



Infoteca's E-Journal



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Medical Student Burnout and the Challenge to Patient Care

By PAULINE W. CHEN, M.D.



Not too long ago, I read a paper titled “[Burnout and Suicidal Ideation Among U.S. Medical Students](#)” in *The Annals of Internal Medicine*. It brought back a flood of memories. Medical school was not easy for me. I knew that I wanted to become a doctor to help people, but I had given little thought to the process. I was poorly prepared for many things: the pressure to excel in ways that seemed so far from caring for people; rapidly mounting debts I signed off on every semester; a roller coaster existence from chronic lack of sleep; hazing from the more experienced students and residents; and the realities of patient suffering despite my best efforts.

Even surgical residency, despite the relentlessly long hours, seemed so much closer to what I wanted to do. Some of my professors tried to “humanize” the process. They invited us to dinner in their homes, supported our extracurricular efforts to set up health screening clinics in low-income neighborhoods, and tried to make our basic science courses more relevant to working with patients. But sitting where I am now, as someone who teaches medical students and who loves helping others as a doctor, I can understand the challenge they faced. Given the fire hose of information medical students must learn in just four years, how does one ever gently take a sip?

Despite my teachers’ efforts, I was about as miserable in medical school as I had ever been. I felt alone. Neither I nor my classmates could admit to failure, and the last thing I wanted to do was to let anyone but my closest friends know just how unhappy I was. Success in medical school was the first step to a future of helping others, and I was not about to jeopardize that. Last week I had dinner with two former classmates from that time. We had not seen each other in over a decade, and after catching up on personal news and reminiscing about gross anatomy lab and our first nights on call, one of them said quietly, “I hated med school. I wanted to quit.” The elephant in our collective memories had broken free.



With that elephant now running loose, and the three of us more comfortable with our own professional accomplishments, the conversation grew more honest. “If you look over my entire lifetime,” my other friend said, “those four years were the lowest point in terms of self esteem.” He held his hand out in the air, plotting an imaginary line that dropped precipitously to his knees. It took nearly 20 years for the three of us to learn that we had each been miserable as medical students. It has taken even longer for researchers to discover the extent to which such feelings exist among American medical students.

In 2006, Dr. Liselotte N. Dyrbye and her colleagues at the Mayo Clinic found that nearly half of the 545 medical students they surveyed suffered from burnout, which they defined as professional distress in three domains: emotional exhaustion, depersonalization and low sense of personal accomplishment. Moreover, the researchers found that each successive year of schooling increased the chances students would experience burnout, despite the fact that they had entered medical school with mental health profiles similar to those of their peers who chose other career paths.

More recently, in the paper on burnout that had first caught my eye, Dr. Dyrbye and her colleagues widened the scope of their research, analyzing survey responses from 2,248 medical students at seven medical schools across the country. Again, nearly half of the students surveyed met the criteria for burnout. But the investigators discovered an even more ominous finding: 11 percent of all the students surveyed also reported having suicidal thoughts in the past year. Dr. Dyrbye notes that we are just starting to learn about the high levels of distress in medical students. “It’s incredibly disconcerting,” she said. “What are the causes? And what can we do as educators to facilitate their well-being? We need a better understanding of the causes of stress to design interventions that will help improve student wellness. Students, just like doctors, need to take care of themselves in order to take care of their patients.”

Medical schools have more recently recognized the importance of this issue. For example, the Liaison Committee on Medical Education, the accrediting authority for medical schools in the United States, now mandates that all schools have a program for student wellness in place that includes “an effective system of personal counseling for its students.”

But beyond the personal implications, what are the ramifications of medical student burnout for patients?

In a third study, Dr. Dyrbye found that when tested for empathy, medical students at baseline generally scored higher than their nonmedical peers. But, as medical students experienced more burnout, there was a corresponding drop in the level of empathy toward patients. “What do they really need to know before graduating from medical school, and how could they most efficiently learn?” Dr. Dyrbye asked, reflecting on one of the central challenges of medical education. “All the information we want to share with them is not necessarily what they really need to learn.”

By the time my dinner with my former classmates last week had ended, we had made plans to stay in touch and to do something I had never been sure I would ever do: return to my medical school in two years’ time to celebrate our 20th reunion. Over the course of our dinner conversation I felt strangely connected and nostalgic about medical school; I was deeply moved by what my two classmates had chosen to do with their education. One is a well-loved community obstetrician/gynecologist; the other is a psychiatrist devoted to teaching, working in a county medical clinic and caring for severely traumatized Hmong refugees. And both love their work as doctors.

As I listened to them talk about their work, I was reminded of one other thing Dr. Dyrbye had told me. “We need to change things,” she had said, “because maybe the students who are most vulnerable are the ones who are most empathic.”

<http://www.nytimes.com/2008/10/31/health/chen10-30.html?nl=8hlth&emc=hltha8>



Microsoft to battle in the clouds

By Rory Cellan-Jones

Technology Correspondent, BBC News, Los Angeles



Microsoft has unveiled a cloud computing service, in which data and applications will not be stored on individuals' computers.

The new platform, dubbed Windows Azure, was announced at Microsoft's Professional Developers Conference in Los Angeles.

The platform was described by Microsoft's chief software architect Ray Ozzie as "Windows for the cloud".

The framework will be offered alongside the next Windows release, Windows 7.

The move sees Microsoft taking on established players like Google and Amazon in the rapidly growing business of online software.

The aim is to allow developers to build new applications which will live on the internet, rather than on their own computers.

Microsoft believes consumers will also want to store far more of their data - from letters to photos to videos - on the servers in its "cloud" of giant data centres around the world, so that it can be accessed anywhere, from any device.

Microsoft software architect Ray Ozzie on the new "Windows for the cloud" The move, which Microsoft sees as a major shift in its corporate strategy, was unveiled in front of 6,000 software developers from around the world.

The term cloud computing has become increasingly fashionable, as companies with large data centres start renting out space to businesses wanting to build rapidly growing online applications without needing to invest in more servers as traffic grows.

For consumers, there is the prospect of a future where much of their data and many of the applications they use could be stored online "in the cloud".

'Bloaty' software

Microsoft, which still reaps huge profits from its Windows and Office products, is now moving into territory where it has so far struggled to make an impact.

Google, dominant in search and in online advertising, already has a suite of online applications living in the "cloud". Sam Schillace, who runs Google Docs, says he is not worried by the arrival of a big new rival.

"Competition, even stiff competition from Microsoft doesn't bother us because it will either make the internet as a whole better or it will be irrelevant to making it better."

Google's cloud computing developer Sam Schillace predicts a move to online documents

Without naming Microsoft, Mr Schillace drew a contrast between the old model of "bloaty" software and a more open future where online applications would be updated virtually every week.

"The way people work and the way people communicate, openness and velocity and nimbleness and focus are much more valuable and I think that's a very big shift."

Fast-moving clouds

Amazon, with big data centres handling millions of e-commerce transactions, has been another pioneer in this field, with its Elastic Cloud Service.

Using the spare capacity on its servers, it allows a range of customers big and small - from Facebook application developers to the Washington Post - to build applications which can cope with a sudden rush of demand.

In his speech in Los Angeles, Ray Ozzie said he "tipped his hat" at Amazon for its work in this field, saying "we are all standing on their shoulders."

Microsoft is taking a different approach from some of its rivals, insisting that its customers still want to be able to choose to have their software offline, on their own computers, as well as online in the web cloud.

"We believe deeply in on-premises software and we believe deeply in this new world of software in the cloud," said Ray Ozzie.

It's a strategy which rivals will say is designed to protect the profits from its existing software products. But the scene is set for a battle in the clouds between the few big companies wealthy enough to be able to build the huge data centres on which this new form of computing will depend.

Story from BBC NEWS:

<http://news.bbc.co.uk/go/pr/fr/-/2/hi/technology/7693993.stm>

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Arctic ice thickness 'plummets'

By Mark Kinver

Science and environment reporter, BBC News



The thickness of Arctic sea ice "plummeted" last winter, thinning by as much as 49 centimetres (1.6ft) in some regions, satellite data has revealed.

A study by UK researchers showed that the ice thickness had been fairly constant for the previous five winters.

The team from University College London added that the results provided the first definitive proof that the overall volume of Arctic ice was decreasing.

The findings have been published in the journal *Geophysical Research Letters*.

"The ice thickness was fairly constant for the five winters before this, but it plummeted in the winter after the 2007 minimum," lead author Katharine Giles told BBC News.

I think this is the first time that we can definitively say that the bulk overall volume of ice has decreased

Dr Seymour Laxon

University College London

Sea ice in the Arctic shrank to its smallest size on record in September 2007, when it extended across an area of just 4.13 million sq km (1.59 million sq miles), beating the previous record low of 5.32 million sq km, measured in 2005.

The team from the university's Centre for Polar Observation and Modelling - part of the UK's National Centre for Earth Observation - found that last winter the ice had thinned by an average of 26cm (0.9ft) below the 2002-2008 winter average.

Dr Giles added that the data also showed the western Arctic experienced the greatest impact, where the ice thinned by up to 49cm (1.6ft).

Melting point

The recent record losses of ice cover in the Arctic has led to suggestions that the region could have reached a "tipping point" but some uncertainty over the causes had remained, explained co-author Seymour Laxon.

"The extent can change because the ice can be redistributed, increasing the amount of open water," he told BBC News. "But this does not reduce the overall amount of ice."

"To determine whether the reduction in sea ice extent is the result of ice being piled up against the coast or whether it is the result of melting, you need to measure the thickness."

"I think this is the first time that we can definitively say that the bulk overall volume of ice has decreased," observed Dr Laxon.

"So this means melting; it doesn't mean that the ice has just been pushed up against the coastline."

Dr Giles explained that the measurements gathered by satellite provided a continuous data-set and had a number of advantages over other methods.

"Drilling, submarines or aircraft; all of these techniques can be limited by time and space," she said.

"You can only sample relatively small areas, and you cannot have a continuous time series - it's a very harsh environment, so field experiments in winter are logistically difficult."

"We have been using satellite data, which means we get coverage all across the Arctic Ocean (apart from the very centre) and we get it continuously, so we have great coverage both in terms of time and area."

The measurements were recorded via a radar altimeter onboard the European Space Agency's (Esa) Envisat satellite.

The altimeter fires pulses of electromagnetic waves down on to the ice, which reflects them back up to a receiver on the satellite.

The time taken for the waves to complete this journey is recorded, and it is a fairly straightforward calculation to work out the height of the ice above sea level.



As one tenth of the ice sits above the water, it is then possible to work out the overall volume and thickness of ice in that location.

Dr Laxon said the project's findings are being used to help climate modellers refine their projections of what is going to happen in the future.

"The time when Arctic sea ice is going to disappear is open to a lot of debate," he said.

"About five years ago, the average projection for the sea ice disappearing was about 2080.

"But the ice minimums, and this evidence of melting, suggests that we should favour the models that suggest the sea ice will disappear by 2030-2040, but there is still a lot of uncertainty."

The researchers hope to keep the data series, funded by the EU and the Natural Environmental Research Council (Nerc), running for as long as satellite-based measurements are available.

Story from BBC NEWS:

<http://news.bbc.co.uk/go/pr/fr/-/2/hi/science/nature/7692963.stm>

Published: 2008/10/28 02:53:51 GMT

<http://news.bbc.co.uk/2/hi/science/nature/7692963.stm>



Alarm raised on teenage hackers

By Mark Ward

Technology correspondent, BBC News



Increasing numbers of teenagers are starting to dabble in hi-tech crime, say experts.

Computer security professionals say many net forums are populated by teenagers swapping credit card numbers, phishing kits and hacking tips.

The poor technical skills of many young hackers means they are very likely to get caught and arrested, they say.

Youth workers added that any teenager getting a criminal record would be putting their future at risk.

Slippery slope

"I see kids of 11 and 12 sharing credit card details and asking for hacks," said Chris Boyd, director of malware research at FaceTime Security.

Many teenagers got into low level crime by looking for exploits and cracks for their favourite computer games.

Communities and forums spring up where people start to swap malicious programs, knowledge and sometimes stolen data.

For a kid, getting a criminal record is the worst possible move

Graham Robb, Youth Justice Board

Some also look for exploits and virus code that can be run against the social networking sites popular with many young people. Some then try to peddle or use the details or accounts they net in this way.

Mr Boyd said he spent a lot of time tracking down the creators of many of the nuisance programs written to exploit users of social networking sites and the culprit was often a teenager.

From such virus and nuisance programs, he said, many progress to outright criminal practices such as using phishing kits to create and run their own scams.

"Some are quite crude, some are clever and some are stupid," he said.

The teenagers' attempts to make money from their life of cyber crime usually came unstuck because of their poor technical skills.

"They do not even know enough to get a simple phishing or attack tool right," said Kevin Hogan, a senior manager Symantec Security Response.

"We have seen phishing sites that have broken images because the link, rather than reference the original webpage, is referencing a file on the C: drive that is not there," he said.

Symantec researchers have collected many examples of teenagers who have managed to cripple their own PCs by infecting them with viruses they have written.

Video choice

Chris Boyd from FaceTime said many of the young criminal hackers were undermined by their desire to win recognition for their exploits.

"They are obsessed with making videos of what they are doing," he said.

Many post videos of what they have done to sites such as YouTube and sign on with the same alias used to hack a site, run a phishing attack or write a web exploit.

Many share photos or other details of their life on other sites making it easy for computer security experts to track them down and get them shut down.

Mr Boyd's action to shut down one wannabe hacker, using the name YoGangsta50, was so comprehensive that it wrung a pledge from the teenager in question to never to get involved in petty hi-tech crime again.

Mathew Bevan, a reformed hacker who was arrested as a teenager and then acquitted for his online exploits, said it was no surprise that young people were indulging in online crime.

"It's about the thrill and power to prove they are somebody," he said. That also explains why they stuck with an alias or online identity even though it was compromised, he added.

"The aim of what they are doing is to get the fame within their peer group," he said. "They spend months or years developing who they are and their status. They do not want to give that up freely."

Graham Robb, a board member of the Youth Justice Board, said teenagers needed to appreciate the risks they took by falling into hi-tech crime.



"If they get a criminal record it stays with them," he said. "A Criminal Record Bureau check will throw that up and it could prevent access to jobs."

Anyone arrested and charged for the most serious crimes would carry their criminal record with them throughout their life.

Also, he added, young people needed to appreciate the impact of actions carried out via the net and a computer.

"Are they going to be able to live with the fact that they caused harm to other people?" he said. "They do not think there is someone losing their money or their savings from what they are doing."

"For a kid, getting a criminal record is the worst possible move."

Story from BBC NEWS:

<http://news.bbc.co.uk/go/pr/fr/-/2/hi/technology/7690126.stm>

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Screening hope for pre-eclampsia

By Helen Briggs
BBC News

Please turn on JavaScript. Media requires JavaScript to play.

Karen Partridge, from Bristol, developed pre-eclampsia twice

A blood test that screens pregnant woman for pre-eclampsia long before symptoms develop could be available in the next five years, doctors predict.

The condition, which leads to the deaths of 1,000 babies each year in the UK alone, could be detected as early as the first trimester, a study suggests.

A predictive test could save many lives by enabling closer monitoring of high-risk pregnancies, experts say.

Routine urine and blood pressure checks can pick it up only after 20 weeks.

These researchers have made a vital finding that, if confirmed by other studies, has the potential to translate into a simple test that could potentially save many lives

Prof Jeremy Pearson British Heart Foundation

The condition is managed for as long as possible with aspirin and extra monitoring, but delivery is the only cure.

Dr Victoria Bills, lead researcher on the study, published in Clinical Science Journal, said the discovery of a protein in the blood that appears to be linked with pre-eclampsia may be used to predict the condition early on in pregnancy.

"I would certainly hope that within my lifetime as an obstetrician - potentially in the next five to ten years - that possibly we may be able to develop a simple blood test which we can offer to women as early as 12 weeks in order to quantify whether they are at high-risk of developing pre-eclampsia later on in that pregnancy," she told the BBC.

She said the substance, which goes by the full name VEGF165b, might give a clue to the cause of pre-eclampsia, and possibly eventually a way to prevent it.

Please turn on JavaScript. Media requires JavaScript to play.

Dr Victoria Bills talks about her research

"If a test is available for the condition, I think people will want to know, because even though we don't have a cure for it, research shows that if we give women low-dose aspirin, it lowers their risk," Dr Bills explained.



Commenting on the study of 70 patients, Donald Peebles, consultant in obstetrics at University College Hospital, London, said it was part of a massive effort by researchers worldwide to predict poor pregnancy outcome, particularly pre-eclampsia and premature labour.

He said the research needed to be carried out on bigger numbers of patients and compared with other proteins that might also indicate early signs of pre-eclampsia.

"This is a very useful part of the development of a screening test for the prediction of pre-eclampsia," he said.

A screening test will probably be available in the next five years, added Prof Peebles, a spokesperson for the Royal College of Obstetricians and Gynaecologists.

Pre-eclampsia

Affects women in the later stages of pregnancy

Symptoms include high blood pressure, protein in urine, swelling and, in severe cases, liver problems and seizures

Can also affect the unborn baby, causing growth impairment in the womb and the need for premature delivery

Developing a predictive test for pre-eclampsia is regarded by some experts as a "holy grail" in medicine.

Professor Jeremy Pearson, associate medical director at the British Heart Foundation, which funded the research, said: "These researchers have made a vital finding that, if confirmed by other studies, has the potential to translate into a simple test that could potentially save many lives."

The work was carried out at St Michael's Hospital, Bristol, and the University of Bristol. The team measured levels of the chemical in pregnant women at 12 weeks and then at intervals throughout gestation.

They found that in normal pregnancies there was a large increase in the protein by the end of the first trimester, but in women who went on to develop pre-eclampsia it barely increased at all.

Story from BBC NEWS:

<http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/7692836.stm>

Published: 2008/10/28 06:39:08 GMT

Pupils 'worry about their bodies'

More children are worried about their bodies than being bullied, according to an annual survey of pupils' well-being.



Some 32% of 150,000 10 to 15 year olds in England polled for Ofsted said their body was something they worried about, compared to 27% for bullying.

The top concern for those polled was exams at 57%, but 49% also said they were worried about their future.

One in six 10 to 15-year-olds reported they got drunk regularly - while a quarter never had an alcoholic drink.

The figure for not taking drugs was 80% in 2007.

Friends

Some 16% of children said they had been drunk once, twice or more in the past four weeks this year. This compared with 19% of children in 2007.

However, it is not possible to compare many of the results for drug and alcohol consumption with last year's survey as many of the questions have changed.



There did appear to be some changes to bullying, however, with more children being unhappy with the way their school deals with the issue.

Some 44% said they felt their schools dealt with the issue badly compared with 30% in 2007.

But despite the drive to improve nutritional standards in schools, only 23% of children said they had the requisite five portions of fruit and vegetable every day.

And even though last month ministers claimed 90% of children were doing two hours of school sport or more a week, only 35% said they had done at least 30 minutes of sport three to five times in the last week.

Ofsted said the results indicated that bullying was still a problem and that smoking, drinking and drugs remained concerns.

Nonetheless, the vast majority (69%) said they were happy about life at the moment and 95% said they had one or more good friends.

Ofsted chief inspector Christine Gilbert said: "The survey finds much that is positive in their lives, and encouragingly some things have improved since last year's survey.

"However, more needs to be done to support concerns for those children who do not feel safe in schools, those who are bullied and children who smoke, drink and misuse drugs."

Are you a parent? Send us your comments on the issues raised in this story using the form below:

In most cases a selection of your comments will be published, displaying your name and location unless you state otherwise in the box below.

Name

Your E-mail address

Town & Country

Phone number (optional):

Comments

Story from BBC NEWS:

http://news.bbc.co.uk/go/pr/fr/-/2/hi/uk_news/education/7693820.stm

Published: 2008/10/28 01:45:51 GMT



Gifted poor pupils 'need advice'

A lack of effective careers advice is pushing gifted poorer students into wasting their chances of going to university, research suggests.



A report from the Sutton Trust education charity says that improving advice will be key to getting more disadvantaged pupils into university.

It quotes research that found that only half of youngsters received adequate advice on their options after school.

Too many pupils ended up in a "cul de sac of opportunity", said the report.

In particular, it warns that those most likely to miss out on fulfilling their potential are high-ability children from poorer backgrounds, where there is no family advice available about higher education.

The Sutton Trust is calling for every secondary school to have a designated teacher who will be responsible for giving advice about university.

'Ill-informed choices'

It also wants schools to have a duty to give pupils information about university, such as organising visits and giving advice to parents.

Universities should also be targeting their outreach projects at younger age groups, says the report.



"The absence of high-quality advice and support has a particularly negative effect on young people from non-privileged backgrounds, who do not have access to networks of graduates and professionals to make up for deficiencies in the system," says James Turner, the Sutton Trust's director of policy.

"The fear is that too many are making ill-informed choices early on which effectively put them out of the running for certain university choices and careers later in life," he said.

The report highlights previous research which has found weaknesses in the provision of the advice given to teenagers.

This found that students did not feel they received enough information about how going to university and choosing a course could affect their future employment.

The report from the Sutton Trust into improving the participation of disadvantaged youngsters in higher education is to be submitted to the National Council for Educational Excellence.

A spokesman for the Department for Children, Schools and Families said: "Government is committed to ensuring every young person reaches their full potential. By empowering young people with the knowledge and skills they need to make positive choices about their lives, we can achieve this."

National Union of Students president Wes Streeting says the union "has long called for better guidance about higher education for state school pupils".

Shadow university secretary David Willetts said: "We need much better advice on higher education, more information for young people choosing A-levels and a careers adviser in every school. That is why our proposed independent all-age careers service is so important.

"The government must provide earlier, more sustained and more integrated support if they are to stop letting our young people down."

Story from BBC NEWS:

http://news.bbc.co.uk/go/pr/fr/-/2/hi/uk_news/education/7693462.stm

Published: 2008/10/28 01:40:19 GMT



Thoreau Is Rediscovered as a Climatologist

By **CORNELIA DEAN**



CONCORD, Mass. — Henry David Thoreau endorsed civil disobedience, opposed slavery and lived for two years in a hut in the woods here, an experience he described in “Walden.” Now he turns out to have another line in his résumé: climate researcher.

He did not realize it, of course. Thoreau died in 1862, when the industrial revolution was just beginning to pump climate-changing greenhouse gases into the atmosphere. In 1851, when he started recording when and where plants flowered in Concord, he was making notes for a book on the seasons.

Now, though, researchers at Boston University and Harvard are using those notes to discern patterns of plant abundance and decline in Concord — and by extension, New England — and to link those patterns to changing climate.

Their conclusions are clear. On average, common species are flowering seven days earlier than they did in Thoreau’s day, Richard B. Primack, a conservation biologist at Boston University, and Abraham J. Miller-Rushing, then his graduate student, reported this year in the journal *Ecology*. Working with Charles C. Davis, an evolutionary biologist at Harvard and two of his graduate students, they determined that 27 percent of the species documented by Thoreau have vanished from Concord and 36 percent are present in such small numbers that they probably will not survive for long. Those findings appear in the current issue of the Proceedings of the National Academy of Sciences.

“It’s targeting certain branches in the tree of life,” Dr. Davis said. “They happen to be our most charismatic species — orchids, mints, gentians, lilies, iris.”

Of the 21 species of orchids Thoreau observed in Concord, “we could only find 7,” Dr. Primack said.

From 1851 through 1858, Thoreau tracked the first flowerings of perhaps 500 species, Dr. Primack said. “He knew what he was doing, and he did it really systematically.”

Dr. Primack and Dr. Miller-Rushing did their own surveys in 2004, 2005 and 2006. They also consulted notes from Pennie Logemann, a landscape designer who tracked flowering times from 1963 to 1993 as an aid to planning Concord gardens. And they looked at contributions by members of area plant, insect and bird clubs and the work of additional participants in Concord's long line of passionate amateur naturalists, some of whose records are preserved in the Free Public Library here.

One of them, Richard J. Eaton, is best known to botanists for his 1974 book, "A Flora of Concord." Dr. Primack recalled that as a graduate student at Harvard, he had worked alongside Mr. Eaton in the university's natural history collection — curators relegated the two of them to the same obscure table. "He was just this very elderly man," Dr. Primack recalled. "Not a professor, an enthusiast. But he was a very, very good botanist. He used very good methods."

Another contributor, Alfred Hosmer, is more obscure, but his contribution is enormous: detailed notes he made in Concord from 1888 through 1902.

"He was a storekeeper," Dr. Primack told a small group of graduate students as he gathered them around a table in a special collections room in the Concord library one recent morning. He opened a gray cardboard box, sifted through photocopies of Thoreau's notoriously hard-to-read notes and pulled out what looked like an ancient composition book. He turned to a page where an inventory of orchid species ended and one of irises began. The entries move across the page in tiny but precise script.

"You can imagine this as a storekeeper's ledger," Dr. Primack said. But Hosmer's plant nomenclature was more accurate than Thoreau's, he said. "Plus we can read his writing."

According to Dr. Primack, Hosmer spent "15 years walking around Concord for several hours a day several times a week" making notes about plants. "He never wrote about why he was doing this," Dr. Primack said, "but he had known Thoreau when he was a boy. Hosmer was one of the first people who said Thoreau was a genius and not just a nut."

Dr. Primack said he had never heard of Hosmer until his interest in Thoreau led him to search for old journals, diaries and other records. "I started going to all these funny scientific societies we have," he said. "I was getting up in the 'new business' and telling people what I was looking for. I got a lot of leads, but most were not very useful. Then Ray Angelo told me about Hosmer."

Mr. Angelo, who stepped down recently as curator of vascular plants at the New England Botanical Club, is the author of a monograph, "Concord Area Trees and Shrubs." The eminent biologist Ernst Mayr once called him "the most knowledgeable student of the Concord flora" and today, when Dr. Primack and the other researchers are looking for this species or that in Concord, Mr. Angelo tells them where to find it.

The most daunting challenge, though, was making sense of this kind of data.

"There were a couple of big problems," Dr. Miller-Rushing, now at the [University of Maryland](#), said in a telephone interview from Colorado, where he was studying mountain plants. "Thoreau had incredibly messy handwriting. That was a big difficulty." Also, he said, "in some cases he and Hosmer called the same species by different names. We had to figure all that out."

Their work with Dr. Davis and his students began then, after they heard the two give talks at Harvard on their efforts and convinced them additional analysis was necessary.

"We just treated each individual species as a data point," Dr. Primack said. "That was not the way to do it." Dr. Davis and two of his graduate students, Charles G. Willis and Brad Ruhfel, began looking at the species data from an evolutionary perspective including, for example, the relationship between species



traits and abundance. “Those species that are falling out are more closely related than you would expect,” Mr. Willis said.

As Dr. Davis put it, “certain branches of the tree of life are being lopped off.”

But when Dr. Davis and his colleagues began analyzing the data, things got off to a rough start. “It’s actually a very specialized kind of analysis,” Dr. Primack said. Mr. Willis “kept explaining what the analysis was showing, and I kept saying, ‘I don’t understand.’ ”

Once he did understand, he added, it became apparent that “a couple of times they had not done the analysis correctly because they did not understand the field data.”

Now, though, they have figured out how to communicate. “Climate change, ecology and evolutionary biology have been going their own separate ways,” Mr. Ruhfel said. “We see now we have information we can share and really further the field.”

Now the professors and their graduate students are on the trail of more data. For example, there is growing evidence that as birds change their migration patterns in response to climate change, they may no longer be in sync with the insect species they feed on. Elizabeth Bacon, another of Dr. Primack’s graduate students, is combing Thoreau’s notes on birds and the records of the Nuttall Ornithological Club, a local organization, to see what they can contribute.

Dr. Miller-Rushing worked this summer in the Rockies on whether plants that begin to flower earlier have more problems with late-season frost.

Mr. Willis and Mr. Ruhfel are looking at which species are moving in to Concord to occupy niches vacated by vanished plants, and whether they come from “adjacent species pools,” as Mr. Willis puts it.

The scientists say their research demonstrates the importance of simply watching the landscape and recording what occurs in it. And it demonstrates the importance of old records and natural history collections, Dr. Davis said. But in general, he said, there is little interest in devoting money, time and space to their preservation.

“It’s hard to defend the space on major campuses,” Dr. Davis said. “Eaton could not have prepared his ‘Flora’ unless Harvard University had maintained herbarium specimens. Hosmer’s book was here in Concord for 100 years before anyone used it.”

<http://www.nytimes.com/2008/10/28/science/earth/28wald.html?8dpc>



In Rome, a New Museum Invites a Hands-On Approach to Insanity

By **ELISABETTA POVOLEDO**



ROME — The logo of the Mind’s Museum is an overturned funnel. It is a reference to a 15th-century painting by Hieronymus Bosch that depicts a doctor using a scalpel to extract an object (the supposed “stone of madness”) from the skull of a patient. The doctor is wearing a funnel as a hat.

“It’s one of the earliest icons of madness,” said Pompeo Martelli, the psychiatrist turned director of this unusual museum, which is in the former psychiatric hospital of Santa Maria della Pietà on the northwestern outskirts of Rome. (In its earlier days “there was an out of sight, out of mind mentality,” he said.) The painting, now in the Prado Museum in Madrid, invites the obvious question of who is more mad, the doctor or the hapless patient.

The Santa Maria hospital was closed in 1978 after the passage of an Italian law substituting community services for institutionalized care of many of the mentally ill.

Overturing preconceptions about mental illness is the leitmotif of the eight-year-old Mind’s Museum (museodellamente.it), which reopened this month after a high-tech overhaul by Studio Azzurro, a Milan-based art collective that works mostly with interactive and video environments.

“The idea was to make it extremely participatory, a museum that can register and note the impressions of the visitor,” said Paolo Rosa, who founded Studio Azzurro with two other artists in 1982. “It’s not a static but a dynamic project, in continuous flux.”

In one interactive installation, next to a painted sign that reads, “Up close, no one is normal,” visitors try to synchronize recorded and mirror images of themselves. “It’s about seeking a balance between what you are and what you see,” Dr. Martelli said.

In another, visitors sit for a photograph that is projected onto a board along with photos of past patients at the institution, who recount their life stories in sad, lilting taped monologues.

In yet another, visitors are invited to sit at a desk and hold their hands over their ears to hear the singsong whispers of unseen voices. “That’s one of the symptoms of madness, isn’t it?” Dr. Martelli said, smiling.

Explaining the concept, Mr. Rosa of Studio Azzurro said: “The spectator assumes madness and unconsciously adopts the guise of someone on the inside. We didn’t want to dramatize but to include drama, and to let loose the imaginative dimension that madness elicits, which can be fertile even for those who think themselves as sane.”

The Mind’s Museum is a more hands-on — and heads-on — experience than other European psychiatric museums like the Dr. Guislain Museum in Ghent, Belgium, or the Het Dolhuys Museum in Haarlem, the Netherlands.

Unlike some directors and curators in this museum field, Dr. Martelli was not interested in examining the role that art can play in treating mental illness. There is no collection of patient paintings like that of the Prinzhorn collection of the Psychiatric University Hospital in Heidelberg, Germany, for example. (Still, the artwork of two inmates and that of a doctor is included in two installations.)

“It’s nice — it’s a way of lightening everything that happened in here,” said Maria Morena, a former psychiatric nurse at the hospital who can remember a time when patients lived 60 to a pavilion, eating with spoons (nothing sharp) and sleeping on cotton sheets so stiff that “they scratched like sandpaper.”

The museum is on the main floor of Pavilion 6 of the former psychiatric complex, which today also houses national health system offices. “Our mission is linked to public health, but we’re somewhat atypical,” said Dr. Martelli, whose mandate includes preserving more than 250,000 case histories of patients who were treated there since around 1850. “We are preserving and protecting that patrimony.”

It is the largest historical psychiatric archive in Italy, Dr. Martelli said. Using software developed by his staff, other Italian psychiatric archives have been following his lead, and a resulting network will provide researchers with a database that tracks past psychiatric trends and tendencies in Italy.

Yet the museum’s target audience is not scholars or specialists, but rather high school and middle school students, which explains its embrace of Studio Azzurro’s high-tech interactive approach. (At the end of the day, it takes museum workers about 10 minutes to go through the dozen rooms and shut down all the computers and instruments.)

“Today it’s not enough to go into a classroom and hand out pamphlets about schizophrenia or anorexia,” Dr. Martelli said. “Young people are on another wavelength.” Originally, the museum, which opened in 2000, followed a more traditional line, with objects and panel explanations. “It wasn’t that useful to opening a discourse” on the stigma of mental illness, Dr. Martelli said. But it was set up by a group of psychiatrists rather than curators or museum experts.

On a recent day Chiara Preti, a high school teacher who grew up nearby, toured the refitted museum as part of a training course with other colleagues. She said she found the experience useful. “The point the museum makes is that mental illness is a disease,” she said. “It doesn’t give a moral or a political judgment.” She recalled that in her childhood, her father would give spare change to former patients who hung around the grounds even after the hospital had shut down.

