the engineers and researchers of SRON, the HIFI partners and the European Space Agency (ESA) could breathe freely again that Thursday evening. After some minor last obstacles had been overcome -- it took an extra day warming up the back-up Local Oscillator Control Unit (the module in which the malfunction took place) to a degree that would ensure that the switch on would bear no risks whatsoever -- HIFI is now in full swing again. Just like most space instruments HIFI has a back up system in case of a failure in the electronic system, and all tests have shown convincingly that the control units of the back up system function perfectly. Moreover, the sensors of HIFI perform on the same high level as in the beginning of August 2009, when the infrared spectrometer astonished the scientific community with the first, crystal clear observations of ionized carbon, the most challenging aspect of the measurement programme.

Strange readings

The first indication that something was wrong with HIFI came from mission control in Darmstadt on 3 August 2009. "Groningen, we have a problem." In the daily communications with Herschel/HIFI strange readings had been received. HIFI was in a state that was not described in the manuals. After months of

intensive investigations and deliberations only one consistent scenario for this anomaly remained. Due to an unknown cause -- possibly a cosmic ray hit in the computer memory of one of the auxiliary computers-- the processor of the Local Oscillator Control Unit (LCU) detected an error, rebooted and lost communication with the instrument's main computer. In this process after a little over a second inadvertently the standby switch was activated. This standby switch has been designed to protect the LCU against power drops on the main power line from the satellite, but now fully powered sent a voltage peak through the system. This peak was fatal for one of the diodes in one of the LCU DC/DC convertors.

The past months scientist from ESA, SRON and the HIFI partners have worked intensively to first determine the nature of the problem, and then on the necessary changes in the software to monitor the integrity of the computer memory and to prevent the malfunction from happening again. The first task in this process was to disable the standby switch that normally protects the Local Oscillator Control Unit (LCU) against sudden power drops. Normally it protects the precious Local Oscillator chains but now it got activated at the wrong moment. It was also necessary to subdue or eliminate any remaining voltage peaks in the system. The team achieved this by cutting back in all relay switching activities. Finally a software change ensured that communications with the LCU will not be disturbed again."

Complex technological puzzle

HIFI Project leader Peter Roelfsema: "It turned out to be a very complex technological puzzle that we had to solve based on limited information and under a great deal of pressure. But for all researchers involved, quickly finding an answer to this question was a matter of professional pride. We had to -- and would -- crack the problem with HIFI as soon as humanly possible, but we also had to take the time to be thorough. Scientists all over the world were waiting on the observations from HIFI. There are no certainties in space research; instruments that have to do precision work in the hostile environment of space will always be vulnerable. But we are confident that HIFI can now carry out all scientific observations."

The scientific observations focus on the quest for ionized carbon and water in the Universe. Principal investigator Frank Helmich says: "Ionized Carbon is important to astronomers because it is a good indicator for the warming up and cooling down of the gas from which stars and planets take shape. Therefore with HIFI we get a better idea of how the 'thermostat' of the Universe works. Water is probably the lubricant of the proces which gives birth to stars and planets. The molecule takes care of cooling extremely hot gases -- just like ionized carbon -- which enables them to concentrate to new suns. And HIFI also charts the atmospheres of planets and comets in our solar system. All in all we count on a rich scientific output again. This is really thanks to the great efforts made by all of the researchers at ESA, SRON and the HIFI partners, who have worked together as a single team. The motivation to crack this problem came from the depths of the professional pride of the staff themselves. While I hadn't expected anything else, I'm really very proud of this."

Story Source:

Adapted from materials provided by [SRON Netherlands Institute for Space Research](http://www.sron.nl).

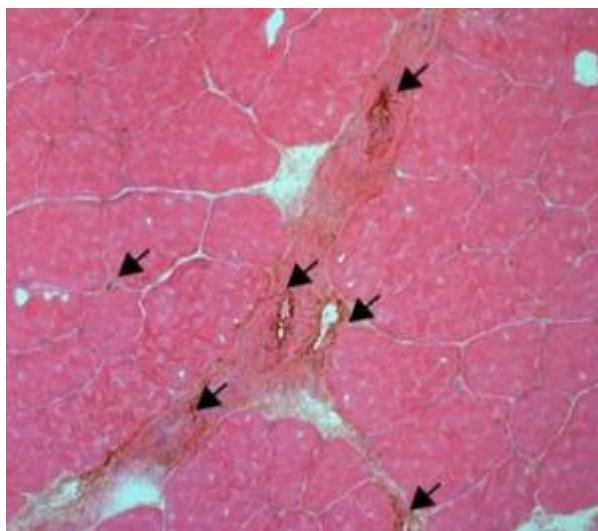
<http://www.sciencedaily.com/releases/2010/01/100115204418.htm>

Gender-Biased Heart Damage

Androgen treatment repaired (arrows) damaged vessels in castrated mice. (Credit: Sieveking, D.P., et al. 2010. J. Exp. Med. doi:10.1084/jem.20091924)

ScienceDaily (Jan. 16, 2010) — A man's male hormones may ward off heart damage by helping vessels around the heart regenerate, suggest Australian researchers in a report posted January 13 in the *Journal of Experimental Medicine*.

While studies have shown that estrogen helps blood vessels regenerate, both in the uterus after menstruation and around the heart after wear and tear, little is known about whether or not men make up for a lack of the female hormone. Some researchers have theorized that this disparity accounts for why men tend to suffer worse heart attacks more often and earlier in life than women. However, Sieveking and colleagues find that this trend may be due to a drop in androgens, a collective term for male hormones, as men age.



Cells derived from the umbilical cord of a human male fetus responded to androgens by moving and multiplying -- activities associated with new vessel growth. Furthermore, castrated mice, which produced fewer androgens, fared poorly after the researchers inflicted vessel damage intended to resemble injuries that occur during a heart attack or a stroke. And treating the castrated mice with androgens hastened their recovery. Therefore, the authors suggest that androgen replacement therapy might one day be used to treat men at risk for heart disease. The therapy currently receives attention for possibly inducing other rejuvenating benefits, such as increased energy and muscle mass. However, it's been approached with caution as androgens have been shown to assist in tumor growth in prostate cancer -- perhaps by stimulating tumor-promoting vessel growth.

Story Source:

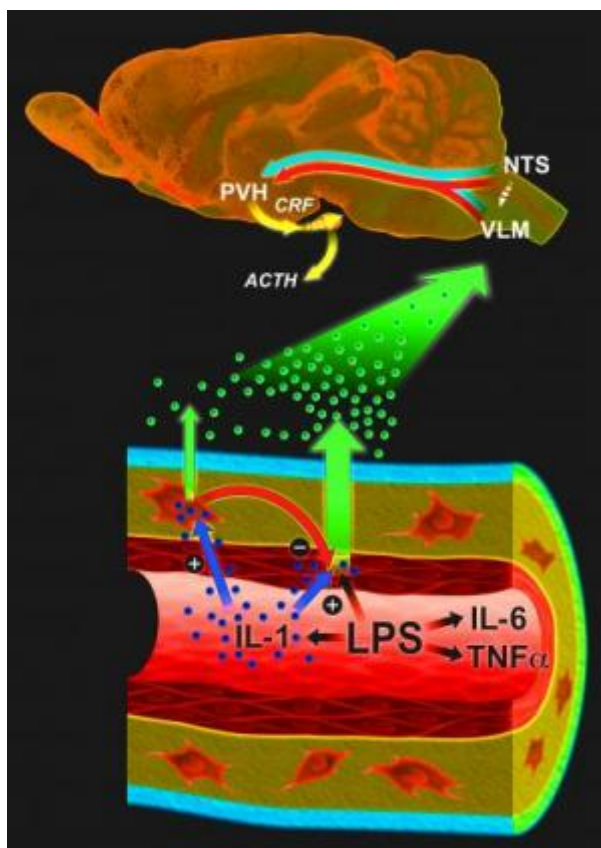
Adapted from materials provided by [Rockefeller University Press](#), via [EurekAlert!](#), a service of AAAS.

Journal Reference:

1. Daniel P. Sieveking, Patrick Lim, Renée W.Y. Chow, Louise L. Dunn, Shisan Bao, Kristine C.Y. McGrath, Alison K. Heather, David J. Handelsman, David S. Celermajer, and Martin K.C. Ng. **A sex-specific role for androgens in angiogenesis.** *Journal of Experimental Medicine*, 2010; DOI: [10.1084/jem.20091924](https://doi.org/10.1084/jem.20091924)

<http://www.sciencedaily.com/releases/2010/01/100113172304.htm>

Dual Role for Immune Cells in the Brain



Endothelial cells and macrophages work together to transmit and modulate the strength of inflammatory immune signals to the brain. (Credit: Image: Courtesy of Jamie Simon, Salk Institute for Biological Studies.)

ScienceDaily (Jan. 16, 2010) — We all have at one time or another experienced the typical signs of an infection: the fever, the listlessness, the lack of appetite. They are orchestrated by the brain in response to circulating cytokines, the signaling molecules of the immune system. But just how cytokines' reach extends beyond the almost impenetrable blood-brain barrier has been the topic of much dispute.

In their latest study, researchers at the Salk Institute for Biological Studies describe how, depending on the nature of the stimulus, resident macrophages lined up along the blood-brain barrier play opposing roles in the transmission of immune signals into the brain.

"These macrophages act as accelerators to enlist the brain's participation in dealing with immune insults, but when necessary slam on the brakes to prevent the central inflammatory response from going overboard," explains postdoctoral researcher Jordi Serrats, Ph.D., who co-led the study with Jennifer C. Schiltz, Ph.D., formerly a postdoctoral researcher in the Salk's Neuronal Structure and Function Laboratory and now an assistant professor at the Uniformed Services University in Bethesda, Maryland.

The Salk researchers' findings, which are published in the Jan. 14, 2010 edition of the journal *Neuron*, may pave the way for novel therapies for sufferers of chronic neurodegenerative diseases, such as Amyotrophic Lateral Sclerosis (ALS), Parkinson's, Alzheimer's and prion diseases, in which central inflammatory mechanisms play an important role.

"The fact that we have identified a potent anti-inflammatory mechanism in the brain presents a new target to intervene in the wide range of central nervous system diseases that possess an inflammatory

component," says the study's senior author, Paul E. Sawchenko, Ph.D., a professor in the Neuronal Structure and Function Laboratory.

In response to an infection, inflammatory cytokines such as interleukin-1 are generated at the site of infection. These cytokines circulate in the blood and communicate with neurons in the brain to engage the hypothalamo-pituitary-adrenal (HPA) axis, an integral part of the brain's stress response machinery. The HPA axis involves the interaction of the hypothalamus, the pituitary gland, which sits just below the hypothalamus and the adrenal glands at the top of the kidneys.

Like a central command center, the hypothalamus sends out corticotropin-releasing factor, which stimulates the pituitary gland to secrete adrenocorticotropic hormone. The latter signals the adrenal glands to ramp up the production of glucocorticoids, which mobilize energy reserves to cope with inflammatory insults. But they also act as very powerful immunosuppressants preventing excessive cytokine production and immune cell proliferation.

"Cytokines are big molecules that don't cross the blood-brain barrier freely," says Sawchenko. "The question of how these molecules access the brain to trigger this whole array of adaptive responses such as fever, inactivity, sleepiness, and activation of the brain's stress response machinery has been a nagging problem in the side of neuroimmunology for many years."

Earlier research by Sawchenko and others suggested a vascular route whereby cytokines interact with vessel walls to generate secondary messengers, which then engage the relevant circuitry in the brain. Tightly packed endothelial cells, which line almost 400 miles of narrow capillaries throughout the brain, are perfectly positioned to record circulating immune signals but they require a very strong signal to become activated. Perivascular macrophages, on the other hand, are more sensitive but don't have direct access to the bloodstream.

To disentangle the exact role of these two cell types, Serrats took advantage of the macrophages' ability to engulf and ingest solid particles. He injected liposomes containing clodronate, a drug that can cause cell death, into the lateral cerebral ventricle. The liposomes were taken up by the macrophages, which were selectively killed off.

Without perivascular macrophages, the animals were unable to respond to blood-borne interleukin-1 and initiate the brain's so-called acute phase responses, which help the body deal with the challenge at hand but also cause the familiar feeling of "being sick." But to their surprise, the Salk researchers found that the same cells put a damper on the pro-inflammatory activities of endothelial cells, which form the lining of blood vessels and are only stirred to action-but very powerfully once they are-when they encounter lipopolysaccharide, a key component of the cell wall of certain bacteria."Many neurodegenerative diseases are worsened by systemic inflammation or infections," says Sawchenko. "Once we identify the molecules that mediate the two-way communication between perivascular macrophages and endothelial cells we can develop strategies for managing the adverse health consequences of central inflammatory responses."

Researchers who also contributed to the study include postdoctoral researchers Borja García-Bueno, Ph.D., and Teresa M. Reyes, Ph.D., at the Salk Institute as well as Nico van Rooijen, Ph.D., a professor at the Vrije Universiteit Medical Center in Amsterdam, The Netherlands. The work was funded in part by the Clayton Medical Research Foundation, the National Institutes of Health, the Spanish Ministry of Education and Science and CIBERSam.

Story Source:

Adapted from materials provided by [Salk Institute](#), via [EurekAlert!](#), a service of AAAS.

<http://www.sciencedaily.com/releases/2010/01/100113122301.htm>

How Music 'Moves' Us: Listeners' Brains Second-Guess the Composer



New research predicts that expectations about what is going to happen next in a piece of music should be different for people with different musical experience and sheds light on the brain mechanisms involved. (Credit: iStockphoto/Anna Bryukhanova)

ScienceDaily (Jan. 16, 2010) — Have you ever accidentally pulled your headphone socket out while listening to music? What happens when the music stops? Psychologists believe that our brains continuously predict what is going to happen next in a piece of music. So, when the music stops, your brain may still have expectations about what should happen next.

A new paper published in *NeuroImage* predicts that these expectations should be different for people with different musical experience and sheds light on the brain mechanisms involved.

Research by Marcus Pearce Geraint Wiggins, Joydeep Bhattacharya and their colleagues at Goldsmiths, University of London has shown that expectations are likely to be based on learning through experience with music. Music has a grammar, which, like language, consists of rules that specify which notes can follow which other notes in a piece of music. According to Pearce: "the question is whether the rules are hard-wired into the auditory system or learned through experience of listening to music and recording, unconsciously, which notes tend to follow others."

The researchers asked 40 people to listen to hymn melodies (without lyrics) and state how expected or unexpected they found particular notes. They simulated a human mind listening to music with two computational models. The first model uses hard-wired rules to predict the next note in a melody. The second model learns through experience of real music which notes tend to follow others, statistically speaking, and uses this knowledge to predict the next note.

The results showed that the statistical model predicts the listeners' expectations better than the rule-based model. It also turned out that expectations were higher for musicians than for non-musicians and for familiar melodies -- which also suggests that experience has a strong effect on musical predictions.

In a second experiment, the researchers examined the brain waves of a further 20 people while they listened to the same hymn melodies. Although in this experiment the participants were not explicitly

informed about the locations of the expected and unexpected notes, their brain waves in responses to these notes differed markedly. Typically, the timing and location of the brain wave patterns in response to unexpected notes suggested that they stimulate responses that synchronise different brain areas associated with processing emotion and movement. On these results, Bhattacharya commented, "... as if music indeed 'moves' us!"

These findings may help scientists to understand why we listen to music. "It is thought that composers deliberately confirm and violate listeners' expectations in order to communicate emotion and aesthetic meaning," said Pearce. Understanding how the brain generates expectations could illuminate our experience of emotion and meaning when we listen to music.

Story Source:

Adapted from materials provided by [University of Goldsmiths London](#).

Journal Reference:

1. Pearce MT, Ruiz MH, Kapasi S, Wiggins G, Bhattacharya J. **Unsupervised statistical learning underpins computational, behavioural, and neural manifestations of musical expectation.** *NeuroImage*, 2009; DOI: [10.1016/j.neuroimage.2009.12.019](https://doi.org/10.1016/j.neuroimage.2009.12.019)

<http://www.sciencedaily.com/releases/2010/01/100115204704.htm>

Excess DNA Damage Found in Cells of Patients With Friedreich's Ataxia

ScienceDaily (Jan. 16, 2010) — Elevated levels of DNA damage have for the first time been found in the cellular mitochondria and nuclei of patients with the inherited, progressive nervous system disease called Friedreich's ataxia (FRDA), says a multicenter research team led by an expert from the University of Pittsburgh Cancer Institute (UPCI). The findings, described in *PLoS Genetics*, shed light on the molecular abnormalities that lead to the disease, as well as point the way to new therapeutic approaches and the development of biomarker blood tests to track its progression.

"In FRDA, mutations in the gene frataxin reduce production of a protein that plays a role in keeping iron levels in balance within mitochondria," explained Bennett Van Houten, Ph.D., Richard M. Cyert Professor of Molecular Oncology and leader of the molecular and cellular cancer biology program at UPCI, and professor, Department of Pharmacology and Chemical Biology, University of Pittsburgh School of Medicine. "Frataxin binds iron and helps build iron-sulfur clusters, which are important constituents of cellular proteins."

"While iron is what allows blood cells to carry oxygen, too much iron is toxic to the body," said Astrid C. Haugen, lead author and program analyst at the National Institute of Environmental Health Sciences (NIEHS), part of the National Institutes of Health (NIH). "Friedreich's ataxia leads to iron overload, setting the stage for cumulative DNA damage that eventually affects patients' nerve and muscle cells."

According to the National Institute of Neurological Disorders and Stroke (NINDS), about 1 out of 50,000 Americans has Friedreich's ataxia. Symptoms appear from 5 to 15 years of age and include ataxia, or gait disturbance, that results from degeneration of nerves in the spinal cord and muscle; muscle wasting; and speech problems. Heart enlargement, arrhythmias, and heart failure are common and often the cause of early death in the most severely affected. Patients typically require wheelchairs within 10 to 20 years after symptoms begin.

For the study, the researchers profiled gene activity in blood samples from FRDA children to search for biomarkers of the disease, as compared to young healthy donors. Those data were compared to blood tests from FRDA adults, and the latter compared to a second group of healthy individuals.

"We saw gene activity patterns that are associated with responses to DNA damage, and our comparisons and follow-up tests showed us that FRDA patients have far more damage than seen in healthy people," said Dr. Van Houten, who noted that everyone has some DNA damage, at various stages of repair, in their cells. "We found gene expression signatures that correlated with frataxin levels, age of disease onset and a standardized measure of patient disability."

"If further testing validates the set of genes and activity profiles as predictive biomarkers, they could be useful in assessing the current status of a patient's illness as well as the response to experimental therapies in clinical trials," he said. "Also, new drug targets might be found in the DNA repair and iron-processing pathways affected by the lack of frataxin, generating much-needed treatment breakthroughs."

The study team includes researchers from NIEHS; NINDS; Durham, N.C.-based Expression Analysis Inc.; Duke University; Université Pierre et Marie Curie, Paris; and Hôpital Pitié-Salpêtrière, Paris.

This work was supported by the NIH Intramural Program and a Bench-to-Bedside award.

Story Source:

Adapted from materials provided by [University of Pittsburgh Schools of the Health Sciences](http://www.sciedaily.com/releases/2010/01/100115094107.htm), via [EurekAlert!](http://www.eurekalert.com), a service of AAAS.

<http://www.sciedaily.com/releases/2010/01/100115094107.htm>



Regimens: Questioning Benefit of Diabetes Test Strips

By RONI CARYN RABIN

People with Type 2 diabetes are often advised to use blood-glucose test strips to monitor their blood sugar levels, but a Canadian analysis has found that routine self-monitoring is not cost-effective for many patients: the strips can cost almost a dollar each, and they prevent comparatively few complications of diabetes.

The finding was part of an analysis that prompted the Canadian Agency for Drugs and Technologies in Health to issue a nonbinding recommendation against routine self-monitoring for many Type 2 diabetics — those who do not take insulin.

Experts in the United States said more studies were needed, but they emphasized that glucose test strips, which are covered by insurance, could be helpful for adjusting diet, exercise and drug regimens.

In addition, they are recommended for Type 2 patients who take insulin or the drugs called sulfonylureas, which stimulate insulin production; those patients are at risk for hypoglycemia, or very low blood sugar.

But for other Type 2 patients, the test strips' benefits fall off sharply.

Another Canadian study reported that more than 1,000 patients would need to use the strips regularly to prevent a single case of kidney failure, for example, and about 500 would need to be treated to prevent a single stroke, amputation or case of blindness.

Rather than rely on test strips, Canadian experts said, patients need to be vigilant about their diet, exercise, weight and blood pressure.

“The message we’d like to impart to those living with Type 2 Diabetes,” said Barb Shea, vice president of the health agency, “is that it takes more than testing your blood to look after your health.”

<http://www.nytimes.com/2010/01/19/health/research/19regi.html?nl=health&emc=healthupdateema>

3

Behavior: Too Much Sitting Shortens Lives, Study Suggests

By RONI CARYN RABIN

A new study from Australia suggests that couch potatoes live shorter lives.

The study followed 8,800 adults ages 25 and older for six and a half years and found that each daily hour of television viewing was associated with an 18 percent increase in deaths from heart disease and an 11 percent increase in overall mortality.