“It was a part of the city,” she said. “And with the museum, it’s kind of nice having its history be part of your life.”

<http://www.nytimes.com/2008/10/28/arts/design/28insa.html?ref=design>

Jacking into the Brain--Is the Brain the Ultimate Computer Interface?

How far can science advance brain-machine interface technology? Will we one day pipe the latest blog entry or NASCAR highlights directly into the human brain as if the organ were an outsize flash drive?

By Gary Stix

The cyberpunk science fiction that emerged in the 1980s routinely paraded “neural implants” for hooking a computing device directly to the brain: “I had hundreds of megabytes stashed in my head,” proclaimed the protagonist of “Johnny Mnemonic,” a William Gibson story that later became a wholly forgettable movie starring Keanu Reeves.

The genius of the then emergent genre (back in the days when a megabyte could still wow) was its juxtaposition of low-life retro culture with technology that seemed only barely beyond the capabilities of the deftest biomedical engineer. Although the implants could not have been replicated at the Massachusetts Institute of Technology or the California Institute of Technology, the best cyberpunk authors gave the impression that these inventions might yet materialize one day, perhaps even in the reader’s own lifetime.

In the past 10 years, however, more realistic approximations of technologies originally evoked in the cyberpunk literature have made their appearance. A person with electrodes implanted inside his brain has used neural signals alone to control a prosthetic arm, a prelude to allowing a human to bypass limbs immobilized by amyotrophic lateral sclerosis or stroke. Researchers are also investigating how to send electrical messages in the other direction as well, providing feedback that enables a primate to actually sense what a robotic arm is touching.

But how far can we go in fashioning replacement parts for the brain and the rest of the nervous system? Besides controlling a computer cursor or robot arm, will the technology somehow actually enable the brain’s roughly 100 billion neurons to function as a clandestine repository for pilfered industrial espionage data or another plot element borrowed from Gibson?

Will Human Become Machine?

Today’s Hollywood scriptwriters and futurists, less skilled heirs of the original cyberpunk tradition, have embraced these neurotechnologies. *The Singularity Is Near*, scheduled for release next year, is a film based on the ideas of computer scientist Ray Kurzweil, who has posited that humans will eventually achieve a form of immortality by transferring a digital blueprint of their brain into a computer or robot.

Yet the dream of eternity as a Max Headroom–like avatar trapped inside a television set (or as a copy-and-paste job into the latest humanoid bot) remains only slightly less distant than when René Descartes ruminated on mind-body dualism in the 17th century. The wholesale transfer of self—a machine-based facsimile of the perception of the ruddy hues of a sunrise, the constantly shifting internal emotional palette and the rest of the mix that combines to evoke the uniquely subjective sense of the world that constitutes the essence of conscious life—is still nothing more than a prop for fiction writers.

Hoopla over thought-controlled prostheses, moreover, obscures the lack of knowledge of the underlying mechanisms of neural functioning needed to feed information into the brain to re-create a real-life cyberpunk experience. “We know very little about brain circuits for higher cognition,” says Richard A. Andersen, a neuroscientist at Caltech.

What, then, might realistically be achieved by interactions between brains and machines? Do the advances from the first EEG experiment to brain-controlled arms and cursors suggest an inevitable, deterministic progression, if not toward a Kurzweilian singularity, then perhaps toward the possibility of



inputting at least some high-level cognitive information into the brain? Could we perhaps download *War and Peace* or, with a nod to *The Matrix*, a manual of how to fly a helicopter? How about inscribing the sentence “See Spot run” into the memory of someone who is unconscious of the transfer? How about just the word “see”?

These questions are not entirely academic, although some wags might muse that it would be easier just to buy a pair of reading glasses and do things the old-fashioned way. Even if a pipeline to the cortex remains forever a figment of science fiction, an understanding of how photons, sound waves, scent molecules and pressure on the skin get translated into lasting memories will be more than mere cyberpunk entertainment. A neural prosthesis built from knowledge of these underlying processes could help stroke victims or Alzheimer’s patients form new memories.

Primitive means of jacking in already reside inside the skulls of thousands of people. Deaf or profoundly hearing-impaired individuals carry cochlear implants that stimulate the auditory nerve with sounds picked up by a microphone—a device that neuroscientist Michael S. Gazzaniga of the University of California, Santa Barbara, has characterized as the first successful neuroprosthesis in humans. Arrays of electrodes that serve as artificial retinas are in the laboratory. If they work, they might be tweaked to give humans night vision.

The more ambitious goal of linking Amazon.com directly to the hippocampus, a neural structure involved with forming memories, requires technology that has yet to be invented. The bill of particulars would include ways of establishing reliable connections between neurons and the extracranial world—and a means to translate a digital version of *War and Peace* into the language that neurons use to communicate with one another. An inkling of how this might be done can be sought by examining leading work on brain-machine interfaces.

Your Brain on Text

Jacking text into the brain requires consideration of whether to insert electrodes directly into tissue, an impediment that might make neural implants impractical for anyone but the disabled. As has been known for nearly a century, the brain’s electrical activity can be detected without cracking bone. What looks like a swimming cap studded with electrodes can transmit signals from a paralyzed patient, thereby enabling typing of letters on a screen or actual surfing of the Web. Niels Birbaumer of the University of Tübingen in Germany, a leading developer of the technology, asserts that trial-and-error stimulation of the cortex using a magnetic signal from outside the skull, along with the electrode cap to record which neurons are activated, might be able to locate the words “see” or “run.” Once mapped, these areas could be fired up again to evoke those memories—at least in theory.

Some neurotechnologists think that if particular words reside in specific spots in the brain (which is debatable), finding those spots would probably require greater precision than is afforded by a wired swim cap. One of the ongoing experiments with invasive implants could possibly lead to the needed fine-level targeting. Philip R. Kennedy of Neural Signals and his colleagues designed a device that records the output of neurons. The hookup lets a stroke victim send a signal, through thought alone, to a computer that interprets it as, say, a vowel, which can then be vocalized by a speech synthesizer, a step toward forming whole words. This type of brain-machine interface might also eventually be used for activating individual neurons.

Still more precise hookups might be furnished by nanoscale fibers, measuring 100 nanometers or less in diameter, which could easily tap into single neurons because of their dimensions and their electrical and mechanical properties. Jun Li of Kansas State University and his colleagues have crafted a brushlike structure in which nanofiber bristles serve as electrodes for stimulating or receiving neural signals. Li foresees it as a way to stimulate neurons to allay Parkinson’s disease or depression, to control a prosthetic arm or even to flex astronauts’ muscles during long spaceflights to prevent the inevitable muscle wasting that occurs in zero gravity.



Learning the Language

Fulfilling the fantasy of inputting a calculus text—or even plugging in *Traveler's French* before going on vacation—would require far deeper insight into the brain signals that encode language and other neural representations.

Unraveling the neural code is one of the most imposing challenges in neuroscience—and, to misappropriate Freud, would likely pave a royal road to an understanding of consciousness. Theorists have advanced many differing ideas to explain how the billions of neurons and trillions of synapses that connect them can ping meaningful messages to one another. The oldest is that the code corresponds to the rate of firing of the voltage spikes generated by a neuron.

Whereas the rate code may suffice for some stimuli, it might not be enough for booting a Marcel Proust or a Richard Feynman, supplying a mental screen capture of a madeleine cake or the conceptual abstraction of a textbook of differential equations. More recent work has focused on the precise timing of the intervals between each spike (temporal codes) and the constantly changing patterns of how neurons fire together (population codes).

Some help toward downloading to the brain might come from a decadelong endeavor to build an artificial hippocampus to help people with memory deficits, which may have the corollary benefit of helping researchers gain insights into the coding process. A collaboration between the University of Southern California and Wake Forest University has worked to fashion a replacement body part for this memory-forming brain structure. The hippocampus, seated deep within the brain's temporal lobe, sustains damage in stroke or Alzheimer's. An electronic bypass of a damaged hippocampus could restore the ability to create new memories. The project, funded by the National Science Foundation and the Defense Advanced Research Projects Agency, might eventually go further, enhancing normal memory or helping to deduce the particular codes needed for high-level cognition.

The two groups—led by Theodore W. Berger at U.S.C. and Samuel Deadwyler at Wake Forest—are preparing a technical paper showing that an artificial hippocampus took over from the biological organ the task of consolidating a rat's memory of pressing a lever to receive a drop of water. Normally the hippocampus emits signals that are relayed to cortical areas responsible for storing the long-term memory of an experience. For the experiment, a chemical temporarily incapacitated the hippocampus. When the rat pressed the correct bar, electrical input from sensory and other areas of the cortex were channeled through a microchip, which, the scientists say, dispatched the same signals the hippocampus would have sent. A demonstration that an artificial device mimicked hippocampal output would mark a step toward deducing the underlying code that could be used to create a memory in the motor cortex—and perhaps one day to unravel ciphers for even higher-level behaviors.

If the codes for the sentence “See Spot run”—or perhaps an entire technical manual—could be ascertained, it might, in theory, be possible to input them directly to an electrode array in the hippocampus (or cortical areas), evoking the scene in *The Matrix* in which instructions for flying a helicopter are downloaded by cell phone. Artificial hippocampus research postulates a scenario only slightly more prosaic. “The kinds of examples [the U.S. Department of Defense] likes to typically use are coded information for flying an F-15,” says Berger.

The seeming simplicity of the model of neural input envisaged by artificial hippocampus-related studies may raise more questions than it answers. Would such an implant overwrite existing memories? Would the code for the sentence “See Spot run” be the same for me as it is for you or, for that matter, a native Kurdish speaker? Would the hippocampal codes merge cleanly with other circuitry that provides the appropriate context, a semantic framework, for the sentence? Would “See Spot run” be misinterpreted as a laundry mishap instead of a trotting dog?

Some neuroscientists think the language of the brain may not be deciphered until understanding moves beyond the reading of mere voltage spikes. “Just getting a lot of signals and trying to understand what

these signals mean and correlating them with particular behavior is not going to solve it," notes Henry Markram, director of neuroscience and technology at the Swiss Federal Institute of Technology in Lausanne. A given input into a neuron or groups of neurons can produce a particular output—conversion of sensory inputs to long-term memory by the hippocampus, for instance—through many different pathways. "As long as there are lots of different ways to do it, you're not even close," he says.

The Blue Brain Project, which Markram heads, is an attempt that began in 2005 to use supercomputer-based simulations to reverse-engineer the brain at the molecular and cellular levels—modeling first the simpler rat organ and then the human version to unravel the underlying function of neural processes. The latter task awaits a computer that boasts a more than 1,000-fold improvement over the processing power of current supercomputers. The actual code, when it does emerge, may be structured very differently from what appears in today's textbooks. "I think there will be a conceptual breakthrough that will have significant implications for how we think of reality," Markram says. "It will be quite a profound thing. That's probably why it's such an intractable problem."

The challenge involved in figuring out how to move information into the brain suggests a practical foreseeable limit for how far neurotechnology might be advanced. The task of forming the multitude of connections that make a memory is vastly different from magnetizing a set of bits on a hard disk. "Complex information like the contents of a book would require the interactions of a very large number of brain cells over a very large area of the nervous system," observes neuroscientist John P. Donoghue of Brown University. "Therefore, you couldn't address all of them, getting them to store in their connections the correct kind of information. So I would say based on current knowledge, it's not possible."

Writing to the brain may remain a dream lost in cyberspace. But the seeming impossibility does not make Donoghue less sanguine about ultimate expectations for feeding information the other way and developing brain-controlled prostheses for the severely disabled. He has been a leader in studies to implant an array of multiple electrodes into the brain that can furnish a direct line from the cortex to a prosthetic arm or even a wheelchair.

Donoghue predicts that in the next five years brain-machine interfaces will let a paralyzed person pick up a cup and take a drink of water and that, in some distant future, these systems might be further refined so that a person with an upper spinal cord injury might accomplish the unthinkable, perhaps even playing a game of basketball with prosthetics that would make a reality of *The Six Million Dollar Man*, the 1970s television series. Even without an information pipeline into the brain, disabled patients and basic researchers might still reap the benefits of lesser substitutes. Gert Pfurtscheller of the Graz University of Technology in Austria and his colleagues reported last year on a patient with a spinal cord injury who was able, merely by thinking, to traverse a virtual environment, moving from one end to the other of a simulated street. Duke University's Miguel A. L. Nicolelis, another pioneer in brain-machine interfaces, has begun to explore how monkeys connected to brain-controlled prosthetic devices begin to develop a kinesthetic awareness, a sense of movement and touch, that is completely separate from sensory inputs into their biological bodies. "There's some physiological evidence that during the experiment they feel more connected to the robots than to their own bodies," he says. The most important consequences of these investigations may be something other than neural implants and robotic arms. An understanding of central nervous system development acquired by the Blue Brain Project or another simulation may let educators understand the best ways to teach children and determine at what point a given pedagogical technique should be applied. "You can build an educational development program that is engineered to, in the shortest possible time, allow you to acquire certain capabilities," Markram says. If he is right, research on neural implants and brain simulations will produce more meaningful practical benefits than dreams of the brain as a flash drive drawn from 20th-century science-fiction literature.

Note: This article was originally published with the title, "Jacking Into the Brain".`

<http://www.sciam.com/article.cfm?id=jacking-into-the-brain&print=true>

Mr. Wizard

By SAM TANENHAUS

THE WIDOWS OF EASTWICK

By John Updike

308 pp. Alfred A. Knopf. \$24.95

John Updike is the great genial sorcerer of American letters. His output alone (60 books, almost 40 of them novels or story collections) has been supernatural. More wizardly still is the ingenuity of his prose. He has now written tens of thousands of sentences, many of them tiny miracles of transubstantiation whereby some hitherto overlooked datum of the human or natural world — from the anatomical to the zoological, the socio-economic to the spiritual — emerges, as if for the first time, in the completeness of its actual being.

This isn't writing. It is magic. And it's not surprising that the author who practices it should be drawn repeatedly to the other, darker kind, though it is often masked in droll comedy. In the 1960s, surveying the field in the literary rat race, Updike put a hex, collectively, on the Jewish novelists (Bellow, Mailer, Malamud, Roth) then looming as his chief competition. He invented a wickedly funny composite parody, Henry Bech, whom he entraps in a web of debilitating spells, from hydrophobia to sleep-anxiety. At one point Bech squanders the best part of a work morning on the toilet, "leafing sadly through *Commentary* and *Encounter*," journals not often hospitable to Updike's own fiction. Lest we, or his rivals, miss the drift, Updike afflicts Bech with the cruelest curse of all, writer's block, which leaves him unable to begin, much less finish, his next novel. "Am I blocked? I'd just thought of myself as a slow typist," Bech weakly jokes to Bea, his current emasculating Gentile mistress, who has supplanted her even more emasculating sister in Bech's bed. "What do you do," Bea sneers in reply, "hit the space bar once a day?"



The first proto-witch in Updike's fiction reared her fetching head in "Snowing in Greenwich Village," published in *The New Yorker* in January 1956, when Updike was 23, a prodigy just out of Harvard. Slight but piquant, more sketch than finished work, this story introduced the Maples, Richard and Joan, newlyweds whose married life Updike has since revisited many times, steering them through child-raising, estrangements and finally divorce. In their first appearance, the young couple, awkwardly ensconced in an apartment on West 13th Street, are shy hosts to an attractive friend who amuses them with sardonic anecdotes, including one about a recent date ("the kind of guy who, when we get out of a taxi and there's a grate giving out steam, crouches down" — Rebecca lowered her head and lifted her arms — "and pretends he's the Devil"). Wry, remote, oddly detached — with an attitude of world-weary narcissism — Rebecca leaves the Maples feeling embarrassed in their innocence. Walking her home that evening, Richard senses she is dangerous, yet responds to her allure: "Not only did she stand

unnecessarily close, but, by shifting the weight of her body to one leg and leaning her head sideways, she lowered her height several inches, placing him in a dominating position exactly fitted to the broad, passive shadows she must have known were on her face.”

All this is mere prelude to the sustained sorcery of “The Witches of Eastwick,” published in 1984, the predecessor to “The Widows of Eastwick.” “Witches” is best known today through the garish distortions of the Hollywood adaptation — a pity since it’s one of Updike’s most ambitious works, a brilliant counterstatement to his masterpiece, the Rabbit Angstrom cycle, our age’s one great serial epic, with its intertwined themes of adultery, death, family strife and social discord.

Rabbit, a comic Everyman, pines for the days “when Americans moved within the American dream, laughing at it, starving on it, but living it, humming it, the national anthem everywhere.” But his alienation doesn’t stop him from grabbing every treat on offer — sex with a hippie runaway, pot-smoking sessions with the half-crazed black radical holed up in Rabbit’s house. And when his wife inherits a Toyota dealership and plants him in the showroom, “Rabbit feels as though he owns it all.” It may well be that “the great American ride is ending,” but like all men Rabbit thinks he’s got a firm grip on the wheel.

“The Witches of Eastwick” flips the switch and reverses the current. Its topic is female empowerment. A triad of literal witches, sexually rapacious divorcées in their 30s, prey on the menfolk in a shabby-trendy Rhode Island seaside town and, as their power grows, also terrorize the local citizens, causing destruction and even death by means of the evils — the “maleficia” — they unleash through spells and chants. The three are also artists manqué: Alexandra, the coven’s earth mother, makes leeringly primitive clay figurines, “little feminist fetishes” sold in local shops; Jane, flinty and acerbic, is an impassioned cellist; Sukie, a willowy redhead, writes an energetic gossip column for the local paper.

Each also keeps a souvenir of her ex-husband — indeed what appears to be an atomized version of his remains. Alexandra’s “rested on a high kitchen shelf in a jar, reduced to multicolored rust, the cap screwed on tight.” Jane’s “hung in the cellar of her ranch house among the dried herbs and simples and was occasionally sprinkled, a pinch at a time, into a philter, for piquancy.” Sukie “had permanized hers in plastic and used him as a place mat.”

All three women are feminists — or at least subscribe to a Nature-centered philosophy of female domination. “Full of the belief that a conspiracy of women upholds the world,” they imagine dethroning the interlocking system of ideas and assumptions men have developed through the centuries — experimental science, religious morality and, above all, the hierarchy of the sexes.

“Not until midlife,” Updike writes of one witch, “did she truly believe that she had a right to exist, that the forces of nature had created her not as an afterthought and companion — a bent rib, as the infamous Malleus Maleficarum had it — but as the mainstay of the continuing Creation, as the daughter of a daughter and a woman whose daughters in turn would bear daughters.”

This sounds dated and is meant to. The novel is a period piece, set during “the Nixon years,” with their bitter mood of polarization. Eastwick’s bluestockings organize antiwar rallies. The local pastor, promiscuous like seemingly all of Eastwick’s men, runs away with a local teenage girl to join a bomb-building band of underground radicals.

Amid all this, witchcraft seems simply another ideology, potentially the basis for a reinterpretation of the human and natural world. Updike makes good sport throughout of pseudofeminist cant. But he is also a master of omniscient sympathy, and gradually the witches’ conviction that they “could move the material world with sympathetic magic” achieves the completeness of a plausible worldview, one that seeps into the broader ethos of Eastwick. “Insofar as they were witches, they were phantoms in the communal mind,” Updike writes. They earn respect for “a certain distinction, an inner boiling such as had in other cloistral towns produced Emily Dickinson’s verses and Emily Brontë’s inspired novel.”



And yet, despite their dream of female empowerment, the witches' fantasies center on a man, a mysteriously well-heeled newcomer "with greasy curly hair half-hiding his ears and clumped at the back so that his head from the side looked like a beer mug with a monstrously thick handle." Unsubtly named Darryl Van Horne, he is either Satan or his emissary, given to voluble though not quite coherent Mephistophelian theorizing. Aware the three divorcées are devil-worshippers, he lures them into the brick mansion, Eastwick's finest, which he has bought and gaudily refurbished. The "malefactresses" cavort in Van Horne's "eight-foot teak hot tub," sexually servicing him and at times one another. They also greedily imbibe his lethal cocktails, "alchemically concocted of tequila and grenadine and crème de cassis and Triple Sec," and compete fiercely on his bubble-roofed tennis court, resorting to tradecraft if it means winning a point. During one heated match, the ball tossed up for a serve "became in midair a bat": "its wings circled in small circumference at first and, next instant, snapped open like an umbrella as the creature flicked away with its pink blind face."

Even as Updike vivifies these inventive debauches, he makes us see the pathos that underlies them. The women, their ravaging appetites and arcane gifts aside, seek only what so many others in their position seek, escape from the dreary sameness of their daily lives — their downscale homes, their needy children (whom they shamelessly neglect), the ostracism forced on divorced women in provincial small-town America.

Unexpectedly, however, the chosen victims of their "maleficia," the spells chanted under a "cone of power," are in almost every instance other women, principally the henpecking wives who complicate their adulteries, though others suffer as well. In the end, the three, "consecrated to evil and its callous self-absorption," wield power ruthlessly, just as men do, and Updike lingers, luridly in places, on the deaths they cause or influence. ("The bone of her skull gave off a surprising high-pitched noise, as if two blocks of wood had been playfully knocked together.") "The Witches of Eastwick," comedy of the blackest sort, reminds us how often in Updike violence disrupts the gleaming surfaces.

All this provides the background for "The Widows of Eastwick," Updike's predictably ingenious sequel, set 30-plus years later. The mood and tone are very different — relaxed and contemplative. The witches, having fled Eastwick and dispersed for second marriages, more or less satisfying, have lately lost their husbands. They tentatively renew their sisterhood on overseas travels in which they test their creaky skills. These opening pages form a long, rather aimless set piece. But it doesn't matter. Who can resist Updike on veiled heads glimpsed in a Cairo market ("lively liquid eyes glared like the bright backs of captured beetles") or on Mao in his coffin ("evenly coated with orange makeup not quite the color of living skin")?

Pleased with their time together, the women return to Eastwick for the summer, sharing cramped quarters in a tacky apartment complex carved from Van Horne's repurposed mansion. A generation has passed and much has changed, despite some superficial parallels. As before, dangers abound — it is post-9/11 America — but the atmosphere of conflict has evaporated, at least in Eastwick. It's now become, as the acidulous Jane complains, a haven of wholesomeness, of "toned-up young mothers driving their overweight boys in overweight S.U.V.'s to hockey practice 20 miles away, the young fathers castrated namby-pambies helping itty-bitty wifey with the housekeeping, spending all Saturday fussing around the lovely home. It's the '50s all over again, without the Russians as an excuse." In the 1960s and early '70s, affluence inspired healthy blasphemies. It has since become its own oppressive piety. "People go around mourning the death of God," Jane sputters, lapsing into sibilance. "It's the death of sssin that bothers me. Without sin, people aren't people any more, they're just ssoul-less sheep."

This is a favorite Updike theme — explored at length in his novel "Couples" (1968) — and it is saturated in irony. We know who's to blame for this simpering generation: their elders, who always put their own anarchic appetites first. Their offspring — "those poor saintly deserted children of ours," in Sukie's words — have rebelled in turn by becoming devoted spouses and overprotective parents.





This communal virtue, though easily mocked, proves infectious. The witches, led by Alexandra, their conscience, contrive to atone for their past crimes, in particular the slow fatal illness they inflicted on a young Wiccan who had joined the wild party at Van Horne's mansion and then calculatedly displaced them. They can't bring her back to life, but perhaps other victims—including an infant, now a grown woman, rendered infertile by their spells — can be nursed to wholeness through the exercise of white magic.

But evil, once done, can't simply be undone. Some damage is irreversible. Besides, their victims have memories too — or have passed them on to kin, including a warlock orphaned by the witches all those years ago and determined to exact vengeance. And the widows' powers have waned. They are old ladies now, approaching or past 70, "ancient bag-hags," betrayed, finally, by the Nature goddess. All along their enchantments had derived from their sex appeal, and it is now gone or very nearly so. Preparing to cast a spell, the three shed their clothes and study the bleak script of their decrepitude, "the wrinkles, the warts and scars, the keratoses and liver spots, the slack muscles and patches of crepey skin crinkled like smooth water touched by a breath of wind, the varicose veins and arthritic deformations with which time had overlaid their old beauty." Teenagers flirting outside a Ben & Jerry's prompt Alexandra to brood on what lies ahead for them: "Sex, entrapment, weariness, death."

Updike's asperities on age inevitably reflect back on himself, but not in the way we might expect. At 76, he still wrings more from a sentence than almost anyone else. His sorcery is startlingly fresh, page upon page.

The principal character in "The Widows of Eastwick" is the town itself, and Updike makes it more sensually real than one's own neighborhood: the "glaring sidewalk, fleshy people in summer shorts casting squat self-important shadows, wilting zinnias in beds next to the concrete post-office steps, the American flag hanging limp on its pole overhead." A summer carnival, where "children were burying their faces in paper cones of cotton candy, and trying to open their mouths wide enough to bite through the thick glaze of candy apples," fosters an air of "false excitement — the shrieks from the Whirlabout, as the circular cages at the end of their long tilting arms flung the willing captives this way and that; the more sedate frights occasioned by the spasmodic rotation of the Ferris wheel, stopping at the bottom to change passengers while all the other seats swung, springing panicky cries from those hoisted topmost into the cool night."

The genius inheres in the precise observation, in the equally precise language, but above all in the illusion that the image has been received and processed in real time, when in truth Updike has slowed events to a dreamlike pace and given them a dream's hyperreality, so that the distinction between the actual and the imagined feels erased. "My first books met the criticism that I wrote all too well but had nothing to say," he once ruefully noted. "My own style seemed to me a groping and elemental attempt to approximate the complexity of envisioned phenomena, and it surprised me to have it called luxuriant and self-indulgent; self-indulgent, surely, is exactly what it wasn't — other-indulgent, rather."

That other, he asserted, added up to nothing less than "the whole mass of middling, hidden, troubled America." No writer of our time has reached into it so deeply or conjured so many of its mysteries so pulsingly to life.

Sam Tanenhaus is the editor of the Book Review and the Week in Review.

<http://www.nytimes.com/2008/10/26/books/review/Tanenhaus-t.html?8bu&emc=bu1>



The Mother of ‘May I?’By **STACY SCHIFF****EMILY POST****Daughter of the Gilded Age, Mistress of American Manners**

By Laura Claridge

Illustrated. 525 pp. Random House. \$30

Here finally is the answer to a question that has come up a few times of late: how do you recover your dignity after your wealthy, prominent spouse publicly humiliates you with his philandering? You might start by writing an etiquette guide, one that will go into countless, best-selling editions. It is under no particular obligation to remind a young woman that “she must not, while wearing her bridal veil, smoke a cigarette” or offer counsel on taking one’s seat at the theater (best “not to drag anything across the heads of those sitting in front of you”) or note the curious correlation between the man who believes himself “a brilliant and interesting talker” and the “rapacious pest.” It should however contain at its heart a five-page dagger — dripping with the age-old poisons of decency, propriety and integrity — called “The Fundamentals of Good Behavior.” There you are within your rights to note that “No matter who he may be, whether rich or poor, in high life or low, the man who publicly besmirches his wife’s name, besmirches still more his own, and proves that he is not, was not, and never will be, a gentleman.” That, anyway, is how Emily Post dealt with the chorus girls and aspiring actresses. And if Emily Post did it — whoever she was — it must be right.

In her new biography, Laura Claridge sets out to resurrect the woman behind the brand. Mrs. Post turns out to be far more than either the aggrieved wife in a public scandal (lavatory sting operations are not new) or the autocrat of etiquette. She was initially the adored only child of a wealthy socialite and the architect Bruce Price, among whose legacies are Tuxedo Park and chateausque Canadian railroad hotels. Born in 1872 in Baltimore, Emily grew up in New York; she emerged from a privileged childhood with a love of the spotlight, a wide creative streak and perfect posture, a straight-spined monument to the marriage of Southern gentility and Northern industry. She moved easily amid but was not at the heart of what she termed Best Society. Instead she got the lecture familiar to everyone else: “Real quality,” the Prices instructed their daughter, “had nothing to do with money or birth.”





She married well if unwisely. Edwin Post liked Long Island; she liked Tuxedo Park. She liked the Knickerbocker Club; he preferred yachting. Even before she became the arbiter of etiquette, it seemed abundantly clear to Mrs. Edwin Post that one spouse does not buy a 129-foot schooner without consulting the other. Fairly late in the game, Claridge reveals Mrs. Post to be the control freak we suspected she was all along: when she finished a jigsaw puzzle, she wrote the date on the box. The restaurant tab could not arrive fast enough. She spent six months in an Albany hotel room so as to be on hand while her son finished flight school. By contrast, Edwin Post — an avid hunter — was prone to building pens for live terrapins in the basement. The turtles made nasty surprise appearances throughout the house for weeks.

In the course of their 13-year marriage Emily produced two sons and published a novel. Claridge pronounces her undone by pregnancy and parenthood, but what truly undid her was the divorce. It was devastating. Naturally she did not let on: a lady shares details of such matters only with “her nearest and wisest relatives.” Five novels followed over the next six years. She was no Edith Wharton although she was a sport, turning out an account even of a 1915 cross-country drive. She discovered she quite liked offering advice and proposed a column to her agent, to be called “Letters of a Worldly Godmother.” He passed.

Only over dessert at a 1920 dinner did a well-connected friend ask, “Why don’t you compose a book on how to behave?” and assist with the necessary introductions. Eighteen months later, at 50, she had the book that would make her — more properly her ex-husband’s — name. Firmly and fluently, with humor and compassion, she discoursed on such eternal subjects as boors, social climbers and betrayed wives. A true architect’s daughter, she had an eye for design and a passion for order; she was convinced that morals and manners occupy adjacent lots. The volume is an advertisement for the belief that good manners will get you places big money will not, the kind of creed to which people with money — if not big money — subscribe.

The next years were an exhilarating race to stay on top of a field she did not create but would long dominate. Revisions of the blue bible of etiquette followed regularly, as did product endorsements (watches, rayon, cigarettes), a flood of journalism, volumes on design and architecture. From the woman who admitted she never set foot in her kitchen came a cookbook. In 1949 she turned out a column on “Etiquette for Truck Drivers.” All of which left little time for terrapin; civilizing the rest of us meant 10- to 15-minute meals for Mrs. Post. Fortunately, that was fine with her. She was very much a feet-on-the-furniture, elbows-on-the-table, doughnut-dunking kind of girl. She was also a whirl of ambition. “I would rather broadcast than eat,” she insisted, eagerly embracing 10-hour workdays.

For years the masterwork evolved with the times — it came to include sections on how to greet a returning veteran, the rules of hitchhiking — until it did no longer. It was the most requested book among G.I.’s during the war, the second most stolen at home. Radio shows and syndicated columns cemented her hold; Post’s were the perfect sermons for a nation in flux. Repeatedly she was named one of the most influential women in America. The mail arrived in torrents. She held the department crown until 1952, her reign cut short only by Amy Vanderbilt or Simone de Beauvoir, depending on how you see it.

Saying disagreeable things, Post noted, is “not a pleasant occupation.” Alas it is now mine. Claridge hails from the leave-no-detail-undisturbed school of biography; she can’t resist a quiver of the thermometer or of the stock market, of which there were rather a few between 1872 and 1929. Do we need the curtain time of the production in which Emily had a bit part at age 6? I feel strongly that Mrs. Post should be allowed to garden without being encouraged in her efforts by modern brainwave researchers at N.Y.U.

Generally too there is a certain disengagement on Claridge’s part. The tributes to a suffocating, overbearing obsessive are all there — who else could have churned out five million words on etiquette in 15 years? — but Claridge seems not to hear them. For most of the big box-office years, Post’s closest company was the help. Time was an issue, but neither the need nor the capacity for friendship seems to have manifested itself. Don’t look to Claridge for elucidation. At times she strains against the facts, or seems willfully to misread them. I’m a little skeptical that one of the lessons of the suffragists was that





“even society women were no longer dependable.” Just because Post published a bad book does not mean “she was willing to fail.” Despite strenuous efforts, it’s difficult to make Emily Post a protofeminist; that portrait of Queen Victoria in her living room actually meant something. And while acknowledging that Post was not always engaged in topical issues — she was often fully out of step with her time — Claridge seems intent on summoning every figure of the age onstage. Freud, Marie Curie, Helen Keller, Caruso, F. Scott Fitzgerald, Bonnie and Clyde, Joe McCarthy all parade past. It’s a crowded production, also difficult to hear over the screech of scenery. There are few immutable rules of biography, but I would hazard this one: If the Triangle fire erupts and the subject in no way feels the heat, the Triangle fire does not belong in the biography. What exactly is Gene Autry doing here?

After the divorce, Emily Post never pronounced her husband’s name again. She also set an extra place at the table for the rest of her life. Fine manners, or something else? Mrs. Post is always cordial, never intimate. Over 450 pages, Claridge returns the favor.

Stacy Schiff is the author, most recently, of “A Great Improvisation: Franklin, France, and the Birth of America.”

<http://www.nytimes.com/2008/10/26/books/review/Schiff-t.html?8bu&emc=bua2>



Designed to Sell

By **STEVEN HELLER**



What's the big idea? If you consumed magazine advertising during the late 1950s and early '60s, you might recall there was a shift from the straightforward hawking of goods, using often humorless and ham-handed promotional tools — trade characters, slogans, testimonials, romanticized and idealized illustrations — to surprisingly ironic, convention-busting campaigns (for example, the one for the Volkswagen “lemon”). On Madison Avenue this was called “the creative revolution,” and the weapon of choice was “the big idea,” or what George Lois, one of the leading revolutionaries, describes in *GEORGE LOIS ON HIS CREATION OF THE BIG IDEA* (Assouline, \$50) as a new method of working “with words and images that catch people’s eyes, penetrate their minds, warm their hearts and cause them to act.”

This sounds de rigueur for admen today. But when Lois, born in 1931 to Greek immigrants, started plying his craft, the old-school (WASPy) advertising industry was rather staid and artless. Lois and his mentors, like Paul Rand and Reba Sochis, and colleagues like Helmut Krone, Gene Federico and Lou Dorfsman represented the first wave of “ethnic” men and women — mostly New Yorkers — who joined agencies like William H. Weintraub and Doyle Dane Bernbach or started their own small firms. They worked in creative teams, each made up of a copywriter and a designer/art director. Lois was an art director, though he didn't limit himself simply to layout or picture making. He conceived really big ideas for old and new brands and sometimes used theatrical presentations to make certain his clients would accept them. A big idea was nothing unless it was published. And for Lois, nothing was more revolutionary than forcing “a conservative, indoctrinated society” to look at the world differently — albeit through his eyes. Still, given its agenda, advertising was always a double-edged sword, mixing art and commerce.

Over the years Lois has published a number of greatest-hits collections, featuring the “When You Got It, Flaunt It!” ads for Braniff International, in which he presented “the world’s oddest couples” (like the poet [Marianne Moore](#) and the pulp novelist Mickey Spillane, who talked about writing), and the “I Want My MTV” promos. For MTV he persuaded [Mick Jagger](#) to appear in a commercial, which helped turn around the fortunes of what was then a fledgling cable network. Although many familiar ads are repeated in this new book, the stories of their geneses are often illuminating. Lois frequently gives the impression that his best work was instinctive, but “The Big Idea” reveals him to be a savvy connoisseur of high and low art. During his five-decade career, he has tapped into African, Asian, pre-Columbian, Renaissance and modern art, among other things, for inspiration. Almost all his work contains historical or cultural references. For example, he conceived nearly 100 Esquire magazine covers in the '60s and early '70s; one



of the most famous, which showed [Andy Warhol](#) drowning in a can of Campbell's soup, was based on a scene in "North by Northwest" in which [Cary Grant](#) and Eva Marie Saint are dwarfed by the gigantic presidential busts on Mount Rushmore. "I stored the Lilliputian imagery in the computer in my head," he writes. And his "ugly Nauga," the mascot for UniRoyal's Naugahyde, was influenced by a tiny, mythic Japanese beast called a Shishi.

Unlike old-school advertisements, Lois's had humanity. My favorite story is about the time he hired [Joe Louis](#) to pose in an ad for a brokerage firm (the first to advertise on television). The headline read "Edwards & Hanly — Where were you when I needed you?" It alluded to the fact that although Louis had earned \$5 million during his boxing career and contributed a tidy sum to the American war effort in the '40s, by the '60s he was broke and being hounded by the I.R.S. "Using Joe was a powerfully subtle way of telling the world that he had been treated disgracefully by the government and that the boys at Edwards & Hanly were tuned in to the real world," Lois writes. "The commercial was an immediate sensation as the media exploded with TV interviews and articles about the almost forgotten champ and his mistreatment by an ungrateful Uncle Sam." Of course, not all big ideas were meant to right wrongs (most were intended to sell products), but Lois sometimes used advertising to help change popular attitudes. This book underscores the effectiveness of his methods.

Jan Tschichold (1902-74) was as indispensable to modern typography as Lois was to modern advertising. However, unless you're a designer, an art director or a font wonk, you probably don't know his name, or how to pronounce it (CHICK-old). Nonetheless, his designs helped change the antiquated ways in which visual communication, including advertising and book publishing, was practiced in Germany in the 1920s and '30s, and they influenced most modern designers well into the second half of the 20th century.

In his books and magazine articles, Tschichold codified what is called the "New Typography," characterized by sans-serif typefaces and asymmetrical composition. It was an unconventional style practiced by members of the Bauhaus, Russian Constructivist and De Stijl movements. ACTIVE LITERATURE: Jan Tschichold and New Typography (Hyphen Press/Princeton Architectural Press, \$75), by Christopher Burke, a typeface designer and type historian, is not the first but is decidedly the most thorough biography published to date and sets in stone Tschichold's enormous contribution. Tschichold upended the design establishment in October 1925, when he guest-edited a special issue of *Typographische Mitteilungen* (Typographic News), which had always been fairly conservative, and showcased for the first time avant-garde designs from revolutionary Russia, Germany and elsewhere in Europe, making the case for their adoption by commercial artists. His October revolution was a rebuke to the German traditionalists who were weighed down with strict rules and illegible letter forms. Earlier in 1925 he had published a manifesto (which Burke uncovered and reprints here), arguing that typography must be precise, without ambiguity: "A communication should have the 1) briefest, 2) simplest, 3) most urgent form." The New Typography would employ "the simplest form" and "the minimum means."

This notion of economy set the modern approach apart from the German black-letter tradition, but Tschichold went further in upsetting the status quo: "National typefaces (Fraktur, Textura, Old Slavonic) are excluded as generally incomprehensible and as leftovers from history." The New Typography admittedly had a leftist affinity, since much of Tschichold's early work was directly influenced by the Communist El Lissitzky and other left-wing designers. When the Nazis came to power in 1933, Fraktur was rehabilitated as the national (or volk) letter, and the New Typography was tarred as culturally Bolshevik. Tschichold, who was arrested shortly after [Hitler](#) took office, left Germany for Switzerland later that year.

The author's extensive research is not only a model for future design historians to follow, but it also fills in many gaps in the life and work of this seminal modern figure. Burke has unearthed a trove of printed and original material (sketches for typefaces, rough layouts for book-page designs) that has never been published, including designs for books and magazines that were lost to decay. Many of the designs, like Tschichold's 1927 poster for the *Graphische Werbekunst* (graphic advertising art) exhibition and his 1931





stencil Transito typeface, look as if they could have been done yesterday. In fact, some designers pretty much copy his work today.

Most people are familiar with Alexander Calder's large kinetic mobiles made of sheet metal and rods and with his grounded sculptures (called "stabiles"), like the red-painted steel "Crab" permanently installed outside the Museum of Fine Arts in Houston. Some might also know "Calder's Circus," featuring abstract performers made of cloth, wood and wire, which has been on display at the Whitney Museum in New York for more than 20 years. Despite that work's cartoonishness, probably very few know that Calder was an illustrator for *The New York Times*, *The New York Herald*, *The Philadelphian* and the Communist publication *New Masses*. In the '20s he worked for *The National Police Gazette*, a journal that made sport of scandal and crime, drawing scenes of people in places like Central Park and Coney Island, as well as caricatures of celebrity athletes. "Calder's affinity for the circus is often noted in relation to one of his *Police Gazette* illustrations," Joan Simon writes in the beautifully produced *ALEXANDER CALDER: The Paris Years, 1926-1933* (Whitney Museum of American Art/Centre Pompidou/Yale University, \$60), edited with Brigitte Leal, which covers his formative years in Paris, where he broke from the Ashcan School tradition he had embraced at the Art Students League in New York.

This smartly designed book, including a half-dozen essays by writers like Henry Petroski and Annie Cohen-Solal, serves as the catalog for a new exhibition at the Whitney exploring Calder's evolution from a reportorial cartoonist to a cartoon sculptor using wire as his medium. In addition to new studio photographs of his art, vintage newspaper clippings and documentary images of early work abound. There are also rare shots of Calder as a svelte young man (I had seen only the ones of him with a large physique and a shock of white hair). Although other artists have used wire imagery, Calder was its true originator. He said, "I think best in wire," and "I seemed to have a knack" for drawing "with a single line." His first wire figure, Simon writes, was "an abstracted rooster with radiating lines for feet," done in 1925. That same year he created a wire valentine for his mother. During his years in Paris, he made wire caricatures of Josephine Baker, Jimmy Durante and John D. Rockefeller playing golf. He also made wire toys and other wire animals, among them a pair of copulating pigs. Although these pieces are comparatively minor, the Paris period clearly leads to his larger work and bigger ideas.

There's a similarity between Calder's wire animals and the paintings discovered in 1940 in the Lascaux cave in France, which were made somewhere around 20,000 years ago. Look at *CAVE ART* (Phaidon, \$90), by Jean Clottes, a leading specialist in prehistoric art, and you might wonder if those old guys stole some of the modern movement's best ideas. A lot of art produced under the modern umbrella appears to have roots in the Aurignacian, Gravettian, Solutrean and Magdalenian cultures (Paleolithic societies named after the French sites "where they were first identified by their tools, weapons and adornments").

After his introduction, Clottes's text consists of extended captions explaining the photographs. Philippe Apeloig's elegant typographic design and the off-white paper handsomely frame the high-quality visuals.

But talk about big ideas — you can't get any bigger than this first evidence of man-made pictorial representation. And these works do not appear all that primitive. The petroglyph of a group of giraffes from Niger, carved as if in the manner of a checkerboard about 10,000 years ago, and the scene of an archer hunting bears and reindeer, found in Norway in 1973, prefigure the reductive approach to design devised for information graphics in the 20th century; they also recall the minimalist glyphs used by Paul Klee and Joan Miró. While some of the art hints at Expressionism, Impressionism and even Surrealism, you have to wonder if the continuous-line images didn't somehow get channeled into Calder's wire.

<http://www.nytimes.com/2008/10/26/books/review/Heller-t.html?8bu&emc=bu2>



Shelley's Daughters

Reviews by **TERRENCE RAFFERTY**

When the strange, arresting, thoroughly frightening novel called "Frankenstein" was published in London on New Year's Day, 1818, there was no author named on the title page, and readers and reviewers, almost to a person, assumed the book had been written by a man. They were mistaken. The creator of "Frankenstein, or the Modern Prometheus" was Mary Shelley, who was the daughter of the radical political thinker William Godwin (to whom it was dedicated) and the feminist Mary Wollstonecraft, and the wife of the poet Percy Bysshe Shelley — and who, when she finished the novel, a few months shy of her 20th birthday, became the mother of horror.



In that capacity she has had many more sons than daughters. Or so it seems, at least, for in the nearly two centuries that have passed since this teenage English girl delivered herself of the first great modern horror novel, men — as is their wont — have coolly taken possession of the genre, as if by natural right, some immutable literary principle of primogeniture. Until fairly recently, just about all the big names in horror, the writers whose stories dominate the anthologies and whose novels stay in print forever, have been of the masculine persuasion: Poe, Le Fanu, Stoker, Lovecraft, M. R. James, King, Straub. Charlotte Perkins Gilman's remarkable 1892 tale of madness, "The Yellow Wallpaper," manages to creep into the odd collection, as does Shirley Jackson's story "The Lottery," which is so disturbing that it induced a significant number of New Yorker readers to cancel their subscriptions when it appeared in the magazine's pages in 1948. But for the most part, a woman's place in horror has been pretty well defined: she's the victim, seen occasionally and heard only when she screams.

It's probably unwise to speculate on the deep reasons for this, to assert, say, that men have some greater temperamental affinity for the hideous doings horror thrives on, or that women are more likely to shrink from the contemplation of pure, rampaging evil. (It may be the case that men have historically been afflicted with a rather more urgent need to test themselves against such dangers, but let's leave all that to the gender-studies departments, shall we?) What can be said with certainty, though, is that women writers, even the best of them, have rarely made a career of horror, as the male luminaries of the genre mostly have. Gilman, for example, occupied herself primarily with nonfiction on feminist issues, and Jackson, aside from "The Lottery" and her superb 1959 novel, "The Haunting of Hill House," in fact wrote very little that fits comfortably into the genre: no vampires, no werewolves, no zombies, just a lot of people whose lives feel to them inexplicably threatened and unstable. (Her 1954 novel, "The Bird's



Nest,” about a young woman with multiple personalities, is a prime example of the sort of real-world unease her eerily detached prose tends to generate; it has, come to think of it, quite a bit in common with the mundane domestic horror of “The Yellow Wallpaper.”)

Even Mary Shelley, after her initial triumph, merely dabbled in the unspeakable for the rest of her writing life. The second half of her too-little-known 1826 novel, “The Last Man,” imagines the end, by plague, of humankind, but is, despite its dire subject, less horrific than elegiac — it’s a book about the death of Romanticism. Three of Shelley’s shorter forays into the fantastic were collected in 2004 in a slim volume called TRANSFORMATION (Hesperus, paper, \$13.95) and demonstrate conclusively that horror as such didn’t interest her profoundly: for her, fiction was more about ideas than sensations. In recent years, though, women — perhaps emboldened by the success of the florid vampire novels written by the pre-Jesus Anne Rice — have been claiming a much larger share of their genre birthright, even devoting themselves, in many cases, exclusively to horror. Or maybe it would be more accurate to say they’re writing fiction that uses the traditional materials of horror for other purposes, because novels like those of the wildly popular Laurell K. Hamilton or the Y.A. phenomenon Stephenie Meyer don’t appear to be concerned, as true horror should be, with actually frightening the reader. (Rice wasn’t, either.) The publishing industry has even cooked up a new name to brand this sort of horroroid fiction, in which vampires and other untoward creatures so vividly express their natural and unnatural desires: it’s called “paranormal romance.”

Unreadable as most of this stuff is (at least for us males), there’s a certain logic to this turn of pop-cultural events, in that we the reading public no longer share a clear consensus on what constitutes abnormal, or indeed scary, behavior. In the unlamented prefeminist world, women were themselves so routinely marginalized as “different” or “other” that perhaps it’s not such a stretch for them to identify, as many now seem to, with entities once considered monstrous, utterly beyond the pale. And, further, quite a few of these monsters, notably the vampires, are beautiful, worldly and unstoppable strong — which makes them useful vehicles for empowerment fantasies.

A measure of doubt, or at least ambivalence, about what should terrify us isn’t necessarily a bad thing for a writer. Times change, as do the shapes of our fears: it’s probably just as well not to be too sure where the real threats to our bodies and souls are coming from. Women horror writers, who seem less certain these days than men, have been doing some of the most original and freshly unnerving work in the genre. In 2003, Sara Gran published a terrific short novel called COME CLOSER (Berkley, paper, \$6.99), in which a happily married young urban professional finds herself suddenly and incomprehensibly attracted to violence, obscenity, promiscuity, all the nasty sensations her orderly and apparently satisfying life has always excluded. This overpowering walk-on-the-wild-side impulse leads to some extremely unpleasant behavior. The novel is either a demonic-possession story or, like “The Yellow Wallpaper,” a tale of a woman’s everyday madness, and Gran blurs the line suggestively. Is it scarier if the demon is external and real, or internal — self-generated and imagined? In “Come Closer,” the distinction feels purely academic.

Gran is, in the tradition of women writing horror, only a sporadic contributor to the genre. The sole book she’s come out with in the past five years is a noirish crime novel called “Dope.” But “Come Closer” remains one of the signal works of contemporary female horror because Gran manages to locate in her heroine’s anguished sexuality a kind of terror that the paranormal romancers routinely (and lucratively) deny, the uneasy sense that the forces unleashed inside her might be uncontrollable — rampant, voracious, indifferent to natural limits and not unambiguously benign.

Sex has always, of course, been the dirty little secret of horror’s appeal, because what terrifies us is also, often, what attracts us. Where sex is concerned, the distinction between freedom and helplessness — being, as a Romantic writer might say, in the thrall of one’s passions — can be a very, very fine one. And the feeling of helplessness is at the heart of horror. Even when sex isn’t the subject, the good female writers in the genre seem more intimate with that feeling than their male counterparts. Although the protagonist of Alexandra Sokoloff’s recent novel THE PRICE (St. Martin’s, \$23.95) is a man, it’s difficult to imagine a male horror writer putting a member of his own sex through what Sokoloff’s Will





Sullivan endures: the advanced cancer of his young daughter, the loss of his wife's love and trust, the long hours spent roaming hopelessly through the corridors of a hospital, a setting in which even the strongest of us can, as the endless days of chronic illness grind past, start to feel defeated, impotent. When the only way out of the impasse comes in the form of a smooth-talking man offering deals fishier than even 21st-century Wall Street would countenance, the hero's no-exit despair appears fully justified, and irreversible. Sokoloff has the integrity to leave this dire situation essentially unresolved, the glib devil unvanquished, evil still at large in the hospital and in the world.

Sarah Langan, who made a striking debut a couple of years ago in "The Keeper," isn't one for tidy resolutions either. Her most recent book, *THE MISSING* (Harper/HarperCollins, paper, \$6.99), continues the grim story of social entropy begun in her first, the collective madness of the dying Maine mill town in "The Keeper" having migrated to a more upscale community and now taken the form of a virus that creates "a hostile, schizophrenic state within its hosts." This is the diagnosis of a local psychiatrist named Fenstad Wintrob — a name that looks as if it has to be an anagram of something, though I've been unable to work it out. (A bit of bonus futility in a book that already has plenty.) But the shrink, like everyone else in town, is powerless to resist the disease or to stop its inexorable spread, and the novel becomes, like Mary Shelley's "Last Man," a mournful end-of-the-world narrative, a vision of a society perishing from within, exhausted by its own excesses — although the excesses in this case aren't those of idealism, as they were in Shelley's time. And in Langan's book (which won, and deserved, the Horror Writers Association's Bram Stoker Award for the best novel of 2007), the last man standing is a woman.

There's an end-of-the-world feel, too, in Elizabeth Hand's startling, unclassifiable *GENERATION LOSS* (Small Beer, \$24), which was recently honored with the first Shirley Jackson Award for what the award's Web site calls "outstanding achievement in the literature of psychological suspense, horror and the dark fantastic." (Sarah Langan was one of the judges.) Amorphous as this definition may sound, it suits the kind of unsettling stories Hand likes to tell, not only in this novel but also in her melancholy 2006 collection *SAFFRON AND BRIMSTONE* (M Press, paper, \$14.95) and her latest book, *THE BRIDE OF FRANKENSTEIN: Pandora's Bride* (Dark Horse, paper, \$6.99). "Generation Loss" also takes place in Maine, not in a town but on a bleak island populated mostly by a handful of aging counterculture types hanging on, in the starkest isolation, to the remnants of their old ideals: all are sad, some are crazy, and one may be a serial killer. The narrator is a seriously damaged woman named Cass Neary, once a famous photographer of New York's punk scene and now drifting through life in a bitter, narcotic haze, unable to find an appropriate vehicle for her great artistic passion, which is death. (The work that made her fleeting reputation was a volume called "Dead Girls.") To her, the harsh, unforgiving landscape of that Maine coastal island feels like home.

There's nothing supernatural in "Generation Loss," but it's full of mysteries — all originating in its characters' troubled psyches — and full of terrors that can't be explained. Like the heroine of Hand's brilliant horror story "Cleopatra Brimstone," Cass Neary has been the victim of a rape, and like the title humanoid of "Pandora's Bride," she is stubbornly and defiantly independent. Hand's bride announces at the very outset of her peculiar memoir: "In fact I was to be no male's bride: from the moment I knew fire and was thus born, my goal has always been to steal fire, and power, for myself. I am no man's creature and no man's possession." This writer's Promethean project, her fire-stealing strategy, has always been, as Cass Neary's is and Mary Shelley's was, art itself — the act of creation and all its frightful ambiguities. Near the end of "Generation Loss," Cass comments on another artist's work: "It was a horrifying world, but it was a real one. How many of us can say we've made a new world out of the things that terrify and move us?" At least a few of the women writing horror today can say just that. And there's no way to mistake the new worlds they're making for the work of men.

<http://www.nytimes.com/2008/10/26/books/review/Rafferty-t.html?8bu&emc=bu2>



Cracking Wise**By DAVID KIRBY****HUMAN DARK WITH SUGAR**

By Brenda Shaughnessy

77 pp. Copper Canyon Press. Paper, \$15



About three pages into this book, I remembered a joke: “Knock-knock!” “Who’s there?” “Control Freak — now you say, ‘Control Freak who?’ ” Brenda Shaughnessy’s poems bristle with imperatives: confuse me, spoon-feed me, stop the madness, decide. There are more direct orders in her first few pages than in six weeks of boot camp.

Only Shaughnessy’s kidding. Or she is and she isn’t. If you just want to boss people around, you’re a control freak, but if you can joke about it, then your bossiness is leavened by a yeast that’s all too infrequent in contemporary poetry, that of humor. A wisecrack here and there can give life to a deadly serious agenda; a little wit adds dimension to a topic limited by its own darkness. And there isn’t a single poem in “Human Dark With Sugar” that isn’t funny.

Actually, all you sobersides out there can be that way, if you want; Shaughnessy has enough spritzzy, brainy humor to spike the thin milk of your musings and give them body. This new book of hers is the winner of the James Laughlin Award from the Academy of American Poets, a prize given for the best second book of poems by an American and one named for a poet and publisher whose own work often has a gentle wit.

There’s nothing gentle about Shaughnessy’s wit. “Parthenogenesis” starts off as an ode to weight gain: “It’s easy to make more of myself by eating,” it begins, “and sometimes easy’s the thing,” because if you’re twice yourself, you’ve not only halved your troubles but you’ll never be lonely again. In the same poem, a pregnant teenager also takes the easy route, by “having the baby at the prom / undetected and, in a trance of self-preservation, / throwing it away in the girls’ room trash,” which is good for the teenager, or so she thinks, though not so good for anyone else.

On Shaughnessy goes, leaping from one bodily dilemma to another. But once you've decided that "Parthenogenesis" is just a darkly humorous catalog of the many ways in which we fool ourselves, she ups the stakes in the last four lines, where she says, in effect, that what we'd all really like to do is destroy ourselves and put a new person in our place who happens to be just like us. This idea of the divided self is not a new one, but Shaughnessy shows there's life in the old story yet.

When she's not talking to herself in these poems, which she often is, Shaughnessy's speaker addresses a lover who, one suspects, is a straw man: no real person could take this much intensity. The first line of "Drift" says, "I'll go anywhere to leave you but come with me." The title of "First Date and Still Very, Very Lonely" says it all, as does that of "Replaceable Until You're Not." When Shaughnessy titles a poem "One Love Story, Eight Takes," you can bet they'll all be her takes. And when she offers one called "I'm Perfect at Feelings," you just say, right. The voice that does all this yakking is awfully engaging, but it's also more than a little overcaffeinated. You want its owner to love you, but when things quiet down, you're happy to have the house to yourself again.

The world is unwieldy — love's unwieldy, that's for sure — but so is the language that is the only whip we can tame the world with. Implicitly, all of these poems comment on how muscular language is but also how contrary, and more than a few of them tackle that paradox head-on. "A Poet's Poem" begins, "If it takes me all day, / I will get the word freshened out of this poem."

Which, of course, the speaker can't, and so she ends by saying "I can't stand myself."

Which, of course, she can.

David Orr wrote in these pages recently that a lot of poetry these days reads like a heap of John Ashbery with a few Gertrude Stein-isms sprinkled on top. There's some of that in Shaughnessy's work, though she goes both deeper and broader than her trendy contemporaries. There are nods to the zeitgeist, sure: she name-checks Roland Barthes in an epigraph, Susan Sontag in a dedication. But there's a ton of Emily Dickinson's curiosity here as well as some of the stridency of Sylvia Plath, and even a faint echo of the Coleridge whose hopped-up singer in "Kubla Khan" makes those who hear him cry "Beware!"

As I read Shaughnessy's poems, I can't help hearing not only her poetic ancestors but Abbott and Costello as well: not the film bumblers being chased by Frankenstein but the double-talkers whose "Who's on First?" routine is often imitated, never duplicated. People are funny. Words are funnier. And poems, when they're at their smartest and best-made, are funniest of all.

David Kirby's books include "The House on Boulevard St.: New and Selected Poems."

<http://www.nytimes.com/2008/10/26/books/review/Kirby-t.html?8bu&emc=bua2>

Real Robinson Crusoe: Evidence Of Alexander Selkirk's Desert Island Campsite



A scene from Robinson Crusoe, showing Crusoe and Friday. (Credit: iStockphoto/Duncan Walker)

ScienceDaily (Oct. 30, 2008) — Cast away on a desert island, surviving on what nature alone can provide, praying for rescue but fearing the sight of a boat on the horizon. These are the imaginative creations of Daniel Defoe in his famous novel *Robinson Crusoe*. Yet the story is believed to be based on the real-life experience of sailor Alexander Selkirk, marooned in 1704 on a small tropical island in the Pacific for more than four years, and now archaeological evidence has been found to support contemporary records of his existence on the island.

An article in the journal *Post-Medieval Archaeology* presents evidence from an archaeological dig on the island of Aguas Buenas, since renamed Robinson Crusoe Island, which reveals evidence of the campsite of an early European occupant. The most compelling evidence is the discovery of a pair of navigational dividers which could only have belonged to a ship's master or navigator, as evidence suggests Selkirk must have been. Indeed Selkirk's rescuer, Captain Woodes Rogers' account of what he saw on arrival at Aguas Buenas in 1709 lists 'some practical pieces' and mathematical instruments amongst the few possessions that Selkirk had taken with him from the ship.

The finds also provide an insight into exactly how Selkirk might have lived on the island. Postholes suggest he built two shelters near to a freshwater stream, and had access to a viewpoint over the harbour from where he would be able to watch for approaching ships and ascertain whether they were friend or foe. Accounts written shortly after his rescue describe him shooting goats with a gun rescued from the ship, and eventually learning to outrun them, eating their meat and using their skins as clothing. He also

passed time reading the Bible and singing psalms, and seems to have enjoyed a more peaceful and devout existence than at any other time in his life.

David H Caldwell, National Museums Scotland, is pleased with the results of the dig: “The evidence uncovered at Aguas Buenas corroborates the stories of Alexander Selkirk’s stay on the island and provides a fascinating insight into his existence there. We hope that Aguas Buenas, with careful management, may be a site enjoyed by the increasing number of tourists searching for the inspiration behind Defoe’s masterpiece.”

Alexander Selkirk was born in the small seaside town of Lower Largo, Fife, Scotland in 1676. A younger son of a shoemaker, he was drawn to a life at sea from an early age. In 1704, during a privateering voyage on the Cinque Ports, Selkirk fell out with the commander over the boat’s seaworthiness and he decided to remain behind on Robinson Crusoe Island where they had landed to overhaul the worm-infested vessel. He cannot have known that it would be five years before he was picked up by an English ship visiting the island.

Published in 1719, Robinson Crusoe is one of the oldest and most famous adventure stories in English literature. Whilst it is unclear whether Defoe and Selkirk actually met, Defoe would certainly have heard the stories of Selkirk’s adventure and used the tales as the basis for his novel.

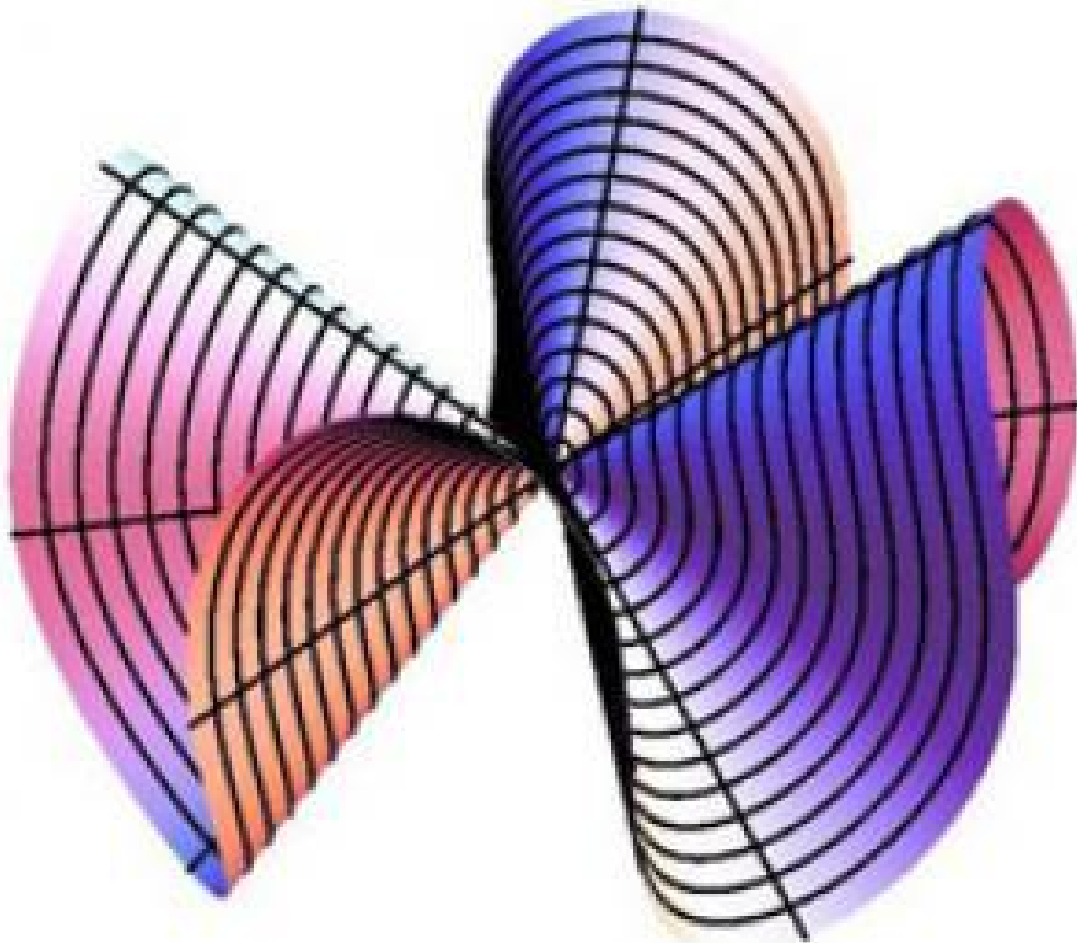
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Adapted from materials provided by Maney Publishing, via AlphaGalileo.

<http://www.sciencedaily.com:80/releases/2008/10/081029105803.htm>

Why Some Marine Algae Are Shaped Like Crumpled Paper



Examples of e-cones with two, three and four folds (Credit: Copyright CNRS- Martin Michael Müller)

ScienceDaily (Oct. 30, 2008) — What is the connection between crumpled paper and marine algae? Saddle-like shapes similar to those found in an Elizabethan "ruff" collar, say the physicists at the Laboratory for Statistical Physics at the Ecole normale supérieure.

They have modeled them and calculated their energy. It turns out that the most stable shape is that adopted by certain marine algae.

A practical experiment

Cut out a disk from a sheet of paper, place it on your coffee cup, and press the tip of your pen down on the center of the disk: the paper curls up, forming a cone-shaped fold. In the language of physics, this is known as a 'conical point'. When you crumple up a sheet of paper, you can also see miniature conical points, which are formed starting out from the folds.

Ice cream cones or ruffs



Two researchers at the Laboratory for Statistical Physics at the Ecole normale supérieure have studied these conical points. Or to be more precise, they tried to see how conical points generate 'e-cones'. What is an e-cone? If you remove a wedge from a disk and stick together the edges of the remaining shape, you get an 'ice-cream cone'. Whereas if you add a wedge that is larger than the one that was removed, you get an e-cone (e stands for excess).

E-cones can take on an infinite number of shapes, without the intervention of any external force. The physicists modeled these e-cones in order to predict their shape and the elastic stresses generated. Their work shows that the symmetrical shape with two folds is the one with the lowest energy. This is found in certain marine algae which spontaneously adopt this shape during growth.

Journal reference:

1. Martin Michael Müller, Martine Ben Amar, Jemal Guven. **Conical Defects in Growing Sheets.** *Physical Review Letters*, 2008; 101 (15): 156104 DOI: [10.1103/PhysRevLett.101.156104](https://doi.org/10.1103/PhysRevLett.101.156104)

Adapted from materials provided by [CNRS](http://www.cnrs.fr).

<http://www.sciencedaily.com/releases/2008/10/081026094936.htm>



HIV-infected Patients Should Start HAART Sooner, Study Suggests

ScienceDaily (Oct. 30, 2008) — Under current treatment guidelines, highly active antiretroviral therapy (HAART) should be considered for HIV-infected patients when their CD4+ T-cell counts fall below 350 cells per cubic millimeter (mm³). However, new epidemiological research suggests that patients with HIV may have less risk of dying if they begin HAART sooner.

HIV ravages CD4+ T-cells, one of the human immune system's primary weapons for fighting off infection. As virus levels increase in the blood, HIV-infected patients experience a decrease in CD4+ T-cells and declining health. HAART--a combination of at least three HIV medicines--is used to reduce virus levels.