Those who watched television four hours or more a day were 80 percent more likely to die of cardiovascular disease than those who watched two hours or less, and 46 percent more likely to die of any cause. And it did not matter whether they were overweight, according to the study, which appeared Jan. 11 in the online edition of Circulation: Journal of the American Heart Association.

Although it is possible that people who were already ill watched more television than those who were healthy, the researchers tried to rule that out by excluding subjects who already had heart disease and by adjusting for differences in risk factors like diet and smoking.

While the benefits of physical activity have been well studied, there is growing interest among researchers in assessing the effects of being sedentary.

“For many people, on a daily basis, they simply shift from one chair to another — from the chair in the car to the chair in the office to the chair in front of the television,” said the study’s lead author, David Dunstan of the Baker IDI Heart and Diabetes Institute in Victoria, Australia. “Even if someone has a healthy body weight, sitting for long periods still has an unhealthy influence on blood sugar and blood fats.”

<http://www.nytimes.com/2010/01/26/health/26beha.html?ref=research>

Gravel 'traps Exxon Valdez oil'

By Mark Kinver

Science and environment reporter, BBC News

Large quantities of oil spilled during the 1989 Exxon Valdez disaster can still be found beneath gravel beaches in Alaska, a study has discovered.



Writing in *Nature Geoscience*, a team of scientists found that oil just a few inches down was dissipating up to 1,000 times slower than oil on the surface.

They suggested that a lack of oxygen and nutrients in the gravel was slowing the dispersal of the remaining oil.

The results could have implications for cleaning up future spills, they added.

Considered to be one of the worst environmental disasters of its kind, the Exxon Valdez tanker spilled 38,000 tonnes of crude oil into Alaska's Prince William Sound after the vessel hit a reef.

As a result, more than 2,000km (1,250 miles) of coastline was affected, killing thousands of seabirds and having a serious impact on the region's fishing industry.

In the five years after the disaster, the oil was shown to be dispersing at a rate of about 70% each year.

Most clean-up operations in the area ended in 1992 because the remaining oil was expected to disperse within a few years.

Lingering legacy

A later study discovered that the oil was disappearing at a rate of just 4% each year, and that an estimated 20,000 gallons remained in the beaches.

Researchers led by Professor Michel Boufadel from Temple University in Philadelphia, US, carried out a three-year study on a number of beaches to find out the cause behind the lingering deposits.

Prof Boufadel, director of the university's Center for Natural Resources Development and Protection, said the gravel beaches they examined were made up of two layers: a top level that was highly permeable, and a lower level that had very low permeability.

While the two layers were made from the same material, he said the lower level had become compacted as a result of tidal movements, limiting the volume of seawater that was able to penetrate the gravel.

In their paper, the team observed that the upper layer temporarily stored the oil, while it slowly and continuously filled the lower layer.

"You have a high amount of oxygen in the seawater, so you would think that the oxygen would diffuse in the beach and get down 2-4 inches (5-10cm) into the lower layer and get to the oil," said Prof Boufadel.

"But the outward movement of [fresh groundwater] in the lower level is blocking the oxygen from spreading down into that lower level."

He explained that oxygen and nutrients were needed to sustain micro-organisms that "ate" the oil.

However, without the necessary supply of the key ingredients reaching the lower level, the biodegradation of the oil was occurring at a much slower rate.

"We suggest that similar dynamics could operate on tidal gravel beaches around the world, which are particularly common in mid- and high-latitude regions," the team wrote in their paper.

"Thus, our findings are of direct application for the susceptibility of beaches worldwide to long-term oil contamination and provide guidelines for remediating oil-polluted beaches."

They added that climate change was reducing ice cover, "exposing the Arctic to oil exploitation and shipping" and increasing the risk of oil spills in the future.

Professor Boufadel and his team are now exploring ways to deliver the necessary levels of oxygen and nutrients to affected areas to accelerate the dissipation of the remaining oil.

Story from BBC NEWS:

<http://news.bbc.co.uk/go/pr/fr/-/2/hi/science/nature/8465607.stm>

Published: 2010/01/18 23:35:07 GMT

Ancient Egypt's Toxic Makeup Fought Infection, Researchers Say

By SINDYA N. BHANOO



The elaborate eye makeup worn by Queen Nefertiti and other ancient Egyptians was believed to have healing powers, conjuring up the protection of the Gods Horus and Ra and warding off illnesses.

Science does not allow for magic, but it does allow for healing cosmetics. The lead-based makeup used by the Egyptians had antibacterial properties that helped prevent infections common at the time, according to a report published Friday in *Analytical Chemistry*, a semimonthly journal of the American Chemical Society.

“It was puzzling; they were able to build a strong, rich society, so they were not completely crazy,” said Christian Amatore, a chemist at the École Normale Supérieure in Paris and one of the paper’s authors. “But they believed this makeup was healing — they said incantations as they mixed it, things that today we call garbage.”

Dr. Amatore and his fellow researchers used electron microscopy and X-ray diffraction to analyze 52 samples from containers of Egyptian makeup preserved at the Louvre.

They found that the makeup was primarily made by mixing four lead-based chemicals: galena, which produced dark tones and gloss, and the white materials cerussite, laurionite and phosgenite.

Because the samples had disintegrated over the centuries, the researchers were not able to determine what percentage of the makeup was lead.

Although many written texts, paintings and statues from the period indicate that the makeup was extensively used, Egyptians saw it as magical, not medicine, Dr. Amatore said.

In ancient Egypt, during periods when the Nile flooded, Egyptians had infections caused by particles that entered the eye and caused diseases and inflammations. The scientists argue that the lead-based makeup acted as a toxin, killing bacteria before it spread.

But while their research provides a fascinating insight into an ancient culture, the scientists say the makeup is not something that should be used today.

Dr. Amatore said that the toxicity of lead compounds overshadowed the benefits and that there had been many documented cases of poisoning as a result of lead in paints and plumbing in the 20th century.

Neal Langerman, a physical chemist and the president of Advanced Chemical Safety, a health safety and environmental protection consulting firm, said, “You probably won’t want to do this at home, especially if you have a small child or a dog that likes to lick you.”

Nonetheless, Dr. Langerman said, it makes sense that the Egyptians were attracted to the compounds.

“Lead and arsenic, among other metals, make beautiful color pigments,” he said. “Because they make an attractive color and because you can create a powder with them, it makes sense to use it as a skin colorant.”

The issue of lead in makeup continues to be debated in the cosmetics industry, particularly with regard to the small amounts of lead found in some lipsticks.

While some advocacy groups and doctors argue that, over time, lipstick wearers might absorb levels of lead that could result in behavioral issues, the Food and Drug Administration has said that the trace amounts of lead in makeup are too small to cause harm.

“It’s the dose that makes the poison,” Dr. Langerman said, in paraphrasing the Renaissance physician Paracelsus. “A low dose kills the bacteria. In a high dose, you’re taking in too much.”

<http://www.nytimes.com/2010/01/19/science/19egypt.html?ref=science>

Evolution goes from foot to hand

By Victoria Gill
Science reporter, BBC News

Scientists may have solved the mystery of how human hands became nimble enough to make and manipulate stone tools.



The team reports in the journal *Evolution* that changes in our hands and fingers were a side-effect of changes in the shape of our feet.

This, they say, shows that the capacity to stand and walk on two feet is intrinsically linked to the emergence of stone tool technology.

The scientists used a mathematical model to simulate the changes.

Other researchers, though, have questioned this approach.

Campbell Rolian, a scientist from the University of Calgary in Canada who led the study, said: "This goes back to Darwin's *The Descent of Man*."

"The results are quite exciting"
Paul O'Higgins Hull York Medical School

"[Charles Darwin] was among the first to consider the relationship between stone tool technology and bipedalism.

"His idea was that they were separate events and they happened sequentially - that bipedalism freed the hand to evolve for other purposes.

"What we showed was that the changes in the hand and foot are similar developments... and changes in one would have side-effects manifesting in the other."

Shape-shifting

To study this, Dr Rolian and his colleagues took measurements from the hands and feet of humans and of chimpanzees.

Their aim was to find out how the hands and feet of our more chimp-like ancestors would have evolved.

The researchers' measurements showed a strong correlation between similar parts of the hand and foot. "So, if you have a long big toe, you tend have a long thumb," Dr Rolian explained.

"One reason fingers and toes may be so strongly correlated is that they share a similar genetic and developmental 'blueprint', and small changes to this blueprint can affect the hand and foot in parallel," he said.

With this anatomical data, the researchers were able to create their mathematical simulation of evolutionary change.

"We used the mathematical model to simulate the evolutionary pressures on the hands and feet," Dr Rolian explained.

This model essentially adjusted the shape of the hands or the feet, recreating single, small evolutionary changes to see what effect they had.

By simulating this evolutionary shape-shifting, the team found that changes in the feet caused parallel changes in the hands, especially in the relative proportions of the fingers and toes.

These parallel changes or side-effects, said Dr Rolian, may have been an important evolutionary stem that allowed human ancestors, including Neanderthals, to develop the dexterity for stone tool technology.

Robin Crompton, professor of anatomy at the UK's Liverpool University, said the study was very interesting but also raised some questions.

"I am not personally convinced that the foot and hand of chimpanzees are a good model [of human ancestors' hands and feet] - the foot of the lowland gorilla may be more interesting in this respect," he told BBC News.

He pointed out that there was a lot more to the functional shape and biomechanics of the human foot than just its proportions.

Paul O'Higgins, professor of anatomy at the Hull York Medical School, UK, said: "The results are quite exciting and will doubtless spur further testing and additional work."

Story from BBC NEWS:
<http://news.bbc.co.uk/go/pr/fr/-/2/hi/science/nature/8459572.stm>

Published: 2010/01/18 11:12:56 GMT

Astrium develops space power idea

By Jonathan Amos
Science reporter, BBC News

Europe's biggest space company is seeking partners to fly a demonstration solar power mission in orbit.



EADS Astrium says the satellite system would collect the Sun's energy and transmit it to Earth via an infrared laser, to provide electricity.

Space solar power has been talked about for more than 30 years. However, there have always been question marks over its cost, efficiency and safety.

But Astrium believes the technology is close to proving its maturity.

"Today we are not at an operational stage; it's just a test," said chief executive officer Francois Auque. "In order to implement a solution, of course, we would need to find partnerships and to invest, to develop operational systems," he told BBC News.

Those partnerships could comprise space agencies, the EU or national governments and even power companies, he said.

'Safe' system

Space solar power is an attractive concept because it would be clean, inexhaustible, and available 24 hours a day.

The amount of energy falling on photovoltaic cells placed in orbit is considerably greater than the same solar panels positioned on the Earth's surface. In space, the incidence of light is unaffected by clouds, dust or the filtering effects of atmospheric gases.

Critics, though, have always pointed to multiple hurdles - to the cost of launching and assembling large solar stations in orbit, to the losses in efficiency in conversion, and to the safety issues surrounding some wireless transmission methods, particularly those that use microwaves.

Astrium says the latter can be addressed by using infrared lasers which, if misdirected, would not risk "cooking" anyone in their path.

The company has already tested power transmission via laser in its labs, and is now working on improving the efficiencies of the end-to-end system.

Necessary efficiency

Robert Laine, Astrium's chief technology officer, acknowledges however that there are still some big challenges to be overcome.

"Today, we will be limited in power by the size of the laser we can build. That's a prime limitation," he said.

"On the receive side, the conversion of this infrared energy into electricity - that's something which is progressing very fast and we are working with the University of Surrey [in the UK] to develop converters.

"The principle is to get a very high efficiency of conversion of the infrared [laser light] into electricity. If we achieve 80% then it's a real winner."

Dr Laine said a small demonstration of the technology ought to be ready for launch in the coming decade.

"Like any technology, someone has to demonstrate it first before it can become an operational system," he told BBC News.

"We have reached a point where, in the next five years, we could build something which is in the order of 10-20 kW to transmit useful energy to the ground."

Jonathan.Amos-INTERNET@bbc.co.uk

Story from BBC NEWS:

<http://news.bbc.co.uk/go/pr/fr/-/2/hi/science/nature/8467472.stm>

Published: 2010/01/19 16:56:06 GMT

Buildings 'threaten carbon hope'

UK targets for cutting carbon emissions by 2050 will not be met without radical changes to the engineering of buildings, a report says.



One of the study's authors criticised the government's "woeful track record on setting ill-considered targets".

The Royal Academy of Engineering report lays out a groundwork for reducing the environmental impact of new buildings as well as refurbishment of old ones.

It added there was a serious skills gap in the sector that could grow worse.

Current regulations hold that new homes should be "zero-carbon" by 2016, and all other new build should reach that target by 2020.

However, the Engineering a Low Carbon Built Environment report asserts that the principles that could be applied to drastically reduce energy consumption are simply not being used.

It said that many building principles, such as those that retain heat in a building or make good use of natural light, were known to the Romans but are still not being implemented in modern buildings as much as they could be.

The field of "building engineering physics", which draws on old ideas and new, can address the issue. But the report warns that both the industry and academia are so far failing to produce engineers who can apply the concepts.

“ We see this report as a huge contribution to the debate, really raising the profile of a discipline of engineers that we need ”

Scott Steedman Royal Academy of Engineering

"There are plenty of good examples of buildings around which have been designed with this approach, but there's very little uptake of these ideas," the report's co-author Professor Doug King said.

He held up the example of the Sainsbury's in London's Greenwich as an example of the savings that such building approaches can provide.

While it almost certainly cost significantly more to build than a less eco-friendly building, he estimated that the building saved more than £400,000 a year in energy costs.

"If Sainsbury's had built everyone of their new stores in the last 10 years to this model, then Lord John would be a much happier man in a recession like this," he said.

Contrastingly, Professor King railed against what he termed "eco-bling" - the tendency for many new building projects to fail to reduce their overall energy consumption and then tack on energy generation schemes such as wind turbines or solar panels in a high-visibility effort to make up for some of the wasted energy.

'Woeful' record

The report stresses that the government should support detailed study into how to increase training in building physics, and by how much, in order to ensure the new build projects and refurbishments bring environmental sustainability into line with planned targets.

Because 80% of the buildings that will be occupied in 2050 have already been built, the problem lies more in refurbishments of existing buildings than it does in "new build".

The report's authors estimate that in order to reach targets, the rate of building refurbishment to a high sustainability standard must increase by a factor of four or five above current levels.

"The recent government consultation suggests we're going to get to the position in the next 10 years that building regulations will proceed towards zero carbon emissions (from new build)," Professor King explained.

"I and others like me are very concerned that neither the government nor the industry nor the regulators understand how that needs to be achieved."

"I think this government has an absolutely woeful track record on setting ill-considered targets on sustainability and then having to retract them," Professor King said. He cited a National Audit Office report on building works in 2008 and 2009, which showed that 80% of projects undertaken by the government failed to meet its own standards of sustainability.

However, the authors said that targets should not be revised but rather that implementation of building physics, both in academia and on job sites, must be radically increased.

"We see this report as a huge contribution to the debate, really raising the profile of a part discipline of engineers that we need - who will bring in those new technologies [and] who will bring in new materials and new methods," said report co-author and Royal Academy of Engineering fellow Scott Steedman.

He suggested that the vanguard of that movement could lie with the largest landowners in the UK, such as government and universities.

"These are groups that can take early action and say 'we are requiring this approach from our facilities' to show there's a way forward here. That would help to drive the supply chain," he said.

Story from BBC NEWS:

<http://news.bbc.co.uk/go/pr/fr/-/2/hi/science/nature/8469070.stm>

Published: 2010/01/20 02:23:08 GMT

Nano device targets artery damage

A molecule designed to find, latch onto, then treat hardened arteries could offer a new way to tackle heart disease, say its inventors.



Nanoburrs, developed at the Massachusetts Institute of Technology (MIT), target only damaged cells in blood vessel walls.

Once attached, they can release drugs in precisely the right place.

But the British Heart Foundation warned the technology was some years from being used in patients.

The hardening of the arteries which supply the heart, or atherosclerosis, can eventually lead to blockages which can cause heart attacks.

“ People have been looking for a long time for ways to target a particular drug to a particular part of the body ”

Professor Peter Weissberg British Heart Foundation

The study in the Proceedings of the National Academy of Sciences journal says specialists normally use tiny balloons to force open the vessels, then place a tube called a stent inside to keep it open.

Often the process triggers a rapid re-growth of tissue around the stent which can lead to the artery blocking again, and a recent advance has been a stent which releases drugs for a number of days after insertion to keep this process under control.

The MIT approach offers another way to get these drugs to exactly the right place.

Its nanoburrs are coated with proteins which can only stick to a structure in the blood vessel wall called the "basement membrane".

This is only exposed when the wall is damaged, so only damaged sections of blood vessel are targeted.

Once in place, a reaction takes place to release the drug over a prolonged period - up to 12 days so far.

Long way off

Professor Robert Langer, one of the authors of the research, said: "This is a very exciting example of nanotechnology and cell targeting in action."

He said the technology could target any condition in which the cell wall was compromised in this way, including certain types of cancer, and other inflammatory diseases.

Professor Peter Weissberg, medical director of the British Heart Foundation, said that while the technology was "promising", there were many time-consuming obstacles to overcome before it could be regularly used in patients.

He said: "This is an interesting proof of principle. People have been looking for a long time for ways to target a particular drug to a particular part of the body."

"It wouldn't be able to replace the need for a balloon and stent to open an artery, but it's possible that one day, it may be able to deliver a drug to treat atherosclerosis itself."

Story from BBC NEWS:

<http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/8465531.stm>

Published: 2010/01/19 09:06:12 GMT

Smear test 'bettered by HPV test'

Cervical cancer deaths could be cut if a different screening test was used in the first instance rather than smear tests for over-35s, say researchers.



Testing women for human papillomavirus (HPV), which is strongly linked to the disease, picks up cancers earlier, they told *The Lancet Oncology*.

Italian data on 95,000 women showed those tested for HPV developed fewer cancers than those who only had smears.

But the authors said this strategy was unsuitable for women younger than 35.

In the under-35s, HPV testing would risk over-treatment because it detects problems that would right themselves spontaneously, say the Italian team.

Fewer cancers

Their study followed the large sample of women in Italy over a period of three and a half years.

“ We might be able to spot the warning signs even earlier and it might, in future, mean that women go for screening less often. ”

Dr Lesley Walker, director of cancer information at Cancer Research UK

It found that HPV testing was more sensitive than smear tests at picking up pre-cancerous changes to cervical cells.

According to the researchers, the data suggests HPV testing would also needed repeating less often - five-yearly, rather than three-yearly for smears.

Dr Guglielmo Ronco and his team, from the Centre for Cancer Prevention in Turin, say it should be used as the first check in women over 35 and only those who test positive for the virus should go on to have a smear test and any necessary treatment.

Dr Ronco said: "Our data support the use of stand-alone HPV testing as the primary screening test.

"Picking up the cancers earlier would save lives."

An expert in cervical cancer and screening, Professor Henry Kitchener of Manchester University, welcomed the overall findings.

But he urged caution about the excluding younger women.

"I would think very carefully about ruling out HPV testing for women who are under 35," he said.

"The HPV test has positive benefits because it is so sensitive, and there is uncertainty about how many of the problems it detects in younger women would get better by themselves."

The report was also welcomed by Dr Lesley Walker, director of cancer information at Cancer Research UK, which funds one of the study's authors.

She said: "Cervical screening looks for changes in the cells of the cervix before a cancer has developed.

"This research suggests that by testing for HPV in women aged 35 and over we might be able to spot the warning signs even earlier and it might, in future, mean that women go for screening less often. "

Pilots

The NHS began piloting the use of HPV testing as an "add-on" to smear tests in 2008.

Professor Julietta Patnick, director of the NHS Cancer Screening said: "The NHS Cervical Cancer Screening Programme always takes interest in new studies looking at methods of cervical cancer screening.

"The role of HPV in the development of cervical cancer is well established and we have been exploring the potential use of HPV testing within the cervical screening programme for some time."

Cancer Charities also expressed an interest.

Robert Music, director of cervical cancer charity Jo's Trust, said: "HPV testing will almost certainly have a greater role in the future with the focus on older women because of the high number of transient HPV infections in younger women."

But he warned that testing for the HPV needed to be handled sensitively given that it is a sexually transmitted virus.

"What is also important is for there to be increased education about HPV and HPV testing to avoid future stigma, anxiety and psychosocial damage."

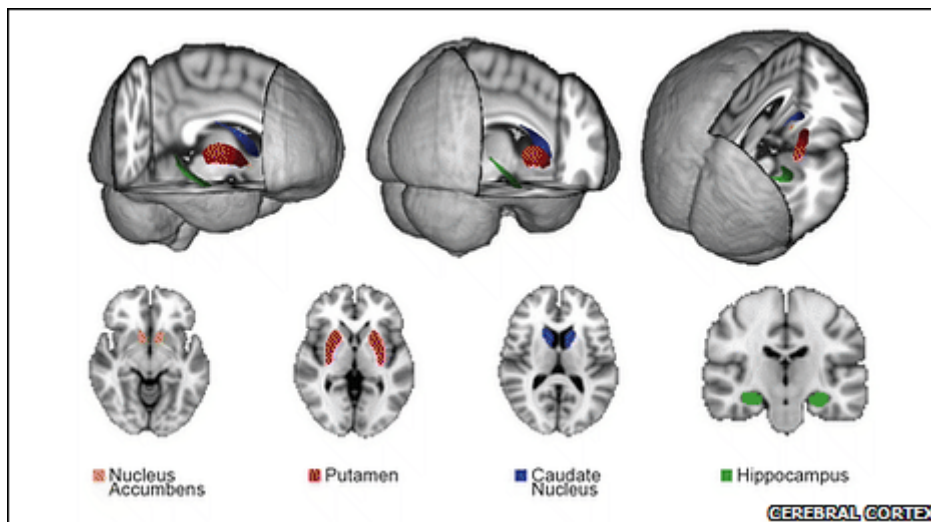
Story from BBC NEWS:

<http://news.bbc.co.uk/1/hi/health/8465837.stm>

Published: 2010/01/19 12:20:24 GMT

Brain size governs 'game prowess'

If you find video games a struggle, it could be to do with the size of certain parts of your brain, a study suggests.



US researchers found they could predict how well an amateur player might perform on a game by measuring the volume of key sections of the brain.

Writing in the journal *Cerebral Cortex*, they suggest their findings could have wider implications for understanding the differences in learning rates.

There is broad acceptance of a link between brain size and intelligence.

However it remains a complicated picture. Within the animal kingdom some smaller brains appear superior to many larger ones: the monkey's compared with the horse, for instance, or the human and the elephant.

But there are certain parts of the brain which can be disproportionately larger, and this may explain some differences in cognitive ability - between individuals as well as species.

A multi-disciplinary team from the University of Illinois, the University of Pittsburgh and Massachusetts Institute of Technology recruited 39 adults - 10 men, 29 women - who had spent less than three hours each week playing video games in the previous two years.

They then had to play one of two versions of a specially developed game. One required them to focus exclusively on achieving a single goal, the other involved shifting priorities.

Playing power

MRI scans showed participants with a larger nucleus accumbens, which is part of the brain's reward centre, outperformed others in the first few hours, perhaps due to the "sense of achievement and the emotional reward" accompanying achievement in the earliest stages of learning, the team speculated.

But those players who ultimately performed best on the game in which priorities changed had larger sections deep in the centre of the brain, known as the caudate and putamen.

“ No matter what your brain size is it's what you do with it that counts ”

Timothy Bates University of Edinburgh

"This makes sense, because these areas have been linked to learning procedures and new skills, as well as adapting to changing environments. These people could do a number of things at once. Think of it like driving a car, as well as looking at the road, you're tampering with your GPS, and talking to your passengers," says Prof Arthur Kramer of the University of Illinois.

"The great thing about using a video game rather than methodical cognitive tests is that it brings us a step closer to the real world and the challenges people face."

In total, the team calculated that nearly a quarter of the difference in performance could be predicted by measuring the volume of the brain.

Keep trying

The findings should not however be used to support a determinist view of the world in which everyone simply had to accept the brain they were born with, nor as paving the way for a brave new world in which people's brains were regularly measured to predict their ability, Prof Kramer said.

"It has been shown that some parts of the brain are fairly plastic - they can change and develop. The more we learn about these structures and function the more we can understand the circuits that promote memory and learning. That can have educational benefits but also implications for an ageing population where dementia is an issue."

Timothy Bates, a professor of psychology at the University of Edinburgh, said the study's findings fitted with increasingly prevailing views about brain size and cognitive ability.

"But that's no excuse for saying I'm not going to bother doing my homework. The person born with the large brain can easily be outstripped by someone with a smaller brain. No matter what your brain size is, it's what you do with it that counts. Just remember the hare and the tortoise."

Story from BBC NEWS:

<http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/8471182.stm>

Published: 2010/01/20 18:22:58 GMT

Dye turns fabric into a battery

Ordinary cotton and polyester fabrics have been turned into batteries that retain their flexibility.

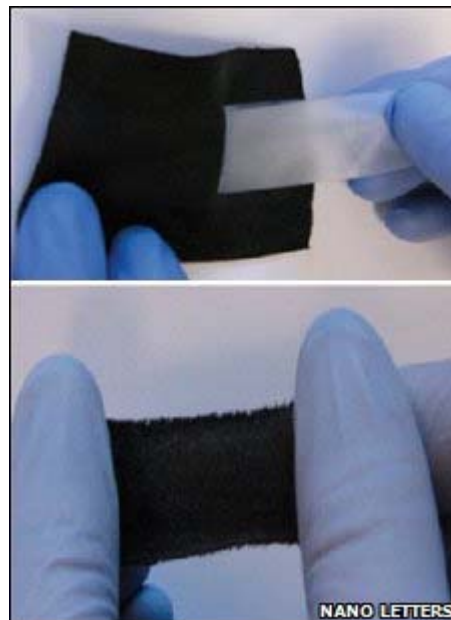
The demonstration is a boost to the nascent field of "wearable electronics" in which devices are integrated into clothing and textiles.

The approach is based on dipping fabrics in an "ink" of tiny tubes of carbon, and was first demonstrated last year on plain copier paper.

The new application to fabrics is reported in the journal *Nano Letters*.

"Wearable electronics represent a developing new class of materials... which allow for many applications and designs previously impossible with traditional electronics technologies," the authors wrote.

A number of research efforts in recent years have shown the possibility of electronics that can be built on flexible and even transparent surfaces - leading to the often-touted "roll-up display".



However, the integration of electronics into textiles has presented different challenges, in particular developing approaches that work with ordinary fabrics.

Now, Yi Cui and his team at Stanford University in the US has shown that their "ink" made of carbon nanotubes - cylinders of carbon just billionths of a metre across - can serve as a dye that can simply and cheaply turn a t-shirt into an "e-shirt". The idea is the same as that outlined in their work with plain paper; the interwoven fibres of fabrics, like those of paper, are particularly suited to absorbing the nanotube ink, maintaining an electrical connection across the whole area of a garment.

Cloth is simply dipped into a batch of nanotube dye, and is then pressed, to thin and even out the coating.

The fabric maintains its properties even as it is stretched or folded. Even rinsing the samples in water and wringing them out does not change their electronic properties. "Our approach is easy and low-cost while producing great performance," Professor Cui told BBC News.

"Fabrics and paper represent two technologies with a thousand-year-old history. We combined 'high-tech' - nanotechnology - with traditional 'low-tech' to produce new applications."

The next step is to integrate the approach with materials that store more energy, in order to create more useful batteries. By combining the approach with other electronic materials in the ink, the team believes even wearable solar cells are possible.

Story from BBC NEWS:
<http://news.bbc.co.uk/go/pr/fr/-/2/hi/technology/8471362.stm>

Published: 2010/01/21 16:50:58 GMT

Genome Study Provides a Census of Early Humans

By NICHOLAS WADE

From the composition of just two human genomes, geneticists have computed the size of the human population 1.2 million years ago from which everyone in the world is descended.

They put the number at 18,500 people, but this refers only to breeding individuals, the “effective” population. The actual population would have been about three times as large, or 55,500.

Comparable estimates for other primates then are 21,000 for chimpanzees and 25,000 for gorillas. In biological terms, it seems, humans were not a very successful species, and the strategy of investing in larger brains than those of their fellow apes had not yet produced any big payoff. Human population numbers did not reach high levels until after the advent of agriculture.

Geneticists have long known that the ancestors of modern humans numbered as few as 10,000 at some time in the last 100,000 years. The critically low number suggested that some catastrophe, like disease or climate change induced by a volcano, had brought humans close to the brink of extinction.

If the new estimate is correct, however, human population size has been small and fairly constant throughout most of the last million years, ruling out the need to look for a catastrophe.

The estimate, reported in the issue on Tuesday of The Proceedings of the National Academy of Sciences, was made by a team of population geneticists at the University of Utah led by Chad D. Huff and Lynn B. Jorde.

The human population a million years ago was represented by archaic species like *Homo ergaster* in Africa and *Homo erectus* in East Asia. The Utah team says its estimate of 18,500 implies “an unusually small population for a species spread across the entire Old World.” But that estimate would apply to the worldwide population only if there were inbreeding between the humans on the different continents. If not, and if modern humans are descended from just one of these populations, like *Homo ergaster* in Africa, then the estimate would apply only to that.

Richard G. Klein, a paleoanthropologist at Stanford, said it was hard to believe the population from which modern humans are descended was as small as 18,500 “unless they were geographically restricted to Africa or a small part of it.” There is no independent way of assessing a genetics-based estimate of population size at this period, Dr. Klein said, although archaeologists have developed ways of assessing ancient populations of more recent times. The Utah team based its estimate on the genetic variation present in two complete human genomes, one prepared by the government’s human genome project and the other by J. Craig Venter, the genome sequencing pioneer. The government decoded a single copy of a mosaic genome derived from a medley of people, apparently of European and Asian origin. Dr. Venter decoded both copies of his own genome, the one inherited from his father and the one from his mother.

The Utah team thus had three genomes to work with and looked at ancient elements known as Alu insertions, the youngest class of which appeared in the human genome around a million years ago. The amount of variation seen in the DNA immediately surrounding the Alu insertions gave a measure of the size of human population at that time.

Their estimate agrees almost exactly with an earlier one, also based on Alu insertions but with sparser data. The insertions tag ancient regions of the genome that are unaffected by the recent growth in population, Dr. Huff said.

<http://www.nytimes.com/2010/01/19/science/19human.html?ref=science>

Narrowing an Eating Disorder

By ABBY ELLIN

The year was 1988, and I was a college student on my junior year abroad, traveling aimlessly through the Middle East and Europe. My backpack was crammed with shorts and T-shirts, bathing suits and sarongs, my Walkman and Grateful Dead tapes. And oh, yes, a scale, buried deep beneath layers of socks. Having been a chubby adolescent — and having spent six summers at fat camp — I was terrified of gaining weight.

Unfortunately, nothing gave me as much pleasure as eating, which I did with abandon.

To maintain some semblance of control, I divided my eating into Food Days and Nonfood Days: that is, days when I consumed vast amounts, and days when I policed my caloric intake with military precision. The routine kept my weight in check, more or less. Never mind that it was insane.

No one at my college health center knew what to do with me. Clearly, I wasn't anorexic; I was slightly round, in fact. I didn't purge, so bulimia was out. To my distress, the counselors told me there was nothing they could do for me and sent me on my way.

Today, I would probably qualify for a diagnosis of "eating disorder not otherwise specified," usually known by its acronym, Ednos. In the current edition of the Diagnostic and Statistical Manual of Mental Disorders, it encompasses virtually every type of eating problem that is not anorexia or bulimia.

Though its name is less familiar, it is diagnosed more often than those two disorders — in 4 percent of American women each year, according to the National Eating Disorders Association. (The association does not have statistics on men.) Subsets of Ednos include binge eating disorder, purging disorder, night eating syndrome, chewing and spitting out food, and even picky eating.

But the diagnosis baffles many clinicians, who call it ambiguous, vague and unwieldy. And so the American Psychiatric Association is overhauling its definition of Ednos for the next edition of the diagnostic manual, known as D.S.M.-5, to be published in 2013.

"The consensus is that Ednos is 'too big,' meaning it is being used more frequently than is desirable, as that label does not convey much specific information," said Dr. B. Timothy Walsh, a professor of psychiatry at Columbia who is chairman of the eating disorders work group for the new manual.

Dr. Walsh said the panel was "considering a range of ways to reduce the frequency with which that very broad category is used." For now, though, Ednos remains the nation's the most common eating disorder. A September 2009 study in The International Journal of Eating Disorders found that Ednos was often a way station between an eating disorder and recovery or, less commonly, from recovery to a full-blown eating disorder.

While traveling with a scale in your backpack is not one of the criteria, preoccupation with weight and food is. So are severe chronic dieting, frequent overeating, night eating syndrome, purging disorder and possibly compulsive exercising. If that sounds a little vague — find me one woman who isn't preoccupied with her body size — psychologists make a distinction.

"The eating has to be disordered in some way, as does the behavior relating to eating," said Ruth H. Striegel-Moore, a professor of psychology at Montana State University. "Also, it has to lead to some kind of impairment. For instance, some women will not go to parties because they're worried about eating.

"If you're restricting yourself so much that it affects your work negatively, you would meet the criteria for Ednos."

Even so, many clinicians say the diagnosis is just too roomy.

“One of the difficulties with Ednos is that there’s a lot of diversity within that category,” said Craig Johnson, director of the eating disorders program at Laureate Psychiatric Clinic and Hospital in Tulsa, Okla. “Because there are different presentations that not all clinicians are familiar with, there’s a risk that people who have disordered eating who could benefit from clinical attention won’t know that they have a problem.”

Indeed, one reason the panel wants to change the guidelines is to help patients with eating problems recognize them even if they do not exhibit any of the traditional symptoms.

Kris Shock, for example, used laxatives and restricted her food for years, but she never threw up or binged, and her weight was average. She did not seek psychiatric help for what she and her husband called her “eating problem” until age 31, when she became addicted to the diet pill ephedra, she said in a recent interview.

Now 37 and the director of a child care center in Atlanta, Ms. Shock said that when she finally got her diagnosis of Ednos, “it was like, ‘Ah, I am sick enough to get help and have the recovery experience.’”

Most health insurance policies do not cover Ednos. (Ms. Shock refinanced her home to pay for her week-and-a-half-long stay at a residential treatment center.) Yet people with it are at risk for many of the same medical problems that afflict anorexics or bulimics, including osteoporosis, heart attacks, hormone imbalance and even death. A study in the Oct. 15 issue of The American Journal of Psychiatry reported that the mortality rate associated with Ednos exceeded that for anorexia nervosa and bulimia.

With that in mind, many doctors blur the diagnostic lines just so their patients can get insurance coverage. A chewer and spitter might be classified as bulimic, Dr. Striegel-Moore said; an almost-anorexic would fall under binge eating disorder.

Clinicians say patients like these often need to feel they have a “real” eating disorder.

“A lot of patients feel this stigma if they know they’re diagnosed with Ednos: ‘Obviously, I’m not good enough to be anorexic,’” said Nicole Hawkins, director of clinical services at Center for Change, an eating disorder treatment center in Orem, Utah. “I’ve had many patients feel that they need to lose more weight so they lose their period so they can change the diagnosis. Patients really feel they have to get ‘better’ at their eating disorder to deserve treatment.”

That is how Stacey Taylor felt. Ms. Taylor, 26, a prekindergarten teacher in Alexandria, La., said she had been dieting since age 7; at 16, she lost 70 pounds, and from then until age 25 she purged and abused diet pills, diuretics and laxatives. Although she vomited 3 to 11 times a day, she was never classified as bulimic because she did not binge, and her weight was never low enough to be anorexic.

“The doctors would look at me and say, ‘You don’t look like you have an eating disorder — go home and get something to eat,’” she recalled, adding that she didn’t think she was “sick enough” to need help, either.

Some doctors say weight requirements should be eliminated for all eating disorders in the new diagnostic manual. Deb Burgard, an eating disorder specialist in Los Altos, Calif., notes that people of any weight and body mass index may binge, purge or diet excessively.

“I have worked with plenty of restricting average-sized and fat patients who really should be diagnosed with anorexia nervosa,” said Dr. Burgard, a founder of Health at Every Size, an approach that focuses on health rather than weight. “But there is confusion based on the current D.S.M. whether they meet the

criteria for the diagnosis if they are not at a low B.M.I. — even if their current weight is extremely low for them individually and they’re showing signs of starvation.”

Perhaps the most difficult part of treating Ednos is that “normal” eating is such an elusive concept. Thinness tends to be the ideal, no matter what lengths people go to get there.

“What Ednos really demonstrates,” said Dr. Johnson, at Laureate in Tulsa, “is that we don’t have empirically derived diagnoses in psychiatry.

“Think about the diagnosis of depression. When does someone have a clinical syndrome versus a mood fluctuation? At what point should it be regarded as a condition that needs treatment? When you talk about food habits, it becomes extraordinarily complicated, because everybody has a relationship with food, and it’s usually a somewhat complicated one.”

Abby Ellin is the author of “Teenage Waistland: A Former Fat Kid Weighs In on Living Large, Losing Weight and How Parents Can (and Can’t) Help.”

<http://www.nytimes.com/2010/01/19/health/19eat.html?ref=science>

Birds 'breathe like alligators'

By Doreen Walton

Science reporter, BBC News

Alligators and birds share a breathing mechanism which may have helped their ancestors dominate Earth more than 200 million years ago, scientists say.



Research published in the journal *Science* found that like birds, in alligators air flows in one direction.

Birds' lung structure allows them to breathe when flying in low oxygen, or hypoxic, conditions.

This breathing may have helped a common ancestor of birds and alligators thrive in the hypoxic period of the Triassic.

Mammals 'hiding'

"It might explain a mystery that has been around for quite some time", Dr Colleen Farmer from the University of Utah told BBC News.

The mystery in question is why the archosaurs came to dominate Earth after the planet's worst mass extinction 251 million years ago.

" It implies that all dinosaurs... had bird-like lungs "

Dr Colleen Farmer

Archosaurs evolved into two different branches which developed into crocodylians, dinosaurs, flying pterosaurs and eventually birds.

Synapsids, which evolved to include mammals, had been dominant in the Permian period before the mass extinction.

Some survived but were toppled from their perch by the archosaurs.

Any mammal-like synapsid survivors "were teeny little things hiding in cracks" said Dr Farmer. "I think it's because they couldn't compete.

"It wasn't until the die-off of the large dinosaurs 65 million years ago that mammals made a comeback and started occupying body sizes larger than an opossum."

To demonstrate alligator lung mechanisms, the scientists measured airflow in anesthetised animals, showing it flows in one direction rather than in and out of chambers.

They also pumped water containing tiny fluorescent beads into the lungs of dead alligators to observe the flow.

Puzzle solved

The researchers believe the similarity in lung structure may explain why some animals were better able to adapt after the extinction, when oxygen levels dropped.

"We know that birds are really good at breathing in hypoxic conditions. They can fly at altitudes that would kill a mammal," said Dr Farmer.

"Many archosaurs, such as pterosaurs, apparently were capable of sustaining vigorous exercise. Lung design may have played a key role in this capacity.

"That's been a puzzle, why do birds have these very different lungs? But now we can date it back to the common ancestor of birds and crocodilians.

"It implies that all dinosaurs, herbivores like *Triceratops* and carnivores like *Tyrannosaurus*, had bird-like lungs," Dr Farmer added.

Story from BBC NEWS:

<http://news.bbc.co.uk/go/pr/fr/-/2/hi/science/nature/8453053.stm>

Published: 2010/01/17 15:02:25 GMT

Stem cell transplant hopes lifted

A technique which may eventually remove the need for matched bone marrow transplants has been used in humans for the first time.



It is hoped that "master cells" taken from umbilical cords could be used on any patient without rejection.

The latest advance, published in the journal Nature Medicine, greatly multiplies the tiny number of cells from the cord ready for a transplant.

UK charity Leukaemia Research said this could be the "holy grail" for doctors.

Aggressive treatment

The current system of bone marrow transplantation helps patients who have diseases, such as leukaemia, which affect the stem cells in their bone marrow where new blood cells are grown.

“ The holy grail is to have an "off the peg" source of unlimited numbers of "neutral" stem cells ”
Dr David Grant Leukaemia Research

Their own bone marrow cells are killed off by aggressive treatment and cells from a matched donor are introduced in their place.

However, a matching donor cannot always be found, despite extensive donor registries held by organisations such as the Anthony Nolan Bone Marrow Trust and, even with a carefully matched donor, there is still a risk that the patient's body will reject the new cells.

Cells extracted from umbilical cords could overcome these problems - they do not have the characteristics which would normally trigger immune rejection, so it is likely that cells from a single baby's cord could be used in any patient, without the need for matching.

However, there is one big disadvantage - there are not enough cells in a single cord to meet the needs of an adult patient.

Scientists have been looking for ways to either combine the cells from more than one baby, or to "expand" the cell numbers in the laboratory.

The second of these options is far from straightforward - simply allowing the stem cells to divide and increase in the laboratory means that many of the resulting extra cells will be simple blood cells, which do not have the ability to produce new cells themselves.

Quick to work

Researchers at the Fred Hutchinson Cancer Research Center in Seattle believe they may have found a way.

They manipulated a "signalling pathway" in the stem cells to trigger an increase in numbers without losing their stem cell status.

After success in laboratory animals, these cells were used in human patients, and the researchers found that they were accepted by the body more quickly and contributed more to the rebuilding of functioning bone marrow than "non-expanded" cord blood transplants.

Dr David Grant, Scientific Director of charity Leukaemia Research said: "The holy grail is to have an 'off the peg' source of unlimited numbers of 'neutral' stem cells which can be given to any patient safe in the knowledge that they will not cause the very difficult 'graft versus host' problems that lead to rejection and often the death of the patient.

"This is a promising development towards this because the concern has been that once stem cells start 'growing' they lose their stem cell properties and progress to ordinary blood cells with a very limited lifespan."

Henny Braund, chief executive of The Anthony Nolan Trust, said the potential for umbilical cord blood was "huge", and that the charity had already imported well over 250 units of umbilical cord blood.