Although current treatment guidelines recommend that patients begin HAART once their CD4+ T-cell counts fall below the 350 cells/mm³ threshold, the optimal time to begin therapy has been unclear because of insufficient clinical trial data. U.S. and Canadian researchers, working through the International Epidemiology Databases to Evaluate AIDS (IeDEA), set out to take steps towards establishing a clinical basis for initiating treatment.

IeDEA, a global network of clinics that serve HIV patients and collect data important to key HIV/AIDS research questions, was initiated by and is funded in part by the National Institute of Allergy and Infectious Diseases (NIAID), a component of the National Institutes of Health (NIH). IeDEA is co-funded by the National Cancer Institute and the Eunice Kennedy Shriver National Institute of Child Health and Human Development.

From 1996 to 2006, the research team examined 8,374 HIV-infected study participants with CD4+ T-cell counts of 351-500 cells/mm³ who had never taken antiretroviral treatment and were free of AIDS-related illnesses. Thirty percent (2,473) of the study participants began taking HAART, while the remaining 70 percent (5,901) of participants deferred treatment until their CD4+ T-cell counts fell below 350 cells/mm³. The researchers found a 71 percent higher risk of death for patients who deferred treatment rather than initiating HAART, suggesting that therapy should begin at an earlier stage of HIV disease than currently recommended. A randomized clinical trial will be necessary to confirm this finding and support changes to established treatment guidelines.

Mari M. Kitahata, M.D., of the University of Washington in Seattle, will present the findings on October 26, 2008, during the joint annual meeting of the Interscience Conference on Antimicrobial Agents and Chemotherapy (ICAAC) and the Infectious Diseases Society of America (IDSA) in Washington, D.C.

Adapted from materials provided by NIH/National Institute of Allergy and Infectious Diseases, via [EurekAlert!](#), a service of AAAS.

<http://www.sciencedaily.com/releases/2008/10/081027101353.htm>

New Supercomputer Can Do 50 Trillion Operations Per Second

ScienceDaily (Oct. 30, 2008) — In less time than the blink of an eye, the Translational Genomics Research Institute's new supercomputer at Arizona State University can do operations equal to every dollar in the recent Wall Street bailout.

That would be 700 billion computations in less than 1/60th of a second, says Dan Stanzione, director of the High Performance Computing Initiative at ASU's Ira A. Fulton School of Engineering.

The "Saguaro 2" supercomputer, housed on the first floor of ASU's Barry M. Goldwater Center for Science and Engineering, is capable of 50 trillion mathematical operations per second.

"That's the equivalent of taking a calculator and doing one operation per second, by hand, continuously for the next one and a half million years," Stanzione said.

Although the computing world changes daily, and measurements depend on numerous factors, Stanzione said, for some functions, ASU's new computer may be among the top five in the world.

TGen will need that speed as it continues its research into a variety of human diseases through the use of data-rich DNA sequencing, genotyping, microarrays and bioinformatics.

"This is really a remarkable testament," to the cooperative efforts of ASU and TGen, said Dr. Jeffrey Trent, President and Scientific Director of TGen, especially in a tight funding environment.

The new supercomputer will help TGen's efforts in translational biomedicine, developing new therapies targeted for individual patients suffering from Alzheimer's, autism, diabetes, coronary heart disease, melanoma, pancreatic cancer, prostate cancer, colon cancer, multiple myeloma, and breast cancer.

Dr. Edward Suh, TGen's Chief Information Officer, said a joint TGen-ASU computer support team is being assembled, and he urged the creation of more partnerships between TGen and ASU.

"I am confident this new supercomputer system will help the ASU and TGen scientists expedite their research, and accelerate innovation in biomedical and engineering research," Suh said. "It is my hope to see this supercomputer system, and a supporting informatics program which Dan and I are putting together, bring the ASU and TGen scientists closer than before for even greater success."

Saguaro 2 – a partially water-cooled set of 7-foot-tall black monolith computer racks, each with as many as 512 processor cores, and linked by ultra-high-speed Infiniband cables – was funded in part by a nearly \$2 million grant in July by the National Institutes of Health. The grant was in response to a wide range of scientific activities proposed by TGen, the Ira A. Fulton School of Engineering, and ASU's BioDesign Institute.

The new system doubles the capabilities of ASU's High Performance Computing Initiative (HPCI). The system consists of Intel microprocessors, servers from Dell, storage from Data Direct Networks, and components from a number of other partners, including fiber optic cables from Phoenix-based Zarlink.

More importantly for TGen, the new system has 20 times the previous computational power available to TGen researchers, said James Lowey, director of TGen's High Performance Biocomputing Center.



The new supercomputer also adds to the storage capacity of the HPCI, bringing the total storage to 1.5 quadrillion bytes, or 1.5 petabytes -- or 15 followed by 14 zeroes (1,500,000,000,000,000). That's enough storage space to record nearly a quarter million DVD discs.

The HPCI storage will be used to store a vast array of data from TGen's sequencers and simulations, as well as other large datasets from ASU researchers, including a high resolution mapping of the moon to be performed in 2009 by NASA's Lunar Reconnaissance Orbiter.

"As we move in science into the nano scale of materials and molecular design and diagnostics, or into the macro scale of global climate or the motion of the galaxies, experimentation becomes more expensive and difficult, and simulation becomes invaluable," Stanzione said. "The speed of those simulations determine the speed of progress."

The computational speed of Saguaro 2 is especially critical to the work of TGen. "In 2009, more genome sequence data will be generated than all the words spoken by humans in all of history. Teasing meaningful understanding from this avalanche of data is also the role of HPC (high performance computing)," Stanzione said.

Adapted from materials provided by The Translational Genomics Research Institute.

<http://www.sciencedaily.com/releases/2008/10/081029084044.htm>



Climate Change Seeps Into The Sea



MODIS image showing a plankton bloom off Norway. (Credit: Image courtesy of NASA)

ScienceDaily (Oct. 30, 2008) — Good news has turned out to be bad.

The ocean has helped slow global warming by absorbing much of the excess heat and heat-trapping carbon dioxide that has been going into the atmosphere since the start of the Industrial Revolution.

All that extra carbon dioxide, however, has been a bitter pill for the ocean to swallow. It's changing the chemistry of seawater, making it more acidic and otherwise inhospitable, threatening many important marine organisms.

Scientists call ocean acidification "the other carbon dioxide problem." They warn that because it causes such fundamental changes in the ocean, it could impact millions of people who depend on the ocean for food and resources. "The growing amount of carbon dioxide in the ocean could have a bigger effect on life on Earth than carbon dioxide in the atmosphere," says JPL's Charles Miller, deputy principal investigator for NASA's new Orbiting Carbon Observatory, scheduled to launch next January.

The ocean takes in and stores most of the heat from the sun that is deposited at Earth's surface -- heat that would otherwise be melting land ice and warming the atmosphere. The ocean also absorbs about one third of the carbon dioxide that humans now put into the air. The rest is taken up by terrestrial vegetation and soils or remains in the atmosphere, increasing the greenhouse effect.

"The ocean surface acts like a sponge to soak up excess carbon dioxide from the atmosphere," says Scott Doney, a senior scientist in marine chemistry at the Woods Hole Oceanographic Institution in Woods Hole, Mass. Much of the extra dissolved carbon is in the ocean's upper few thousand feet. However, at

high latitudes, surface water quickly cools, becomes saltier and denser and sinks, carrying the dissolved carbon to some of the deepest parts of the ocean.

Mix carbon dioxide with water and the result is carbonic acid. After that first simple chemical reaction comes a slightly more complicated series of changes in seawater chemistry. The final outcome is a lowering of the ocean's pH -- meaning the ocean is more acidic, and, ironically, a reduction in a particular form of carbon -- carbonate ion -- that many marine organisms need to make shells and skeletal material. The lower pH and lack of carbonate ion have serious consequences for life in the ocean.

Carbon, Carbon Everywhere, but Not the Right Kind to Use

Closest to the atmospheric source of excess carbon dioxide, the ocean's surface waters are the first to show the effects of acidification. Since the beginning of the industrial era, the pH of surface waters has decreased slightly but significantly from 8.2 to 8.1, and it continues to decrease. Scientists project the pH of surface water will decrease by the year 2100 to a level not seen on Earth over the past 20 million years, if not longer.

Likely casualties of ocean acidification are the marine plants and animals that use carbonate to form hard shells or other structures. These include mollusks like clams and oysters, and reef-building corals. Not only does ocean acidification limit their access to the carbonate they need for building material, it could become severe enough to dissolve existing coral structures and the shells of living organisms.

Since most corals live in shallow waters, coral reefs, some of the most biologically diverse places on Earth, are particularly vulnerable. "They are already under assault from warming water, over-fishing and habitat degradation," says Doney. "Environmental stress is leading to more incidents of 'coral bleaching,' which occurs when the symbiotic algae that lives inside the coral leaves or dies, and from which reefs often do not recover. Ocean acidification may push corals over the edge." Winner, Loser or Adapter? One of the most abundant forms of marine phytoplankton, coccolithophores, are an important part of the carbon cycle in the ocean, taking carbon from the water and turning it into hard hubcap-like disks that eventually fall to the seafloor.

Ocean acidification may threaten the tiny coccolithophore by reducing the amount of carbonate ion in seawater that it uses to make its body armor. On the other hand, acidification appears to benefit at least some coccolithophore species by increasing the quantity of other forms of carbon that the microscopic plant uses in photosynthesis.

Other sensitive areas are the Southern Ocean and the subpolar North Pacific, where acidification threatens to unravel important food chains by making life difficult for a small marine snail called a pteropod. It's a favorite food of small fishes, which, in turn, support larger fishes, penguins, whales and seabirds. Ocean acidification strips seawater of the carbonate ion that pteropods need to build new shells, and it also damages their existing ones.

There will be some winners and losers, says Doney, as the effects of growing ocean acidification are felt. "Although we don't know exactly how many species depend on pteropods, clams, oysters, mussels or other shelled organisms for food, or on coral reefs for critical habitat, it's clear that ocean acidification will cause a wholesale alteration of some marine ecosystems in ways we can't predict," he explains.

History isn't much of a guide. While there have been times in Earth's past when the ocean was more acidic than now, most environmental changes occurred at a considerably slower pace than today. "At the rates of climate change and ocean acidification we're seeing now, many organisms may be not able to keep up," Doney says.

That Sinking Feeling



Much of the carbon now in the air will find its way into the ocean with predictable results. "Even if we stopped adding carbon dioxide to the atmosphere today, ocean acidification will continue to increase," says Doney. "What marine fisheries and coral reefs will look like 100 years from now is a big question. We need to know how much carbon dioxide is being taken up, more about the gas exchange between the ocean and the atmosphere, and how this mechanism is affected by climate change."

NASA's new Orbiting Carbon Observatory will help provide some of the answers after it is launched in January 2009. A NASA Earth System Science Pathfinder mission, it will make precise measurements of atmospheric carbon dioxide on a global scale.

The Orbiting Carbon Observatory will help identify carbon dioxide sources and sinks -- things that absorb and store carbon -- on land and in the ocean and show how they vary over time. Researchers will be able to combine mission data with numerical models to estimate global patterns of the exchange of carbon dioxide from the ocean and atmosphere.

"We'll have a much better idea about what's going on over the ocean where measurements have been sparse," explains Miller. "This is especially true in the Southern Ocean, which we believe is a big sink for carbon dioxide based on existing models."

While the Orbiting Carbon Observatory may be the newest NASA mission to help address the issue of ocean acidification, NASA has many other projects and missions that provide important information about ocean biology and chemistry that relates directly to this problem. These include NASA's Moderate Resolution Imaging Spectroradiometer (MODIS), flying on the Terra and Aqua satellites, and the Sea-Viewing Wide Field-of-View Sensor (SeaWiFS). These instruments collect data on ocean color -- a key component of many studies of ocean ecology, plankton and coral reefs. Another example is the recent National Oceanic and Atmospheric Administration and NASA-sponsored Southern Gas Exchange Experiment. During this six-week research cruise, scientists investigated how gases, including carbon dioxide, move between the ocean and the atmosphere in high winds and rough seas.

The really big question is how much longer the ocean can continue to be a sink for atmospheric carbon dioxide before becoming saturated -- a process that may already be under way. The implications for our future climate -- and the ocean -- are immense.

More information about NASA missions that contribute to studies of ocean acidification is available at:

- <http://oco.jpl.nasa.gov/>
- <http://modis.gsfc.nasa.gov/about/>
- <http://oceancolor.gsfc.nasa.gov/SeaWiFS/>
- <http://so-gasex.org/media.html>

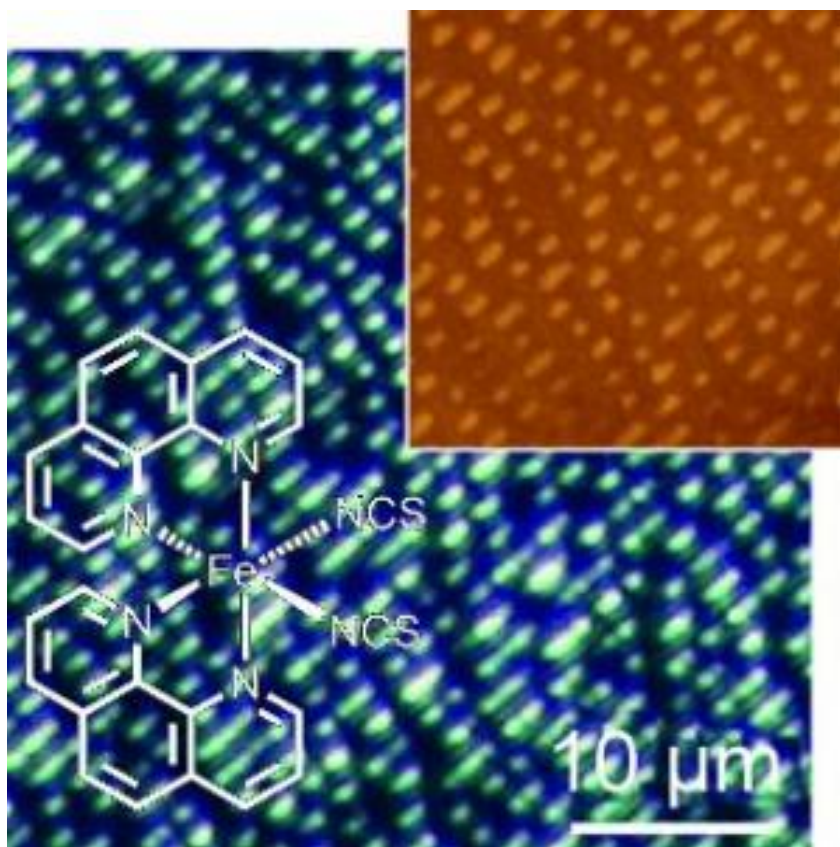
To find out more about climate change, NASA missions, and the vital signs of the Earth's climate, visit <http://climate.jpl.nasa.gov>

Adapted from materials provided by NASA. Original article written by Rosemary Sullivant.

<http://www.sciencedaily.com/releases/2008/10/081029090335.htm>



Progress Toward New Storage Media: Reliable Nanopatterns On Chips



Scientists have been able to produce reliable nanopatterns of a spin-transition compound on silicon oxide chips. This is a decisive step toward a new generation of molecular storage media in which binary data are stored by the "switching" of electron spins. (Credit: Copyright Wiley-VCH)

ScienceDaily (Oct. 30, 2008) — In this information age, increased storage capacity is a central challenge for science and technology. A team of German and Italian researchers has pursued this by exploring the concept of "nanostructured storage domains".

As the scientists, led by Massimiliano Cavallini at the National Research Council (CNR) in Bologna (Italy) and Mario Ruben at the Forschungszentrum Karlsruhe (Germany), report in the journal *Angewandte Chemie*, they have been able to produce reliable nanopatterns of a spin-transition compound on silicon oxide chips. This is a decisive step toward a new generation of molecular storage media in which binary data are stored by the "switching" of electron spins.

Currently, computer hard drives store data by magnetizing the surface of a rotating disk. Each "storage cell" has an "address", so that stored data can be accessed directly. To increase storage capacity, the individual magnetic domains are made smaller and smaller; we are however getting close to the limit. Thermal excitation occasionally causes some of the magnetic particles to flip in the other direction. When the domains are very small, the entire cell can rapidly lose its magnetization.

To achieve higher information density, we could change to other switchable material properties, such as the transition between two spin states. For example, iron(II) compounds can exist in either a high- or a low-spin state. "Switching" (flipping) can be controlled by changes in temperature, pressure, or electromagnetic radiation.



In addition to two distinguishable states to represent 0 and 1, data storage also requires a unique “address” for each storage location that can be identified by the optical writing and reading units of the computer. This requires an interface that makes the nanoscopic spin-state transitions of the molecular switching units compatible with the microscale instrument environment. This is possible if the spin-transition compound can be put into a highly ordered micro- or nanostructure.

By using special unconventional micro- and nanolithographic techniques, the team was able to “print” a neutral iron(II) complex onto a silicon wafer in the form of very fine lines. In this process, the nanocrystals organize themselves into a preferred orientation along the line. Furthermore, the researchers were able to transfer the pattern of a recorded CD onto a film of this iron compound. This is the first proof that it is possible to produce readable logic patterns with a spin-transfer compound.

To make the stripe structures technologically useful, the switching process must be adapted to room-temperature conditions; work on this front is already at an advanced stage.

Journal reference:

1. . **Micro- and Nanopatterning of Spin-Transition Compounds into Logical Structures.**
Angewandte Chemie International Edition, 2008, 47, 8596%u2013600 DOI:
[10.1002/anie.200802085](https://doi.org/10.1002/anie.200802085)

Adapted from materials provided by [Wiley-Blackwell](http://www.wiley-blackwell.com).

<http://www.sciencedaily.com/releases/2008/10/081027140721.htm>



Computer Scientists Seek New Framework For Computation

ScienceDaily (Oct. 30, 2008) — There have been several revolutions during the 60 year history of electronic computation, such as high level programming languages and client/server separation, but one key challenge has yet to be fully resolved. This is to break down large complex processes into small more manageable components that can then be reused in different applications.

There are many possible ways of doing this, but none of them cope well with all processes, with the major problem lying in the dependant links, or correlations, between components that cannot be broken down, the threads that interconnect whole computer processes or programs. These correlations are common to all processes in which computation is involved, including biological systems and the emerging field of quantum computing, as well as conventional programming.

European computer scientists believe the time is right now for a coordinated effort to solve the correlation problem and a group of them recently held a workshop organised by the European Science Foundation (ESF) to establish a framework for further research. The workshop was an astounding success, firstly in identifying that correlations in computer science represented an important problem common to the whole field of programming and software development now highly relevant to all industries and everybody's lives. It was, as was noted by the workshop's convenor Ellie D'Hondt, a specialist in quantum computing research at Vrije Universiteit in Brussels, an important forum for accumulating the required expertise to take the field forward.

"We are now at a stage where all participants understand why we need a correlation paradigm, that there is a commonality between the fields included, and we converged on a definition and basic principles," said D'Hondt. "People are now ready to do research on the problem, and this is what we should get together on in another year or so."

Now is a good time to tackle the correlation problem. The evolution of general purpose computing has reached a point where the correlation problem can stand in the way of progress. The explosion of the Internet has been associated with rapid growth in software components designed to be reused to avoid the cost of duplicated programming effort.

The workshop discussed progress in the relatively new field of aspect-oriented software development (AOSD), which is bringing new techniques for isolating the correlations cutting across software components. The techniques of AOSD make it possible to modularise those aspects of a system or process that cut across different components. In this way the cross cutting aspects themselves can be broken down into reusable components or objects. This in turn enables a whole process to be broken down more completely into components that also embrace the cross cutting aspects.

Research into correlation is also timely because expertise is emerging independently in three different fields, quantum computing, bio computing, and AOSD, the latter being most applicable to general purpose computing. As D'Hondt noted, cooperation between specialists in these fields is needed to avoid duplication of effort, but more particularly because it will stimulate and drive forward the whole study of correlations. On this front the ESF workshop was highly successful, because it brought together representatives from each of the three fields in small groups. "It was amazing to have these groups of people actually communicate," said D'Hondt. "We split up into small groups where there would be one aspect, one quantum and one bio person, people not usually knowing each other beforehand, and this worked! People came up with small presentations after only one day of talks getting introduced to the whole body of work."

A common thread emerged from these mini-workshops, which was the fact that correlations appear when progressing from the high level global description of a problem to the lower level local components.

"Correlations capture the interaction between the parts," said D'Hondt. In other words the devil is in the detail. This is as true in biological systems as say a web based search engine. In the human brain for example it is possible to define how long term memories are formed, but this does not tell us how an individual neuron might be phase locked with another at a local level, so that the two depend on each other. Similarly in computation, a high level view does not describe the particular order in which lower level components need to be executed on the basis of the correlations or links between them. For example two sub-programs might share a common variable, which decides when they have to be executed within a larger task or application.

The ESF workshop also established a common theme, which was that correlations can be a good thing, rather than a hindrance to computation, as has been shown in quantum computing. "Correlations are often seen as a burden, a nuisance, something making the problem hard to solve," said D'Hondt. "But my experience in quantum computing tells me it is something that can also steer computations or even make them possible."

Quantum computing involves entangled states that can actually be exploited to perform specific tasks more quickly – in effect just one computation can sometimes execute a large number of entangled components, each of which would require separate processing in a traditional computer.

The ultimate objective set out in the ESF workshop was to produce a recipe for programming taking full account of correlations, but this is still a long way off. Yet as D'Hondt noted, the basic framework for a new programming paradigm based on correlations in computer science was established.

The ESF workshop, Correlations in Computer Science, was held in Vielsalm, Belgium during August 2008.

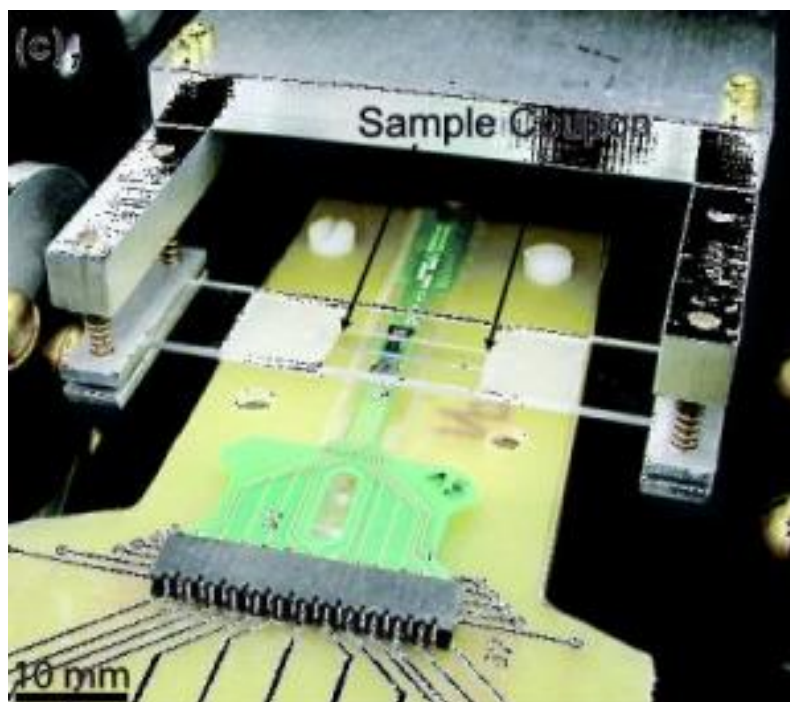
Adapted from materials provided by European Science Foundation.

<http://www.sciencedaily.com/releases/2008/10/081029104256.htm>

Toward Non-invasive Disease Diagnosis With Wellness Cards

A new electronic "reader" could provide disease diagnosis from a small amount of a patient's saliva or blood. (Credit: American Chemical Society)

ScienceDaily (Oct. 29, 2008) — Scientists are reporting development of a device that could serve as the electronic "reader" for a coming generation of "wellness cards," specimen holders used to diagnose disease from a drop of a patient's saliva or blood. The research, done by scientists in Utah, Iowa, Arizona, and Minnesota, is presented in two papers in ACS' Analytical Chemistry.



In those studies, Marc Porter and colleagues describe using the same technology at the heart of miniaturized hard disk drives to create the new rapid-screening sensor. Using a phenomenon known as giant magnetoresistance (GMR), the device can detect samples on much smaller areas compared to older technologies, the papers note.

As a test, Porter demonstrated the GMR sensor could detect as few as 800 magnetic beads with microscopic dimensions. "Several laboratories have begun to transition GMRs from the data storage domain to that of the bioanalytical sciences," the paper states. "We believe that, by leveraging advances made in the magnetic recording industry (for example portable digital music players), a robust, field-deployable, assay device capable of sensing single-binding events is just over the horizon."

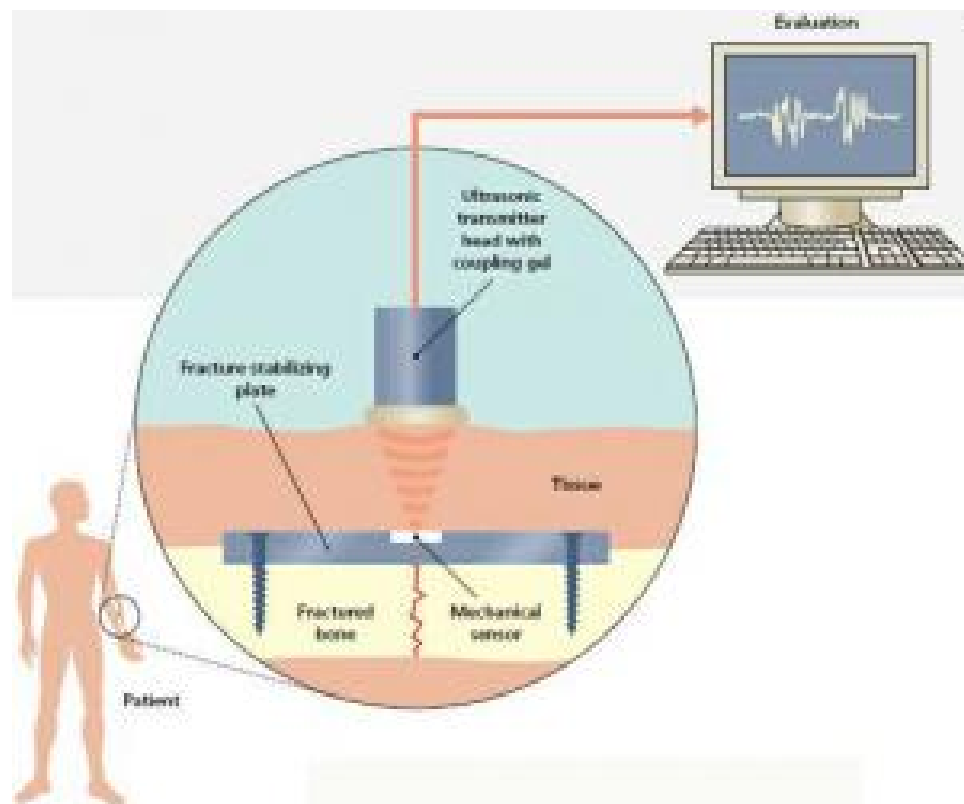
Journal references:

1. Nordling et al. **Giant Magnetoresistance Sensors. 1. Internally Calibrated Readout of Scanned Magnetic Arrays.** *Analytical Chemistry*, November 2008 DOI: [10.1021/ac8009577](https://doi.org/10.1021/ac8009577)
2. Millen et al. **Giant Magnetoresistive Sensors. 2. Detection of Biorecognition Events at Self-Referencing and Magnetically Tagged Arrays.** *Analytical Chemistry*, November 2008; DOI: [10.1021/ac800967t](https://doi.org/10.1021/ac800967t)

Adapted from materials provided by American Chemical Society.

<http://www.sciencedaily.com/releases/2008/10/081027112944.htm>

Monitoring Broken Bones Without Using Electronics: Wireless Bone Monitor



A mechanical sensor in the implant monitors the tensile and compressive forces it suffers. The measured data can be read out using an ultrasound device and analyzed by computer. (Credit: Image courtesy of Empa Materials Science & Technology)

ScienceDaily (Oct. 29, 2008) — The novel sensor is intended one day to help doctors monitor broken bones as they grow back together. Depending on the values of the forces measured by the sensor, they can decide whether the healing process is progressing normally or whether there is a danger that the fracture or implants might be overloaded. Until now doctors have used expensive and complicated electronic devices which sent the measured data to the outside world as radio signals.

According to Felix Gattiker of Empa's Electronics, Metrology and Reliability Laboratory, an electronics-free sensor offers many advantages – not least of the financial kind. In the new Empa sensor the data is read out by means of an ultrasonic scanner.

The solution is in the form of a small, hollow spiral which sits on the implant together with a fluid reservoir. When the implant is subject to compression or tension the level of fluid in the spiral changes. This level is measured with the help of an ultrasonic device, and the resulting data allows the mechanical loading on the implant to be calculated.

The ultrasonic image is, however, too indistinct to allow the fluid level to be determined visually, so the Empa researchers decided to analyze the ultrasonic signal in more detail. They quickly found a dependence between the ultrasonic echo generated over the complete spiral and the actual fill level – the weaker the ultrasonic echo measured, the higher the level, and therefore the greater the force acting on the sensor.



The sensor produces reliable measurement data, as numerous experiments with artificial tissues – mixtures of gelling agent, glass ballotini and graphite powder, which depending on the mixing ratios allow different types of tissue to be simulated – have demonstrated. Not only that, it is also economic to manufacture, being very much cheaper than the existing electronic versions.

The next step is to test the accuracy of the new method using various animal tissues, since each material has its own acoustic signature because it reflects and absorbs ultrasonic energy differently. In addition, the Empa scientists are investigating the idea of making the sensor out of biodegradable materials, in which case the device would simply dissolve away in the patient's body after completing its task.

The surgeon therefore need not sharpen his or her scalpel a second time, there being no need to remove the sensor when the fracture has healed. And finally, there is the outstanding matter of finding an industrial partner to manufacture the sensors and integrate them into the implants.

Adapted from materials provided by Empa Materials Science & Technology.

<http://www.sciencedaily.com/releases/2008/10/081024103858.htm>



Vaccinating Family Members Offers Important Flu Protection To Newborns

ScienceDaily (Oct. 29, 2008) — Vaccinating new mothers and other family members against influenza before their newborns leave the hospital creates a "cocooning effect" that may shelter unprotected children from the flu, a virus that can be life-threatening to infants, according to researchers at Duke Children's Hospital.

The hospital-based outreach tested in this study proved effective at boosting immunization rates in parents – especially new fathers – and siblings who otherwise may not be vaccinated.

"The Centers for Disease Control and Prevention does not recommend vaccinating newborns for flu because they're too young, however they're a part of the population that is at highest risk," explains Emmanuel (Chip) Walter, MD, a pediatric infectious disease specialist at Duke Children's Hospital. He presented the findings of the CDC-funded study at the annual ICAAC/IDSA meeting in Washington, DC.

"Newborns have the highest rate of hospitalizations due to influenza when compared to any other age group of children. Their rates of influenza-related hospitalization are similar to people age 80 and older. And, in some seasons the influenza-associated mortality rate is highest among infants. We want to protect the newborn by vaccinating the entire family, and send parents home with one less thing to worry about."

The study was carried out from October 2007 to February 2008 at Durham Regional Hospital. Educational material was distributed to new mothers, and a flu vaccine clinic was set up to facilitate the vaccinations for other family members around the time of a newborn's birth. Duke University Medical Center served as the comparison site.

Walter reported that vaccination coverage of new mothers and other family members increased 16 percent at Durham Regional when judged against the comparison site. And, while the researchers were encouraged to learn that approximately 40 percent of pregnant women had received vaccinations – more than previously noted – their efforts resulted in an additional 45 percent of new mothers who had not received a flu shot during pregnancy choosing to be vaccinated. Equally significant was the number of new dads and siblings who received the flu shot when compared to the comparison site.

"Our study shows that offering the flu vaccine to new mothers during their baby's stay in the hospital is an effective way to assure that all women have the opportunity to get vaccinated and thereby protect their own health and the health of their baby," says Walter. "It also proved to be a convenient, and possibly the most effective way for fathers to be vaccinated. Protection of the newborn from the dangers of influenza is maximized when those who have the closest contact are vaccinated."

Adapted from materials provided by Duke University Medical Center.

<http://www.sciencedaily.com/releases/2008/10/081026150142.htm>

'Digital Dark Age' May Doom Some Data



Jerome P. McDonough says an unintended consequence of our rapidly digitizing world is the potential of a "digital dark age." (Credit: Photo by L. Brian Stauffer)

ScienceDaily (Oct. 29, 2008) — What stands a better chance of surviving 50 years from now, a framed photograph or a 10-megabyte digital photo file on your computer's hard drive?

The framed photograph will inevitably fade and yellow over time, but the digital photo file may be unreadable to future computers – an unintended consequence of our rapidly digitizing world that may ultimately lead to a “digital dark age,” says Jerome P. McDonough, assistant professor in the Graduate School of Library and Information Science at the University of Illinois at Urbana-Champaign.