"Sadly in the UK, despite our scientific expertise, umbilical cord blood is still very much an untapped resource and we are only able to collect and store a tiny amount of the cords we need.

"We really need a properly resourced UK cord blood collection programme.

"Further investment is crucial if we are to capitalise on this amazing resource and save more lives."

Story from BBC NEWS:

<http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/8462488.stm>

Published: 2010/01/18 00:03:50 GMT

Weaker wine 'may prevent cancers'

Swapping a daily glass of wine for a slightly weaker alternative could be enough to lower the risk of some cancers, a charity suggests.



Studies suggest that people who drink wine with an alcohol content of 10% rather than 14% might benefit, says the World Cancer Research Fund.

The charity called for more low-alcohol wines and beers to be available for sale.

An industry expert said UK consumers were asking for "lighter" wines.

The calculation was based on figures in a 2007 report which looked at the evidence for a link between alcohol consumption and cancer.

That report recommended that men should have no more than two drinks a day, and women no more than one.

The figures used to reach that conclusion were detailed enough to reveal the likely extra risk posed by each extra 10 grams of alcohol - just over one unit - regularly consumed.

From this, scientists calculated that, in theory, a person drinking one large 250ml glass of wine a night would have a 7% lower risk of bowel cancer if they normally drank 10% strength wine rather than 14%.

“ From a cancer prevention point of view it is best not to drink at all. But we have to be realistic and the fact is that many people in the UK enjoy a drink and see it as part of their social life. ”

Dr Rachel Thompson World Cancer Research Fund

This is only a modest decrease of risk for an individual, and there is no clear evidence about how long someone would need to substitute weaker wine for their usual tittle in order to reap this benefit.

However, the charity said that for every 100 people who did it, one case of bowel cancer would be avoided.

While the detailed studies only applied to bowel cancer, it said that there was no reason to believe that the risk of other cancers linked to alcohol, such as throat, oesophageal and breast, would not respond in a similar way.

'Minor change'

Dr Rachel Thompson, science programme manager for WCRF, said: "From a cancer prevention point of view it is best not to drink at all.

"But we have to be realistic, and the fact is that many people in the UK enjoy a drink and see it as part of their social life.

"Making this change might seem quite minor to do, but it could have a real impact on cancer risk.

"If everyone who drinks 14% wine at the moment switched to lower-alcohol wine tomorrow, for example, it is likely hundreds of cancer cases in the UK a year could be prevented."

She said that while it was possible to find weaker alternatives, most wines still had a strength of 13% or 14%, and called on retailers to make more weaker wines available.

She said that beer drinkers could also expect similar benefits if they switched from premium strength to lower-alcohol brands.

More popular

Dr Peter Sasieni, a researcher in cancer prevention statistics from Queen Mary's University of London, said that while it was difficult to be precise about how a decision to change drinking lifestyle would affect individual cancer risk over the years, a move to lower-strength wines could offer protection.

He said: "Given that alcohol can be bad for you even in fairly low amounts, that would start to suggest that people should take note of the percentage of alcohol in their wine.

"If they are enjoying the 10% glass as much as the 14% one, it would make sense to opt for the 10%."

Gavin Partington, from industry body the Wine and Spirit Trade Association, said that the rise in the alcohol content of the wine sold in the UK was due to the increasingly popularity of southern hemisphere wines from countries such as Argentina, Chile and Australia, which, due to the climate, tended to have a higher content.

He said: "What we are noticing is that 'lighter' wines - such as Pinot Grigio - seem to be becoming far more popular, and these tend to have a lower alcohol content.

"This means that it is likely that more of these lower alcohol wines will be more available in the supermarket, simply as a product of changing consumer demand."

Story from BBC NEWS:

<http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/8462044.stm>

Published: 2010/01/18 00:04:03 GMT

'Sufficient checks' on locum GP

By Jane Dreaper
BBC News health correspondent in Wisbech, Cambridgeshire

An expert has told an inquest examining the deaths of two patients that EU doctors "lack understanding" of some strong drugs used in the UK.



The patients, David Gray and Iris Edwards, were treated by a doctor who'd flown in from Germany the previous day.

Nigeria-born Dr Daniel Ubani, who was trained in Germany, gave Mr Gray a huge overdose of diamorphine painkiller.

An expert in out-of-hours services, Dr Mark Reynolds, said sufficient checks had been carried out on Dr Ubani.

He told the hearing: "I believe this tragedy was ultimately caused by the differences in training and experience of Dr Ubani to that of doctors in the UK.

"The learning should be at a national level.

"These are very strong drugs and there's definitely a lack of understanding and familiarity with them, in my opinion, among some EU doctors."

Dr Reynolds said the cases of the two deaths and also one other patient "gave significant cause for concern about Dr Ubani's competence to be working in the urgent care sector".

Induction pack

The inquest heard Dr Ubani was given an induction pack containing advice that it would "almost never be appropriate" to give doses of diamorphine higher than 30mg.

Mr Gray was given 100mg in two injections. He died soon afterwards.

Dr Reynolds said: "Should Dr Ubani have consulted this pack, he would have been able to understand the appropriate dose."

The inquest heard how European Union doctors can apply to join the UK medical register without further assessment being needed.

Letter

Earlier the inquest heard that an internal letter, written after Mr Gray's death, admitted "financial pressure" and "reduced medical cover".

The letter from the company's executive, Dr Chris Browning, which was written 11 days later, said: "It's become clear there are a few areas where our patient care is at risk of slipping.

"The distance between you and a patient shouldn't be a factor in whether or not to arrange a visit.

"If a visit is indicated, it is the responsibility of Take Care Now control to provide it."

The letter also refers to doctors sometimes informally arranging to split shifts.

It added: "There have been occasions when this was arranged without the knowledge of the control room."

The letter tells staff that patients needing palliative care "will need a face-to-face visit in almost all cases".

Training

Dr Browning is due to give evidence later in the inquest. Take Care Now has lost its contract to supply services in the Fenlands area of Cambridgeshire.

The inquest has also heard from a Take Care Now trainer, Karen Byford, who showed Dr Ubani how to use the company's laptop system.

She told the hearing: "He seemed to understand what I was saying to him, albeit occasionally I had to re-word a sentence to him.

"He took more notes than was normal. Other than that, I didn't notice anything out of the ordinary."

The inquest continues.

.

Story from BBC NEWS:
<http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/8461407.stm>

Published: 2010/01/15 16:31:53 GMT

'Raise antibiotic dose' for obese

Emma Wilkinson

Health reporter, BBC News

Patients may have to be prescribed higher doses of antibiotics because of rising rates of obesity, say doctors.



The standard "one-size fits all" dose may not clear infection in larger adults and increases the risk that resistance will develop, they argue.

More work is needed to guide GPs on how and when to alter doses, an editorial in *The Lancet* to accompany the study by doctors from Greece and the US says.

GPs said it was an interesting theory but may end up being expensive.

Around one in four adults in England is classified as obese - an increase from 15% in 1993.

“ Patients are getting taller and larger and it does seem right that patients are given the appropriate strength of drug ”

Professor Steve Field, Royal College of GPs

Given the fact people are getting larger, use of standard doses of antibiotics in all adults, regardless of size, is outdated, argue two doctors from Greece and the US.

Size and even the proportion of body fat a person has, can affect the concentration of antibiotics in the body, potentially reducing how effective they are in larger patients, they say.

And failure to clear an infection because too small a dose is given may raise the risk of resistance - already an increasing problem for doctors.

Likewise, smaller than average patients may get too much drug, and suffer greater side-effects as a consequence.

Guidance



An accompanying editorial said dose adjustments could easily be made if research was done to guide doctors in treating obese patients.

Professor Steve Field, chair of the Royal College of GPs said he would encourage "appropriate" antibiotic prescribing and lots of patients are given them unnecessarily.

But he added: "Patients are getting taller and larger and it does seem right that patients are given the appropriate strength of drug.

"However, this might cost a lot of money because pharmaceutical companies would have to provide different doses of medication.

"At the moment, most come in two strengths and we would not want to see an increase in costs."

He added that GPs will already use their judgment to alter medication doses where necessary.

Professor Hugh Pennington, an expert in antibiotics from the University of Aberdeen, said antibiotics would differ in how size altered their effectiveness.

"But studies on this would not be hard to do.

"If you have too little of a drug it's not going to be good for treating the infection but it also raises the possibility that the organism will become resistant.

"They're such powerful drugs, we want to make sure we are using them properly."

Story from BBC NEWS:

<http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/8459280.stm>

Published: 2010/01/15 00:15:17 GMT



Anti-malaria plant genes mapped

By Doreen Walton

Science reporter, BBC News

Global supply of a key, plant-based, anti-malaria drug is set to be boosted by a genetic study, scientists say.



Researchers have mapped the genes of *Artemisia annua* to allow selection of high-yield varieties.

The study, published in the journal *Science*, aims to make growing the plant more profitable for farmers.

"It's a major milestone for the development of this crop," Professor Ian Graham from the University of York in the UK told BBC News.

Short supply

The research has been welcomed by Dr Chris Drakeley, director of the Malaria Centre at the London School of Hygiene and Tropical Medicine. "Anything that enables an increased yield of product from something like *Artemisia annua* is a major step.

"This is the first line anti-malarial in nearly all endemic countries at the moment and supplies can be limited."

Artemisinin combination therapies, or ATCs, are used widely to treat malaria and are seen as the best solution to the parasite's increasing resistance to anti-malarial drugs.

" All the information and tools we've developed in this work are free for people to use "

Professor Ian Graham University of York

Professor Graham, who led the study, hopes that new higher yielding and more robust varieties could increase global supply of the malaria treatment within three years.

"Our aim is to have hybrid seeds that can be released to farmers in the developing world by 2011 or 2012. With a year lag for planting, this would have an impact on supply in 2012 or 2013."

"We have to wait six to eight months from putting the seed in the ground to harvesting the crop and seeing how it has performed."

Dr Drakeley hopes the new varieties will become available quickly.

"This will allow an increase in the basic compound that forms ATC therapies. If they can get these seeds out in the timeframe they're talking about it'll be a major advance," he said.

To identify the best plants for hybrid seed production, researchers measured characteristics of individual plants, for example, the number of artemisinin producing glands on the leaf. They also performed tests to find the plants with the best genetic make-up.

The resulting seeds are being planted in field trials in China, East Africa, India and Madagascar. "We are expecting to end up with not just one hybrid.

"Ideally we would like good hybrids for east Africa and good hybrids for India etc.," explained Professor Graham.

The study is the culmination of three years work funded by the Bill and Melinda Gates Foundation and the genetic maps and markers the researchers have identified will be made available for free all over the world.

"All the information and tools we've developed in this work are free for people to use for the charitable purpose," Professor Graham told BBC News.

"We're also working with seed producers so they can produce the seeds as cheaply as possible for the developing world."

Window of time

Scientists hope a better supply of the drug might also help with the problem of fake drugs being distributed.

Some treatments being sold have been found to have no drug content or to be substandard in quality. This can make them fatal or they can be more likely to encourage resistance rather than combat the disease.

"Hopefully, if the final product is easier and cheaper to procure after this development, it might lessen the production of counterfeit drugs," said Dr Drakeley.

Professor Graham believes that the development of drug resistance by the malaria parasite has made the work more urgent.

"We have a window of time when we can use artemisinin effectively, and we want to have a stable, reliable supply that can be used in that window," he said.

Story from BBC NEWS:

<http://news.bbc.co.uk/go/pr/fr/-/2/hi/science/nature/8454721.stm>

Published: 2010/01/14 19:07:12 GMT

Light shed on fish gill mystery

By Victoria Gill

Science reporter, BBC News

Biologists have cast doubt on the long-held theory that fish gills evolved primarily for the purpose of breathing.



The researchers studied the development of gills in rainbow trout larvae.

Their experiment suggests that it is likely that fish evolved gills for the primary purpose of regulating the chemicals in their bodies.

The team reports in the Royal Society journal Proceedings B that this developmental study gives an insight into the evolution of fish gills.

Clarice Fu, a zoologist from the University of British Columbia in Canada, led the study.

She and her colleagues found, as the larvae matured, their gills developed the ability to regulate the chemicals in their blood earlier than they began to take up oxygen.

To discover this, the team measured the uptake of ions, which are charged chemical particles, such as sodium.

These ions are necessary for the body's cells to function, but they become toxic if their levels in the blood become too high.

Ms Fu explained that fish take up these ions from the surrounding water, to "maintain this delicate ion balance in their blood".

"In freshwater fish, like rainbow trout, they tend to lose ions from their blood to the water, because the ion concentration in blood is greater than that of freshwater," she said.

The team took measurements from the gills of young, developing rainbow trout to find out what functions they were performing.

"When the gills are still immature, a significant portion of ion uptake occurs at the skin. As the fish get older and the gills mature, [this] can gradually shift to... the gills," said Ms Fu.

"We found that ion uptake shifted from the skin to the gills earlier than oxygen uptake. This led us to propose that the gills are needed for ion regulation earlier than they are needed for oxygen uptake."

Watching evolution

Ms Fu told BBC News that the "pressures" on developing larvae are similar to evolutionary pressures.

"Some of these pressures include an increasingly active lifestyle, greater body size, increasingly thicker skin," she said.

Scientists often study larval development to investigate evolution.

Ms Fu explained that, as the larvae developed, the pressures drove ion exchange to the gills before the animals started to breathe through their gills, so the same thing may have happened as the fish evolved.

Professor Rick Gonzalez, from the University of San Diego in the US, studies the physiology of aquatic animals.

He described the study as a "very interesting first step", but said it wasn't clear if it answered the question of why fish evolved gills.

"Gills combine some of the functions of the lungs and kidneys in mammals, which leads to interesting interactions of function," he told BBC News.

"The physical and chemical nature of the water can play an important role in their function. So how these all work together to get the various jobs done is very interesting and offers insight into how natural selection works."

Story from BBC NEWS:

<http://news.bbc.co.uk/go/pr/fr/-/2/hi/science/nature/8454592.stm>

Published: 2010/01/13 17:12:14 GMT

Hydro scheme awarded major prize

By Roger Harrabin

Environment analyst, BBC News

A UK scheme to generate power from mountain streams is one of three winners of a £1m prize for saving carbon emissions at the local level.



The prize is awarded by the lottery-funded body Nesta, which encourages innovation in the UK.

The Green Valleys project in Wales' Brecon Beacons currently generates power from 10 wild mountain streams.

The eventual aim of the venture is to make the Brecon area a net exporter of electricity.

'Intelligent support'

Normally, hydro-power relies on dams but Brecon uses micro-hydro, which involves diverting up to 50% of a stream's flow into buried pipes which lead to camouflaged generators. The project is planning 40 more of such micro-power stations.

With extra help from energy advice surgeries, super-efficient vehicles and wood-burning stoves, 13 local communities in Brecon have cut carbon emissions by about 20% in a year, according to Nesta.

Grenville Ham, who founded Green Valleys, said the Environment Agency imposed strict rules to protect the water level of the streams and ensure that wildlife in the streams was not harmed. National Park rules ensured that the schemes were heavily disguised visually.

"We put a few rocks into a stream to ensure that enough water is held back to cover the inlet to the pipe," he said.



"Then the pipes have a mesh on so fish can't get caught. And the generators are all housed in huts no bigger than a garden shed and built of local stone with turf roofs. We normally put them among farm buildings so they blend in."

Lord Puttnam, chairman of the Nesta judges, said: "Whilst Copenhagen showed just how difficult it is to reach consensus amongst governments, the Big Green Challenge shows how local efforts can triumph."

"When people are empowered and are given intelligent support they can make the world of difference in the fight against climate change".

Enterprise

Another prize-winner is the Isle of Eigg, where 38 families are working together in a bid to halve their carbon emissions.

The initiative is being led by the Isle of Eigg Heritage Trust and involves a wide range of projects from installing insulation and solar panels to producing local food and developing low-carbon community transport.

They are attempting to live within a five kilowatt (kW)/household energy cap. The trust says its approach has generated interest from Ecuador, Galapagos and Alaska, as well as Birmingham and Edinburgh. Nesta says Eigg cut CO2 emissions in the past year by 32%.

The other £300,000 prize was taken by Ludlow's Household Energy Service - a volunteer-led company that helps households reduce carbon emissions, improve energy efficiency and save money on fuel bills.

It provides free energy surveys - conducted by volunteers - that identify practical energy-saving measures along with estimates of the financial savings they could generate.

HES has expanded into Shropshire, Herefordshire, Radnorshire and Montgomeryshire - increasing its reach to 15,000 homes. HES cut CO2 emissions in the past year by 10%, according to Nesta.

While Nesta applauds the enterprise of community-led schemes, other energy analysts would point out that for the UK to achieve its long-term emissions targets there would need to be a revolution in energy generation and supply way beyond the reach of small communities like these.

Story from BBC NEWS:

<http://news.bbc.co.uk/go/pr/ft/-/2/hi/science/nature/8458154.stm>

Published: 2010/01/14 02:41:26 GMT



'No such thing' as safe cocaine

The image of cocaine as a "safe party drug" is a myth that must be dispelled, say UK experts, as a study shows the drug is linked to 3% of sudden deaths.



The British Heart Foundation said the findings, published in the European Heart Journal, were a reminder that the drug can have devastating effects.

Although the data comes from south-west Spain, researchers said the results should apply to Europe in general.

They said anyone could suffer the deadly consequences of taking cocaine.

Fotini Rozakeas of the British Heart Foundation said: "The reality is that there are risks every time you use it.

“ Our findings show that cocaine use causes adverse changes to the heart and arteries that then lead to sudden death ”

Dr Joaquin Lucena, researcher

"Cocaine can have devastating effects on the user including heart attacks, life-threatening heart rhythms, strokes and even sudden death.

"The potential deadly consequences from cocaine use can happen to anyone who takes it, even in previously young healthy people with no history of heart disease."

Deadly cocktail

In the study, 21 out of 668 sudden deaths were related to cocaine use and all of these occurred in men aged between 21 and 45.

Most involved problems with the heart and the majority of the men were also smokers and had been drinking alcohol at the same time as taking cocaine.



Lead researcher Dr Joaquin Lucena, of the Institute of Legal Medicine in Seville, said these habits added up to a lethal cocktail for the heart.

He said: "Our findings show that cocaine use causes adverse changes to the heart and arteries that then lead to sudden death."

His teams looked at post-mortem reports and investigated all the circumstances surrounding sudden deaths in Seville between 2003 and 2006.

Their findings suggested any amount of the drug could be toxic.

"Some patients have poor outcomes with relatively low blood concentrations, whereas others tolerate large quantities without consequences," they told the *European Heart Journal*.

Story from BBC NEWS:

<http://news.bbc.co.uk/1/hi/health/8454652.stm>

Published: 2010/01/13 00:00:28 GMT



Blood drug offers dementia hope

Researchers believe a drug used to lower blood pressure could be even more effective against Alzheimer's disease than they previously thought.



People taking angiotensin receptor blockers (ARBs) were up to 50% less likely to develop dementia than those taking other blood pressure drugs.

Combined with another drug, ARBs also protected against further deterioration among those already with the disease.

The study of more than 800,000 men appears in the British Medical Journal.

The team from the Boston University School of Medicine presented initial results from the study two years ago, but further work suggests that ARBs - normally prescribed only to patients who cannot tolerate the more standard ACE inhibitors - confer greater protection than had been thought.

“ The prospect of using already existing drugs to help in the fight against dementia is attractive ”
Dr Susan Sorensen Alzheimer's Society

The search is on for an effective means to guard against Alzheimer's - and delay deterioration - as the number of people worldwide with the condition is set to soar as life expectancy grows.

Latest calculations suggest more than 115 million people across the globe will suffer from dementia by 2050.

High blood pressure over long periods can lead to damaged blood vessels, and this is known to increase the risk of not only strokes and heart disease, but dementia as well.

Some types of dementia are directly related to the condition of the arteries supplying the brain, but blood pressure is also thought to play a role in Alzheimer's disease, which is linked to the appearance of protein deposits in brain tissue.



Staying at home

Researchers looked at records of more than 800,000 people - 98% of whom were men - treated for high blood pressure between 2002 and 2006.

Those who took angiotensin receptor blockers (ARBs) were up to 50% less likely, over that period, to be diagnosed with dementia compared with those on other blood pressure medication.

When taken in combination with ACE inhibitors, the risk was even further reduced.

Of those with a diagnosis of dementia, this same combination meant they were 67% less likely to be admitted to a nursing home or die prematurely.

The reasons why the drug may have this effect are unclear, but it is thought it may help prevent nerve cell injury from blood vessel damage, or help the nerve cell recover after the vessel has been damaged.

"This new research not only adds to the evidence that treatments for high blood pressure could help stop the development of dementia but suggests that some of these treatments may be more suited to this than others," Dr Susanne Sorensen, head of research at the Alzheimer's Society.

"The prospect of using already existing drugs to help in the fight against dementia is attractive. However, more research is needed to weigh up the benefits of this type of treatment as a protective tool."

Story from BBC NEWS:
<http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/8453885.stm>

Published: 2010/01/13 00:00:16 GMT



Green tea 'may block lung cancer'

Drinking green tea may offer some protection against lung cancer, say experts who studied the disease at a medical university in Taiwan.



The latest work in more than 500 people adds to growing evidence suggesting the beverage has anti-cancer powers.

In the study, smokers and non-smokers who drank at least a cup a day cut their lung cancer risk significantly, a US cancer research conference heard.

The protection was greatest for people carrying certain genes.

But cancer experts said the findings did not change the fact that smoking is bad for health.

Daily cuppa

Green tea is made from the dried leaves of the Asian plant *Camellia sinesis* and is drunk widely across Asia.

The rates of many cancers are much lower in Asia than other parts of the world, which has led some to link the two.

Laboratory studies have shown that extracts from green tea, called polyphenols, can stop cancer cells from growing.

“ The best thing a smoker can do to reduce their risk of lung cancer, and more than a dozen other cancer types, is to quit.”

Yinka Ebo of Cancer Research UK

But results from human studies have been mixed. Some have shown a protective effect while others have failed to find any evidence of protection.

In July 2009, the Oxford-based research group Cochrane published a review of 51 studies on green tea and cancer which included over 1.5 million people.

They concluded that while green tea is safe to drink in moderation, the research so far is conflicting about whether or not it can prevent certain cancers.

Reduced risk

Dr I-Hsin Lin, of Shan Medical University, found that among smokers and non-smokers, people who did not drink green tea were more than five times as likely to get lung cancer than those who drank at least one cup of green tea a day.

Among smokers, those who did not drink green tea at all were more than 12 times as likely to develop lung cancer than those who drank at least a cup a day.

Researchers then analysed the DNA of people in the study and found certain genes appeared to play a role in the risk reduction.

Green tea drinkers, whether smokers or non smokers, with certain types of a gene called IGF1, were far less likely to develop lung cancer than other green tea drinkers with different types of this gene.

Yinka Ebo, of Cancer Research UK, said the findings should not be used as an excuse to keep smoking.

"Smoking tobacco fills your lungs with around 80 cancer-causing chemicals. Drinking green tea is not going to compensate for that.

"Unfortunately, it's not possible to make up for the harm caused by smoking by doing other things right like eating a healthy, balanced diet.

"The best thing a smoker can do to reduce their risk of lung cancer, and more than a dozen other cancer types, is to quit."

Story from BBC NEWS:
<http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/8453628.stm>

Published: 2010/01/13 09:26:26 GMT

Science explains the wrinkly dog

By Jonathan Amos
Science correspondent, BBC News

Just how did the Shar-pei get its famous wrinkled appearance?



Scientists who have analysed the genetics of 10 pedigree dog breeds believe they now have the answer.

Their research identifies 155 distinct locations in the animals' genetic code that could play a role in giving breeds their distinctive appearances.

In the Shar-pei, the team found differences in a gene known as HAS2 which makes an enzyme known to be important in the production of skin.

"There was probably a mutation that arose in that gene that led to a really wrinkly puppy and a breeder said, 'hey, that looks interesting, I'm going to try to selectively breed this trait and make more of these dogs'," explained Joshua Akey from the Department of Genome Sciences at the University of Washington, Seattle, US.

Small differences

The pedigree dog has become a fascination - and a remarkably useful research tool - for geneticists.

The domestication of the grey wolf more than 10,000 years ago, and the selective breeding that followed, has resulted in more than 400 breeds - each with a distinctive physique, coat colour and temperament.

These discrete populations give scientists the opportunity to compare and contrast the genetics of the different groups, making it easier to find the causes of specific traits.

"Man's best friend" is helping scientists locate the faulty genes that cause disease in both dogs *and* humans, as well giving a useful insight into how evolution works at a molecular level.

Dr Akey and colleagues studied 32 wrinkled and 18 smooth-coated Shar-peis and compared a specific stretch of their DNA with that of other breeds.

The team found four small, but significant, differences in the genetics of the two skin types of the Shar-pei versus the other breeds. These single nucleotide polymorphisms (SNPs), as they are called, were located in the HAS2 gene.

New targets

"HAS2 makes hyaluronic acid synthase 2, and it's an enzyme that makes hyaluronic acid, and that's one of the principal constituents of the skin," explained Dr Akey.

"There are rare human cases where there are mutations that lead to really severe wrinkling in humans, too.

"So, that suggested it was a good candidate to look at; and sure enough, when we sequenced it we saw that that gene explained wrinkling in Shar-peis," he told BBC News.

As well as giving insights into the Shar-pei, the research has also identified a raft of other locations in the dog genome that can now be investigated further to understand better why pedigree animals look the way they do.

"The thing that excites me most about our study is that in the last five years, five genes have been identified that contribute to this vast diversity in dog breeds," said Dr Akey.

"So our study found all five of those genes and then we found 150 new targets to explore. It's a powerful approach to look at the genetic legacy of selective breeding."

Dr Akey and colleagues report their findings in the Proceedings of the National Academy of Sciences (PNAS).

Jonathan.Amos-INTERNET@bbc.co.uk

Story from BBC NEWS:

<http://news.bbc.co.uk/go/pr/fr/-/2/hi/science/nature/8453794.stm>

Published: 2010/01/12 10:27:31 GMT

The solar cell that builds itself

By Jason Palmer

Science and technology reporter, BBC News

Researchers have demonstrated a simple, cheap way to create self-assembling electronic devices using a property crucial to salad dressings.



It uses the fact that oil- and water-based liquids do not mix, forming devices from components that align along the boundary between the two.

The idea joins a raft of approaches toward self-assembly, but lends itself particularly well to small components.

The work is reported in Proceedings of the National Academy of Sciences.

Crucially, it could allow the large-scale assembly of high-quality electronic components on materials of just about any type, in contrast to "inkjet printed" electronics or some previous self-assembly techniques.

Specific gravity

Such efforts have until now exploited the effect of gravity, assembling devices through so-called "sedimentation".

In this approach, "blank" devices are etched with depressions to match precisely-shaped components. Simply dumped into a liquid, the components should settle down into the blank device like sand onto a riverbed, in just the right places.

"That's what we tried for at least two years and we were never able to assemble these components with high yield - gravity wasn't working," said Heiko Jacobs of the University of Minnesota, who led the research.

SELF-ASSEMBLY EXPLAINED

- The oil/water mix contains a number of individual solar cell elements
- Each is coated with a "water-loving" molecule on the bottom and a "water-hating" one on top
- The elements align neatly at the oil/water boundary in a two-dimensional sheet
- The "blank" solar cell has pre-cut places for the elements and is dipped through the boundary
- As it is slowly drawn upwards, the elements pop into place

"Then we thought if we could concentrate them into a two-dimensional sheet and then have some kind of conveyor belt-like system we could assemble them with high yields and high speed," he told BBC News.

To do that, the team borrowed an idea familiar to fans of vinaigrette: they built their two-dimensional sheets at the border between oil and water.

They first built a device blank as before, with depressions lined with low-temperature solder, designed for individual solar cell elements.

They then prepared the elements - each a silicon and gold stack a few tens of millionths of a metre across - and put different coatings on each side.

On the silicon side, they put a hydrophobic molecule, one that has a strong tendency to evade contact with water. On the gold side, they put a hydrophilic molecule, which has the converse tendency to seek out water.

By getting the densities of the oil- and water-based parts of the experiment just right, a "sheet" of the elements could be made to "float" between the two, pointing in the right direction thanks to their coatings.

The conveyor belt process is to simply dunk the device blank through the boundary and draw it back slowly; the sheet of elements rides up along behind it, each one popping neatly into place as the solder attracts its gold contact.

The team made a working device comprising 64,000 elements in just three minutes.

Bendy future

Having proved that the concept works, the team is now investigating just how small they can go in terms of individual elements, or how large they can go in finished devices.

The approach should also work for almost any material, stiff or flexible, plastic, metal or semiconductor - a promising fact for future display and imaging applications.

Babak Parviz, a nano-engineering professor at the University of Washington in Seattle, said the technique is a "clear demonstration that self-assembly is applicable across size scales".

"Self-assembly is probably the best method for integrating high-performance materials onto unconventional substrates," he told BBC News.

The method tackles what Dr Parviz said is the most challenging problem - the proper alignment of thousands of parts, each thinner than a human hair. But it also works with the highest-performance materials, he said.

"For example, this method allows one to use single-crystal silicon, which is far superior to other types of silicon for making solar cells."

Story from BBC NEWS:

<http://news.bbc.co.uk/go/pr/fr/-/2/hi/science/nature/8452912.stm>

Published: 2010/01/12 12:20:58 GMT



Writing English as a Second Language

Posted By William Zinsser

A talk to the incoming international students at the Columbia Graduate School of Journalism, August 11, 2009

Five years ago one of your deans at the journalism school, Elizabeth Fishman, asked me if I would be interested in tutoring international students who might need some extra help with their writing. She knew I had done a lot of traveling in Asia and Africa and other parts of the world where many of you come from.

I knew I would enjoy that, and I have—I've been doing it ever since. I'm the doctor that students get sent to see if they have a writing problem that their professor thinks I can fix. As a bonus, I've made many friends—from Uganda, Uzbekistan, India, Ethiopia, Thailand, Iraq, Nigeria, Poland, China, Colombia and many other countries. Several young Asian women, when they went back home, sent me invitations to their weddings. I never made it to Bhutan or Korea, but I did see the wedding pictures. Such beautiful brides!

I can't imagine how hard it must be to learn to write comfortably in a second—or third or fourth—language. I don't think *I* could do it, and I admire your grace in taking on that difficult task. Much of the anxiety that I see in foreign students could be avoided if certain principles of writing good English—which nobody ever told them—were explained in advance. So I asked if I could talk to all of you during orientation week and tell you some of the things my students have found helpful.

So that's why we're here today.

I'll start with a question: What is good writing?

It depends on what country you're from. We all know what's considered "good writing" in our own country. We grow up immersed in the cadences and sentence structure of the language we were born into, so we think, "That's probably what every country considers good writing; they just use different words." If only! I once asked a student from Cairo, "What kind of language is Arabic?" I was trying to put myself into her mental process of switching from Arabic to English. She said, "It's all adjectives."

Well, of course it's not *all* adjectives, but I knew what she meant: it's decorative, it's ornate, it's intentionally pleasing. Another Egyptian student, when I asked him about Arabic, said, "It's all proverbs. We talk in proverbs. People say things like 'What you are seeking is also seeking you.'" He also told me that Arabic is full of courtesy and deference, some of which is rooted in fear of the government. "You never know who's listening," he said, so it doesn't hurt to be polite. That's when I realized that when foreign students come to me with a linguistic problem it may also be a cultural or a political problem.

Now I think it's lovely that such a decorative language as Arabic exists. I wish *I* could walk around New York and hear people talking in proverbs. But all those adjectives and all that decoration would be the ruin of any journalist trying to write good English. No proverbs, please.

Spanish also comes with a heavy load of beautiful baggage that will smother any journalist writing in English. The Spanish language is a national treasure, justly prized by Spanish-speaking people. But what makes it a national treasure is its long sentences and melodious long nouns that express a general idea. Those nouns are rich in feeling, but they have no action in them—no people doing something we can picture. My Spanish-speaking students must be given the bad news that those long sentences will have to be cruelly chopped up into short sentences with short nouns and short active verbs that drive the story forward. What's considered "good writing" in Spanish is not "good writing" in English.



So what is good English—the language we’re here today to wrestle with? It’s not as musical as Spanish, or Italian, or French, or as ornamental as Arabic, or as vibrant as some of your native languages. But I’m hopelessly in love with English because it’s plain and it’s strong. It has a huge vocabulary of words that have precise shades of meaning; there’s no subject, however technical or complex, that can’t be made clear to any reader in good English—if it’s used right. Unfortunately, there are many ways of using it wrong. Those are the damaging habits I want to warn you about today.

First, a little history. The English language is derived from two main sources. One is Latin, the florid language of ancient Rome. The other is Anglo-Saxon, the plain languages of England and northern Europe. The words derived from Latin are the enemy—they will strangle and suffocate everything you write. The Anglo-Saxon words will set you free.

How do those Latin words do their strangling and suffocating? In general they are long, pompous nouns that end in *-ion*—like implementation and maximization and communication (five syllables long!)—or that end in *-ent*—like development and fulfillment. Those nouns express a vague concept or an abstract idea, not a specific action that we can picture—somebody doing something. Here’s a typical sentence: “Prior to the implementation of the financial enhancement.” That means “Before we fixed our money problems.”

Believe it or not, this is the language that people in authority in America routinely use—officials in government and business and education and social work and health care. They think those long Latin words make them sound important. It no longer rains in America; your TV weatherman will tell that you we’re experiencing a precipitation probability situation.

I’m sure all of you, newly arrived in America, have already been driven crazy trying to figure out the instructions for ordering a cell phone or connecting your computer, or applying for a bank loan or a health insurance policy, and you assume that those of us who were born here can understand this stuff. I assure you that we don’t understand it either. I often receive some totally unintelligible letter from the telephone company or the cable company or the bank. I try to piece it out like a hieroglyphic, and I ask my wife, “Can you make any sense of this?” She says, “I have no idea what it means.”

Those long Latin usages have so infected everyday language in America that you might well think, “If that’s how people write who are running the country, that’s how I’m supposed to write.” It’s not. Let me read you three typical letters I recently received in the mail. (I keep letters like this and save them in a folder that I call “Bullshit File.”)

The first one is from the president of a private club in New York. It says, “Dear member: The board of governors has spent the past year considering proactive efforts that will continue to professionalize the club and to introduce efficiencies that we will be implementing throughout 2009.” That means they’re going to try to make the club run better.

Here’s a letter to alumni from the head of the New England boarding school I attended when I was a boy. “As I walk around the Academy,” she writes, “and see so many gifted students interacting with accomplished, dedicated adults” [*that means boys and girls talking to teachers*] and consider the opportunities for learning that such interpersonal exchanges will yield...” Interpersonal exchanges! Pure garbage. Her letter is meant to assure us alumni that the school is in good hands. I’m not assured. One thing I know is that she shouldn’t be allowed near the English department, and I’m not sure she should even be running the school. Remember: how you write is how you define yourself to people who meet you only through your writing. If your writing is pretentious, that’s how you’ll be perceived. The reader has no choice.

Here’s one more—a letter from the man who used to be my broker; now he’s my investment counsel. He says, “As we previously communicated, we completed a systems conversion in late September. Data conversions involve extra processing and reconciliation steps [*translation: it took longer than we thought*]

it would to make our office operate better]. We apologize if you were inconvenienced as we completed the verification process [*we hope we've got it right now*]. "Further enhancements will be introduced in the next calendar quarter" [*we're still working on it*]. Notice those horrible long Latin words: *communicated, conversion, reconciliation, enhancements, verification*. There's not a living person in any one of them.

Well, I think you get the point about bad nouns. (Don't worry—in a minute I'll tell you about good nouns.) I bring this up today because most of you will soon be assigned to a beat in one of New York's neighborhoods. Our city has been greatly enriched in recent years by immigrants from every corner of the world, but their arrival has also brought a multitude of complex urban problems. You'll be interviewing the men and women who are trying to solve those problems—school principals, social workers, health-care workers, hospital officials, criminal justice officials, union officials, church officials, police officers, judges, clerks in city and state agencies—and when you ask them a question, they will answer you in nouns: Latin noun clusters that are the working vocabulary of their field. They'll talk about "facilitation intervention" and "affordable housing" and "minimum-density zoning," and you will dutifully copy those phrases down and write a sentence that says: "A major immigrant concern is the affordable housing situation." But I can't picture the affordable housing situation. Who exactly are those immigrants? Where do they live? What kind of housing is affordable? To whom? As readers, we want to be able to picture specific people like ourselves, in a specific part of the city, doing things we might also do. We want a sentence that says something like "New Dominican families on Tremont Avenue in the Bronx can't pay the rent that landlords ask." I can picture that; we've all had trouble paying the landlord.

So if those are the bad nouns, what are the good nouns? The good nouns are the thousands of short, simple, infinitely old Anglo-Saxon nouns that express the fundamentals of everyday life: *house, home, child, chair, bread, milk, sea, sky, earth, field, grass, road* ... words that are in our bones, words that resonate with the oldest truths. When you use those words, you make contact—consciously and also *subconsciously*—with the deepest emotions and memories of your readers. Don't try to find a noun that you think sounds more impressive or "literary." Short Anglo-Saxon nouns are your second-best tools as a journalist writing in English.

What are your *best* tools? Your best tools are short, plain Anglo-Saxon *verbs*. I mean *active* verbs, not *passive* verbs. If you could write an article using only active verbs, your article would automatically have clarity and warmth and vigor.

Let's go back to school for a minute and make sure you remember the difference between an active verb and a passive verb. An active verb denotes one specific action: JOHN SAW THE BOYS. The event only happened once, and we always know who did what: it was John who activated the verb SAW. A passive-voice sentence would say: THE BOYS WERE SEEN BY JOHN. It's longer. It's weaker: it takes three words (WERE SEEN BY instead of SAW), and it's not as exact. How often were the boys seen by John? Every day? Once a week? Active verbs give momentum to a sentence and push it forward. If I had put that last sentence in the passive—"momentum is given to a sentence by active verbs and the sentence is pushed forward by them"—there is no momentum, no push.

One of my favorite writers is Henry David Thoreau, who wrote one of the great American books, *Walden*, in 1854, about the two years he spent living—and thinking—in the woods near Concord, Massachusetts. Thoreau's writing moves with simple strength because he uses *one active verb after another* to push his meaning along. At every point in his sentences you know what you need to know. Here's a famous sentence from *Walden*:

I went to the woods because I wished to live deliberately, to front only the essential facts of nature, and see if I could not learn what it had to teach, and not, when I came to die, discover that I had not lived.

Look at all those wonderful short, active verbs: *went, wished, front, see, learn, die, discover*. We understand exactly what Thoreau is saying. We also know a lot about *him*—about his curiosity and his vitality. How alive Thoreau is in that sentence! It's an autobiography in 44 words—39 of which are words



of *one syllable*. Think about that: only five words in that long, elegant sentence have more than one syllable. Short is always better than long.

Now let me turn that sentence into the passive:

A decision was made to go to the woods because of a desire for a deliberate existence and for exposure to only the essential facts of life, and for possible instruction in its educational elements, and because of a concern that at the time of my death the absence of a meaningful prior experience would be apprehended.

All the life has been taken out of the sentence. But what's the biggest thing I've taken out of that sentence? I've taken *Thoreau* out of that sentence. He's nowhere to be seen. I've done it just by turning all the active verbs into passive verbs. Every time I replaced one of Thoreau's active verbs with a passive verb I also had to add a noun to make the passive verb work. "I went to the woods because" became "A decision was made." I had to add the noun *decision*. "To see if I could learn what it had to teach—two terrific verbs, learn and teach; we've all learned and we've all been taught—became "for possible instruction." Can you hear how dead those Latin nouns are that end in i-o-n? Decision. Instruction. They have no people in them doing something.

So fall in love with active verbs. They are your best friends.

I have four principles of writing good English. They are Clarity, Simplicity, Brevity, and Humanity.

First, Clarity. If it's not clear you might as well not write it. You might as well stay in bed.

Two: Simplicity. Simple is good. Most students from other countries don't know that. When I read them a sentence that I admire, a simple sentence with short words, they think I'm joking. "Oh, Mr. Zinsser, you're so funny," a bright young woman from Nigeria told me. "If I wrote sentences like that, people would think I'm stupid." Stupid like Thoreau, I want to say. Or stupid like E. B. White. Or like the King James Bible. Listen to this passage from the book of Ecclesiastes:

I returned and saw under the sun, that the race is not to the swift, nor the battle to the strong, neither yet bread to the wise, nor yet riches to men of understanding, nor yet favor to men of skill, but time and chance happeneth to them all. [*Look at all those wonderful plain nouns: race, battle, bread, riches, favor, time, chance.*]

Or stupid like Abraham Lincoln, whom I consider our greatest American writer. Here's Lincoln addressing the nation in his Second Inaugural Address as president, in 1865, at the end of the long, terrible, exhausting Civil War:

With malice toward none, with charity for all, with firmness in the right as God gives us to see the right [*eleven straight one-syllable words*], let us strive on [*active verb*] to finish the work we are in, to bind up [*active verb*] the nation's wounds, to care [*active verb*] for him who shall have borne the battle and for his widow and his orphan [*specific nouns*],—to do all which may achieve and cherish a just and lasting peace among ourselves and with all nations.

Here's another American President, Barack Obama, also a wonderful writer, who modeled his own style on Lincoln's. In his memoir, *Dreams from My Father*, a beautifully written book, Obama recalls how, as a boy,

At night, lying in bed, I would let the slogans drift away, to be replaced with a series of images, romantic images, of a past I had never known.

They were of the civil rights movement, mostly, the grainy black-and-white footage that appears every February during Black History Month. . . . A pair of college students . . . placing their orders at a lunch



counter teetering on the edge of riot. . . . A county jail bursting with children, their hands clasped together, singing freedom songs.