According to McDonough, the issue of a looming digital dark age originates from the mass of data spawned by our ever-growing information economy – at last count, 369 exabytes worth of data, including electronic records, tax files, e-mail, music and photos, for starters. (An exabyte is 1 quintillion bytes; a quintillion is the number 1 followed by 18 zeroes.)

The concern for archivists and information scientists like McDonough is that, with ever-shifting platforms and file formats, much of the data we produce today could eventually fall into a black hole of inaccessibility.

“If we can't keep today's information alive for future generations,” McDonough said, “we will lose a lot of our culture.”

Contrary to popular belief, electronic data has proven to be much more ephemeral than books, journals or pieces of plastic art. After all, when was the last time you opened a WordPerfect file or tried to read an 8-inch floppy disk?



“Even over the course of 10 years, you can have a rapid enough evolution in the ways people store digital information and the programs they use to access it that file formats can fall out of date,” McDonough said.

Magnetic tape, which stores most of the world's computer backups, can degrade within a decade. According to the National Archives Web site by the mid-1970s, only two machines could read the data from the 1960 U.S. Census: One was in Japan, the other in the Smithsonian Institution. Some of the data collected from NASA's 1976 Viking landing on Mars is unreadable and lost forever.

From a cultural perspective, McDonough said there's a “huge amount” of content that's only being developed or is available in a digital-only format.

“E-mail is a classic example of that,” he said. “It runs both the modern business world and government. If that information is lost, you've lost the archive of what has actually happened in the modern world. We've seen a couple of examples of this so far.”

McDonough cited the missing White House e-mail archive from the run-up to the Iraq War, a violation of the Presidential Records Act.

“With the current state of the technology, data is vulnerable to both accidental and deliberate erasure,” he said. “What we would like to see is an environment where we can make sure that data does not die due to accidents, malicious intent or even benign neglect.”

McDonough also cited Barack Obama's political advertising inside the latest editions of the popular videogames “Burnout Paradise” and “NBA Live” as an example of something that ought to be preserved for future generations but could possibly be lost because of the proprietary nature of videogames and videogame platforms.

“It's not a matter of just preserving the game itself. There are whole parts of popular and political culture that we won't be able to preserve if we can't preserve what's going on inside the gaming world.”

McDonough believes there would also be an economic effect to the loss of data from a digital dark age.

“We would essentially be burning money because we would lose the huge economic investment libraries and archives have made digitizing materials to make them accessible,” he said. “Governments are likewise investing huge sums to make documents available to the public in electronic form.”

To avoid a digital dark age, McDonough says that we need to figure out the best way to keep valuable data alive and accessible by using a multi-prong approach of migrating data to new formats, devising methods of getting old software to work on existing platforms, using open-source file formats and software, and creating data that's “media-independent.”

“Reliance on open standards is certainly a huge part, but it's not the only part,” he said. “If we want information to survive, we really need to avoid formats that depend on a particular media type. Commercial DVDs that employ protection schemes make it impossible for libraries to legally transfer the content to new media. When the old media dies, the information dies with it.”

Enthusiasm for switching from proprietary software such as Microsoft's Office suite to open-source software such as OpenOffice has only recently begun to gather momentum outside of information technology circles.





“Software companies have seen the benefits of locking people into a platform and have been very resistant to change,” McDonough said. “Now we are actually starting to see some market mandates in the open direction.”

McDonough cites Brazil, the Netherlands and Norway as examples of countries that have mandated the use of non-proprietary file formats for government business.

“There has been quite a movement, particularly among governments, to say: ‘We’re not going to buy software that uses proprietary file formats exclusively. You’re going to have to provide an open format so we can escape from the platform,’ ” he said. “With that market demand, you really did see some more pressure on vendors to move to something open.”

Adapted from materials provided by University of Illinois at Urbana-Champaign.

<http://www.sciencedaily.com/releases/2008/10/081027174646.htm>



Flexible, Affordable Light Source Can Be Printed



Researchers have developed a flexible organic light-emitting diode (OLED) element that can be mass produced using roll-to-roll printing technology. (Credit: Image courtesy of Technical Research Centre of Finland (VTT))

ScienceDaily (Oct. 29, 2008) — Researchers working in the European ROLLED project have developed a flexible organic light-emitting diode (OLED) element that can be mass produced using roll-to-roll printing technology. The OLED elements can be used to add value to product packages. The new method is considerably cheaper than the traditional manufacturing method.

At its simplest, the flexible OLED element can be used in product packaging, posters or on supermarket shelves to attract the attention of consumers. It can also be connected to sensors measuring the freshness of food contained in packages. It can also be used to prevent product copying.

Arto Maaninen, Technology Manager of the VTT Technical Research Centre in Finland, predicts that the first OLED elements will be in commercial use within a couple of years. The project was coordinated by VTT, and project participants included INM, CSEM, Ciba, Hansaprint, UPM and PolyIC.

An OLED is an organic light emitting diode, functioning in a way similar to LED lights. Importantly, the power consumption of the OLED light source is very low. Using organic materials, OLED light elements can be affordably manufactured using printing methods on large, flexible surfaces.

The OLED element developed under the ROLLED project is made from organic materials and is encapsulated in a moisture barrier film. The element is 200-250 micrometers thick, the equivalent to three or four sheets of paper.

The manufacturing method was tested in two demonstration tests. The first was presented as a two-colour OLED element that is attached to a product package. When the package is unopened, a green tick is displayed. When the package is opened, the fuse is blown and the tick changes into a red cross.

The second demonstration showed how the OLED element can be powered by an NFC telephone. The EU flag, with the stars representing the Members, was printed on a business card. When an NFC phone was placed near the card, the stars printed with the OLED elements lit up.



The current production cost of an OLED element is tens of cents. Researchers, however, are aiming for some end applications that cost as little as just a few cents. The acquisition cost of the equipment needed in the manufacturing process is clearly lower, and the speed of production is higher than in traditional production methods. The savings achieved can be up to half of the traditional production costs of OLED elements manufactured using a glass substrate.

The expertise developed during the production of flexible OLED elements can also be applied to the printing of solar cells used as a power source for various small portable devices.

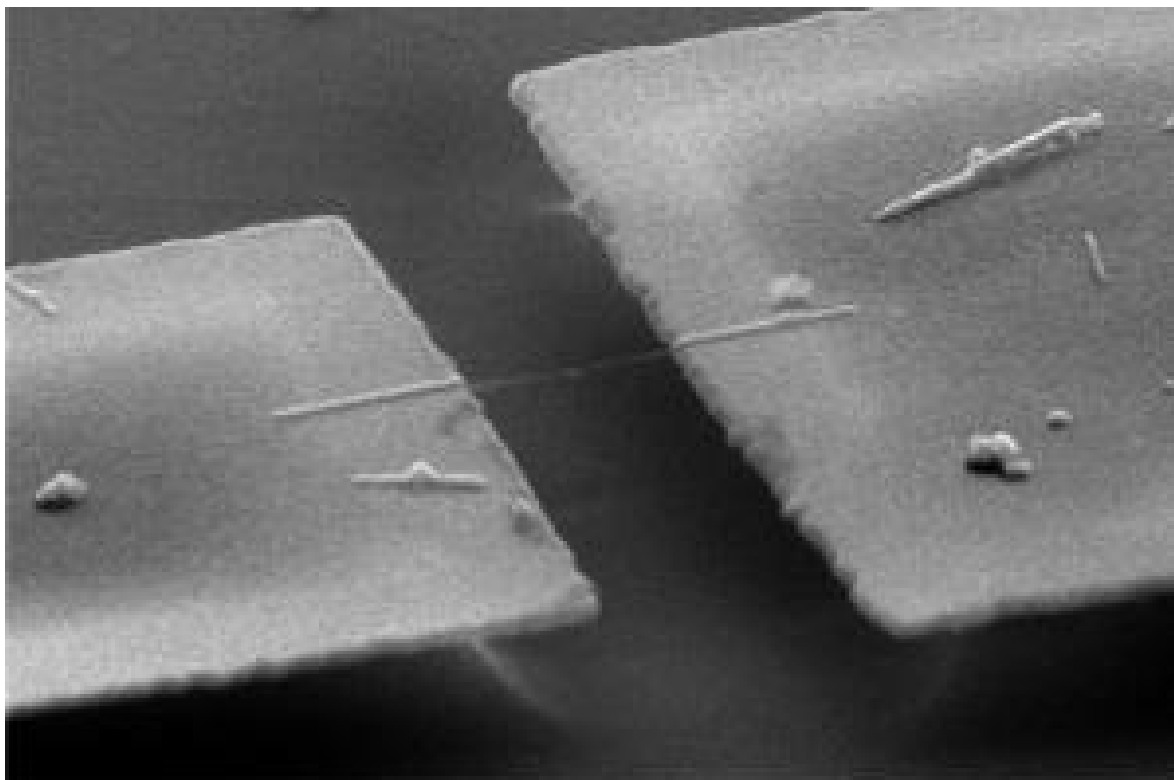
The new OLED element was developed in the EU-funded ROLLED project, coordinated by VTT. Within this project VTT developed the printing process, CSEM different patterning technologies, and INM anode inks and barriers. VTT also developed a low work function cathode ink that enhances the functioning of the components by lowering the power supply voltage and reducing power consumption. It can be used in all printable electronics components, including transistors, solar cells and other electronics components.

Adapted from materials provided by Technical Research Centre of Finland (VTT).

<http://www.sciencedaily.com/releases/2008/10/081028132300.htm>



New Mass Sensor To Weight Atoms With Unprecedented Resolution



The image is a scanning electron microscope image of the device. A suspended nanotube is attached to two large gold electrodes. (Credit: Image courtesy of CSIC- Consejo Superior de Investigaciones Científicas)

ScienceDaily (Oct. 29, 2008) — A group of researchers led by Adrian Bachtold of the CIN2 laboratory in Spain has developed an ultrasensitive mass sensor, which can measure tiny amounts of mass with atomic precision, and with an unprecedented resolution to date.

The device is based on a carbon nanotube of 1 nanometer diameter which is clamped at both ends to two electrodes. It works as an electromechanical resonator characterized by a mechanical resonance frequency as if it was a string on a guitar. When atoms are directed towards the nanotube, they hit and stick to its surface. This increases the nanotube mass, thereby reducing its resonance frequency: this slowing of the vibration is used to quantify the mass of the atoms.

At room temperature, the nanotube resonator has a resolution of 25 zeptograms (zg) but cooling the nanotube down to 5 Kelvin (268.15 degrees C below zero) the resolution improves to 1.4 zeptograms. A zeptogram equals 10^{-21} grams or, which is the same, a thousandth part of one millionth of one millionth of one millionth of a gram.

A sensor of this resolution would allow the detection of tiny amounts of mass such as the mass of proteins or other molecules with atomic resolution. Also, it could be used to monitor nuclear reactions in individual atoms, or biological molecules in chemical reactions.

The researchers tested the device by measuring the mass of evaporated chromium atoms, and the performance, as explained in an article published in the journal *Nanoletters*, is exceptional. The CIN2



(Research Center for Nanoscience and Nanotechnology), is a joint centre belonging to the Spanish National Council for Scientific Research (CSIC) and the Nanotechnology Catalanian Institute (ICN). The other members of the team are Benjamin Lassagne and Daniel Garcia, both of CIN2, and Albert Aguasca, from the Universitat Politècnica de Catalunya.

A remaining challenge

One of the challenges of nanotechnology and nanomechanics is having a mass spectrometer working at subatomic level. The maximum resolution had been achieved with some silicon resonators (with a resolution of about 7 to zeptograms temperature of 4.2 Kelvin). Now, the work of Bachtold and co-workers has substantially increased that resolution through the use of carbon nanotubes.

The mass of a nanotube is very low, barely a few atograms (which is a millionth of one millionth of a microgram, or 10^{-18} g), so that any tiny amount of added mass will be detected. In addition, the nanotubes are mechanically ultrarigid, which makes them excellent candidates to be used as mechanical resonators.

Now, the team of Bachtold is improving the measurement set up and hopes to achieve in the near future the resolution of 0.001 zg, the mass of one nucleus. The researchers will then place proteins on the nanotube and monitor the change of the mass during chemical reactions (when a hydrogen atom is released from the protein, for instance).

Nanotechnology has been advancing rapidly in the few last years. Even so, there remain many challenges ahead, and one of them is a mass spectrometer to allow work at that level, with small biological molecules or atoms.

The development of the CIN2 team has coincided in time with others of similar characteristics, both from the U.S.A. One, at the Technical University of California (Caltech) and the other at the University of California (Berkeley). Both groups have developed mass sensors based on carbon nanotubes, with minor differences between the methods used. The fact was recently highlighted in the journal Nature Nanotechnology.

Journal reference:

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Adapted from materials provided by CSIC- Consejo Superior de Investigaciones Científicas.

<http://www.sciencedaily.com/releases/2008/10/081028132110.htm>



Statins Show Promise For Blood Clot Prevention

ScienceDaily (Oct. 29, 2008) — Statins, the class of drugs commonly used for lowering cholesterol, are now showing promise at preventing deep vein thrombosis (DVT) or blood clots, an affliction that occurs in nearly 2 million Americans each year.

New research presented at CHEST 2008, the 74th annual international scientific assembly of the American College of Chest Physicians (ACCP), suggests that the use of statins may be associated with a significant reduction in the occurrence of venous thromboembolism (VTE), a condition that includes DVT and pulmonary embolism, in patients with solid organ tumors, including breast, lung, and colon cancers.

“The results of our research are interesting and thought provoking,” said study author Danai Khemasuwan, MD, Albert Einstein Medical Center, Philadelphia, PA. “We hope that our research alerts the scientific community to the potential of statins in reducing VTE.”

Dr. Khemasuwan and his colleagues from Albert Einstein Medical Center evaluated the influence of statins use on the incidence of VTE by reviewing 740 consecutive patients admitted to the hospital between October 2004 and September 2007 with a diagnosis of breast, lung, colon, prostate, stomach, esophagus, pancreas, ovary, kidney, or brain cancer. The occurrence of VTE, risk factors for VTE, and use of statins were recorded. Patients who either used statins for less than 2 months or who never used statins were allocated to the control group.

The mean age of the entire study population was 65 years, 52 percent of subjects were women, and 76 percent were African-American. A total of 26 percent of patients received statins, and the overall incidence of VTE was 18 percent. The analysis revealed that patients receiving statins were significantly less likely to develop VTE than the control group, with 8 percent of patients receiving statins developing VTE compared with 21 percent in the control group. A logistical regression analysis yielded the same results irrespective of smoking, documented metastatic disease, current use of chemotherapy, immobilization, and use of aspirin.

Although the authors could not draw conclusions about the cause and effect relationship between statins and VTE, Dr. Khemasuwan feels the data are promising. “If the results of our study are confirmed in a prospective randomized, controlled trial, this could have very significant implications for the medical community.”

“Recent studies have examined the use of statins for the prevention of lung disease, stroke, and other neurologic disorders,” said James A. L. Mathers, Jr., MD, FCCP, President of the American College of Chest Physicians. “The results of this study are promising and suggest a potential role for statins in the prevention of thromboembolism.”

CHEST 2008 is the 74th annual international scientific assembly of the American College of Chest Physicians, held October 25-30 in Philadelphia, PA.

Adapted from materials provided by American College of Chest Physicians.

<http://www.sciencedaily.com/releases/2008/10/081027101336.htm>

Brain's 'Hate Circuit' Identified



New research has found that people who view pictures of someone they hate display activity in distinct areas of the brain that, together, may be thought of as a 'hate circuit.' (Credit: iStockphoto/Valentin Casarsa)

ScienceDaily (Oct. 29, 2008) — People who view pictures of someone they hate display activity in distinct areas of the brain that, together, may be thought of as a 'hate circuit', according to new research by scientists at UCL (University College London).

The study, by Professor Semir Zeki and John Romaya of the Wellcome Laboratory of Neurobiology at UCL, examined the brain areas that correlate with the sentiment of hate and shows that the 'hate circuit' is distinct from those related to emotions such as fear, threat and danger – although it shares a part of the brain associated with aggression. The circuit is also quite distinct from that associated with romantic love, though it shares at least two common structures with it.

The results are an extension of previous studies on the brain mechanisms of romantic and maternal love from the same laboratory. Explaining the idea behind the research, Professor Zeki said: "Hate is often considered to be an evil passion that should, in a better world, be tamed, controlled, and eradicated. Yet to the biologist, hate is a passion that is of equal interest to love. Like love, it is often seemingly irrational and can lead individuals to heroic and evil deeds. How can two opposite sentiments lead to the same behaviour?"

To compare their present results with their previous ones on romantic love, Zeki and Romaya specifically studied hate directed against an individual. Seventeen subjects, both female and male, had their brains scanned while viewing pictures of their hated person as well as that of neutral faces with which they were familiar. Viewing a hated person showed activity in distinct areas of the brain that, together, may be thought of as a 'hate circuit'.

The 'hate circuit' includes structures in the cortex and in the sub-cortex and has components that are important in generating aggressive behaviour, and translating this into action through motor planning, as if the brain becomes mobilised to take some action. It also involves a part of the frontal cortex that has

been considered critical in predicting the actions of others, probably an important feature when one is confronted by a hated person.

The subcortical activity involves two distinct structures, the putamen and insula. The former, which has been implicated in the perception of contempt and disgust, may also be part of the motor system that is mobilised to take action, since it is known to contain nerve cells that are active in phases preparatory to making a move.

Professor Zeki added: "Significantly, the putamen and insula are also both activated by romantic love. This is not surprising. The putamen could also be involved in the preparation of aggressive acts in a romantic context, as in situations when a rival presents a danger. Previous studies have suggested that the insula may be involved in responses to distressing stimuli, and the viewing of both a loved and a hated face may constitute such a distressing signal.

"A marked difference in the cortical pattern produced by these two sentiments of love and hate is that, whereas with love large parts of the cerebral cortex associated with judgment and reasoning become de-activated, with hate only a small zone, located in the frontal cortex, becomes de-activated. This may seem surprising since hate can also be an all-consuming passion, just like love. But whereas in romantic love, the lover is often less critical and judgmental regarding the loved person, it is more likely that in the context of hate the hater may want to exercise judgment in calculating moves to harm, injure or otherwise extract revenge.

"Interestingly, the activity in some of these structures in response to viewing a hated face is proportional in strength to the declared intensity of hate, thus allowing the subjective state of hate to be objectively quantified. This finding may have legal implications in criminal cases, for example."

Unlike romantic love, which is directed at one person, hate can be directed against entire individuals or groups, as is the case with racial, political, or gender hatred. Professor Zeki said that these different varieties of hate will be the subject of future studies from his laboratory.

Journal reference:

1. Zeki et al. **Neural Correlates of Hate**. *PLoS ONE*, 2008; 3 (10): e3556 DOI: [10.1371/journal.pone.0003556](https://doi.org/10.1371/journal.pone.0003556)

Adapted from materials provided by [University College London](http://www.ucl.ac.uk), via [EurekAlert!](http://www.eurekalert.com), a service of AAAS.

<http://www.sciencedaily.com/releases/2008/10/081028205658.htm>



Microsoft Introduces Windows 7, Ending Vista Brand

By **JOHN MARKOFF**

LOS ANGELES — Microsoft introduced what it said would be a slimmer and more responsive version of its Windows operating system on Tuesday, while unceremoniously dropping the brand name Vista for the new product.

The new version will instead be branded Windows 7, because it is the seventh of a long line of operating systems for PCs developed by the company since the 1980s. The company did not say when it would sell Windows 7 to the public.

The company also said that it was planning to introduce a Web-based version of its Office programs, which is aimed at heading off a new wave of competitors like Google Docs and Zoho, which have deployed word processors, spreadsheets and presentation programs that run on a Web browser. The company was vague, however, about how it would price the programs and acknowledged that it would face skeptical Wall Street analysts who think the strategy would cannibalize the company's profitable Office franchise.

After almost two years, Windows Vista is still getting a lackluster reception from consumers and facing a relentless marketing barrage from Apple.

The problem was highlighted last week when Microsoft reported its financial results for the most recent quarter. Its Windows unit reported just a 2 percent rise in revenue against a 4 percent decline in operating income. The computer industry viewed the setback as a shift of historic proportions. The company acknowledged last week that the mix of Windows sales in both mature and emerging markets had tipped more toward low-cost PCs, which come with lower-margin versions of Windows and often not Vista. Sales of Office software rose 23 percent, bringing in more revenue than the operating system.

On Tuesday morning, the company demonstrated Windows 7 before a group of more than 6,000 programmers attending the company's Professional Developers' Conference being held here through Thursday.

"We've done a lot of work around how you manage the windows, how you launch programs and how you manage the windows of the programs that you've launched," said Steven Sinofsky, the Microsoft technologist who has led the development of the new version of Windows. "It's all about personalization and putting you in control of the PC, and that's a big initiative that we've had."

Mr. Sinofsky took the stage and issued an apology of sorts for the problems and frustrations associated with Windows Vista. He said the company had listened to and was responding to the feedback.

"We got feedback from reviews, from the press, a few bloggers here and there, oh, and some commercials," he said, with a nod to a lengthy Apple advertising campaign that has mercilessly poked fun at Microsoft's woes.

He also said that he had not taken particular offense at Apple's ad campaign teasing the giant software developer. However, the laptop did have an "I'm a PC" sticker on its cover, a reference to a recent series of ads Microsoft ran that were widely viewed as a somewhat belated response to Apple. "As an engineering team we have to do what engineers do, when you build a product, when you build a service, you step back and say what have we learned from this, what can we do better, what went well, how do we build on our experience," he added.





He then demonstrated a “pre-beta” version of Windows, acknowledging that some features were still missing. The presentation focused generally on the more polished control features of Windows 7 including how on-screen notifications are handled, an issue that was an irritant for early Vista users who complained about the nannylike behavior of the software.

Other new features in this very early version included an enhanced and more flexible task-bar, more powerful search features, and an easier-to-use home network and file sharing. There was also a hint that Microsoft plans to revise Windows 7 to take advantage of the coming wave of multicore microprocessors from Intel and Advanced Micro Devices. Mr. Sinofsky said the company would give more details on the ability of the new program to handle up to 256 processors.

Mr. Sinofsky, who previously led the development of the company’s Office application, showed Windows 7 running on a low-priced Lenovo notebook computer equipped with just one gigabyte of memory and a relatively low-power Intel Atom microprocessor. This suggests that the new version of the program will require far fewer resources than its predecessor, although Mr. Sinofsky declined to make specific performance promises.

Microsoft also said that it planned to offer versions of a number of its Office applications via a Web browser instead of as an application on a PC, via the Microsoft Office Live Web service, and to businesses through a hosted subscription.

http://www.nytimes.com/2008/10/29/technology/business-computing/29soft.html?_r=1&th&emc=th&oref=slogin





New Orleans Rising, by Hammer and Art

By **SHAILA DEWAN**

NEW ORLEANS — Over the last few weeks more than a few locals have stopped by to inform a small construction crew in the Lower Ninth Ward here that it obviously does not know what it is doing. “The whole time we’ve been here, people have been like, ‘You know, that’s not the way to build a house,’ ” said Karen Del Aguila, laughing. “They’d be like, ‘Are you guys licensed?’ ”

Ms. Del Aguila, an assistant to the artist Wangechi Mutu, and her crew have been building the frame of a traditional shotgun house, not as a permanent dwelling but as part of Prospect.1 New Orleans, an ambitious new art biennial that is to open here on Saturday and continue through Jan. 18. Billed as the largest exhibition of contemporary art ever held on American soil, the biennial is intended to help restore the cultural vibrancy of a city that remains on its knees three years after Hurricane Katrina.

With a star-filled roster of 81 artists and a projected 50,000 visitors from out of town, it may indeed bring benefits to New Orleans. But it is already clear that the arrangement has not been one-sided, and the New Orleans contribution has been rich. With its history of destruction and rebirth, artistic triumph and economic struggle, this crumpled crescent of a city provides a singular interpretive context that acts as a resonance chamber. Some of the art refers directly to Hurricane Katrina, like Ms. Mutu’s “ghost house,” which sits on the property of an elderly woman whose attempts to rebuild were stymied by a vanishing contractor. But most of it does not have to.

In a shedlike community center a few blocks from the ghost house, the New York artist Janine Antoni has deposited a “soft wrecking ball” made of lead and scarred by the act of demolition. Nearby, the Chilean artist Sebastián Preece has excavated the foundation of a Lower Ninth Ward house and transplanted it elsewhere. Adam Cvijanovic, another New York artist, has taken a page from traditional New Orleans style and, in an unused house, installed a custom wallpaper that presents a lavish scene of a waterlogged swamp with no humans in sight. At the United States Mint in the French Quarter, Stephen G. Rhodes, from Los Angeles, is building a Hall of Presidents in which the presidents themselves are largely absent.

Other pieces mine the city and its history. The Thai artist Navin Rawanchaikul will present the jazz funeral that was never held for Narvin Kimball, the banjo player for the Preservation Hall Jazz Band, who died in March 2006 in Charleston, S.C., where he went after the storm. Skylar Fein has recreated a French Quarter gay lounge that burned in a suspicious fire in 1973, killing about half the patrons.

Miguel Palma, a Portuguese artist, is building a modified Higgins boat, a World War II vessel manufactured in New Orleans that, in Mr. Palma’s version, contains a mini-tsunami. “Instead of war games, you have rescue games,” he said.

In this way New Orleans has become a collaborator, instigator and subject. Residents have volunteered by the hundreds to act as docents, provide exhibition sites (admission to all events is free) and assist the artists. Dan Cameron, the impresario behind Prospect.1 and a former senior curator at the New Museum in New York, said that as he was planning the biennial, a friend frequently reminded him of a quotation from Bob Dylan’s “Chronicles”: “Everything in New Orleans is a good idea.”

Prospect.1, Mr. Cameron said, is “just 81 people running around with good ideas, and basically everyone they meet goes, ‘Oh yeah, sure, I’ll help.’ ” “It is American,” he continued, “but it’s no longer what we think of as American — it’s drop what you’re doing and go do what your neighbor’s doing.”



This is, after all, the city of spontaneous parades. Mr. Cameron said he was careful to select artists for the first Prospect who would attract critics and collectors but were not divas whose expectations might exceed the abilities of a first-time exhibition on a shoestring budget of \$3.2 million.

“I would have liked to have taken a few more risks,” Mr. Cameron said. “Curatorially, I like high-risk situations.”

Almost every artist, even those whose work is not site-specific, visited New Orleans last year to get a feel for the city and the more than 20 biennial sites, which include the Edgar Degas Foundation; the New Orleans African American Museum of Art, Culture and History; the Battle Ground Church; and the Ideal Auto repair shop.

Some artists were inspired to depart from routine practice. Ms. Mutu, who created the ghost house, is best known for works on paper. The painter Mark Bradford built a three-story ark in a part of the Lower Ninth Ward that had some of the worst flooding after the hurricane.

Mr. Bradford’s project gathered momentum after he met Keith Calhoun and Chandra McCormick, well-known local photographers who lost thousands of negatives to Katrina. (Hundreds of them are still awaiting salvage in a freezer that reeks of rot and floodwater.) Mr. Bradford met the couple as they were fixing up an old duplex they call the L9 Center for the Arts, and introduced them to Mr. Cameron. They in turn connected Mr. Bradford to people who could help him build.

Mr. Bradford auctioned one of his paintings, raising \$65,000 to help renovate L9, Mr. Calhoun said. The space has become a biennial site, and recently Anne Deleporte, a French artist who lives in New York, was there finishing an “anti-collage” of selectively painted-over newspaper.

She said New Orleans had eagerly watched the piece take shape, with some regularly checking on her progress. “There are people, at the end of the day, they just walk by and say, ‘Thank you,’ ” she said. “That’s something I’ve never seen anywhere else in the art world.”

Nine of the 81 artists taking part in the biennial live in Louisiana. Still, Mr. Calhoun said he would reserve judgment on Prospect.1’s impact on the city. “We have so many talented local artists, I’m hoping there will be some kickback for them too,” he said.

Although there is no telling how much attention will flow to the local museums and galleries, they are putting their best faces forward. And the biennial has already changed the arts environment in New Orleans. The Contemporary Arts Center New Orleans, where Mr. Cameron is the visual arts director, will open its top two floors to the public for the first time in years. Four artists are installing work at the Charles J. Colton Junior High School, which fell into disuse after the storm but is now, under the auspices of the Creative Alliance of New Orleans, offering free space to artists who agree to work with public school students.

Courtney Hopen, 23, a local artist who creates graphic novels and recently moved to New Orleans after graduating from Princeton, said she hoped that the biennial would upend some stereotypes about what constitutes art in New Orleans.

“I hope it draws in a lot more tourists, or at least a different crowd of tourists who will take a look at some of the more experimental and less mainstream New Orleans art,” Ms. Hopen said. “I hope it will bring attention to people doing something other than that fleur-de-lis and jazz.”

<http://www.nytimes.com/2008/10/29/arts/design/29pros.html?th&emc=th>

Frequent Urination Protects Against Bladder Cancer, Study Finds

ScienceDaily (Oct. 31, 2008) — A new study has analyzed the effect of urinary frequency on the risk of bladder cancer. The research, which is published in the latest number of the *International Journal of Cancer*, shows a direct association between the number of times people get up at night to urinate and protection against bladder cancer.

Night-time is usually the period during which there is the longest time interval between urination. For this reason the “length of time carcinogenic agents, such as those from tobacco for example, are present in the urine, constitutes an important factor towards the likelihood of developing bladder cancer”, explains Juan Alguacil to SINC. Juan Alguacil is a researcher from the University of Huelva and one of the authors of the study, which has appeared recently in the *International Journal of Cancer*.

The research group, made up of Spanish and North American scientists, analysed the urinary frequency in 884 recently diagnosed bladder cancer cases and in 996 non-cancer ‘control patients’, from five regions in Spain. The patients, aged between 21 and 80 years, came from 18 hospitals in Vallés, Barcelona, Asturias, Alicante and Tenerife.

Although the best advice is to avoid exposure to carcinogenic agents (e.g. to stop smoking and to avoid direct contact with chemical products or pollution particles), the risk of bladder cancer could be reduced by increasing urinary frequency and drinking water. The results of the analysis indicate that those people who usually get up at night at least twice to pass urine reduced their risk of suffering from bladder cancer by 40-59%. This “protective effect” was found in both men and women and did not relate to the consumption of tobacco or the quantity of water they drank.

This is an exhaustive international study undertaken to date about the effect of urinary frequency in bladder cancer. The authors underline that “it would be necessary to transport this discovery from the laboratory to the hospital in order to achieve the prevention of almost 357,000 new cases of bladder cancer that are diagnosed every year throughout the world, and the 145,000 deaths that are caused by this cancer. The data put forward last July in the latest session of the Spanish National Congress of Urology indicate that in Spain more than 15,000 new cases of bladder cancer are diagnosed every year. The incidence of this tumour, one of the highest in the world, is rising mainly due to a greater life expectancy for the population and to the increasing incidence amongst women.

According to the experts, to an extraordinary degree, the consumption of tobacco is leading to an increase of the incidence of this disease among women, which until now has been infrequent. In fact, it is estimated that in the near future the incidence of bladder cancer will be equal in both sexes, owing to the increase in the number of women who smoke. According to the conclusions of the congress, between 50 and 70% of smokers will end up developing a tumour of this type, the main warning sign of which is the appearance of blood in the urine.

Journal reference:

1. Silverman et al. **Does increased urination frequency protect against bladder cancer?** *International Journal of Cancer*, 2008; 123 (7): 1644 DOI: [10.1002/ijc.23572](https://doi.org/10.1002/ijc.23572)

Adapted from materials provided by Plataforma SINC, via AlphaGalileo.

<http://www.sciencedaily.com/releases/2008/10/081030194232.htm>

Sea Urchin Yields Key Secret Of Biomineralization



Sea urchin. The teeth and bones of mammals, the protective shells of mollusks, and the needle-sharp spines of sea urchins and other marine creatures are made-from-scratch wonders of nature. (Credit: iStockphoto/Ronald Fernandez)

ScienceDaily (Nov. 1, 2008) — The teeth and bones of mammals, the protective shells of mollusks, and the needle-sharp spines of sea urchins and other marine creatures are made-from-scratch wonders of nature.

Used to crush food, for structural support and for defense, the materials of which shells, teeth and bones are composed are the strongest and most durable in the animal world, and scientists and engineers have long sought to mimic them.

Now, harnessing the process of biomineralization may be closer to reality as an international team of scientists has detailed a key and previously hidden mechanism to transform amorphous calcium carbonate into calcite, the stuff of seashells. The new insight promises to inform the development of new, superhard materials, microelectronics and micromechanical devices.

In a report Oct. 27 in the Proceedings of the National Academy of Sciences, a group led by University of Wisconsin-Madison physicist Pupa Gilbert describes how the lowly sea urchin transforms calcium carbonate — the same material that forms "lime" deposits in pipes and boilers — into the crystals that make up the flint-hard shells and spines of marine animals. The mechanism, the authors write, could "well represent a common strategy in biomineralization...."