Such images became a form of prayer for me [*beautiful phrase*], bolstering my spirits, channeling my emotions in a way that words never could. They told me [*active verb*] . . . that I wasn't alone in my particular struggles, and that communities . . . had to be created, fought for, tended like gardens [*specific detail*]. They expanded or contracted [*active verbs*] with the dreams of men. . . . In the sit-ins, the marches, the jailhouse songs [*specific detail*], I saw [*active verb*] the African-American community becoming more than just the place where you'd been born or the house where you'd been raised [*simple nouns: place, house*]. . . . Because this community I imagined was still in the making, built on the promise that the larger American community, black, white, and brown, could somehow redefine itself—I believed [*active verb*] that it might, over time, admit the uniqueness of my own life.

So remember: Simple is good. Writing is not something you have to embroider with fancy stitches to make yourself look smart.

Principle number 3. Brevity. Short is always better than long. Short sentences are better than long sentences. Short words are better than long words. Don't say *currently* if you can say *now*. Don't say *assistance* if you can say *help*. Don't say *numerous* if you can say *many*. Don't say *facilitate* if you can say *ease*. Don't call someone an *individual* [*five syllables!*]; that's a person, or a man or a woman. Don't implement or prioritize. Don't say anything in writing that you wouldn't comfortably say in conversation. Writing is talking to someone else on paper or on a screen.

Which brings me to my fourth principle: Humanity. Be yourself. Never try in your writing to be someone you're not. Your product, finally, is you. Don't lose that person by putting on airs, trying to sound superior.

There are many modern journalists I admire for their strong, simple style, whom I could recommend to you as models. Two who come to mind are Gay Talese and Joan Didion. Here's a passage by Talese, from his book of collected magazine pieces, *The Gay Talese Reader*, about the great Yankee baseball star, Joe DiMaggio, who at one point was married to Marilyn Monroe:

Joe DiMaggio lives with his widowed sister, Marie, in a tan stone house on a quiet residential street near Fisherman's Wharf. He bought the house almost thirty years ago for his parents, and after their death he lived there with Marilyn Monroe. . . . There are some baseball trophies and plaques in a small room off DiMaggio's bedroom, and on his dresser are photographs of Marilyn Monroe, and in the living room downstairs is a small painting of her that DiMaggio likes very much [*how nice that sentence is—how simple and direct*]: It reveals only her face and shoulders, and she is wearing a very wide-brimmed sun hat, and there is a soft sweet smile on her lips, an innocent curiosity about her that is the way he saw her and the way he wanted her to be seen by others.

[*Notice all those one-syllable words: "the way he saw her and the way he wanted her to be seen." The sentence is absolutely clean—there's not one word in it that's not necessary and not one extra word. Get rid of every element in your writing that's not doing useful work. It's all clutter.*]

And here's Joan Didion, who grew up in California and wrote brilliant magazine pieces about its trashy lifestyle in the 1960s. No anthropologist caught it better. This passage is from her collection of early magazine pieces, *Slouching Toward Bethlehem*.

There are always little girls around rock groups—the same little girls who used to hang around saxophone players, girls who lived on the celebrity and power and sex a band projects when it plays—and there are three of them out here this afternoon in Sausalito where the Grateful Dead rehearse. They are all pretty and two of them still have baby fat and one of them dances by herself with her eyes closed [*perfect simple image*]. . . .

Somebody said that if I was going to meet some runaways I better pick up some hamburgers and Cokes on the way, so I did, and we are eating them in the Park together, me, Debbie who is fifteen, and Jeff who is sixteen. Debbie and Jeff ran away twelve days ago, walked out of school with \$100 between them [*active verbs: ran away, walked out of school*]. . . .

Debbie is buffing her fingernails with the belt to her suede jacket. She is annoyed because she chipped a nail and because I do not have any polish remover in the car. I promise to get her to a friend's apartment so that she can redo her manicure, but something has been bothering me and as I fiddle with the ignition I finally ask it. I ask them to think back to when they were children, to tell me what they had wanted to be when they were grown up, how they had seen the future then.

Jeff throws a Coca-Cola bottle out the car window. "I can't remember I ever thought about it," he says.

"I remember I wanted to be a veterinarian once," Debbie says. "But now I'm more or less working in the vein of being an artist or a model or a cosmetologist. Or something."

Here's the first paragraph of an article of mine that originally ran in *The New Yorker*. (It's now in my book *Mitchell & Ruff*.)

Jazz came to China for the first time on the afternoon of June 2, 1981, when the American bassist and French-horn player Willie Ruff introduced himself and his partner, the pianist Dwiki Mitchell, to several hundred students and professors who were crowded into a large room at the Shanghai Conservatory of Music. The students and the professors were all expectant, without quite knowing what to expect. They only knew that they were about to hear the first American jazz concert ever presented to the Chinese. Probably they were not surprised to find that the two musicians were black, though black Americans are a rarity in the People's Republic. What they undoubtedly didn't expect was that Ruff would talk to them in Chinese, and when he began they murmured with delight.

Five plain declarative sentences that get the story started at full speed—WHAP! You're right in that room at the Shanghai Conservatory on that June afternoon in 1981.

I've given you these examples because writing is learned by imitation. We all need models. Bach needed a model; Picasso needed a model. Make a point of reading writers who are doing the kind of writing you want to do. (Many of them write for *The New Yorker*.) Study their articles clinically. Try to figure out how they put their words and sentences together. That's how I learned to write, not from a writing course.

Two final thoughts. Some of you, hearing me talk to you so urgently about the need to write plain English, perhaps found yourself thinking: "That's so yesterday. Journalism has gone digital, and I've come to Columbia to learn the new electronic media. I no longer need to write well." I think you need to write even more clearly and simply for the *new* media than for the *old* media. You'll be making and editing videos and photographs and audio recordings to accompany your articles. Somebody—that's you—will still have to *write* all those video scripts and audio scripts, and your writing will need to be lean and tight and coherent: plain nouns and verbs pushing your story forward so that the rest of us always know what's happening. This principle applies—and will apply—to every digital format; nobody wants to consult a Web site that isn't instantly clear. Clarity, brevity, and sequential order will be crucial to your success.

I emphasize this because the biggest problem that paralyzes students is not how to write; it's how to organize what they are writing. They go out on a story, and they gather a million notes and a million quotes, and when they come back they have no idea what the story is *about*—what is its proper narrative shape? Their first paragraph contains facts that should be on page five; facts are on page five that should be in the first paragraph. The stories exist *nowhere* in time or space; the people could be in Brooklyn or Bogotá.

The epidemic I'm most worried about isn't swine flu. It's the death of logical thinking. The cause, I assume, is that most people now get their information from random images on a screen—pop-ups, windows, and sidebars—or from scraps of talk on a digital phone. But writing is *linear* and *sequential*; Sentence B must follow Sentence A, and Sentence C must follow Sentence B, and eventually you get to Sentence Z. The hard part of writing isn't the writing; it's the thinking. You can solve most of your writing problems if you stop after every sentence and ask: "What does the reader need to know next?"

One maxim that my students find helpful is: *One thought per sentence*. Readers only process one thought at a time. So give them time to digest the first set of facts you want them to know. Then give them the next piece of information they need to know, which further explains the first fact. Be grateful for the period. Writing is so hard that all of us, once launched, tend to ramble. Instead of a period we use a comma, followed by a transitional word (*and*, *while*), and soon we have strayed into a wilderness that seems to have no road back out. Let the humble period be your savior. There's no sentence too short to be acceptable in the eyes of God.

As you start your journey here at Columbia this week, you may tell yourself that you're doing "communications," or "new media," or "digital media" or some other fashionable new form. But ultimately you're in the storytelling business. We all are. It's the oldest of narrative forms, going back to the caveman and the crib, endlessly riveting. What happened? *Then* what happened? Please remember, in moments of despair, whatever journalistic assignment you've been given, all you have to do is tell a story, using the simple tools of the English language and never losing your own humanity.

Repeat after me:

Short is better than long.

Simple is good. (*Louder*)

Long Latin nouns are the enemy.

Anglo-Saxon active verbs are your best friend.

One thought per sentence.

Good luck to you all.

Article printed from The American Scholar: <http://www.theamericanscholar.org>

URL to article: <http://www.theamericanscholar.org/writing-english-as-a-second-language/>

Movie Misquotations

By FRED R. SHAPIRO

MOMIE MISQUOTATIONS

Over the last century or so, movie quotations, like pop-music lyrics, have come to replace Biblical verses and Shakespearean couplets as our cultural lingua franca, our common store of wit and wisdom. Yet many of the most frequently cited motion-picture lines turn out to be misquotations. The speech from “Dirty Harry” in which Clint Eastwood says, “You’ve got to ask yourself one question: ‘Do I feel lucky?’ Well, do ya, punk?” is commonly shortened to “Do you feel lucky, punk?” Michael Douglas’s “Greed, for lack of a better word, is good” (“Wall Street”) is condensed to “Greed is good.” Expressions of James Cagney like “You dirty, yellow-bellied rat” (“Taxi!”) and “Dirty, double-crossing rat” (“Blonde Crazy”) are immortalized as the snappier “You dirty rat.”

Why do we so frequently get the lines wrong?

One phenomenon at work, as in the cases above, is compression. Even Bartlett’s Familiar Quotations falls prey to this type of error. It cites “Apocalypse Now”: “I love the smell of napalm in the morning. It smells like victory.” What Robert Duvall really says is: “I love the smell of napalm in the morning. You know, one time we had a hill bombed for 12 hours. When it was all over, I walked up. We didn’t find one of ’em, not one stinkin’ . . . body. The smell, you know that gasoline smell, the whole hill. Smelled like victory.”

Sometimes lines are altered so they can stand alone, without the cinematic context. In “Island of Lost Souls,” Charles Laughton remarks, “They are restless tonight.” Now we paraphrase this as “The natives are restless.” Sometimes a specific reference is changed to a generalized one. “If you build it, he will come” from “Field of Dreams” becomes “If you build it, they will come.” Misquotations often improve upon the screenwriters’ originals by offering a better rhythm or cadence. Thus “Win just one for the Gipper” (Pat O’Brien in “Knut Rockne, All American”) is remembered more melliflously as “Win one for the Gipper.”

The most famous example of a film line improved by the popular mind is, of course, Ingrid Bergman’s request to the pianist in “Casablanca”: “Play it, Sam. Play ‘As Time Goes By.’” It didn’t take long for the line to begin to shift. Nigel Rees, the British author and quote maven, has noted that Jack Benny included “Sam, Sam, play that song for me again, will you?” in a radio parody of the movie a year later. At some point along the way, it became the memorable “Play it again, Sam,” which Woody Allen helped to cement by using the paraphrase as the title of a 1969 play and a 1972 motion picture.

Another notable instance of the progression of cinematic phrasing toward greater euphony is a line of Mae West’s. For her play “Diamond Lil,” West wrote: “Why don’t you come up sometime?” The later film “She Done Him Wrong” made it longer: “Why don’t you come up sometime and see me?” We know it today as “Why don’t you come up and see me sometime?”

Sometimes movie dialogue is recalled inaccurately so as to preserve visual cues that would otherwise be lost. “Me Tarzan, you Jane” is so established that Bartlett’s is again taken in, sourcing this as “Spoken by Johnny Weissmuller in the movie ‘Tarzan the Ape Man.’” In fact, in the film Weissmuller alternately taps himself and Jane Parker, repeating, “Jane . . . Tarzan.” It was only later, in an interview in Photoplay magazine, that Weissmuller poked fun at his role by characterizing it as “Me Tarzan, you Jane.”

Misquotations can sometimes be quite subtle, faintly but significantly improving the diction of a quote. The Laurel and Hardy catchphrase “Here’s another nice mess you’ve gotten me into” has been transmuted to “Here’s another fine mess. . . .” Our memory can sex up a line, misstating Jean Harlow’s “Would you be shocked if I put on something more comfortable?” (“Hell’s Angels”) as “Excuse me while I slip into something more comfortable.” Wording can also be changed to keep up with colloquial speech. In 1948, in “The Treasure of the Sierra Madre,” Alfonso Bedoya declared, “I don’t have to show you any stinking badges!” In a 1967 episode of the TV series “The Monkees” and in “Blazing Saddles” (1974), this was revised to the now-dominant version: “Badges? We don’t need no stinking badges!”

The boldest form of misquotation is the wholesale fabrication, attributing words to movies in which nothing like them appeared. These are sometimes created by comedians doing impressions of actors in movies. Charles Boyer is widely thought to have spoken “Come with me to the Casbah” to Hedy Lamarr in “Algiers,” but as Nigel Rees discovered, the line was the creation of Boyer impersonators who used it to mock the film, and it was not uttered on screen. The phrase most famously associated with Cary Grant — “Judy, Judy, Judy” — was never spoken by Grant in a movie and may have had a similar origin in an impersonation of him.

When a quotation captures the essence of a performer, we want to believe it was spoken, even if it would have been anachronistic. Again Mae West and “She Done Him Wrong” (1933) provide an example. “Is that a gun in your pocket, or are you just happy to see me?” is often ascribed to that film, but it does not appear there or in any of her other early productions: it was too risqué for the time of its supposed use.

It is a fitting homage to the fantasy machine of Hollywood that its verbal gems are no less compelling when their origins are themselves fantasies.

Fred R. Shapiro is the editor of “The Yale Book of Quotations” and associate librarian and lecturer in legal research at Yale Law School.

<http://www.nytimes.com/2010/01/17/magazine/17FOB-onlanguage-t.html>

Cold, Hard Facts About Saving Florida's Oranges

By: Bruce Dorminey



Orange juice concentrate — the frozen food staple routinely gobbled out in breakfast pitchers — now makes up the bulk of Florida's citrus industry. It's even traded as a commodity on the New York Board of Trade.

But before it becomes a twinkle in the eye of an ambitious futures trader, the oranges themselves must first hazard Sunshine State's sometimes unpredictable winters. And, of late, they haven't been all balmy and mild.

A late December and early January cold snap saw temperatures in south and central Florida drop from shirt-sleeve weather to sub-freezing. Those crucial sub-freezing hours can make the difference between an orange grove free from the scourges of winter frost and higher prices in the check-out line.

For well over a century, however, the U.S. Department of Agriculture citrus-breeding program has been trying to make citrus trees more resistant to winter freezes.

While all commercial citrus is evergreen, the key to solving the problem of cold hardiness lies in *Poncirus trifoliata*, aka the "trifoliolate orange," a deciduous species that is the most cold hardy of any citrus out there. It originated in northern China, and in the U.S. can now be found as far north as Pennsylvania.

Problem is, it produces a small, seedy and completely unpalatable piece of fruit.

"Even its direct hybrids taste terrible," said horticulturalist Ed Stover at the USDA's agricultural research station at Florida's Fort Pierce. "But the idea is to combine some of *Poncirus'* cold tolerance with the fruit quality of cultivated citrus. This is hybridization, not genetic engineering. We plan on testing cold hardiness in some fourth-, fifth- and sixth-generation hybrids."

This spring, Stover and colleagues will plant some hundred of these orange hybrids at a couple of sites in north Florida, perhaps as far north as Live Oak and Ocala. Over the next 10 years, the aim is to identify citrus varieties capable of tolerating once-in-a-decade type freezing within the northern fringe of Florida's citrus belt.

As for damage to this year's citrus crop, citrus extension agent Chris Oswalt of Florida's orange-rich, south-central Polk County, said that while leaf loss and fruit damage are a given, he doesn't expect his county to lose actual trees.

That's not a bad outcome for fruit that actually originated in tropical Asia.

Citrus has been culturally synonymous with Florida for centuries — orange trees were first grown in the late 16th century around St. Augustine on the then Spanish colony's northeast coast. By the 18th century, English colonists were planting citrus as far north as South Carolina — until an 1835 freeze spurred citrus' gradual retreat back to Florida. Today, some 850,000 acres of commercial Florida citrus lie mostly south of Orlando.

Despite this winter's early low temperatures, however, the question on most citrus growers' minds is not how to weather this latest bout of inscrutable winter, but how to counter the more immediate danger of Greening Huanglongbing disease.

Greening disease causes fruit and leaf discoloration as a result of the ravages of its signature bacterium, *Candidatus Liberibacter asiaticus*.

The bacterium is spread by a small flying insect about the size of a fruit fly — the Asian citrus psyllid, which was initially identified in Florida more than a decade ago. Greening disease itself was first found in Florida in late 2005.

Greening has already also been found in Georgia, Louisiana and South Carolina, and the USDA is worried the disease might spread to Texas, Arizona and California.

"We're now losing citrus to real estate development and disease," said horticulturalist Gene Albrigo at the University of Florida's citrus research and education center in Lake Alfred. "Some individual groves in the south have probably lost 20 or 30 percent due to Greening."

But could Florida's recent cold have also provided a silver lining by serendipitously reducing Greening disease's pesky psyllid population, the same way it's taken a shot at invasive iguanas and pythons?

"You would hope that the cold would reduce some of the psyllids," Oswalt said. "But it won't completely get rid of them."

So, for now, making the citrus trees resistant to the Asiaticus bacterium remains the most practical option. One scenario involves genetically inserting anti-microbial amino acid compounds from plants like soy beans or spinach. Researchers are hopeful that Greening can be dealt with swiftly in the not too distant future.

Citrus' continual struggles with old man winter, however, will likely continue for decades.

http://www.miller-mccune.com/science_environment/cold-hard-facts-about-saving-florida-s-oranges-1744?utm_source=Newsletter92&utm_medium=email&utm_content=0119&utm_campaign=newsletters

I See a Quake in Your Future. Sometime.

By: Melinda Burns



Science is messy. For every step forward on the road to truth, there are two steps in some other direction. And the way toward earthquake prediction, the Holy Grail of seismology, is littered with the dashed hopes of those who have failed.

"Even well-trained scientists, even brilliant scientists, can fool themselves in their quest to prove something they believe or want to be true," says Susan Hough in her engaging new book, *Predicting the Unpredictable: The Tumultuous Science of Earthquake Prediction*. "... It is a hard thing for any scientist to do, to admit they have been on a path that isn't going to go anywhere."

Sifting through the rubble of more than a century of fruitless effort, Hough tells how California, a state living dangerously on the boundary of clashing tectonic plates, became a hotbed not only of earthquake science but also earthquake-prediction fiascos.

Scientists learned to map quakes and measure their motion, laying the foundations for strict building codes that saved countless lives. They could accurately predict that the San Andreas Fault was overdue for a massive quake ... someday. But virtually every time they ventured to warn the public that a quake was coming on or before a specific date, they were wrong.

There was, for example, the famous "Palmdale bulge," a so-called warping of the San Andreas Fault in the Mojave Desert, reported by the U.S. Geological Survey in 1976 as a sign of an impending quake. It turned out to be an error in measurement.

There were the two men who studied underground "rock bursts" and predicted that a major quake would strike near Lima, Peru, in 1981. "Did they get the idea from *The Tibetan Book of the Dead*?" a colleague asked. No such quake occurred.

And there was the USGS again in the late 1980s, armed with the information that magnitude 6 earthquakes struck Parkfield, Calif., every 22 years on average and boldly predicting a moderate quake on the San Andreas Fault near the town by 1992. The quake, when it finally came in 2004, was 37 years after the previous one. It became a famous example of the "irregular regularity" of earthquakes. "Fools and charlatans" was the epithet that Charles Richter, creator of the Richter magnitude scale, reserved for those who claimed to make precise earthquake predictions.

But Hough, a seismologist with the Southern California Earthquake Center, a fellow of the American Geophysical Union and the author of several other books on earthquakes, treats the many failures and dead ends of her profession with sympathy. She is focused on the business of science, and science almost always proceeds in fits and starts. Skeptics may engage in hazing, careers may end in regret, but debunking bad ideas is part of the testing that must go on.

"One can't hope to push boldly into the frontier of knowledge and pick the right path every time," Hough writes. "... Science goes wrong when scientists refuse to recognize evidence that is staring them in the face, telling them they are on the wrong path."

The fault line running through Hough's tale is a tantalizing notion: Reliable earthquake prediction that would save countless thousands of lives was right around the corner. She shows how scientists measured real precursors to earthquakes, such as changes in the chemistry and level of groundwater; electromagnetic signals called earthquake "lights;" unusual releases of gas or heat along a fault line; changes in the speed of seismic waves; and — the most popular phenomena of all — changes in the patterns of small and moderate quakes. These apparent signals were documented both before and after the fact. But to date, no one has been able to use them to make a successful prediction. The problem, Hough posits, "might not be solvable."

Looking beyond California, Hough examines quakes in Hawaii, Sumatra, Chile, Japan, Iran and even Missouri, where a big one struck in 1812, toppling chimneys in Louisville, Ky., and ringing church bells as far away as in Charleston, S.C. A year later, an aftershock rocked the heartland, causing the Mississippi River to flow briefly backward and carry boatmen upstream.

In one of her most compelling stories, Hough draws aside the curtain on the magnitude 7.3 quake that struck Haicheng in northern China in 1975, killing 2,000. There had been rumblings of the earth leading up to it, and the Chinese authorities claimed to have evacuated the population in time, saving untold thousands of lives. They relied in part on citizen reports of well-water fluctuations and strange animal behavior in the weeks before the quake, especially 100 snakes seen emerging incongruously from winter hibernation.

The news from Haicheng helped boost the funding for earthquake safety in the U.S., but it was also a shot in the arm for prediction scientists, who spent years following leads that were later discredited. As Hough tells it, the Haicheng hype was partially manufactured. In any case, the euphoria was short-lived. A year later, in 1976, the Chinese government reported 250,000 deaths in Tangshan, where a massive quake struck without warning.

Predicting the Unpredictable is a lucid, nuanced book, sprinkled with arresting photos, diagrams and sidebars for the lay reader. Occasionally, Hough provides too much information on the ins and outs of one esoteric debate or another, perhaps out of deference to her peers. She is at her best when she deftly compares earthquakes to popcorn popping, or invokes comedian Jay Leno to drive home a point. ("Hey don't do me any [favors] — I can predict aftershocks, OK? You know when they happen? Right after an earthquake.")

Most scientific research goes on behind closed doors. Hough's book reveals the inner workings of the profession even as it stumbles, like Alice, into Wonderland. After a century of failed predictions, most seismologists in the U.S. and Europe have become, at best, agnostics on the subject. They're focused



instead on how faults interact with neighboring faults, how earthquakes interact with other earthquakes, and how the earth's brittle crust interacts with more plastic layers below.

One thing scientists know for sure is that the southern San Andreas Fault has been 10 months pregnant for decades. The Big One could hit California anytime — maybe by the time this magazine goes to print, or maybe in 50 years.

"And so here we sit, with reason for concern, but grossly imperfect knowledge," Hough concludes. "What do we say? What can we say? There's a bogeyman out there; we know it's scary and dangerous, but how scary and dangerous, we really don't know. And exactly when it will make an appearance, we don't know that either."

http://www.miller-mccune.com/science_environment/i-see-a-quake-in-your-future-sometime-1737

Measuring How Hard 'Old Growth' Takes it on the Chin

By: Bruce Dorminey



Two hours north of Seattle, a quick exit off I-5 brings you within striking distance of some of this country's last remaining old-growth forests.

Here, in season, a wide swath of farmland is normally rife with raspberries, tulips and potatoes, but with summer now only a vague notion, in the distance, the massive North Cascades mountain range shows signs of fresh snow.

There, for miles along the bottom of a meandering glacial stream, lies a healthy stand of old-growth Douglas fir, Western hemlock and Western red cedar.

Such hauntingly majestic stands of old growth were commonplace when Lewis and Clark first set foot in the Northwest. But in the last century, roughly half of old-growth forests in Washington and Oregon have been whacked by logging and wildfire. Now, it's feared climate change looms as their nemesis.

"In Washington and Oregon, we're down to less than a quarter of what we might have had historically," said Tom Spies, a forest ecologist at the U.S. Forest Service's Pacific Northwest Research station in Corvallis, Ore. "There's between 3-to-8 million acres of Pacific Northwest old growth left. And most of that reduction has been due to land-use change on non-federal land."

In Washington and Oregon, 350- to 750-year-old Douglas fir and Western hemlock forests make up the bulk of old growth on the western, wetter side of the Cascade mountains.

To take a firsthand look, I set out in a steady rain with Mignonne Bivin, an energetic plant ecologist from the North Cascades National Park. Our first stop was about a tenth of a mile from the Thunder Creek trailhead, technically part of the Ross Lake National Recreation area.

There, Bivin verified a bona fide specimen of old-growth Douglas fir, its trunk roughly 60 inches in diameter. It can take 60 to 80 years to grow a tree 20 inches in diameter. However, North Cascades old growth tends to run between 50 to 60 inches in diameter, or roughly 5 feet in diameter — a lot of tree to hug. So, despite their characteristic old-growth resiliency to fire and seasonal changes, these old trees are still not immune to gravity.

A couple of hundred yards further down the trail, a whole cedar has been upended; its roots on full display, taking dirt and boulders the size of small coffee tables along with it.

Thus, it's clear that even without logging or climate extremes, old-growth longevity can be cut short by a potent combination of rain-sodden soil and a few strong gusts of wind.

And 40 years after the North Cascades National Park was first established, there remain a few trees along this trail that still show signs of mutilation by timbermen.

Today, however, the combination of the Mount Baker-Snoqualmie National Forest to the west and the Okanogan and Wenatchee national forests to the east, makes this region the United States' largest federally protected wilderness area outside of Alaska.

In Washington and Oregon, at least 75 percent to 85 percent are on federal lands. The Northwest Forest Plan of 1994, an initiative of the Clinton administration, continues to monitor some 24 million acres of federally managed land.

While there has been significant progress in preserving old growth since that plan was first enacted, Spies said, it's hard to guess what climate change is going to do over the next century.

In another decade, however, such predictive old growth models are expected to be aided by NASA's planned Desdyni (Deformation, Ecosystem Structure and Dynamics of Ice) satellite, a five-year Earth-observing mission, scheduled for launch in 2019.

Desdyni will probe Northwest forests with light detection and ranging (or LIDAR) sensors that use laser pulses to reflect the forests' structure, foliage, canopy and biomass. Old-growth forest structure should cause lots of reflectance in the laser pulse signal, but differentiating between specific tree species would be more difficult.

Still, the ultimate goal for such technology is to give an up-to-date, unbiased estimate of just how much Northwest old growth is still out there. Some environmentalists put that figure at only 10 percent.

"There is no consistent definition of old growth and there never will be," Spies said. "If you define it by age, in the Pacific Northwest, it usually starts around 150 to 200 and goes up from there."

The logging industry would like old-growth age classifications to be skewed older, while environmentalists want them lowered. But Bivin says if an ecosystem functions like an old-growth forest, it doesn't really matter if it's 200, 300 or 1,000 years old. Most of the old-growth trees in the North Cascades National Park, she notes, average between 350 to 800 years old.

For the past 15 years, much of the old forests have been preserved and managed under the Northwest Forest Plan. The plan was initiated in large part to try and preserve wildlife species that depend on Northwest old growth. As a result, the northern spotted owl quickly became an environmental poster child.

Even so, northern spotted owl populations are going to continue to decline, since old forests on non-federal lands are still being lost, said Eric Forsman, a research scientist with the U.S. Forest service, also

at the Pacific Northwest Research Station. As a result, he remains pessimistic about the spotted owl's long-term prospects.

While the northern spotted owl has not been plentiful in the North Cascades in recent years, even casual hikers can detect hints of abundant wildlife. We come upon a large hollowed-out cedar snag that looks like a soundstage prop from *The Lord of the Rings*. Such snags (essentially vertically standing dead trees) play host to a variety of insects and thus make good food sources for wildlife. The same goes for the forest floor's old-growth logs, which can take 600 years or more to completely decompose.

The trail snakes around the creek bottom until reaching the Thunder Creek bridge. Although the bridge marks the end of the line for most day hikers, it's the gateway to a 15-mile stretch of mountainous backcountry.

Bivin said it's no coincidence that this old growth lies along a creek bed fed by nutrient-rich glacial silt and a steady supply of moisture. She also notes that this river corridor is a lot more stable than much of the area's steep slopes where the risk of avalanche, rock fall and fire is much more prevalent.

But it's debatable just how much of such remaining Northwest old growth will actually be preserved in these types of thriving ecosystems.

Forsman said that, in theory, it's possible to grow old forests, but it will require "long-term vision and willpower."

"We'll always have some old growth in the Pacific Northwest," Spies said, "but the longer we go into the latter part of this century, it's not clear how much. We do know that there are elevated rates of mortality in old-growth trees due to drought stress and fire," both hallmarks of climate change.

In many parts of the country, Spies said conservationists see logging as less of a threat than real estate development. But now, he notes the biggest threat of all is climate change.

http://www.miller-mccune.com/science_environment/measuring-how-hard-old-growth-takes-it-on-the-chin-1724

It's Like e-Harmony for Lab Rats

A new federal Web site hopes to match human research volunteers with medical researchers.

- By: Melinda Burns



Top federal health agency creates ResearchMatch.com to make it easier for medical researchers and interested volunteers to find each other.

A national program to streamline the recruitment of volunteers for biomedical clinical trials has been launched online by the National Institutes of Health, the primary federal agency charged with supporting and developing medical research in the United States.

People who want to participate in approved clinical trials can log on now to ResearchMatch.org and self-register. Beginning in January, researchers looking for volunteers will be able to review their personal profiles and send them an e-mail message through ResearchMatch — initially, without knowing the volunteer's name, address or phone number.

If, after the initial message, a prospective volunteer wants to release his or her contact information, the researcher might provide more specifics about the study and ask the person to complete a survey at home, go to an outpatient clinic or travel to a research hospital. There is no obligation to participate.

Since the ResearchMatch Web site went up Nov. 10, about 2,300 volunteers from 48 states have registered, organizers said. The program is aimed primarily at medical research but is open to researchers in the social sciences as well.

"ResearchMatch offers a convenient solution to the complex, competitive and often costly participant recruitment system," said Gordon Bernard, a principal investigator for the Vanderbilt Institute for Clinical and Translational Research, in Nashville, Tenn., which is hosting the national registry. "NIH data indicates that 85 percent of trials don't finish on time due to low patient participation, and 30 percent of trial sites fail to enroll even a single patient."

The NIH invests more than \$28 billion in medical research yearly. Most of the funding is awarded through 50,000 competitive grants to more than 325,000 researchers, working at more than 3,000 universities, medical schools and clinics, in every state and around the world.

Yet studies show that only 4 percent of the U.S. population has ever participated in a clinical trial. According to a 2008 survey by the [Society for Women's Health Research](#), 94 percent of Americans say their doctors have never referred them to a medical study.

In fact, finding volunteers is the most difficult part of clinical trials, said [Steven Alexander](#), a pediatric researcher who directs the compliance and training programs for clinical research at the Stanford University School of Medicine in Palo Alto, Calif. Stanford and Vanderbilt belong to a network of 52 hospitals and universities supporting ResearchMatch.

It is particularly hard to find volunteers in pediatrics because serious disease is uncommon in children, Alexander said. He recalled how, several years ago, a study that he helped conduct on children with kidney disease was inconclusive because he and his colleagues could not find enough participants.

"The question was whether a protein-restricted diet could reduce the rate of kidney-function deterioration in children," Alexander said. "You start the study, you get it going, you spend the money, and then if you don't have enough subjects, you end up not answering your question. You don't have enough information to say that whatever you saw was a significant result. It means it could have happened by chance."

Some researchers have resorted to running ads in newspapers and on Craigslist and even putting up posters in elevators to get the word out, Alexander said.

"We're not down to Twitter yet, but we've used just about everything else," he said.

For volunteers trying to connect with clinical trials, it can be like looking for a needle in a haystack, too. Stanford gets hundreds of calls from very sick people who are trying to hook up with researchers, but with 1,000 active studies under way at its School of Medicine, it's difficult to find the right matches, Alexander said.

ResearchMatch is being billed as the first nonprofit initiative in the U.S. to put researchers in touch with a "disease-neutral" database of prospective volunteers. It places the burden on the researcher to find volunteers who fit their studies, instead of the other way around. It is designed to complement [ClinicalTrials.gov](#), an NIH initiative that asks volunteers to pick the trials that might work for them.

"Instead of having the volunteer spend a wealth of time looking and searching for the right match, researchers with approved studies will be able to search the registry for potential matches," said Kirstin Scott, the program manager. "It's a pool of interested volunteers. There is no disease prerequisite. You can have breast cancer, asthma, cardiovascular conditions or a rare disease — or you can be perfectly healthy. A family could register on the site."

Typically, people seek to join a clinical trial in order to obtain free access to a drug or medical treatment that they could not otherwise afford, or to participate in an experimental program, not yet approved for general use, that they believe might cure their disease. They may want to help researchers find a cure for a family member who is afflicted. They may be healthy and simply committed to moving medicine forward.

"There are truly altruistic people who are determined to be on the team," Alexander said. "Or they have a serious medical problem and are looking for the most advanced treatment. There's a lot of good medicine that can be done in the setting of clinical research."



Childhood leukemia is now a curable disease because a lot of determined people volunteered their children for clinical trials, and doctors were able to learn more about the timing and use of already existing medications, Alexander said.

"It is the great success story of clinical research," he said. "Childhood leukemia was cured by clinical research. It wasn't the silver bullet of some wonderful medicine.

"Every child with leukemia now is a part of a study. I think that's the model for all of us. It is like a mission. It is the only way."

The 52 institutions supporting ResearchMatch are affiliated with the Clinical and Translational Science Awards, a national network of medical research institutions working to improve the way medical research is conducted across the country. All researchers must submit their studies to a review board for approval before soliciting volunteers.

http://www.miller-mccune.com/science_environment/it-s-like-e-harmony-for-lab-rats-1722



A Really Hard Test Really Helps Learning

Challenging tests and falling short may be hard on the ego, but they can do more than mere studying for eventually getting it right.

- By: Nate Kornell and Sam Kornell | January 19, 2010



More challenging tests and falling short can do more than mere studying for eventually learning more.
stockxpert.com

The first time Sarah Patterson got pimped by her attending doctor, it was a distinctly unpleasant experience.

A medical student at the University of California, San Francisco, Patterson had just begun a rotation on the wards of the city's General Hospital. While doing rounds, the doctor asked her, in front of their entire medical team, to list all of the causes of atrial fibrillation — a kind of medical school pop quiz that Patterson and her fellow students refer to as "getting pimped."

"I didn't know all of them, and I fumbled and tried to string together what I knew into a coherent answer," she recalls. "It wasn't fun." But, Patterson says, as unpleasant as the incident was, it was effective. "I know a lot about atrial fibrillation now. Fear and failure are good motivators."

Patterson's experience is one with which anyone who has ever taken a pop quiz can doubtless identify. And her interpretation of it — that failure inspired her to learn everything she could about atrial fibrillation — is supported by research I recently published in the *Journal of Experimental Psychology*:

Learning, Memory, and Cognition. Working with [Robert Bjork](#), a professor of psychology at UCLA, and Matthew Hays, a former graduate student there, we found that two widely held assumptions about learning — one about testing, and the other about making mistakes — are based on misconceptions.

Education theory has long upheld the virtue of errorless learning. Learn something right the first time around, the idea goes, and you won't be plagued by errors in the future. This belief isn't confined to the classroom. "Don't practice mistakes," coaches, music teachers and educators across the country tell their pupils.

But our research indicates that errors are not necessarily the enemy of learning; they can, in fact, enhance it. Likewise, the widely held belief that testing serves no purpose other than assessing performance is built on a similar misconception. In reality, testing — whether self-testing or testing in the classroom — can, under the right conditions, better promote learning than can studying.

A recurring theme in the field of cognitive psychology is the human tendency toward overconfidence. Research shows that people routinely overestimate not only their ability to understand the world, but also how well they perform both simple and complex tasks, from driving to accurately recalling the details of an event that occurred just a few days prior.

A recent study by researchers at Cornell and the University of Illinois, for example, found that students in a sophomore psychology class overestimated their performance on a test even after being promised up to \$100 if they could accurately assess how well they did. As the researchers pointed out, the same pattern has emerged in studies of hunters (quizzed about their knowledge of firearms), medical residents (evaluating their patient-interviewing skills) and college debaters (assessing their performance after an event), among many others.

The frequent gap between confidence and performance makes clear the value of testing as a diagnostic tool. Tests permit us to relinquish responsibility for assessing our own performance — the test does it for us, and, if it's at all well designed, does so more accurately than we would be able to manage on our own.

What is less well understood is the value of testing as learning tool, quite aside from its diagnostic worth. Not long ago I, along with [Lisa Son](#), a professor of psychology at Barnard College, conducted a study in which we found that students studying word pairs recognized that testing was the best way to monitor their learning — to find out what they did and didn't remember about the word pairs after studying them.

What they didn't appreciate, however, was the virtue of testing as a learning strategy in its own right. Students who studied the word pairs one time through and then took a quiz on them were better able, later on, to remember the pairs than students who simply studied them twice. But the students in the first group thought they performed worse than they would have had they been able to study the words again.

This confusion is widespread, and it has implications for everyday life. Anyone who has to renew their license, or has decided to take up photography as a hobby, or has become interested in birding, or would like to be able to identify important congressional players in the fight over health care — these and any number of other disparate occasions for learning can be made more productive with the help of a test. Next time you have to commit a chunk of material to memory, consider devising one to improve the process.

But it also means something for national education policy. The merits — or lack thereof — of testing as an educational tool has, since the introduction of the No Child Left Behind Act under President George W. Bush, become a polarizing topic in American politics. NCLB instituted a system of standardized tests nationwide, which are meant to act as a kind of national barometer for educators — and for federal officials deciding where to send education funding — that is, as a tool for comparing performance across schools and school districts.

Critics of NCLB argue, among other things, that it forces educators to "teach to the test" and takes away time from studying, which, the assumption goes, is where actual learning occurs. But as our research indicates, so long as students are made to review their mistakes, testing performs a vital function as a learning tool. Educators and policymakers might consider this when they debate the merits not only of NCLB, but also when they formulate curricula and design lesson plans.

If testing is a good way to learn, then, an obvious question arises: How difficult should tests be? The answer, according to our study, is quite difficult — a fact that runs counter to at least one well-established strain of American educational theory.

Since at least the early 1960s, some education theorists have upheld the virtue of errorless learning. The idea is straightforward, and it makes intuitive sense: The best way to learn is the way that involves allowing into the process as few initial errors as possible. B.F. Skinner, a Harvard psychologist in the 1950s and '60s, was an important proponent of this theory. In 1958, Skinner published a study in which he proposed, based on his work with rats and pigeons, a set of guidelines about how people should approach complex tasks, such as education.

Skinner argued that based on his results with pigeons and rats, the best way to learn is also the most error free. As he put it, "It is a salutary thing to try to guarantee a right response at every step in the presentation of a subject matter." He also said, "There is no evidence that what is easily learned is more readily forgotten."

Skinner was wrong on both counts. Challenging materials lead to errors, but they also make learners more active participants in their learning and, as a result, create long-lasting memories (even in monkeys). Cognitive psychologists sometimes use the term "desirable difficulty" to refer to this phenomenon. The idea shouldn't be taken too far — obviously, getting drunk before a test is unlikely to improve one's prospects. But it's remarkable just how dramatically a challenge inspires focus and memory.

In our study, we asked nearly 200 UCLA undergraduates to answer questions that they could not, in fact, answer — in some cases because the questions were too difficult, and in others because the questions were, unbeknownst to the students, fictional. "What peace treaty ended the Calumet War?" we asked, and "What is the name of the sailor who took the first solo voyage around Cape Evergreen?"

In one condition, the questions and answers were shown together; in another, the questions were shown alone at first, and then the answer was shown. Students in the second condition, faced with questions they were extremely unlikely to answer correctly, nevertheless ended up performing significantly better on a later test of their knowledge than their counterparts, who had been exposed to the answers — along with the questions — at the outset of the study.

We drew an obvious conclusion from this result, but it runs counter to what many people might consider common sense. Clearly, students in the second condition learned more by trying unsuccessfully to think of the answers on their own than their counterparts, who simply studied all of the information we gave them.

In case this seems too strange to be credible, consider another study we conducted demonstrating the same phenomenon. We gave 400 University of California, Irvine undergraduates a brief text about colorblindness written by the neurologist Oliver Sacks. We found that the students learned more when they were asked questions about the text before they read it — questions they could not answer — than when they were given additional time to study Dr. Sacks work.

Both studies independently indicate a striking fact. We tend to assume that the best way to consume and remember information is through the application of rigorous, extended study. What we fail to see, however, is that the process of trying to work through a problem to which we don't know the answer



focuses our attention on it in a way that simply studying it does not. The desire to get the answer right, and the frustration of failure, is partly to account.

But there's another element as well. When we struggle to learn something, and fail, the moment we finally get the answer it imprints itself more deeply on our mind than it would have had struggle and failure not preceded it.

Chick Hearn, the late broadcaster for the Los Angeles Lakers, used to preach "don't practice mistakes" — advice Sam and I considered gospel, at least on the basketball court. In retrospect, Chick was partly right: Yes, you shouldn't practice mistakes, but neither should you make practice so easy as to avoid making mistakes.

If I had to identify one overarching lesson from our study it would be this: When you make mistakes, don't just let them slip by — correct them. Create challenging learning environments, make mistakes and then learn from them.

http://www.miller-mccune.com/culture_society/a-really-hard-test-really-helps-learning-1727

Threats, Anxieties Ingredients of Conservatism

Conservative ideas, like support for the status quo and justifications for inequality, can make the world seem like a more secure place for those who don't like uncertainty.

- By: [Lee Drutman](#) | January 12, 2010



General feelings of threat and specific anxiety about other ethnic groups sometimes do lead individuals to embrace political conservatism. flickr.com

Over the past year, a conservative right-wing movement has found a loud political voice in the United States. Strongly anti-government, the movement seems largely oriented around a message that anything the Obama administration wishes to accomplish is an attack on American tradition, and it is up to them to stop this radical socialist agenda emanating from Washington to preserve the country.

This burst of activity has left some asking where such a rush of conservative energy might come from. Is it a response to the anxiety and uncertainty of tough economic times? Does having an African-American president have anything to do with it?

According to some new research on the cognitive origins of political conservatism, the answers may be yes and yes.