"If we can harness these mechanisms, it will be fantastically important for technology," argues Gilbert, a UW-Madison professor of physics. "This is nature's bottom-up nanofabrication. Maybe one day we will be able to use it to build microelectronic or micromechanical devices."

Gilbert, who worked with colleagues from Israel's Weizmann Institute of Science, the University of California at Berkeley and the Lawrence Berkeley National Laboratory, used a novel microscope that employs the soft-X-rays produced by synchrotron radiation to observe how the sea urchin builds its spicules, the sharp crystalline "bones" that constitute the animal's endoskeleton at the larval stage.

Similar to teeth and bones, the sea urchin spicule is a biomineral, a composite of organic material and mineral components that the animal synthesizes from scratch, using the most readily available elements in sea water: calcium, oxygen and carbon. The fully formed spicule is composed of a single crystal with an unusual morphology. It has no facets and within 48 hours of fertilization assumes a shape that looks very much like the Mercedes-Benz logo.

These crystal shapes, as those of tooth enamel, eggshells or snails, are very different from the familiar faceted crystals grown through non-biological processes in nature. "To achieve such unusual — and presumably more functional — morphologies, the organisms deposit a disordered amorphous mineral phase first, and then let it slowly transform into a crystal, in which the atoms are neatly aligned into a lattice with a specific and regular orientation, while maintaining the unusual morphology," Gilbert notes.

The question the Wisconsin physicist and her colleagues sought to answer was how this amorphous-to-crystalline transition occurs. The sea urchin larval spicule is a model system for biominerals, and the first one in which the amorphous calcium carbonate precursor was discovered in 1997 by the same Israeli group co-authoring the current PNAS paper. A similar amorphous-to-crystalline transition has since been observed in adult sea urchin spines, in mollusk shells, in zebra fish bones and in tooth enamel. The resulting biominerals are extraordinarily hard and fracture resistant, compared to the minerals of which they are made.

"The amorphous minerals are deposited and they are completely disordered," Gilbert explains. "So the question we addressed is 'how does crystallinity propagate through the amorphous mineral?'"

To answer it, Gilbert and her colleagues observed spicule development in 2- to 3-day-old sea urchin larvae. The sea urchin spicule is formed inside a clump of specialized cells and begins as the animal lays down a single crystal of calcite in the form of a rhombohedral seed, from which the rest of the spicule is formed. Starting from the crystalline center, three arms extend at 120 degrees from each other, as in the hood ornament of a Mercedes-Benz. The three radii are initially amorphous calcium carbonate, but slowly convert to calcite.

"We tried to find evidence of a massive crystal growth, with a well defined growth front, propagating from the central crystal through the amorphous material, but we never observed anything like that," Gilbert says. "What we found, instead, is that 40-100 nanometer amorphous calcium carbonate particles aggregate into the final morphology. One starts converting to crystalline calcite, then another immediately adjacent converts as well, and another, and so on in a three-dimensional domino effect. The pattern of crystallinity, however, is far from straight. It resembles a random walk, or a fractal, like lightning in the sky or water percolating through a porous medium," explains Gilbert.

The new work, according to Gilbert, brings science a key step closer to a thorough understanding of how biominerals form and transform. Knowing the step-by-step process may permit researchers to develop new crystal structures that can be used in applications ranging from new microelectronic devices to medical applications.

The new study was funded by the National Science Foundation and the U.S. Department of Energy.

Adapted from materials provided by [University of Wisconsin-Madison](http://www.sciencedaily.com/releases/2008/10/081027174634.htm).
<http://www.sciencedaily.com/releases/2008/10/081027174634.htm>

Grapes And Grape Extracts May Lower Cardiovascular Disease Risk, Review Article Suggests



ScienceDaily (Nov. 1, 2008) — A growing body of research data suggests that consuming foods rich in polyphenols from grapes, including red wine, helps reduce the risk of heart disease, according to a review article in the November issue of *Nutrition Research*.

"Consumption of grape and grape extracts and/or grape products such as red wine may be beneficial in preventing the development of chronic degenerative diseases such as cardiovascular disease," write Wayne R. Leifert, Ph.D., and Mahinda Y. Abeywardena, Ph.D., of Commonwealth Scientific and Industrial Research Organisation in Adelaide, Australia.

The authors review the accumulating evidence that grape polyphenols work in many different ways to prevent cardiovascular and other "inflammatory-mediated" diseases. Polyphenols are natural antioxidants found in grapes and some other plant foods. Their types and actions vary, depending on where in the grape they are found. Grape seeds, grape skin, and grape juice contain several types of polyphenols, including resveratrol, phenolic acids, anthocyanins, and flavonoids.

Through their antioxidant effects, grape polyphenols help to slow or prevent cell damage caused by oxidation. Polyphenols decrease oxidation of low-density lipoprotein cholesterol ("bad" cholesterol)—a key step in the development of atherosclerosis (hardening of the arteries). Grape polyphenols also have other protective effects on the heart and blood vessels, including actions to reduce blood clotting, abnormal heart rhythms, and blood vessel narrowing. It's not yet clear exactly how these benefits of polyphenols occur, although there is evidence of effects on cellular signaling and on the actions of certain genes. The wide range of health-promoting effects suggests that several different, possibly interrelated mechanisms may be involved.

So far, most of the evidence on grape polyphenols comes from laboratory experiments and animal studies. However, a few studies support the disease-preventing benefits of grapes in humans. Studies in patients



treated with grape seed extracts have shown improvements in blood flow and cholesterol levels. In other studies, drinking Concord grape juice has improved measures of blood flow in patients with coronary artery disease and lowered blood pressure in patients with hypertension.

Studies investigating the lower rates of heart disease in France—the so-called "French paradox"—first raised the possibility that red wine might have health benefits. The subsequent research reviewed by Drs. Leifert and Abeywardena helps build the case that grapes and grape products might be a useful part of strategies to lower the high rate of death from cardiovascular disease.

At a time of growing interest in the use of "functional foods and nutraceuticals" to promote heart health, grapes and grape polyphenols are "attractive candidates" for use in such supplements, Drs. Leifert and Abeywardena believe. "Therefore," they conclude, "supplementation with grape seed, grape skin or red wine products may be a useful adjunct to consider for a dietary approach in the prevention of cardiovascular diseases, although additional research is required to support such a strategy."

Adapted from materials provided by Elsevier, via EurekAlert!, a service of AAAS.
<http://www.sciencedaily.com/releases/2008/10/081028103105.htm>



Last Of His Kind? Researchers Complete Mitochondrial Genome Of Ancient Mummy, The Tyrolean Iceman



Tyrolean Ice Man. (Credit: Professor Franco Rollo, University of Camerino)

ScienceDaily (Nov. 1, 2008) — The 5,300 year old human mummy – dubbed Ötzi or 'the Tyrolean Iceman' – is highly unlikely to have modern day relatives, according to new research.

A team comprising scientists from Italy and the UK has sequenced Ötzi's entire mitochondrial DNA (mtDNA) genome – which is passed down through the maternal line – and found that he belonged to a genetic lineage that is either extremely rare, or that has died out.

Published in this month's issue of *Current Biology*, the research has generated the oldest complete *Homo sapiens* mtDNA genome to date, and overturns previous research conducted in 1994 on a small section of Ötzi's mtDNA, which suggested that relatives of Ötzi may still exist in Europe.

"Changes arise only gradually in mitochondrial DNA as it is passed down the generations," says co-author Professor Martin Richards of the University of Leeds' Faculty of Biological Sciences, "and so it provides an effective way of tracking ancestry through the female line across many thousands of years, as well as examining evolutionary relatedness across human populations."

The team, led by Professor Franco Rollo at the University of Camerino and Dr Luca Ermini working at both Camerino and Leeds, used powerful new technologies to sequence Ötzi's mtDNA and match it with a modern day haplogroup – in genetic terms, a group that shares a common ancestral DNA sequence. He belonged to a branch of haplogroup K1, which is still common throughout Europe today. However, almost all members of K1 sampled from modern Europeans belong to one of three sub-lineages, whereas Ötzi's lineage was completely distinct.

After death DNA begins to degrade immediately, so ancient DNA is very fragmented and any study of it has to be completed in hundreds of sections. For this research the team tested around 250 fragments, each of which had to be sequenced many times to ensure the results were not distorted.

"Our analysis confirms that Ötzi belonged to a previously unidentified lineage of K1 that has not been seen to date in modern European populations. The frequency of genetic lineages tends to change over time, due to random variations in the number of children people have - a process known as 'genetic drift' - and as a result, some variants die out. Our research suggests that Ötzi's lineage may indeed have become extinct," says Prof Richards.

"We'll only know for sure by sampling intensively in the Alpine valleys where Ötzi was born. However, our results do suggest that studies of ancient samples can fill in gaps in our knowledge left open simply because many genetic lineages died out thousands of years ago. The techniques we've used here are potentially applicable to many other ancient remains."

Ötzi's mummified remains were discovered in September 1991 in the Eastern Alps near the Austro-Italian border. He was approximately 46 years old when he died, and examinations revealed that he had been severely wounded by an arrow and possibly finished off with a mace blow to the face. He is estimated to have lain undiscovered for approximately 5,300 years. His body was almost wholly preserved, together with an array of clothes and weapons, providing an unprecedented insight into the Late Neolithic or Copper Age in Europe. Since 1998 he has been on display at the South Tyrol Museum of Archaeology in Bolzano, Italy.

The research was funded by global pharmaceutical company Eli Lilly and Co.

Journal reference:

1. Luca Ermini, Cristina Olivieri, Ermanno Rizzi, Giorgio Corti, Raoul Bonnal, Pedro Soares, Stefania Luciani, Isolina Marota, Gianluca De Bellis, Martin B. Richards, and Franco Rollo. **The Complete Mitochondrial Genome Sequence of the Tyrolean Iceman.** *Current Biology*, Online October 30, 2008 [[link](#)]

Adapted from materials provided by University of Leeds.
<http://www.sciencedaily.com/releases/2008/10/081030123829.htm>

Exercise Prevents Fatty Liver Disease, New Study Suggests

ScienceDaily (Oct. 31, 2008) — It's easy to go to the gym on a regular basis right after a person buys the gym membership. It's also easy to skip the gym one day, then the next day and the day after that. A new University of Missouri study indicates that the negative effects of skipping exercise can occur in a short period.

The researchers found that a sudden transition to a sedentary lifestyle can quickly lead to symptoms of nonalcoholic fatty liver disease (hepatic steatosis), which affects at least 75 percent of obese people.

“We found that the cessation of daily exercise dramatically activates specific precursors known to promote hepatic steatosis,” said Jamal Ibdah, professor of medicine and medical pharmacology and physiology in the MU School of Medicine. “This study has important implications for obese humans who continually stop and start exercise programs. Our findings strongly suggest that a sudden transition to a sedentary lifestyle increases susceptibility to nonalcoholic fatty liver disease.”

Nonalcoholic fatty liver disease is a reversible condition that causes fat to accumulate in liver cells of obese people. As Westernized societies are experiencing a weight gain epidemic, the prevalence of the disease is growing, Ibdah said.

In the study, researchers gave obese rats access to voluntary running wheels for 16 weeks. Scientists then locked the wheels, and transitioned the animals to a sedentary condition. After 173 hours, or about seven days, the rats began showing signs of factors responsible for promoting hepatic steatosis. In the animals tested immediately at the end of 16 weeks of voluntary running, there were no signs of hepatic steatosis.

“Physical activity prevented fatty liver disease by 100 percent in an animal model of fatty liver disease,” said Frank Booth, a professor in the MU College of Veterinary Medicine and the MU School of Medicine and a research investigator in the Dalton Cardiovascular Research Center. “In contrast, 100 percent of the group that did not have physical activity had fatty liver disease. This is a remarkable event. It is rare in medicine for any treatment to prevent any disease by 100 percent.”

Journal reference:

1. Rector et al. **Cessation of daily exercise dramatically alters precursors of hepatic steatosis in Otsuka Long-Evans Tokushima Fatty (OLETF) rats.** *The Journal of Physiology*, 2008; 586 (17): 4241 DOI: [10.1113/jphysiol.2008.156745](https://doi.org/10.1113/jphysiol.2008.156745)

Adapted from materials provided by [University of Missouri-Columbia](http://www.unimissouri.edu).

<http://www.sciencedaily.com/releases/2008/10/081029141047.htm>

Wildflower Declines In Thoreau's Concord Woods Are Due To Climate Changes



Dogwood flowers. Plant families that have been especially hard-hit by global warming have included lilies, orchids, buttercups, violets, roses, dogwoods, and mints. (Credit: iStockphoto/Melissa Carroll)

ScienceDaily (Nov. 1, 2008) — Drawing on records dating back to the journals of Henry David Thoreau, scientists at Harvard University have found that different plant families near Walden Pond have borne the effects of climate change in strikingly different ways. Some of the plant families hit hardest by global warming have included beloved species like lilies, orchids, violets, roses, and dogwoods.

Over the past 150 years, some of the plants in Thoreau's woods have shifted their flowering time by as much as three weeks as spring temperatures have risen, the researchers say, while others have been less flexible. Many plant families that have proven unable to adjust their flowering time have experienced sharp declines or even elimination from the local landscape -- the fate of nearly two-thirds of the plants Thoreau found in the 1850s around Walden Pond in Concord, Mass.

"It had been thought that climate change would result in uniform shifts across plant species, but our work shows that plant species do not respond to climate change uniformly or randomly," says Charles C. Davis, assistant professor of organismic and evolutionary biology in Harvard's Faculty of Arts and Sciences. "Some plants around Walden Pond have been quite resilient in the face of climate change, while others have fared far worse. Closely related species that are not able to adjust their flowering times in the face of rising temperatures are decreasing in abundance."

Some 27 percent of all species Thoreau recorded in the mid-19th century are now locally extinct, and another 36 percent are so sparse that extinction may be imminent. Plant families that have been especially hard-hit by global warming have included lilies, orchids, buttercups, violets, roses, dogwoods, and mints. Many of the gainers have been weedier mustards and knotweeds, along with various non-native species.

"The species harmed by climate change are among the most charismatic found in the New England landscape," Davis says. Scientists can be reasonably confident these losses have resulted from climate change and not habitat loss, he adds, since 60 percent of the land in Concord has remained protected or undeveloped since Thoreau's observations of the area between 1851 and 1858.

Understanding the decline of species abundance over time is constrained by the limited availability of historic data. Davis' work with Harvard graduate students Charles Willis and Brad Ruhfel combines contemporary data, collected by scientists Richard Primack and Abraham Miller-Rushing at Boston University, with Thoreau's records from his time spent at Walden Pond. Thoreau kept meticulous notes documenting the natural history of the region, plant species occurrences, and flowering times. Since then, botanists have resurveyed the territory to create a unique, community-level perspective covering 150 years. During this period, the mean annual temperature in the Concord area has increased by 2.4 degrees Celsius, or 4.3 degrees Fahrenheit.



"The plants in our survey now flower, on average, one week earlier in the spring than their ancestors did in Thoreau's time," Davis says. "However, there is wide variation among plant families. Some have shown no shift in flowering at all, while others now bloom 16 to 20 days earlier in the spring."

As mean annual temperatures increase, plants can adjust their growth patterns in several ways. For example, forests shift toward the poles, alpine tree lines move up mountains to higher altitudes, and flowering time can shift. During eras of climate change, plants that cannot adjust their flowering schedule -- and thus flower at sub-optimal times -- may experience dramatic declines in population size and local extinction.

The work appears this week in the Proceedings of the National Academy of Sciences.

Davis' co-authors are Harvard graduate students Charles Willis and Brad Ruhfel and Richard Primack and Abraham Miller-Rushing of Boston University. Their work was supported by the National Science Foundation.

*Adapted from materials provided by Harvard University, via EurekAlert!, a service of AAAS.
<http://www.sciencedaily.com/releases/2008/10/081027174640.htm>*



Conditions That Initiate Erosion Identified

ScienceDaily (Nov. 1, 2008) — Wind, water, and waves erode billions of tons of soil from the earth's surface. As a result, many rivers are plagued with excessive amounts of suspended sediment. According to the U.S. Environmental Protection Agency, such eroded sediment is the largest nonpoint source pollution in the environment.

While the mechanism responsible for soil erosion may seem obvious –wind, water and wave forces breaking apart particles – in fact, the precise conditions or criterion that sets a particle free from its mates has not been identified. For 72 years, scientists and engineers have been working with a time-averaged force criterion, originally proposed by A. Shields, an American engineer, to describe threshold conditions for sediment to become mobile.

Now, a team of Virginia Tech College of Engineering faculty members and graduate students have demonstrated that sustained spikes in turbulence are responsible for dislodging particles, whether on land or in the water. They report their research results in the October 31 issue of *Science* in the article, "The Role of Impulse on the Initiation of Particle Movement Under Turbulent Flow Conditions."*

Scientists and engineers have long suspected that turbulence, an ubiquitous feature of natural fluid flow phenomena, was part of the equation. Anyone who has flown has experienced turbulence. So a guess that turbulence is the culprit was still not sufficiently informative.

"There has been a need to develop a method that accounts for the role of turbulence on soil erosion in a quantitative way," said civil and environmental engineering Professor Panos Diplas, lead author on the research. "If you measured the velocity of the air flowing across a fixed place in the middle of Virginia Tech's drill field, you would see that velocity fluctuates wildly," Diplas said.

"Wildly and randomly," said mechanical engineering Associate Professor Clint Dancey, co-author.

"When a weather report includes a high wind warning, it will go something like, '30 mph gusting to 70.' Yet the present system for determining erosion potential in a flow only measures a single, time-averaged value. "It does not account for the spikes or their duration," said Diplas.

Diplas, Dancey, and their students began to do experiments to determine the influence of the spikes. What they discovered is that not all spikes are created equal.

Using a metal ball slightly nested among Teflon balls, they introduced electromagnetic pulses of known magnitude and of different millisecond durations. The magnetic field simulated the drag of water in a river. "I had an 'aha moment' when I saw the video of that controlled experiment," said Dancey.

"We saw that, in addition to their amplitude, it was the duration of the 'gusts' that caused the metal ball to be dislodged or eroded from its resting pocket" said Diplas.

Using electromagnetic pulses, the team was able to establish a range of combinations of magnitude and duration that result in particle dislodgement. They call this product of magnitude and duration 'impulse'.

Next, the team moved their investigation to a two-foot-wide, 65-foot-long flume with actual water in the Baker Environmental Hydraulics Laboratory (<http://www.hydraulicslab.cee.vt.edu>) at Virginia Tech. The flume is used to simulate phenomena encountered in natural streams. A half-inch diameter ball was slightly nested on a bed of immobile 'pebbles'. Laser Doppler velocimetry (LDV) measured the instantaneous flow velocity of the water, which was allowed to move with the typical random turbulence of channel flows. Laser beams shining through the flume from outside recorded when the mobile grain



moved. Thus the conditions of drag that caused erosion were captured. The results agreed with the findings of the electromagnetic study, the Science article reports.

"It is fundamental physics with broad applications to water or air flows," said Dancey. "The goal is to produce criteria that are more broadly applicable and have more predictive power."

And not only for the thresholds that result in soil erosion, but for the movement of contaminants. "A lot of particles have chemicals attached to them. At what point does pollution occur?" said Diplas. "That is, if pollutants are resting in a river bed, and there is a flood, at some point the turbulence is going to move the pollutants downstream. We need to know when this will happen!"

Another force capable of mobilizing particles is lift, the force that moves a buried particle out of its bed?. "We have employed a theoretical approach to explain what is happening when lift is the prevailing force experienced by a soil particle. The results in this case agree with those obtained from the electromagnetic experiments when drag was the dominant force. Impulse, not just force, represents the more general criterion for identifying the critical conditions for particle dislodgement." Dancey said.

"We anticipate that this same mechanism will be responsible for particle dislodgement under the more general condition when both drag and lift forces contribute to particle movement," added Diplas.

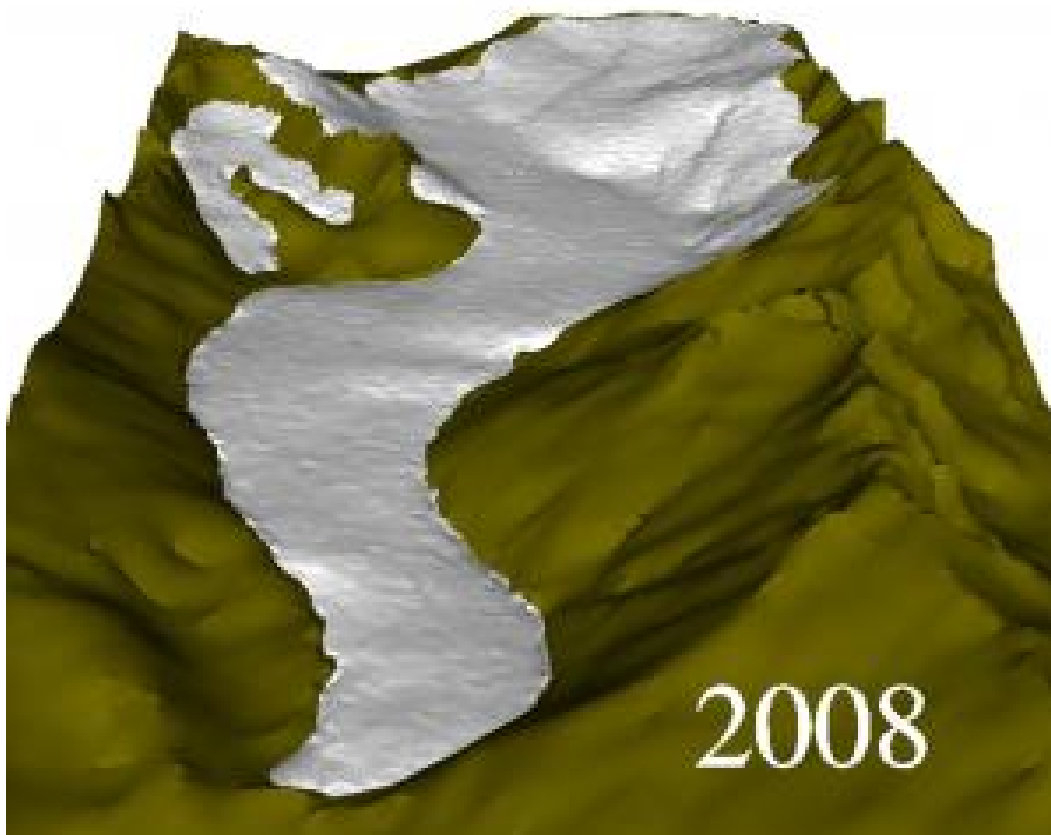
*Authors of the article were Diplas; Dancey; civil and environmental engineering (CEE) Ph.D. students Ahmet O. Celik of Eskisehir, Turkey, and Manousos Valyrakis of Chania, Greece; recent CEE master's degree graduate Krista Greer of Baltimore, Md.; and former Baker Lab visiting scholar Tanju Akar of the civil engineering department at Akdeniz University in Turkey. Greer is now with Rummel, Klepper, and Kahl LLP Consulting Engineers of Baltimore.

The research published in Science was supported by the National Science Foundation.

Adapted from materials provided by Virginia Tech, via EurekaAlert!, a service of AAAS.
<http://www.sciencedaily.com/releases/2008/10/081030144620.htm>



New Model Predicts A Glacier's Life



Rendering of Rhône Glacier in 2008. (Credit: Image courtesy of Ecole Polytechnique Fédérale de Lausanne)

ScienceDaily (Oct. 31, 2008) — EPFL researchers have developed a numerical model that can re-create the state of Switzerland's Rhône Glacier as it was in 1874 and predict its evolution until the year 2100. This is the longest period of time ever modeled in the life of a glacier, involving complex data analysis and mathematical techniques. The work will serve as a benchmark study for those interested in the state of glaciers and their relation to climate change.

The Laboratory of Hydraulics, Hydrology and Glaciology at ETH Zurich has been a repository for temperature, rainfall and flow data on the Rhône Glacier since the 1800s. Researchers there have used this data to reconstruct the glacier's mass balance, i.e. the difference between the amount of ice it accumulates over the winter and the amount that melts during the summer. ⁽¹⁾ Now, led by professor Jacques Rappaz from EPFL's Numerical Analysis and Simulations group, a team of mathematicians has taken the next step, using all this information to create a numerical model of glacier evolution, which they have used to simulate the history and predict the future of Switzerland's enormous Rhone glacier over a 226-year period.

The mathematicians developed their model using three possible future climate scenarios. "We took the most moderate one, avoiding extremely optimistic or pessimistic scenarios," explains PhD student Guillaume Jovet. With a temperature increase of 3.6 degrees Celsius and a decrease in rainfall of 6% over a century, the glacier's "equilibrium line", or the transition from the snowfall accumulation zone to the melting zone (currently situated at an altitude of around 3000 meters), rose significantly. According to

this same scenario, the simulation anticipates a loss of 50% of the volume by 2060 and forecasts the complete disappearance of the Rhône glacier around 2100.

"It is the first time that the evolution of a glacier has been numerically simulated over such a long period of time, taking into account very complex data," notes EPFL mathematician Marco Picasso. Even though measurements have been taken for quite some time, the sophisticated numerical techniques that were needed to analyze them have only been developed very recently.

To verify their results, the mathematicians have also reconstructed a long-vanished glacier in Eastern Switzerland. They were able to pinpoint the 10,000-year-old equilibrium line from vestiges of moraines that still exist ⁽²⁾.

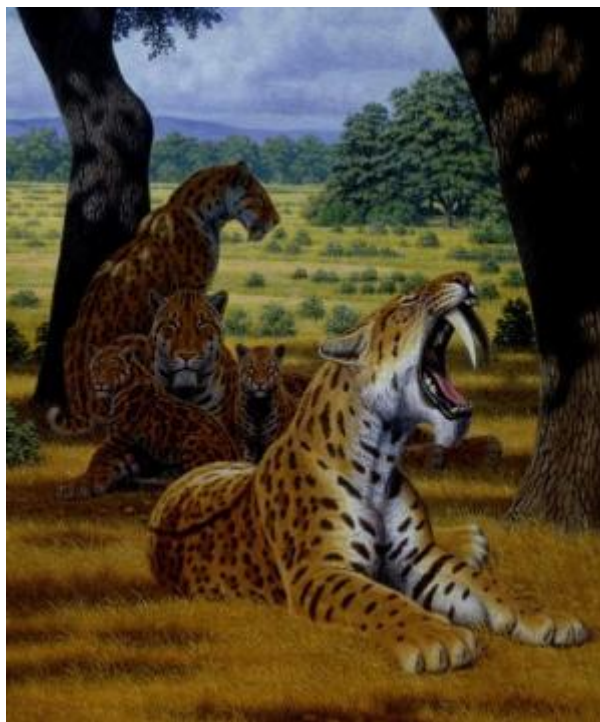
The scientists' work will be of interest not only to climate change experts, but also to those to whom glaciers are important – from tourism professionals to hydroelectric energy suppliers. Picasso adds that this numerical model could be applied to the polar icecaps. "Mathematics and numerical methods have an important role to play in our society," he enthuses. "They allow us to simulate with great confidence a large number of environmental phenomena."

This research was funded by the Swiss National Science Foundation.

1. This research, conducted by the team in Zurich was published in 2008 in the "Journal of Geophysical Research"
2. This research, conducted by the EPFL team in collaboration with Heinz Blatter of ETHZ's Institute for Atmospheric and Climate Science, is described in a paper to be published in the "Journal of Glaciology"

*Adapted from materials provided by Ecole Polytechnique Fédérale de Lausanne.
<http://www.sciencedaily.com/releases/2008/10/081029104258.htm>*

Extinct Sabertooth Cats Were Social, Found Strength In Numbers, Study Shows



A reconstructed scene in the Pleistocene of western North America, showing a group of sabertooth cats of the species *Smilodon fatalis*, with several adults and cubs. (Credit: Artwork by Mauricio Antón)

ScienceDaily (Oct. 31, 2008) — The sabertooth cat (*Smilodon fatalis*), one of the most iconic extinct mammal species, was likely to be a social animal, living and hunting like lions today, according to new scientific research. The species is famous for its extremely long canine teeth, which reached up to seven inches in length and extended below the lower jaw.

Instead of relying on the bones and teeth of the sabertooths to make their findings, scientists from UCLA and the Zoological Society of London concluded that the sabertooth cat was social by using a novel technique: They compared numbers of present-day carnivores competing for kills in Africa with those of mainly extinct species found in a North American fossil deposit.

The research is published in the current issue of the Royal Society's journal *Biology Letters* (Oct. 28). Co-authors also included scientists from South Africa's Tshwane University of Technology and University of Pretoria.

Smilodon existed in North and South America between 1.8 million and 10,000 years ago and is one of the most common species preserved at the Rancho La Brea tar pits of Los Angeles, a fossil deposit in which dying herbivores trapped in sticky asphalt attracted numerous dire wolves and sabertooth cats, some of which also died there.

Because most living cats are solitary, controversy has persisted over the social life of *Smilodon*.

The study reported in *Biology Letters* took a new approach to the question by comparing data from the La Brea fossil record and data obtained from "playbacks" used in Africa, in which the recorded calls of

distressed prey and the sounds of lions and hyenas are used to attract carnivores. This technique has been used by scientists to estimate carnivore densities in eastern and southern Africa.

Results showed that large social species made up a far larger proportion of the animals attracted than one would expect, considering their population size compared to other carnivores. Large social carnivores were, in fact, found to attend approximately 60 times more often than expected on the basis of relative abundance. When these results were compared with the records at the tar pits of California, the scientists found that the proportion of Smilodon records matched the proportion of the large social carnivores in the playbacks.

"It absolutely makes sense that social species will predominate at carcasses, both now and in the past," said Blaire Van Valkenburgh, UCLA professor of ecology and evolutionary biology and senior author on the paper. "Why approach a situation where you are likely to encounter dangerous competitors without having a few friends along?"

The same social advantage, she said, would apply to all scavengers, including early humans, who began consuming more meat about 2 million year ago, some of which they probably scavenged.

Although commonly called the "sabertoothed tiger," the species is actually not closely related to the tiger, which is part of a different subfamily. However, the sabertooth cat was large and muscular, similar in size to a modern-day tiger.

"The extinct sabertooth cat, Smilodon fatalis, has been something of an enigma, with almost nothing known of its behavior," said Chris Carbone, a senior research fellow at the Zoological Society of London and lead author of the paper. "This research allowed us to use the behavior of its present-day relatives to conclude that this extinct cat was more likely to roam in formidable gangs than as a secretive, solitary animal."

Adapted from materials provided by University of California - Los Angeles.
<http://www.sciencedaily.com/releases/2008/10/081031102304.htm>

Over-use Of Organic Fertilizers In Agriculture Could Poison Soils, Study Finds



Composted mud. (Credit: Anne Norman (Creative Commons))

ScienceDaily (Oct. 31, 2008) — Excessive doses of organic residues in agricultural fields could be dangerous for plants, invertebrates and micro-organisms living in the soil. This is the finding of a study carried out by the Autonomous University of Barcelona (UAB), which has shown that the use of appropriate levels of fertilisers would prevent this toxic impact on the soil biota.

Although controlled amounts of organic residues, sewage sludge and animal waste are a good choice for soil fertilisation, they can have damaging effects on soil biota when applied in excessive doses. In an effort to prevent these toxic impacts on soil, a team of researchers from the UAB's Centre for Ecological Research and Forestry Applications (CREAF) has carried out a test that sets the maximum safe doses for organic fertilisers.

“We based this on bio-trials in the laboratory using soil-based organisms that are representative of agro-ecosystems, and which need to be protected: plants (*Brassica rapa*, *Lolium perenne* and *Trifolium pratense*), earthworms, annelids, collembola and micro-organisms,” the study's lead author Xavier Domene told SINC.

The research, which has been published in the magazine *Environmental Pollution*, shows that the low levels of stability in the residues used is one of the main reasons for their damaging effects on plants and animals. “The rapid decomposition of the residue in the ground generates substances such as ammonia, which is the main cause of the toxic effects observed,” said Domene.

Finding a safe dose

The research group established a “safe dose” for each of the seven residues analysed (two kinds of dehydrated sewage sludge, two kinds of composted mud, two kinds of heat-dried mud, and one sample of heat-dried pig waste).

The researchers believe that using these residues in agricultural fields at levels below this cut-off limit would protect 95% of the species potentially present within an agro-ecosystem. The study goes on to explain that by comparing the safe dose with the amounts usually used it is possible to assess the potential impact on soil biota.