Miriam Matthews, a doctoral candidate in social psychology at the Claremont Graduate University, [Shana Levin](#), an associate professor of psychology at Claremont McKenna College, and [Jim Sidanius](#), a professor of psychology and African-American studies at Harvard University, have found evidence that both general feelings of threat and specific anxiety about other ethnic groups sometimes do lead individuals to embrace two tenets of political conservatism — support for the status quo and a belief that there is a natural social hierarchy to society. These tenets provide a salve for uncertainties and anxieties by offering a belief system in which there is a strong order to things.

This theory was originally elaborated in a 2003 paper, "[Political conservatism as motivated social cognition](#)," by John T. Jost and colleagues. They posit that individuals embrace political conservatism to

satisfy internal needs for order, structure and closure in the face of uncertainty, complexity and fear. The paper was based on a meta-analysis of numerous studies showing that people who were more uncomfortable with complexity and ambiguity generally tended to also be more conservative. (For more on Jost's work, see [here](#) and [here](#).)

But correlation does not provide causation, and Matthews and colleagues wanted to know: Did conservative ideas make people more anxious or vice versa? To evaluate how this process played out over time, they analyzed survey data on almost 1,000 undergraduates at the University of California, Los Angeles, as they progressed through four years of college. The findings are reported in *Political Psychology*.

"The research is built on the idea that conservatism is an ideology that is in response to both motivations and cognitions, and that fear and uncertainty and threat stimulate certain motivations," Matthews explained.

The survey first measured students' threat perceptions by asking them how much they agreed with the statement, "More good jobs for other groups come at the expense of fewer good jobs for members of my group." And it measured something scholars call "intergroup anxiety" by asking students to evaluate the statement: "I feel uneasy around people of different ethnicities."

The survey also measured students' attitudes on something called the social dominance orientation scale (a measure of how much individuals believe in the superiority of certain groups over others and are thus unconcerned about inequality), and evaluated students' support for system justification (a measure of whether one believes that the current distribution of resources is fair).

Finally, the students were asked about their political identification: How strongly did they identify as being either a Democrat or a Republican?

By measuring how students' answers to these questions changed over the four years, the researchers showed that the higher a student scored on questions regarding threat perception and discomfort around other ethnicities as freshmen, the higher they scored on both the social dominance and the system justification scales as sophomores and juniors. (Not surprisingly, the two measures were highly correlated.)

And sophomores and juniors with high social dominance orientation and system justification scores became more politically conservative as seniors. In other words, there was a process in which threats and anxieties led students to adopt particular political beliefs that helped them to deal with those threats and anxieties.

"What makes it really interesting is that using very conservative methods, and looking at processes over time, we still found that there was a conservative shift in response to threat perceptions," Matthews said. "A lot of people just treat conservatism as a personality variable that doesn't change, but that doesn't seem to be the case. It seems to be influenced by the situation, and it can be affected by threat perceptions."

Though this study looked only at individuals, it is not hard to extrapolate. Many studies have documented the extent to which national political moods shift rightward in response to external threats, such as 9/11. For example, one study found that, between 2001 and 2004, President Bush's approval ratings peaked in response to terrorism warnings.

Currently, however, with unemployment now topping 10 percent, economic uncertainty is probably weighing more heavily. And there is good reason to think that this kind of uncertainty might be one factor underlying the current conservative movement.

"There is a lot of research into the connection between economic threats and increasing conservatism," Matthews said. "And it makes sense because you've got this idea of resistance to changing the social system because the system seems so unstable, you want to stick with what you know, what seems

familiar."

And then, of course, there is the tricky issue of race. America now has its first African-American president. And as the research described here suggests, there seems to be a direct link from "intergroup anxiety" to political conservatism. If having an African-American president makes this anxiety more salient for certain segments of society, it might indeed heighten their turn to system-justifying and social-dominance feelings and lead to increased conservatism.

In addition to offering some insights into the current political climate, the idea of conservatism as motivated cognition also points to some reasons why people tend to grow more conservative as they grow older. Fear of death may loom larger as a threat, as might a feeling of being increasingly out of touch with the world. This might lead individuals to worldviews that give them more security and stability, hence making them more conservative.

Not surprisingly, this study has not sat well with conservatives. But Matthews wants to be clear: "We're not saying that conservatism is completely crazy. We're just trying to figure out what are all the possible factors that contribute to conservatism. And there can be a shift toward conservatism when managing uncertainty gets to be a little more difficult."

http://www.miller-mccune.com/culture_society/threats-anxieties-ingredients-of-conservatism-1703

Little Stores and Fatter Kids

Lots of urban kids are flocking to eat crappy food peddled by corner stores, but both kids and vendors can be shown a more nutritious way.

- By: [David Richardson](#) | January 15, 2010



New efforts involving both kids and vendors are afoot to change poor eating habits into healthy ones. [jumbledpile / flickr.com](#)

Just what are urban kids getting into when they stop at the corner store on their way to and from school?

A [study](#) by Temple University's [Center for Obesity Research and Education](#) revealed that for a "little more than a dollar" city kids can walk into a typical corner store and fill up with 350 calories of low-nutrition junk, and for many, it has become a way of life and gateway to obesity.

Brianna Almaguer Sandoval of [The Food Trust](#) in Philadelphia said that in low-income neighborhoods, finding a source of nutritious food can be difficult, particularly for young people who lack transportation to supermarkets located outside [poorer communities](#), which some have dubbed "[supermarket deserts](#)."

"It's just corner stores on every single corner, literally," Sandoval said.

Shoppers in these stores are not likely to find much fresh produce; Sandoval said on average "only 11 percent of the items stocked by a typical urban corner store would even be considered healthful."

Her childhood experience was different, Sandoval noted. "I grew up in a suburban/rural area north of the city — it's actually the complete opposite: Every single corner was selling fresh produce. It was never really an issue. Coming to Philadelphia, you can see the issue everywhere."

And it's not just Philly. Epidemiologist [Melissa Nelson Laska](#) at the University of Minnesota led researchers who looked at [corner stores](#) in Minneapolis, Baltimore and Oakland, Calif., as well as

Philadelphia. They determined that while regional differences are apparent on store shelves, overall the lack of healthy fare in corner stores compromises efforts to promote healthy eating in poor communities across the nation.

Sandoval led a team for the Food Trust that helped gather data for the Temple study — published in the October issue of the journal *Pediatrics* by intercepting kids as they left 24 corner stores in targeted areas within four blocks of public school buildings. (The study is part of the [Healthy Corner Store Initiative](#), which aims to improve the availability of healthy foods in bodegas and tiny neighborhood stores that dot many urban areas.)

Canvassers asked permission to look in 833 young shoppers' parcels to examine their purchases, taking note of each item, its ingredients and nutritional value. Not terribly surprising, nacho cheese-flavored chips, sugar-sweetened and artificially flavored drinks and candies topped the list. And unfortunately, other studies have shown that it can be cheaper to get full on junk food than healthier, perishable options.

But what troubled researchers wasn't so much what the kids bought but the central role such unhealthy fare played in their diets.

While the study found that 53 percent of fourth- to sixth-graders in the study area shopped in corner stores, at least occasionally, a significant proportion, about 15 percent, reported they shopped in corner stores both before and after school, five days a week, consuming up to 3,560 calories per week in junk food and soft drinks. For these children, the corner store is a potential health threat.

But Sandoval isn't casting corner stores as the enemy. She wants to recruit them as allies in promoting healthy eating habits.

Better choices through social marketing

While the majority of the students in Food Trust's service area are eligible to participate in free or low-cost school nutrition programs, many of the children from low-income households skip these meals, choosing instead to snack on foods from the ubiquitous bodega. Sandoval says students that she interacts with offer a variety of explanations: transportation that arrives too late for school breakfast programs, they don't like the food the schools offer, or even ambience. Some kids say "it's just not cool" to eat in the cafeteria, under the watchful eyes of adults, when they can buy a snack at the store to nibble at their leisure.

Sandoval says the Healthy Corner Store Initiative spends considerable time with fourth- through sixth-graders in workshops and classroom activities to improve their troubled relationship with food.

Finding time in the academic calendar can be a challenge, Sandoval says. Of equal importance, workshop instructors must address the skeptical attitude of the fourth graders who she says, "want to know, 'OK, so — why are you here?'"

But she says activities like snack food "special missions" and opportunities to work with Food Trust's Youth Leadership Programs can win over the kids. After absorbing the healthy snacking message, the students came up with a promotional campaign with the logo "Snackin' Fresh" and the slogan "Fresh is Best" to help merchants advertise healthy alternatives in the neighborhood shops.

Of course merchants have their livelihoods on the line and are often cautious about changing things too quickly. Kristin Roberts, a community nutrition associate for the [D.C. Healthy Corner Store Program](#), a similar effort in Washington, said, "You don't just walk in and say, 'Hey start carrying fruits and vegetables.' We're talking months, even up to a year of building up trust with the business owners, giving them less risky suggestions at first, and building up to the riskier things, such as perishables."

Often with no more than two aisles of shelving and prime space reserved under contract for particular vendors, Roberts said, it is still possible to make effective changes. Even snack food suppliers have healthier options, she said. "For instance, pretzels are lower fat than regular chips.

"You have to meet them where they're at and start from there."

In Baltimore, researchers led by Hee-ung Song and Joel Gittelsohn of Johns Hopkins University worked with corner stores and two local supermarkets for more than 10 months to improve their stocking and promotion of healthier products. In the November issue of *Public Health Nutrition* they reported that stocking and sales of those products increased "significantly," suggesting that such interventions were feasible. And in November's *Health Education & Behavior*, they reported that working with those same stores' patrons led them to buy more products carrying a label showing they had been vetted by the Baltimore Healthy Stores initiative.

To lower the risk of spoilage involved in stocking perishables, Sandoval offers refrigerated barrels to merchants who want to carry fresh fruit salads with the children's Snackin' Fresh logo, successfully placing the item in dozens of stores. One entrepreneurial owner seized the opportunity to wholesale fruit salads that he prepared at his deli counter to several corner stores around his community.

She believes kids are getting the message. "Almost all of the students we surveyed have tried the fruit salad — many of them more than once."

Sandoval plans to continue the evidence-based approach. The study in its coming phases will track changes in students' body mass index in response to their new awareness and the availability of wholesome alternatives.

Meanwhile, she says activists from cities across the country have joined in an emerging Healthy Corner Store Network to share ideas and practices for healthier kids and healthier communities.

<http://www.miller-mccune.com/health/little-stores-and-fatter-kids-1706>

After the Aftermath

By: Joshua Zaffos



Virginia Tech's Yang Zhang

As children across the Sichuan Province of China sat at their school desks, an earthquake began rattling and knocking buildings to the ground. Felt 1,000 miles away in Beijing, the May 2008 quake would kill roughly 90,000 people, at least 5,300 of them children, according to figures from the Chinese government. Outside observers believe youth casualties are closer to 10,000, a result of the collapse of what Chinese critics later called "tofu dregs schoolhouses."

Yang Zhang, a Chinese national and professor of urban planning at Virginia Tech whose research centers on disaster mitigation, knew the quake would cause major fatalities, and he braced for the government's response. More than three decades earlier, when extreme tremors rocked China, the government suppressed casualty figures for three years.

Questions about the schools' engineering failures and the death of children would haunt the Chinese government's response, but Yang admits to being satisfied with other aspects of the recovery effort, which he saw firsthand when he visited Sichuan a few weeks after the disaster and, again, in July 2009. He was surprised at the openness of the recovery process and the involvement of research experts and international relief groups.

The government even devised a sister-city assistance program that paired communities outside and inside the quake zone. The program directed charitable giving and assigned recovery tasks, such as reconstruction, education and health care. Yang and others say the program spurred financial and other support for earthquake victims, leading Chinese citizens to view the episode as a national, rather than regional, incident.

Like many of the practitioners in the field of disaster research, Yang looked on the moment, tragic as it was, as an opportunity. Countries need to learn from one another, Yang says, when it comes to low-probability, high-consequence events like natural disasters and terrorist attacks, especially as the probabilities and consequences are rising.

The number of recorded natural disasters has doubled in the last two decades, to about 400 a year now. Population growth, particularly in disaster-prone coastal areas, has put more people in disaster's path, and U.N. officials, among others, claim climate change is causing an increase in weather-related disasters. Terrorism, wars and pandemics also seem likely to plague the 21st century.

Hazard managers know how to build structures that can withstand hurricanes and earthquakes. Disaster researchers are working on a more difficult problem: What can the government do to help people overcome the emotional aftershocks that continue, even after the tremors calm and the floodwaters recede? Studies of recent tragedies suggest that displaced children should be one focus of post-disaster aid. But those studies also point out just how little is known about the best ways to reduce the long-term impacts of cataclysm.

The roots of disaster research are military. Concerned about the potential aftermath of a nuclear attack after World War II, the U.S. Army figured it could learn about probable wartime behavior by studying responses to natural and industrial mishaps. Starting in 1950, the Army Chemical Center commissioned the first social-science disaster studies.

The Army assumed that a large-scale nuclear attack would trigger anarchic pandemonium, says David Neal, director of the Center for the Study of Disasters and Extreme Events at Oklahoma State University. The military-supported fieldwork on tornadoes, fires and plane crashes over the following decade observed civilians' social and psychological reactions.

In 1963, with Cuba-based Soviet missiles aimed at Florida, the Office of Civil Defense — a predecessor to the Federal Emergency Management Agency — gave \$200,000 toward the opening of the Disaster Research Center at Ohio State University. The disaster research program became the first of its kind in the world. In 1985, the center would relocate to the University of Delaware.

Years of research and many disasters later, Neal and others can say communities that suffer disaster don't generally descend into Lord of the Flies-type chaos. Based on observation, Neal and others say that people typically attend to their professional responsibilities during disasters and their aftermath. The most effective disaster planning combines some basic collaboration between public and private institutions, and taps the talents of local social networks, such as churches and volunteer groups.

"Whether you're dealing with preparation, response or recovery, it needs to come from the grassroots," Neal says.

The government's responses to the Alaska earthquake of 1964 and hurricanes Betsy in 1965 and Camille in 1969 were ad hoc. Numerous agencies were responsible for bits and pieces of hazards management; relief programs funded new building that faced the same risk as the buildings destroyed in the disasters. FEMA came into existence in 1979, coordinating and consolidating the government's programs. But the agency proved incapable of handling the biggest natural disasters, and its agenda has been largely reactive.

Perhaps most disconcerting is another reality: The U.S. government has been ahead of the rest of the world when it comes to hazards management and dealing with the emotional aftershocks of disaster.

In the days following the Indian Ocean tsunami in December 2004, Tricia Wachtendorf, associate director of the Disaster Research Center, visited Sri Lanka to survey damage and assess recovery in small fishing communities. Her group traveled toward the coast, accompanied by displaced villagers who hadn't returned to their damaged homes.

"Men were extremely hesitant about coming near the shore," Wachtendorf recalls. "There was a persistent sense of uncertainty."

The villages' livelihood and community identity were tied to the source of the destruction, Wachtendorf says, posing special challenges, some emotional and some practical. After fishermen returned to the shore, they had to relearn how to navigate coastal waters that had been significantly altered by the tsunami. At the same time, recovery programs were relocating villages away from the shore in the name of safety — forcing some fishermen to travel 2 miles to get to the coast.

Christopher Lom, the Asia-Pacific spokesman for the nonprofit [International Organization for Migration](#), which provides post-disaster relief around the world, says beachfront land grabs also occurred in Thailand following the tsunami. "There's a fairly strong myth that disasters are equalizers," Wachtendorf says. "But some groups are more vulnerable than others, and not recognizing that really discounts our ability to help those who are impacted."

Research on recent disasters shows that they disproportionately affect the poor. Women, children, ethnic and racial minorities, the elderly and special-needs individuals all tend to face higher degrees of risk because of social, physical and mental obstacles that affect personal decision-making. Poorer families, whether in [Thailand](#) or Louisiana, tend to live in hazard-prone areas where there often are dense populations, few protections against disaster impacts and fewer resources to respond afterward. And clearly, children displaced by disaster are more vulnerable and less resilient than might be imagined.

[Hurricane Katrina](#) didn't flatten hundreds of schools, as happened last year in China, but the 2005 storm and subsequent flooding displaced 163,000 children 19 years old or younger. The hurricane flung kids across the country during the haphazard evacuation; 5,100 juveniles were reported missing in the weeks that followed, and it would take seven months to reunite them with their families.

Children are a particularly understudied population in terms of disaster research, and while some people believe kids can prove exceptionally resilient, the harsh consequences of Katrina suggest less promising outcomes. "We have very little good research on mass displacement and natural disasters," says [Lori Peek](#), a sociology professor at Colorado State University. "But I think we're going to see a lot more of it, so I think we need to learn more about what went wrong."

Peek has conducted hundreds of hours of interviews with adults and children who landed in Colorado after Katrina. She's also spoken to individuals who have returned to the Gulf region. Field studies of displaced children by a dozen researchers, including Peek, reveal magnified risks of emotional and social suffering, not to mention increased mental health problems.

Children displaced by Katrina face overcrowding at new schools and discrimination from new peers. They are tuned in to their families' financial instability and crave the friends and relatives who once formed their social network. "In Colorado, people want to know, 'Are they better off?' That's really difficult [to say] because what does 'better off' mean?" Peek says.

"The Legacy of Katrina's Children," a paper authored by David Abramson and colleagues at Columbia University's [National Center for Disaster Preparedness](#), found that children affected by the storm were more likely to exhibit reduced academic performance, to lose access to health care and to develop clinical mental health problems and behavioral disorders than other children.

"We think [disasters and displacement] have an enormous impact on kids," Abramson says.

Congress has heeded warnings from researchers like Abramson and Peek, creating a [National Commission on Children and Disasters](#) that first met in October 2008. During an August 2009 Senate hearing, the commission chair, Mark Shriver, an official with [Save the Children](#), told policymakers, "We've spent more time, energy and money on pets than we have on kids."

And the panel isn't even set to make policy recommendations until late 2010. (The commission did share some initial recommendations in a October 2009 draft report for the president and Congress.)

Under President Bill Clinton, FEMA was a Cabinet-level bureau and the agency took an "all-hazards" approach to disaster planning that emphasized a comprehensive framework for coordinating response and recovery. Abramson says Clinton's FEMA would likely have demonstrated a "robust" response to Hurricane Katrina.

After the Sept. 11, 2001 terror attacks, however, the Bush administration assumed a homeland security posture, similar to the civil defense agenda of the Cold War era. Policies were narrowly focused on terrorism preparedness, which diverted resources — and attention — that had gone toward dealing with natural disasters.

"The United States does a pretty good job in terms of predicting the impacts, especially for hurricanes," Yang Zhang says, referring to projections of landfalls and storm surges. "The main issue is what happens after the event."

That last notion holds true around the planet. Christopher Lom of the International Organization for Migration spent time in Pakistan following the October 2005 earthquake that killed nearly 80,000. The disaster marked the first implementation of the Inter-Agency Standing Committee cluster approach, a major reform of global emergency response that aims to create a more structured and accountable division of labor among the U.N., local governments and international relief groups responding to a disaster. In Pakistan, Lom says, the cluster system proved efficient in the short term, his group partnering with the military to provide temporary shelter and relief.

But the longer-term future of the impoverished residents of the area amounted to a return to their former, quake-prone villages and buildings, with the delivery of new livestock to some families. Because of that insufficient long-term response, Lom suggests, the disaster may well have given the Taliban a new recruitment tool.

Following the Sichuan earthquake, the Chinese government rebuilt schools, spending millions of dollars to ensure that new buildings won't crumble during another tremor. Smaller villages have been relocated and combined into larger communities, a process that has expedited reconstruction but impeded farming practices and lifestyles. The centralized planning of this response left Yang both impressed and suspicious. "The first thing is the physical recovery, but the more important thing is the social fabric," Yang says, "and there is very little attention [in China] to how do we reconstruct social life."

This spring, the International Organization for Migration projected that climate change could displace up to 200 million people by 2050. (The U.N. estimated in 2005 a more conservative figure of 25 million climate refugees.) The scale of response and recovery efforts required by even the smaller displacement would be staggering.

"We still make decisions that make disasters worse. We have to better understand how to live within our environment," David Neal says.

A 2008 workshop of disaster and natural-hazards researchers produced a report calling for the establishment of a national scientific observatory that would collect and maintain long-term data sets of social, political and environmental variables needed to better understand the vulnerability of people to major disasters and to better help them recover from its emotional impact.

The idea still only exists on paper, but it is getting consideration from officials with the National Science Foundation and other potential partner agencies, according to Walter Gillis Peacock, director of the Hazard Reduction and Recovery Center at Texas A&M University and a lead supporter of the network.

"Beyond just funding engineering and environmental observations, it's a major change from the way we have thought about hazards and especially social-science-based research," Peacock says.



Policymakers have yet to develop long-term, proactive strategies that promote local empowerment and national and international coordination in response to natural disasters.

Donations and volunteer support, spurred by media coverage and benefit concerts, often tail off just weeks after a mass emergency, but communities face the continuing task of rebuilding structurally and socially. The urgent evacuations following Katrina spared lives; research now shows that the response undercut the livelihoods and prospects of individuals — in a way that we may not realize for generations.

"For long periods after disasters, people still have needs," Peek says, "and the needs change over time."

<http://www.miller-mccune.com/health/after-the-aftermath-1644>