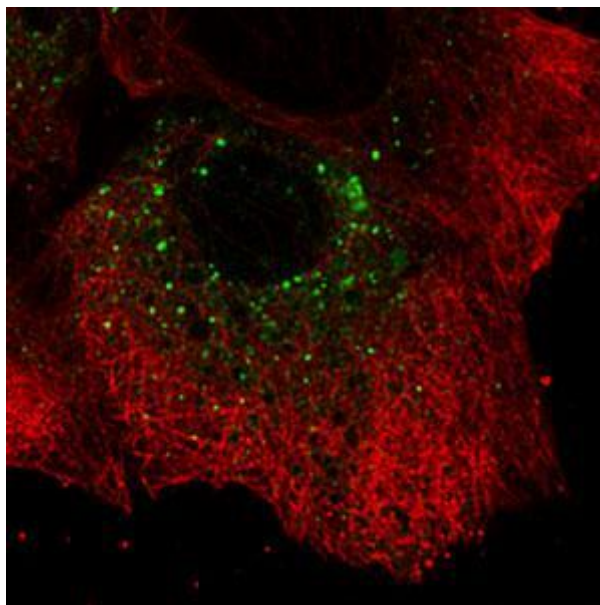
The European Union currently produces a great range of organic residues, using a variety of treatment technologies that minimise their volume and make them easier to handle. According to the researchers, “eco-toxicological criteria should also be included in legislation in order to prevent the environmental impact caused by the use of organic residues”.

Journal reference:

1. Domene et al. **Ecological risk assessment of organic waste amendments using the species sensitivity distribution from a soil organisms test battery.** *Environmental Pollution*, 2008; 155 (2): 227 DOI: [10.1016/j.envpol.2007.12.001](https://doi.org/10.1016/j.envpol.2007.12.001)

*Adapted from materials provided by [Plataforma SINC](#), via [AlphaGalileo](#).
<http://www.sciencedaily.com/releases/2008/10/081030194236.htm>*

By Imaging Live Cells, Researchers Show How Hepatitis C Replicates



Viral campaign. Hepatitis C virus replication complexes (green) in a liver cell. Researchers have found that some of the complexes move around within a cell, traveling along the cell's microtubules (red). (Credit: Image courtesy of Rockefeller University)

ScienceDaily (Oct. 31, 2008) — The hepatitis C virus is a prolific replicator, able to produce up to a trillion particles per day in an infected person by hijacking liver cells in which to build up its viral replication machinery. Now new research — in which scientists have for the first time used fluorescent proteins to image hepatitis C virus replication in live cells — shows that the microscopic viral factories are a diverse mix of big, immobile structures and tiny replication complexes that zip zaniily around inside the cell.

The scientists say their results offer new insights into how this difficult-to-treat virus, and perhaps others in its class, ensures efficient reproduction of itself — knowledge that could help design next-generation treatments.

“There is so much that we don’t know about this virus, so a better understanding of how the pathogen cleverly forms lots of large and small factories to reproduce itself so that it can infect new hosts may be of great benefit,” says study coauthor Benno Wölk, a former postdoctoral researcher in the Rockefeller University Laboratory of Virology and Infectious Disease. He is now a researcher and physician at Hannover Medical School in Germany.

An estimated 170 million people worldwide are chronically infected with hepatitis C, which is a major cause of liver cirrhosis and liver cancer. So progress in understanding and treating the infection is crucial, says the study’s senior investigator, Charles M. Rice, Maurice R. and Corinne P. Greenberg Professor in Virology and director of the Center for the Study of Hepatitis C. “There is no vaccine available for hepatitis C, and current therapies are not always effective because the virus fights back against drugs developed to block replication,” Rice says.

Scientists had until now believed that the virus’s replication process occurred in one or several large complexes inside a cell. It was hard to learn more because in order to see the virus it had to be killed. “Up to this study, researchers have only been able to look at infected cells when they were fixed and

immobile,” Wölk says. “They found areas where the cell membrane was altered and found viral proteins in these structures that suggested that was where replication took place.”

To visualize the replication process, the researchers selected one of the proteins that the hepatitis C virus uses to make its replication factories and fused it to a green fluorescent protein, which emits a green glow when exposed to a specific wavelength of light. They were surprised to see that the small hepatitis C virus replication complexes were transported around the cell. “It’s remarkable that the virus hijacks the cell’s transport machinery to move the viral replication complex around,” Wölk says. “We also learned that for the first several hours after infection only small structures, like dots, formed, which were quickly spread all over the cell. Then the big structures took shape, and they didn’t move.”

The researchers theorize that the small structures are the actual sites of viral replication and that the big structures are clusters of the smaller factories — perhaps formed after the virus has already successfully settled in with the cell. “It is questionable whether the virus even needs the big structures to replicate. They could be performing other functions or they could just represent garbage cans of the cell,” Wölk says. “This is very different from the traditional view.”

Although they can’t say for sure, the group, which also includes Benjamin Büchele of the University of Freiburg in Germany, and Darius Moradpour of the University of Lausanne in Switzerland, suspects that these small, mobile, replication complexes are more efficient and elegant than large structures because they do two things: distribute the factories so that the integrity of the cell is maintained, and keep the complexity of the replication factories to independent, small, manageable units that are easier to control for the virus.

What the researchers discovered in the hepatitis C virus may also prove to be true for related single-strand RNA viruses in the Flaviviridae family, Wölk says. “If that is the case, then we may be able to find a new treatment target for not just one, but many viral infections.”

Journal reference:

1. Wolk et al. **A Dynamic View of Hepatitis C Virus Replication Complexes.** *Journal of Virology*, 2008; 82 (21): 10519 DOI: [10.1128/JVI.00640-08](https://doi.org/10.1128/JVI.00640-08)

Adapted from materials provided by Rockefeller University.
<http://www.sciencedaily.com/releases/2008/10/081030202732.htm>



Quantum Computers? Internet Security Code Of The Future Cracked

ScienceDaily (Nov. 1, 2008) — Researchers at Eindhoven University of Technology (TU/e) in The Netherlands have managed to crack the so-called McEliece encryption system. This system is a candidate for the security of Internet traffic in the age of the quantum computer - the predicted superpowerful computer of the future.

The attack succeeded this month by means of a large number of linked computers throughout the world, says TU/e professor Tanja Lange. Earlier this year she and her PhD student Christiane Peters, together with visiting professor Daniel Bernstein (University of Illinois, Chicago), had discovered a way to speed up attacks against the 30-year-old McEliece cryptosystem. The researchers wrote software that would decrypt a McEliece ciphertext in just 1 week on a cluster of 200 computers.

The software was run recently on several dozen computers in Eindhoven, Amsterdam, France, Ireland, Taiwan and the United States. A lucky computer in Ireland found the ciphertext.

The successful attack was announced recently at a conference in Cincinnati (US) on Post-Quantum Cryptography. The researchers said that the McEliece cryptosystem can be scaled to larger key sizes to avoid their attacks and remains a leading candidate for post-quantum cryptography.

At present, banks use the RSA code from 1977 for securing matters such as electronic transactions. For RSA the currently used key sizes are significantly larger than initially thought: a single PC would need only 3 weeks to break the parameters from the original paper. Yet a quantum computer will have no problems cracking even the improved current version. For this reason, anticipating the introduction of the quantum computer (which Lange thinks will take at least ten more years) and to deal with long-term confidentiality such as health records, researchers are trying to find better encryption systems.

Professor Tanja Lange conducts her research within the Coding theory and Cryptology group of the Department of Mathematics & Computer Science at Eindhoven University of Technology in The Netherlands.

Adapted from materials provided by [Eindhoven University of Technology](http://www.sciencedaily.com/releases/2008/10/081028132303.htm).

Optical Firewall Aims To Clear Internet Security Bottlenecks

ScienceDaily (Nov. 1, 2008) — European researchers are developing the world's first optical firewall capable of analysing data on fibre optic networks at speeds of 40 gigabits per second. Their work promises to save the internet from the looming threat of network security bottlenecks.

As demand for data-intensive services, such as video-on-demand and online gaming increases, telecommunications providers are expanding the high-speed fibre optic networks that form the backbone of the internet. But while network performance has improved, the electronic processes and algorithms used to filter data for security threats are struggling to keep pace.

With demand for data-intensive services only likely to intensify further in the future, bottlenecks seem inevitable unless security processes can be implemented at optical network speeds.

“The amount of data being transmitted can and will get much higher as data-intensive services become more commonplace,” says Graeme Maxwell, the vice-president for Integration Technologies at CIP Technologies in the UK.

“Even with mobile phones, the data sent over 3G networks ends up on a fibre optic cable very quickly, in as little as two or three hops... It's the data analogy of many little streams quickly feeding into a river and causing a massive flood.”

Add to the growth of wireless communications the expansion of fixed-line and cable broadband services in homes and offices, and, according to some estimates, traditional electronic security processes will soon be unable to cope.

“There is a real need for an optical security solution – and that is what we are developing,” Maxwell says.

Working in the EU-funded WISDOM project, Maxwell leads a team of researchers who have demonstrated novel optical circuits capable of searching for and identifying target data patterns at wire speeds of 40Gb/s – the fastest data rate of current commercial networks. Using custom algorithms, their groundbreaking optical firewall looks for patterns in the header content of data packets (the part of the data containing information about the sender, recipient and format) to single out possible viruses, attacks or other threats.

“Our goal is not to replace electronics with optics but to complement existing security processes,” Maxwell notes.

Filtering threats optically

The WISDOM firewall acts as a kind of primary, high-speed filter that routes suspect packets to electronic processes for further analysis. It is able to carry out optical packet recognition, interrogation and manipulation of data streams incorporating features of parity checking, flag status, and header recognition. And, because there is no optical equivalent of electronic memory, the entire process has to be carried out on the fly.

Described as an “optical firewall on a chip”, the system is built on a state-of-the-art hybrid integrated photonic technology platform developed by CIP in which silica-on-silicon circuits form an optical equivalent of an electronic printed circuit board (PCB). Much like a PCB can host different electronic components depending on its intended use, different optical and optoelectronic components can be fitted to the optical circuit board, resulting in a cost-effective and scalable solution.



The hybrid boards can also be fitted with components fit for other uses, with the WISDOM project partners foreseeing applications in sensor systems, avionics, data transmission and optical processing, as well as network security.

“Think about all the applications for today’s electronic PCBs – they are everywhere! Optical boards could have a similar range of uses in the future,” the project coordinator says.

Indeed, Maxwell expects the first commercial application of the boards to be for data transmission over fibre optic networks, with their implementation for network security likely to follow within the next five years.

“The WISDOM project is demonstrating the functionality of an optical firewall, hopefully to the point where we can bring additional manufacturers onboard in a follow-up project,” Maxwell says.

He admits that the idea of an optical firewall is still a new concept to many in the network security sector.

“There are barriers to its acceptance that need to be overcome,” he notes.

However, having survived the bursting of the dot.com bubble eight years ago that led many research groups trying to develop optical security solutions to disband, the research team, which launched the WISDOM project in 2006 with funding from the EU’s Sixth Framework Programme, are well placed to rise to the challenge.

And, with the recent boom in data-intensive services, their solution is likely to be in high demand.

Adapted from materials provided by [ICT Results](#).

<http://www.sciencedaily.com/releases/2008/10/081030194344.htm>



More Hidden Territory On Mercury Revealed By MESSENGER Spacecraft

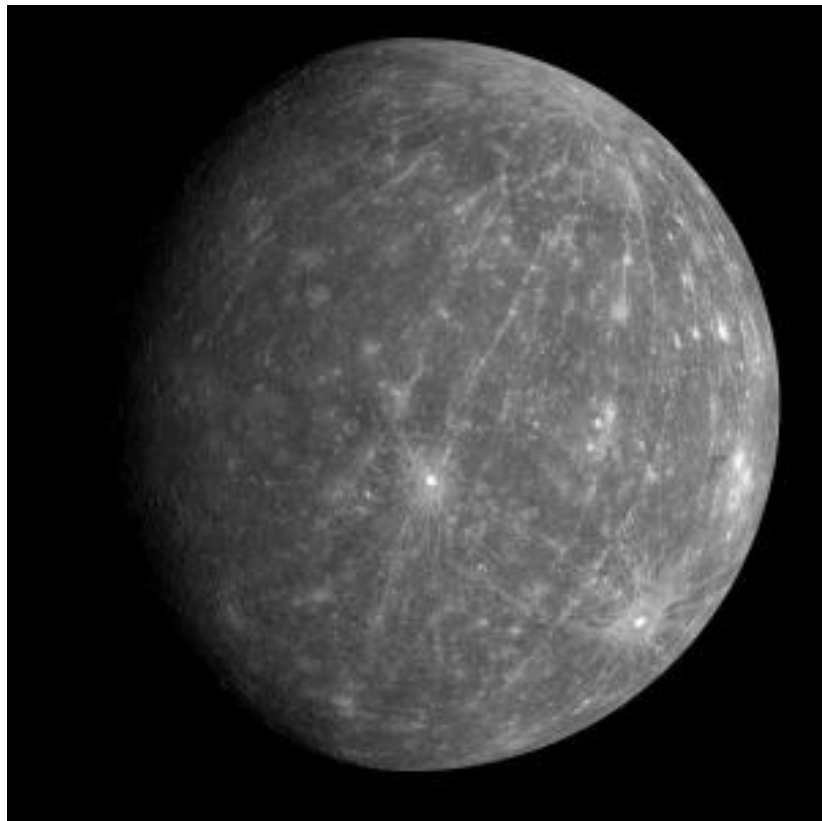


Image of Mercury captured by MESSENGER on the probe's second approach. (Credit: NASA/Johns Hopkins University Applied Physics Laboratory/Carnegie Institution of Washington)

ScienceDaily (Oct. 31, 2008) — A NASA spacecraft gliding over the battered surface of Mercury for the second time this year has revealed more previously unseen real estate on the innermost planet. The probe also has produced several science firsts and is returning hundreds of new photos and measurements of the planet's surface, atmosphere and magnetic field.

The Mercury Surface, Space Environment, Geochemistry, and Ranging, or MESSENGER, spacecraft flew by Mercury shortly after 4:40 a.m. EDT, on Oct. 6. It completed a critical gravity assist to keep it on course to orbit Mercury in 2011 and unveiled 30 percent of Mercury's surface never before seen by a spacecraft.

"The region of Mercury's surface that we viewed at close range for the first time this month is bigger than the land area of South America," said Sean Solomon, principal investigator and director of the Department of Terrestrial Magnetism at the Carnegie Institution of Washington. "When combined with data from our first flyby and from Mariner 10, our latest coverage means that we have now seen about 95 percent of the planet."

The spacecraft's science instruments operated throughout the flyby. Cameras snapped more than 1,200 pictures of the surface, while topography beneath the spacecraft was profiled with a laser altimeter. The comparison of magnetosphere observations from the spacecraft's first flyby in January with data from the probe's second pass has provided key new insight into the nature of Mercury's internal magnetic field and

revealed new features of its magnetosphere. The magnetosphere is the volume surrounding Mercury that is controlled by the planet's magnetic field.

"The previous flybys by MESSENGER and Mariner 10 provided data only about Mercury's eastern hemisphere," explains Brian Anderson of the Johns Hopkins University Applied Physics Laboratory, known as APL, in Laurel, Md. "The most recent flyby gave us our first measurements on Mercury's western hemisphere, and with them we discovered that the planet's magnetic field is highly symmetric."

The probe's Mercury Laser Altimeter, or MLA, measured the planet's topography, allowing scientists, for the first time, to correlate high-resolution topography measurements with high-resolution images.

"The MLA collected altimetry in regions where images from MESSENGER and Mariner 10 data are available, and new images were obtained of the region sampled by the altimeter in January," said Maria Zuber, co-investigator and head of the Department of Earth, Atmospheric, and Planetary Sciences at the Massachusetts Institute of Technology. "These topographic measurements now improve considerably the ability to interpret surface geology."

The Mercury Atmospheric and Surface Composition Spectrometer observed Mercury's thin atmosphere, known as an exosphere. The instrument searched for emissions from sodium, calcium, magnesium, and hydrogen atoms. Observations of magnesium are the first detection of this chemical in Mercury's exosphere. Preliminary analysis suggests that the spatial distributions of sodium, calcium, and magnesium are different. Simultaneous observations of these spatial distributions, also a first for the spacecraft, have opened an unprecedented window into the interaction of Mercury's surface and exosphere.

Spacecraft images also are revealing for the first time vast geologic differences on the surface.

"Now that MESSENGER's cameras have imaged more than 80 percent of Mercury, it is clear that, unlike the moon and Mars, Mercury's surface is more homogeneously ancient and heavily cratered, with large extents of younger volcanic plains lying within and between giant impact basins," said co-investigator Mark Robinson of Arizona State University in Tempe.

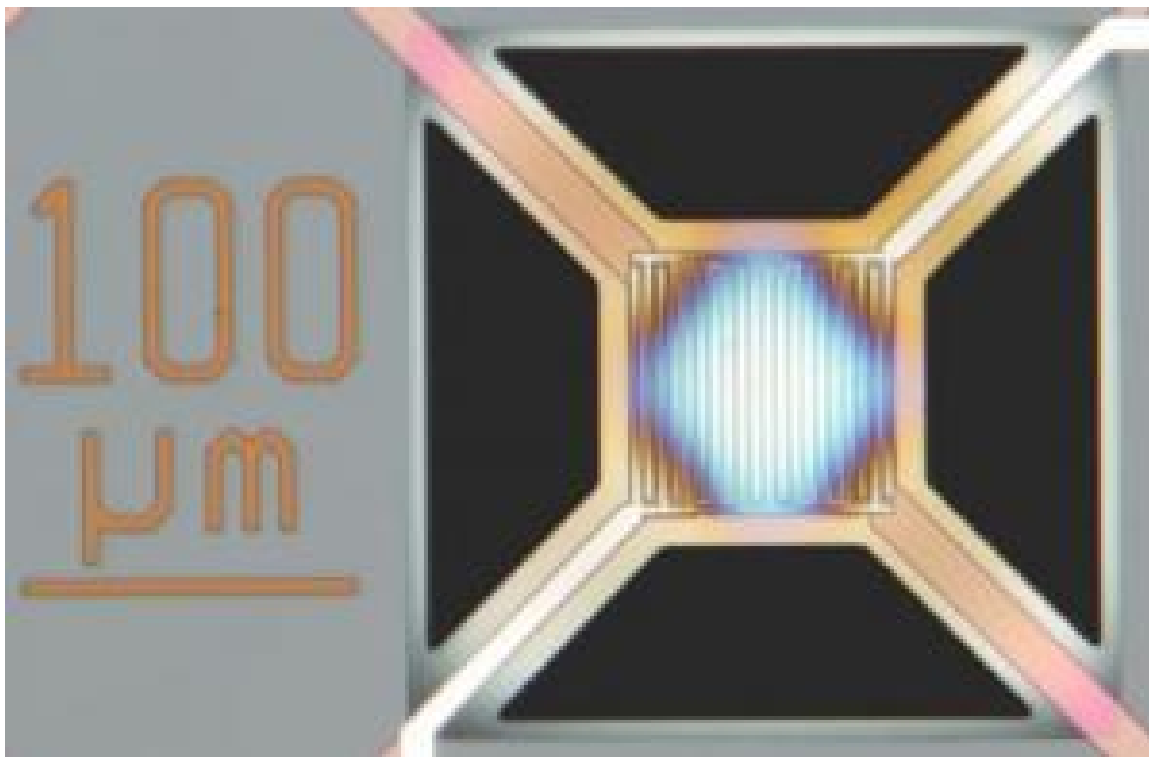
The project is the seventh in NASA's Discovery Program of lower-cost, scientifically focused missions. APL designed, built and operates the spacecraft and manages the mission for NASA's Science Mission Directorate in Washington. Science instruments were built by APL; NASA's Goddard Space Flight Center in Greenbelt, Md.; the University of Michigan, Ann Arbor; and the University of Colorado, Boulder. GenCorp Aerojet of Sacramento, Calif., and Composite Optics Inc. of San Diego, provided the propulsion system and composite structure.

For more information about the Mercury mission, visit: <http://www.nasa.gov/messenger>

Adapted from materials provided by NASA.

<http://www.sciencedaily.com/releases/2008/10/081030091153.htm>

Sniffing Out A Better Chemical Sensor



NIST researchers have developed a new approach for "electronic noses." Comprised of 16 microheater elements and eight types of sensors, the tiny device could be a potent tool for applications such as sniffing out nerve agents, environmental contaminants, and trace indicators of disease, in addition to monitoring industrial processes and aiding in space exploration. (Credit: NIST)

ScienceDaily (Oct. 31, 2008) — Marrying a sensitive detector technology capable of distinguishing hundreds of different chemical compounds with a pattern-recognition module that mimics the way animals recognize odors, researchers at the National Institute of Standards and Technology (NIST) have created a new approach for "electronic noses."

Described in a recent paper, their electronic nose is more adept than conventional methodologies at recognizing molecular features even for chemicals it has not been trained to detect and is also robust enough to deal with changes in sensor response that come with wear and tear. The detector could be a potent tool for applications such as sniffing out nerve agents, environmental contaminants, and trace indicators of disease, in addition to monitoring industrial processes and aiding in space exploration.

In animals, odorant molecules in the air enter the nostrils and bind with sensory neurons in the nose that convert the chemical interactions into an electrical signal that the brain interprets as a smell. In humans, there are about 350 types of sensory neurons and many copies of each type; dogs and mice have several hundreds more types of sensory neurons than that. Odor recognition proceeds in a step-by-step fashion where the chemical identity is gradually resolved: initial coarse information (e.g. ice-cream is fruit-flavored vs. chocolate) is refined over time to allow finer discrimination (strawberry vs. raspberry). This biological approach inspired the researchers to develop a parallel "divide and conquer" method for use with the electronic nose.



The technology is based on interactions between chemical species and semiconducting sensing materials placed on top of MEMS microheater platforms developed at NIST. (See “NIST ‘Microhotplate’ May Help Search for Extraterrestrial Life,” NIST Tech Beat, Oct., 2001.) The electronic nose employed in the current work is comprised of eight types of sensors in the form of oxide films deposited on the surfaces of 16 microheaters, with two copies of each material. Precise control of the individual heating elements allows the scientists to treat each of them as a collection of “virtual” sensors at 350 temperature increments between 150 to 500 °C, increasing the number of sensors to about 5,600. The combination of the sensing films and the ability to vary the temperature gives the device the analytical equivalent of a snout full of sensory neurons.

Much like people detect and remember many different smells and use that knowledge to generalize about smells they haven’t encountered before, the electronic nose also needs to be trained to recognize the chemical signatures of different smells before it can deal with unknowns. The great advantage of this system, according to NIST researchers Barani Raman and Steve Semancik, is that you don’t need to expose the array to every chemical it could come in contact with in order to recognize and/or classify them. Breaking the identification process down into simple, small, discrete steps using the most information rich data also avoids ‘noisy’ portions of the sensor response, thereby incorporating robustness against the effects of sensor drift or aging.

The researchers say that they are continuing to work on applications involving rapid identification of chemicals in unknown backgrounds or in a complex cocktail.

Journal reference:

1. Raman et al. **Bioinspired Methodology for Artificial Olfaction**. *Analytical Chemistry*, October 15, 2008 DOI: [10.1021/ac8007048](https://doi.org/10.1021/ac8007048)

Adapted from materials provided by National Institute of Standards and Technology.
<http://www.sciencedaily.com/releases/2008/10/081029181602.htm>



Clues To Planets' Birth Discovered In Meteorites



A picture of the first discovered (and therefore eponymous) angrite "Angra dos Reis"; which was observed to fall from the sky in 1869 near the town of Angra dos Reis in Brazil. The black; shiny face was produced from melting of the meteorite's surface during passage through Earth's atmosphere. Scale bar is in centimeters. (Credit: Photo courtesy / Maria Zucolotto (Museu Nacional; Brasil))

ScienceDaily (Oct. 31, 2008) — Meteorites that are among the oldest rocks ever found have provided new clues about the conditions that existed at the beginning of the solar system, solving a longstanding mystery and overturning some accepted ideas about the way planets form.

The ancient meteorites, like disk drives salvaged from an ancient computer, still contain magnetic records about the very early history of planets, according to research by MIT planetary scientist Benjamin P. Weiss.

Weiss, the Victor P. Starr Career Development Assistant Professor of Planetary Sciences in the Department of Earth, Atmospheric and Planetary Sciences, and his five co-authors examined pieces of three meteorites called angrites, which are among the most ancient rocks known. The results of their study are being published in *Science* on Oct. 31.

The analysis showed that surprisingly, during the formation of the solar system, when dust and rubble in a disk around the sun collided and stuck together to form ever-larger rocks and eventually the planets we know today, even objects much smaller than planets — just 160 kilometers across or so — were large enough to melt almost completely.

This total melting of the planet-forming chunks of rock, called planetesimals, caused their constituents to separate out, with lighter materials including silicates floating to the surface and eventually forming a crust, while heavier iron-rich material sank down to the core, where it began swirling around to produce a magnetic dynamo. The researchers were able to study traces of the magnetic fields produced by that dynamo, now recorded in the meteorites that fell to Earth.

"The magnetism in meteorites has been a longstanding mystery," Weiss said, and the realization that such small bodies could have melted and formed magnetic dynamos is a major step toward solving that riddle.

Until relatively recently, it was commonly thought that the planetesimals — similar to the asteroids seen in the solar system today — that came together to build planets were "just homogenous, unmelted rocky material, with no large-scale structure," Weiss said. "Now we're realizing that many of the things that were forming planets were mini-planets themselves, with crusts and mantles and cores."

That could change theorists' picture of how the planets themselves took shape. If the smaller bodies were already molten as they slammed together to build up larger planet-sized bodies, that could "significantly change our understanding" of the processes that took place in the early years of the nascent planets, as their internal structures were forming, Weiss said. This could have implications for how different minerals are distributed in the Earth's crust, mantle and core today, for example.

"In the last five or 10 years," Weiss said, "our understanding of the early history of the solar system has undergone a sort of mini-revolution, driven by analytical advances in geochemistry. In this study we used a geophysical technique to independently test many of these new ideas. "

"Events happened surprisingly fast at the beginning of the solar system," he said. Some of the angrite meteorites in this study formed just 3 million years after the birth of the solar system itself, 4,568 million years ago, and show signs that their parent body had a magnetic field that was 20 to 40 percent as strong as Earth's today. "We are used to thinking of dynamo magnetic fields in rocky bodies as uncommon phenomena today. But it may be that short-lived planetesimal dynamos were widespread in the early solar system."

The paper was co-authored by Mitsui Career Development Assistant Professor of Geology Linda Elkins-Tanton, research scientist Eduardo A. Lima, postdoctoral researcher Laurent Carpozen, student James S. Berdahl, and Sabine Stanley, assistant professor of physics at the University of Toronto. The work was supported by a grant from the National Science Foundation's Instrumentation and Facilities Program.

Adapted from materials provided by [Massachusetts Institute of Technology](http://www.sciencedaily.com/releases/2008/10/081030144626.htm).
<http://www.sciencedaily.com/releases/2008/10/081030144626.htm>

Scientists Identify Machinery That Helps Make Memories

ScienceDaily (Nov. 1, 2008) — A major puzzle for neurobiologists is how the brain can modify one microscopic connection, or synapse, at a time in a brain cell and not affect the thousands of other connections nearby. Plasticity, the ability of the brain to precisely rearrange the connections between its nerve cells, is the framework for learning and forming memories.

Duke University Medical Center researchers have identified a missing-link molecule that helps to explain the process of plasticity and could lead to targeted therapies.

The discovery of a molecule that moves new receptors to the synapse so that the neuron (nerve cell) can respond more strongly helps to explain several observations about plasticity, said Michael Ehlers, M.D., Ph.D., a Duke professor of neurobiology and senior author of the study published in the Oct. 31 issue of *Cell*. "This may be a general delivery system in the brain and in other types of cells, and could have significance for all cell signaling."

Ehlers said this could be a general way for all cells to locally modify their membranes with receptors, a process critical for many activities -- cell signaling, tumor formation and tissue development.

"Part of plasticity involves getting receptors to the synaptic connections of nerve cells," Ehlers said. "The movement of neurotransmitter (chemical) receptors occurs through little packages that deliver molecules to the synapse when new memories form. What we have discovered is the molecular motor that moves these packages when synapses are active."

When neurons fire at the same time, their connections strengthen and a person can associate certain features. "Once you have heard someone's name, seen his face, where he was standing, all these features can be bound into a unified packet of information – a percept – and at a very cellular level this occurs by strengthening synaptic connections between co-active neurons," said Ehlers, who is also a Howard Hughes Medical Investigator.

To learn and make new associations, the brain alters the strengths of the synapses' electrical inputs onto cells that compute these features. Scientists studied the hippocampus, where memories form, but this machinery could operate in other brain areas.

"One of earliest changes in Alzheimer's disease is synapse dysfunction, so this molecule might be a new target for that disease," he said. "Abnormal movement of receptors may be implicated in brain development, in autism." He said the molecule potentially is involved "in the abnormal electrical activity of epilepsy and the overactive brain pathways of addiction."

In a series of biochemistry and microscopic imaging experiments, Ehlers and colleagues found that the myosin Vb (five-b) molecule in hippocampal neurons responded to a flow of calcium ions from the synaptic space by popping up and into action. One end of the myosin is attached the meshlike actin filaments so it can "walk" to the end of the nerve cells where receptors are. On its other end, it tows an endosome, a packet that contains new receptors.

"These endosomes are like little memories waiting to happen," Ehlers said. "They are reservoirs of neurotransmitter receptors that brain cells deploy to add more receptors to a particular synapse. More receptors equals stronger synapses."

Electrical impulses cause one nerve cell to dump its neurotransmitter, in this case, glutamate, into the small space between neurons (the synapse), which activates neurotransmitter receptors on the receiving side. These are ion channels that open in response to neurotransmitter and generate the electrical impulse.



When the scientists blocked myosin in single cells, this stopped the addition of new receptors and prevented electrical impulses from getting stronger, showing that myosin is essential to enhancing nerve cell connections.

"This is a very basic cellular mechanism of brain plasticity. It is likely fundamental to brain development and disease," Ehlers said. "The myosin Vb molecule gives us a new way to think about designing therapies for treating memory loss, psychiatric disease and brain development."

Other authors included Zhiping Wang and Ian G. Davidson of the Duke Department of Neurobiology and the Howard Hughes Medical Institute (HHMI); Jeffrey G. Edwards, Nathan Riley and Julie A. Kauer of the Department of Molecular Pharmacology, Physiology, and Biotechnology at Brown University; D. William Provance Jr., Ryan Karcher and John A. Mercer of the McLaughlin Research Institute in Great Falls, Montana; and Xiang-dong Li and Mitsuo Ikebe of the Department of Physiology, University of Massachusetts Medical School. The work was supported by grants from the National Institutes of Health and the HHMI.

Adapted from materials provided by Duke University Medical Center.
<http://www.sciencedaily.com/releases/2008/10/081030123821.htm>



Evidence Of Tsunamis On Indian Ocean Shores Long Before 2004



Kruawun Jankaew led a team of geologists who unearthed evidence that tsunamis have repeatedly washed over a Thai island during the last 2,800 years. (Credit: Brian Atwater)

ScienceDaily (Oct. 31, 2008) — A quarter-million people were killed when a tsunami inundated Indian Ocean coastlines the day after Christmas in 2004. Now scientists have found evidence that the event was not a first-time occurrence.

A team working on Phra Thong, a barrier island along the hard-hit west coast of Thailand, unearthed evidence of at least three previous major tsunamis in the preceding 2,800 years, the most recent from about 550 to 700 years ago. That team, led by Kruawun Jankaew of Chulalongkorn University in Thailand, included Brian Atwater, a University of Washington affiliate professor of Earth and space sciences and a U.S. Geological Survey geologist.

A second team found similar evidence of previous tsunamis during the last 1,200 years in Aceh, a province at the northern tip of the Indonesian island of Sumatra where more than half the deaths from the 2004 tsunami occurred.

Sparse knowledge of the region's tsunami history contributed to the loss of life in 2004, the scientists believe. Few people living along the coasts knew to heed the natural tsunami warnings, such as the strong shaking felt in Aceh and the rapid retreat of ocean water from the shoreline that was observed in Thailand.

But on an island just off the coast of Aceh most people safely fled to higher ground in 2004 because the island's oral history includes information about a devastating tsunami in 1907.

"A region's tsunami history can serve as a long-term warning system," Atwater said.

The research will reinforce the importance of tsunami education as an essential part of early warning, said Jankaew, the lead author.

"Many people in Southeast Asia, especially in Thailand, believe, or would like to believe, that it will never happen again," Jankaew said. "This will be a big step towards mitigating the losses from future tsunami events."

The team found evidence for previous tsunamis by digging pits and auguring holes at more than 150 sites on an island about 75 miles north of Phuket, a Thai tourist resort area ravaged by the 2004 tsunami. That tsunami was generated 300 miles to the west when the seafloor was warped during a magnitude 9.2 earthquake.

At 20 sites in marshes, the researchers found layers of white sand about 4 inches thick alternating with layers of black peaty soil. Witnesses confirmed that the top sand layer, just below the surface, was laid down by the 2004 tsunami, which ran 20 to 30 feet deep across much of the island.

Radiocarbon dating of bark fragments in soil below the second sand layer led the scientists to estimate that the most recent predecessor to the 2004 tsunami probably occurred between A.D. 1300 and 1450. They also noted signs of two earlier tsunamis during the last 2,500 to 2,800 years.

There are no known written records describing an Indian Ocean tsunami between A.D. 1300 and 1450, including the accounts of noted Islamic traveler Ibn Battuta and records of the great Ming Dynasty armadas of China, both of which visited the area at different times during that period. Atwater hopes the new geologic evidence might prompt historians to check other Asian documents from that era.

"This research demonstrates that tsunami geology, both recent and past tsunamis, can help extend the tsunami catalogues far beyond historical records," Jankaew said. The new findings also carry lessons for the northwest coast of North America, where scientists estimate that many centuries typically elapse between catastrophic tsunamis generated by the Cascadia subduction zone.

"Like Aceh, Cascadia has a history of tsunamis that are both infrequent and catastrophic, and that originate during earthquakes that provide a natural tsunami warning," Atwater said. "This history calls for sustained efforts in tsunami education." Findings from both teams are published in the Oct. 30 edition of *Nature*.

Other co-authors of the Thai paper are Yuki Sawai of the Geological Survey of Japan, Montri Choowong and Thasinee Charoentitirat of Chulalongkorn University, Maria Martin of the UW and Amy Prendergast of Geoscience Australia.

The research was funded by the U.S. Agency for International Development, Thailand's Ministry of Natural Resources and Environment, the U.S. National Science Foundation, the Japan Society for the Promotion of Science and the Thailand Research Fund.

Adapted from materials provided by [University of Washington](http://www.sciedaily.com/releases/2008/10/081029141037.htm).

<http://www.sciedaily.com/releases/2008/10/081029141037.htm>

Interferon Could Be A Key To Preventing Or Treating Multiple Sclerosis

ScienceDaily (Nov. 1, 2008) — Multiple sclerosis (MS) results when the body's own defense system attacks nerve fibers in the brain and spinal cord. Now scientists led by John Russell, Ph.D., at Washington University School of Medicine in St. Louis have shown that interferon-gamma plays a deciding role in whether immune cells attack and injure the central nervous system (brain and spinal cord) in mice.

Interferon-gamma is an immune system protein that helps the body defend itself from invaders. In their latest research, which appeared in the October issue of the *Journal of Experimental Medicine*, the researchers show that interferon-gamma determined whether activated immune cells — previously primed to go after nerve cells — would actually cause nerve damage in experimental mice.

The researchers found that in the cerebellums and brainstems of the mice, interferon-gamma was protective. However, in the spinal cord, interferon-gamma had the opposite effect, permitting nerve cell damage.

"Some studies show that the most serious cases of MS in people occur when the immune system specifically targets the cerebellum, a part of the brain responsible for sensory perception, coordination and movement control," says Russell, professor of developmental biology. "Our study suggests that researchers need to look at the amount of interferon-gamma produced in the cerebellum and other brain regions in people with MS."

The researchers studied mice genetically engineered to be physiologically "blind" to interferon-gamma — the mice had none of the usual receptors on their cells that recognize and respond to interferon-gamma. So in these mice it was as though interferon-gamma didn't exist.

In the interferon-insensitive mice, immune cells primed to attack nerves and then injected into the mice's veins were able to get into the cerebellum and brain stem and initiate nerve cell damage leading to MS-like disease.

In comparison, in mice with normal interferon-gamma recognition, immune cells were prevented from entering the brain and causing problems. The exact mechanism to account for this is still under study.

"Down the road, we would like to investigate whether we can prevent disease in the cerebellum in mice if we promote interferon production in that brain region," Russell says. "One way to do that would be to use gene therapy to insert a gene that would increase interferon in the mice's brains. Then we would test the mice to see if they gained protection against MS-like disease."

In contrast to its protective role in the brain, in the spinal cord interferon-gamma helped instigate nerve damage. In mice with intact interferon-gamma recognition, activated and injected immune cells were able to enter the spinal cord and cause injury. In mice without interferon recognition, the immune cells were unable to initiate spinal cord inflammation, and no damage occurred.

"Our research shows that certain characteristics inherent in different regions of the brain and spinal cord can provoke immune attacks on nerve cells," Russell says. "An understanding of the mechanisms involved in immune system invasion of the nervous system may allow development of better models for determining prognosis and treating many neurological diseases such as multiple sclerosis."

This latest research bolsters Russell's central hypothesis about MS and related disorders, which goes against some widely held assumptions. He holds that in physiological circumstances that ultimately lead to MS, the central nervous system itself allows or even aids immune system attacks.



"A scientifically popular view of how MS occurs is that the immune system somehow gets armed against normal brain antigens and attacks neurons," Russell says. "In that view, brain cells have a passive role. But in this and previous research, we've shown that there's a 'conversation' between the immune system and the central nervous system and that molecular signals passed between them are involved in the development of MS-like disease in mice."

Funding from the National Multiple Sclerosis Society and the National Institutes of Health supported this research.

Journal reference:

1. Lees JR, Golumbek PT, Sim J, Dorsey D, Russell JH. **Regional CNS responses to IFN- γ determine lesion localization patterns during EAE pathogenesis.** *Journal of Experimental Medicine*, 2008 Oct 27;205(11):2633-2642

Adapted from materials provided by Washington University School of Medicine.
<http://www.sciencedaily.com/releases/2008/10/081030111001.htm>





Cell Changes Leading To Impaired 'Artificial Kidney' Function Identified

ScienceDaily (Nov. 1, 2008) — Molecular targets identified by a Spanish research team may hold the key to freedom for some sufferers of kidney disease. A new study published in *Disease Models & Mechanisms* (DMM) reveals the cellular signals which cause one treatment for kidney failure to lose its usefulness over time.

One of the most devastating aspects of kidney failure is the strict, time-consuming treatment regimen. Normally, healthy kidneys take on the role of filtering and cleaning the blood. Therefore patients with diseased kidneys traditionally need to attend a dialysis clinic to have their blood cleaned through a special filter. This treatment requires three regular clinic visits per week, with each session lasting three to five hours.

An alternative to this treatment involves creation of an "artificial kidney" in a process known as peritoneal dialysis (PD). Fluid is inserted into the abdominal cavity, and the blood vessel-rich cavity lining, the peritoneum, acts as a filter for the blood. Exchanges of dialysis fluid can take place at home, thus freeing patients of a rigid schedule of clinic visits.

However, the filtration ability of the peritoneum can lose efficiency over time, requiring patients to discontinue PD. In order to understand this change in the peritoneum, scientists Raffaele Strippoli, Miguel del Pozo and colleagues examined the dialysis fluid from PD patients, and identified molecular signals that cause abnormal changes in the peritoneum. They also found that pharmacologically disrupting these signals causes these abnormal cells to revert back to their original state, as they normally existed in the abdominal cavity lining.

These findings support further research on maintaining the effectiveness of PD, and indicate that perhaps even former PD patients could once again have an option to use PD rather than traditional hemodialysis. Additionally, the cellular changes studied in the peritoneum are similar to cell transformations in tumor formation and inflammation. Their findings may aid in greater understanding of cell change in these situations, as well.

Commentary on this work by researchers Raffaele Strippoli and Miguel del Pozo will be featured in the DMM Podcast for issue 4/5 of DMM. Podcasts are available via the DMM website at: dmm.biologists.org.

The report was written by Raffaele Strippoli, Ana Cerzero, and Miguel del Pozo of the Centro Nacional de Investigaciones (CNIC) and Ignacio Benedicto, Maria Luisa Pérez Lozano, and Manuel López-Cabrera of the Hospital Universitario de la Princesa, in Madrid, Spain. The report was published in the November/December issue of a new research journal, *Disease Models & Mechanisms* (DMM), published by The Company of Biologists, a non-profit based in Cambridge, UK.

Adapted from materials provided by The Company of Biologists, via EurekaAlert!, a service of AAAS.
<http://www.sciencedaily.com/releases/2008/10/081028074321.htm>



'Old Blood' Linked To Infection

ScienceDaily (Nov. 1, 2008) — Blood stored for 29 days or more, nearly 2 weeks less than the current standard for blood storage, is associated with a higher infection rate in patients who received transfusions with the blood. In a new study presented at CHEST 2008, the 74th annual international scientific assembly of the American College of Chest Physicians (ACCP), researchers found that patients who received transfusions with blood stored for 29 days or more were twice as likely to suffer from nosocomial infections, including pneumonia, upper respiratory infections, and sepsis, with the oldest blood being associated with the most infections.

Currently, federal regulations allow red blood cells to be stored up to 42 days, after which they must be discarded. “Stored red blood cells undergo changes that promote the release of a number of biochemical substances called cytokines, which can depress the recipients’ immune function and leave them more susceptible to infection,” said study author Raquel Nahra, MD, who conducted her research while at Cooper University Hospital, Camden, NJ. “Those changes start around 14 days of storage and reach a maximum after the blood is discarded at 42 days.”

Researchers from Cooper University Hospital examined the association between the age of packed red blood cells and the development of nosocomial infections (NOSO) in 422 patients receiving blood transfusions who were admitted to an ICU from July 2003 to September 2006. Researchers performed an analysis of the age of the first unit of blood, age of the “oldest” unit of blood (OL), the average age of the unit of blood, and the outcome of NOSO.

“Previous data indicate that the average age of transfused blood is around 17 days old,” said Dr. Nahra. “In our study, the average age of blood was 26 days, and 70 percent of all the blood transfused was older than 21 days, suggesting that a large pool of available blood is old blood with higher levels of cytokines and more potential for an immunosuppressive effect.” The analysis showed that 11 percent of patients died, while 57 patients (13.5 percent) developed NOSO: 32 patients developed one NOSO, 21 developed two NOSO, and 4 developed 3 NOSO. Patients who developed NOSO had a significantly higher OL (28.5 days vs. 32 days), and a significantly greater number of units of blood (2 U vs. 3 U). Patients who received transfusions with blood that was 29 days or older were twice as likely to develop NOSO as those receiving transfusions with blood stored for 28 days or less. When the outcome of “at least one infection” was analyzed, a higher number of units of blood (>5 U) was found to be an independent predictor of infection. Furthermore, while the age of the first unit of blood transfused appeared to be associated with the development of infection, the age of the oldest unit showed the strongest relationship.

Many institutions, including Dr. Nahra’s, use the oldest available blood first, to ensure that it does not go to waste. Researchers speculate that if strict regulation of blood storage were to occur (ie, shorter maximum storage allowance), the overall blood supply may decrease. “More cautious utilization of blood might help to alleviate, at in least part, a diminished blood supply that might result from such a change in policy,” said study director and senior investigator David Gerber, DO, Cooper University Hospital. “More studies are needed, and the overall implications of any such potential changes need to be formally assessed before any major changes in blood storage policy can be proposed.” “The results of this study raise questions about current blood storage standards and transfusion practices and suggest additional research is needed in these areas,” said James A. L. Mathers, Jr., MD, FCCP, President of the American College of Chest Physicians.

Adapted from materials provided by American College of Chest Physicians.
<http://www.sciencedaily.com/releases/2008/10/081028102818.htm>

'Living Fossil' Tree Contains Genetic Imprints Of Rain Forests Under Climate Change



*The distinctive trunk and aerial roots of the tropical tree *Symphonia globulifera* in a rain forest in Panama. (Credit: Rolando Pérez, Smithsonian Tropical Research Institute)*

ScienceDaily (Oct. 31, 2008) — A "living fossil" tree species is helping a University of Michigan researcher understand how tropical forests responded to past climate change and how they may react to global warming in the future.

The research appears in the November issue of the journal *Evolution*.

Symphonia globulifera is a widespread tropical tree with a history that goes back some 45 million years in Africa, said Christopher Dick, an assistant professor of ecology and evolutionary biology who is lead author on the paper. It is unusual among tropical trees in having a well-studied fossil record, partly because the oil industry uses its distinctive pollen fossils as a stratigraphic tool.

About 15 to 18 million years ago, deposits of fossil pollen suggest, *Symphonia* suddenly appeared in South America and then in Central America. Unlike kapok, a tropical tree with a similar distribution that Dick also has studied, *Symphonia* isn't well-suited for traveling across the ocean—its seeds dry out easily and can't tolerate saltwater. So how did *Symphonia* reach the neotropics? Most likely the seeds hitched rides from Africa on rafts of vegetation, as monkeys did, Dick said. Even whole trunks, which can send out shoots when they reach a suitable resting place, may have made the journey. Because Central and South American had no land connection at the time, *Symphonia* must have colonized each location separately.



Once *Symphonia* reached its new home, it spread throughout the neotropical rain forests. By measuring genetic diversity between existing populations, Dick and coworker Myriam Heuertz of the Université Libre de Bruxelles were able to reconstruct environmental histories of the areas *Symphonia* colonized.

"For Central America, we see a pattern in *Symphonia* that also has been found in a number of other species, with highly genetically differentiated populations across the landscape," Dick said. "We think the pattern is the result of the distinctive forest history of Mesoamerica, which was relatively dry during the glacial period 10,000 years ago. In many places the forests were confined to hilltops or the wettest lowland regions. What we're seeing in the patterns of genetic diversity is a signature of that forest history."

In the core Amazon Basin, which was moist throughout the glacial period, allowing for more or less continuous forest, less genetic diversity is found among populations, Dick said. "There's less differentiation across the whole Amazon Basin than there is among sites in lower Central America."

The study is the first to make such comparisons of genetic diversity patterns in Central and South America. "We think similar patterns will be found in other widespread species," Dick said.

Learning how *Symphonia* responded to past climate conditions may be helpful for predicting how forests will react to future environmental change, Dick said.

"Under scenarios of increased warmth and drying, we can see that populations are likely to be constricted, particularly in Central America, but also that they're likely to persist, because *Symphonia* has persisted throughout Central America and the Amazon basin. That tells us that some things can endure in spite of a lot of forest change. However, past climate changes were not combined with deforestation, as is the case today. That combination of factors could be detrimental to many species—especially those with narrow ranges—in the next century."

The researchers received funding from the National Science Foundation and the National Fund for Scientific Research of Belgium.

Adapted from materials provided by [University of Michigan](http://www.sciencedaily.com/releases/2008/10/081030192853.htm).

<http://www.sciencedaily.com/releases/2008/10/081030192853.htm>



Behavioral Link Between Breastfeeding And Lower Risk Of Childhood Obesity

ScienceDaily (Nov. 1, 2008) — Breastfeeding has a number of positive health benefits for baby: it can prevent ear infections and allergies, and lowers the risk of developing respiratory problems. It can also help prevent against obesity later in life, but the reason for this still isn't known.

In an effort to find this link, Katherine F. Isselmann, M.P.H., a doctoral candidate in Temple's department of public health, has been comparing the feeding habits of mothers who breastfed their babies and mothers who bottle fed their babies, and has also examined the eating habits of their pre-school aged children.

In preliminary research presented at this year's American Public Health Association annual meeting on Oct. 28, Isselmann and faculty members in the department of public health at the College of Health Professions surveyed more than 120 mothers on whether they had breastfed or bottle-fed their babies, using either pumped breast milk or formula.

They found breastfed children could more easily determine when they were full. Children who were bottle-fed with pumped breast milk were less likely to respond to the feeling of being full by the time they were preschool-aged. Also, children who had a lower response to fullness had a higher body mass index (BMI).

According to Isselmann, these results suggest a behavioral link between breastfeeding and obesity prevention, in that children who are breastfed grow to have more positive eating behaviors, which could help prevent obesity later in life.

"Mothers who bottle feed often focus on a set amount of ounces per day or time schedule for feeding," said Isselmann. "This could lead mothers to rely more on the bottle for feedback than on the infant's cues of fullness and hunger."

She says with breast-feeding, the ability to measure in ounces how much a baby has eaten isn't there, so mothers can become more in tune with when their babies are done eating and babies are able to develop their own internal cues to signal when they feel full.

While some women may choose not to breastfeed, Isselmann says it's important to encourage mothers who bottle-feed to adopt more infant-focused feeding habits exhibited by mothers who breastfeed.

"The theory of 'x ounces per day' isn't set in stone for growing babies. Some days they may need more food, other days they may need less," said Isselmann.

Other authors on this study are Bradley Collins, Ph.D., Deborah Nelson, Ph.D, and Brian Daly, Ph.D., of the department of public health at Temple University.

Adapted from materials provided by Temple University, via EurekaAlert!, a service of AAAS.
<http://www.sciencedaily.com/releases/2008/10/081028074319.htm>

Pneumococcal Vaccine Could Prevent Numerous Deaths, Save Costs During A Flu Pandemic, Model Predicts

ScienceDaily (Oct. 31, 2008) — A new predictive model shows that vaccinating infants with 7 valent pneumococcal conjugate vaccine (PCV7)--the current recommendation--not only saves lives and money during a normal flu season by preventing related bacterial infections; it also would prevent more than 357,000 deaths during an influenza pandemic, while saving \$7 billion in costs.

Keith P. Klugman, PhD, professor of global health at Emory University's Rollins School of Public Health, will present results of the research using the predictive model at the joint ICAAC/IDSA meeting in Washington, DC, Oct. 25-28. (Interscience Conference on Antimicrobial Agents and Chemotherapy/Infectious Disease Society of America.)

Bacterial infections, particularly pneumococcal disease, can follow a viral illness such as flu and cause secondary infections that worsen flu symptoms and increase influenza-related risk. Bacterial infections may have been the cause of nearly half of the deaths of young soldiers during the 1918 flu pandemic.

"We've known for years that bacterial infections can develop after influenza," says Klugman. "Unlike the 1918 flu pandemic, which preceded the antibiotic era, we now have vaccines that can prevent these types of pneumococcal infections. This model shows what a dramatically different outcome we could expect with standard PCV vaccination."

Klugman and colleagues at Harvard University, i3 Innovus in Medford, Ma. and Wyeth Research constructed a model to estimate the public health and economic impact of current pneumococcal vaccination practices in the context of an influenza pandemic.

Since 2000 the Centers for Disease Control and Prevention (CDC) Immunization Practices Advisory Committee (ACIP) has been recommending PCV vaccinations for infants and children.

The new predictive model was used to compare the results of no PCV vaccination to the current routine vaccination of infants less than two years old. The researchers assessed the effect of vaccination policies under both normal and pandemic influenza conditions. They included both direct vaccination effects in vaccinated individuals and indirect vaccination effects (called herd immunity) in the unvaccinated. For manifestations of pneumococcal disease, they included invasive pneumococcal disease (meningitis or bacteremia), all-cause pneumonia and all-cause acute otitis media (ear infections). The model's estimates were based on the 1918 pandemic.

The new model predicted that current pneumococcal vaccination practices reduce costs in a typical flu season by \$1.4 billion and would reduce costs by \$7 billion in a pandemic. In a pandemic, they would prevent 1.24 million cases of pneumonia and 357,000 pneumococcal-related deaths.

"Our research shows that routine pneumococcal vaccination is a proactive approach that can greatly reduce the effects of a future flu pandemic," says Klugman. Countries that have not yet implemented a pneumococcal vaccination program may want to consider this as part of their pandemic flu preparedness."

The research was funded by Wyeth Research. Dr. Klugman is a paid consultant for Wyeth Pharmaceuticals.

*Adapted from materials provided by [Emory University](#), via [EurekAlert!](#), a service of AAAS.
<http://www.sciencedaily.com/releases/2008/10/081028184742.htm>*

Predicting Evolution's Next Best Move With Simulator

ScienceDaily (Oct. 31, 2008) — Biologists today are doing what Darwin thought impossible. They are studying the process of evolution not through fossils but directly, as it is happening. Now, by modeling the steps evolution takes to build, from scratch, an adaptive biochemical network, biophysicists Eric D. Siggia and Paul Francois at Rockefeller University have gone one step further. Instead of watching evolution in action, they show that they can predict its next best move.

In Darwinian evolution, even the slightest, infinitesimal beginnings can lead to tools as complex as the human eye. But how do innovations like these get started and propagated by natural selection when their raw material is merely individual random genetic mutations? By looking at the series of mutations in evolutionary space, Siggia, head of the Laboratory of Theoretical Condensed Matter Physics and Paul Francois, a postdoc in his lab, now provide a computational answer to one of Darwin's biggest questions.

In this evolutionary space, Francois and Siggia instructed their algorithm to find a network that worked very much like an eye after adjusting to different levels of light. "The eye is a very good example of adaptation," says Francois. "It admits different amounts of light when light levels change, and after some period of adjustment, your eyes work equally well as before. That's what we selected for; we instructed our algorithm to find a network that after responding to some input, always comes back to its initial value, or level of working. That's perfect adaptation."

To find this network, the algorithm, like Darwinian evolution, showed no mercy. During each generation, the algorithm randomly added, deleted or changed the features of genes in a population of gene networks and selected only those that were the most fit, and thus most likely to reproduce. After duplicating the fittest networks in each generation, it repeated the process of mutation, selection and duplication over and over again until it eventually arrived at the network that adapted perfectly to a random biochemical input.

Francois and Siggia found that certain mutations automatically increased a network's fitness and thus were immediately selected. "When you look at systems like the eye or structures like the human spinal cord, you think how could these have evolved from a simple network," says Francois. In their current study, Siggia and Francois looked at how a complex biochemical network could evolve, and an answer came together: It is built through a specific series of mutations that is repeated over and over again, from scratch, every time they restart their simulations.

"So this is really the idea," says Francois. "From one step to the next, you know, more or less, evolution's next best move. In our simulations, that's what we see."

Reference: Physical Biology: June 1, 2008, 5 026009

Adapted from materials provided by Rockefeller University.
<http://www.sciencedaily.com/releases/2008/10/081030201857.htm>

Mysterious Bat Disease Decimates Colonies: Newly Identified Fungus Implicated In White-nose Syndrome



Little brown bat with fungus on muzzle. (Credit: Al Hicks, NY DEC)

ScienceDaily (Oct. 31, 2008) — A previously undescribed, cold-loving fungus has been linked to white-nose syndrome, a condition associated with the deaths of over 100,000 hibernating bats in the northeastern United States. The findings are published in this week's issue of Science.

The probable cause of these bat deaths has puzzled researchers and resource managers urgently trying to understand why the bats were dying in such unprecedented numbers. Since the winter of 2006-07, bat declines at many surveyed hibernation caves exceeded 75 percent.

The fungus – a white, powdery-looking organism – is commonly found on the muzzles, ears and wings of afflicted dead and dying bats, though researchers have not yet determined that it is the only factor causing bats to die. Most of the bats are also emaciated, and some of them leave their hibernacula – winter caves where they hibernate – to seek food that they will not find in winter.

USGS microbiologist and lead author David Blehert isolated the fungus in April 2008, and identified it as a member of the group *Geomyces*. The research was conducted by U.S. Geological Survey scientists in collaboration with the New York State Department of Environmental Conservation, the New York State Department of Health, and others.

Geomyces are a group of fungi that live in soil, water and air and are capable of growing and reproducing at refrigerator-level temperatures. Although the new fungus is a close genetic relative of known Geomyces, it does not look like a typical member of this group under the microscope. "We found that this fungus had colonized the skin of 90 percent of the bats we analyzed from all the states affected by white-nose syndrome," Blehert said.

Researchers don't know yet if white-nose syndrome emerged because this newly identified fungus was introduced into caves or whether the fungus already existed in caves and began infecting bats after they were already weakened from some other cause. "This fungus may have been recently introduced to bat hibernation caves and, if so, human and animal movements among these caves are causes that need to be considered," says Blehert. "Data show the occurrence of white-nose syndrome radiating outward from the site of its first appearance, and genetic identity among fungal isolates from distant caves argues for a recent introduction of this microbe. Before the identification of white-nose syndrome, mass mortality events in bats as a result of disease were very rare."

WNS was first seen in New York during the winter of 2006. Since then, populations of cave-hibernating bats have been drastically declining in Connecticut, Maine, New York and Vermont. Affected species include little brown bats, northern bats, tricolored bats, Indiana bats, small-footed myotis and big brown bats.

Worldwide, bats play critical ecological roles in insect control, plant pollination and seed dissemination, and the decline of North American bat populations would likely have far-reaching ecological consequences, the researchers wrote. They noted that parallels can be drawn between the threat posed by WNS and chytridiomycosis, a lethal fungal skin infection that has recently caused precipitous global amphibian population declines.

"Right now," said Blehert, "we are uncertain about the long-term effects of white-nose syndrome on North American bats, but we are quite concerned about future effects on bat populations wherever environmental conditions are conducive to growth of the fungus. To manage and perhaps halt this disease, we have to first better understand it."

Adapted from materials provided by [United States Geological Survey](http://www.sciencedaily.com/releases/2008/10/081030144613.htm).
<http://www.sciencedaily.com/releases/2008/10/081030144613.htm>

A Picture Is Worth A Thousand Locksmiths



Scenes from one of the proof-of-concept telephoto experiments. The computer scientists successfully decoded this key image, captured at a distance of 195 feet. (Credit: Image courtesy of University of California - San Diego)

ScienceDaily (Oct. 31, 2008) — UC San Diego computer scientists have built a software program that can perform key duplication without having the key. Instead, the computer scientists only need a photograph of the key.

The bumps and valleys on your house or office keys represent a numeric code that completely describes how to open your particular lock. If a key doesn't encode this precise "bitting code," then it won't open your door.

"We built our key duplication software system to show people that their keys are not inherently secret," said Stefan Savage, the computer science professor from UC San Diego's Jacobs School of Engineering who led the student-run project. "Perhaps this was once a reasonable assumption, but advances in digital imaging and optics have made it easy to duplicate someone's keys from a distance without them even noticing."

Professor Savage presents this work on October 30 at ACM's Conference on Communications and Computer Security (CCS) 2008, one of the premier academic computer security conferences.

In one demonstration of the new software system, the computer scientists took pictures of common residential house keys with a cell phone camera, fed the image into their software which then produced the information needed to create identical copies. In another example, they used a five inch telephoto lens to capture images from the roof of a campus building and duplicate keys sitting on a café table more than 200 feet away.

"This idea should come as little surprise to locksmiths or lock vendors," said Savage. "There are experts who have been able to copy keys by hand from high-resolution photographs for some time. However, we argue that the threat has turned a corner—cheap image sensors have made digital cameras pervasive and basic computer vision techniques can automatically extract a key's information without requiring any expertise."



Professor Savage notes, however, that the idea that one's keys are sensitive visual information is not widely appreciated in the general public.

"If you go onto a photo-sharing site such as Flickr, you will find many photos of people's keys that can be used to easily make duplicates. While people generally blur out the numbers on their credit cards and driver's licenses before putting those photos on-line, they don't realize that they should take the same precautions with their keys" said Savage.

As for what to do about the key duplication threat, Savage says that companies are actively developing and marketing new locking systems that encode electromagnetic secrets as well as a physical code. "Many car keys, for example, have RFID immobilizer chips that prevent duplicated keys from turning the car on." he says. In the meantime, he suggests that you treat your keys like you treat your credit card, "Keep it in your pocket unless you need to use it."

How it works

The keys used in the most common residential locks in the United States have a series of 5 or 6 cuts, spaced out at regular intervals. The computer scientists created a program in MatLab that can process photos of keys from nearly any angle and measure the depth of each cut. String together the depth of each cut and you have a key's biting code, which together with basic information on the brand and type of key you have, is what you need to make a duplicate key.

The chief challenge for the software system, called "Sneakey," is to adjust for a wide range of different angles and distances between the camera and the key being captured. To do so, the researchers relied on a classic computer vision technique for normalizing an object's orientation and size in three dimensions by matching control points from a reference image to equivalent points in the target image.

"The program is simple. You have to click on the photo to tell it where the top of the key is, and a few other control points. From here, it normalizes the key's size and position. Since each pixel then corresponds to a set distance, it can accurately guess the height of each of the key cuts," explained Benjamin Laxton, the first author on the paper who recently earned his Master's degree in computer science from UC San Diego.

The researchers have not released their code to the public, but they acknowledge that it would not be terribly difficult for someone with basic knowledge of MatLab and computer vision techniques to build a similar system.

"Technology trends in computer vision are at a point where we need to consider new risks for physical security systems," said Kai Wang, a UC San Diego computer science graduate student and author on the new paper. Wang is a computer vision researcher working on the creating systems capable of reading text on product packaging. This is part of a larger project on creating a computerized personal shopping assistant for the visually impaired from the lab of computer science professor Serge Belongie.

As a computer security expert, Savage said he particularly enjoyed working on a project with computer vision students.

"UC San Diego is very supportive of interdisciplinary work. There are many opportunities for students and faculty to get their hands dirty in fields they may not know much about a lot at first." said Savage.

Adapted from materials provided by [University of California - San Diego](http://www.sciencedaily.com/releases/2008/10/081029181606.htm).
<http://www.sciencedaily.com/releases/2008/10/081029181606.htm>



Researchers Find New Way Of Measuring 'Reality' Of Virtual Worlds

ScienceDaily (Oct. 31, 2008) — A research team, led by North Carolina State University's Dr. Mitzi M. Montoya, has developed a new way of measuring how "real" online virtual worlds are – an important advance for the emerging technology that can be used to foster development of new training and collaboration applications by companies around the world.

A global economy, the rising cost of travel, and increasingly tight budgets have left companies exploring the possible use of virtual worlds to train employees and foster collaboration in areas such as research and development, but until now no one has had a way to measure just how "real" those worlds are. The researchers focused on developing a measurement tool specifically for business applications in the virtual world, noting that the productivity and effectiveness of workers interacting via these online environments is closely linked to how well the workers are able to feel as if they are in the virtual realm.

"This is an important issue," Montoya says, "because we believe that if users feel they are 'present' in the virtual world, they will collaborate better with other members of their team – and the more effective the virtual world will be as a setting for research and development or other collaborative enterprises." In addition, Montoya explains "an increased sense of presence in the virtual world leads to better comprehension and retention of information if the technology is being used for training purposes, and trainees are happier with the process." Montoya is the Zelnak Professor of Marketing and Innovation at NC State.

The measurement scale developed by the researchers for the virtual world is called Perceived Virtual Presence (PVP), and factors in how users interact with the virtual environment, with their work in that environment, and with other users. "Now that we have developed the PVP scale," Montoya says, "it can be used to determine what PVP levels are most conducive to training, collaboration or other applications." Effectively, the PVP scale can be used to design a virtual environment that has the degree of reality that will best cater to a company's specific needs.

Montoya developed the PVP metric with Dr. Anne P. Massey, Dean's Research Professor of Information Systems at Indiana University.

Adapted from materials provided by North Carolina State University.
<http://www.sciencedaily.com/releases/2008/10/081029084038.htm>



Cancer Requires Support From Immune System To Develop

ScienceDaily (Oct. 31, 2008) — Tumors that grow around nerves in a rare genetic disease need cooperation from cells from the immune system in order to grow, reports a team of scientists, including researchers from UT Southwestern Medical Center.

Treating mice with a drug that attacks the immune cells – not the tumor – greatly reduced the size and metabolism of the tumors, the scientists reported. A clinical trial of the treatment in humans has begun.

"It was not the tumor being treated, but its environment," said Dr. Luis Parada, chairman of developmental biology at UT Southwestern and co-senior author of the study, which appears in the Oct. 31 issue of the journal *Cell*. "This insight has led to a very promising therapy of a previously untreatable tumor.

"This is the first time a mouse model has been used to gain insight into a cancer that could not be derived from patient studies," said Dr. Parada, director of the Kent Waldrep Center for Basic Research on Nerve Growth and Regeneration.

The researchers were studying tumors called plexiform neurofibromas, which occur around peripheral nerves. In humans, they occur as part of a genetic disease called neurofibromatosis-1. About 25 percent to 40 percent of people with the disease develop the tumors, which are generally benign but can grow large enough to cause disfigurement or disability and can sometimes become malignant.

These tumors are complex structures that include many different types of cells, particularly Schwann cells, which provide a fatty coating that makes nerve cells electrically efficient, and mast cells.

Because of their complexity, plexiform neurofibromas are difficult to remove surgically, and there is currently no cure for them.

Neurofibromatosis-1 is caused by a mutation in a single gene called *Nf1*. About 250,000 people in the U.S., Europe and Japan have this mutation. The mutation is dominant, meaning that people with one normal gene and one mutated gene develop the disease.

The UT Southwestern researchers had previously found in mice that plexiform neurofibromas develop from Schwann cells that have two mutated copies of *Nf1*. In addition, they discovered that even before a plexiform neurofibroma begins to form around a nerve, mast cells migrate into the area.

In the current study, the scientists used genetically engineered mice to confirm first that the animals need two mutated copies of *Nf1* in their Schwann cells to develop neurofibromas, which the rest of their cells can still have one normal and one mutant *Nf1* gene.

In addition, a bone marrow transplant from normal mice with two normal *Nf1* genes prevented 90 percent of the engineered mice from developing neurofibromas, confirming that even with two mutated genes in the Schwann cells, a mutated copy must also be present in other cells. Bone marrow is the source of mast cells, blood cells and many other types of cells that circulate through blood vessels.

The researchers then focused on the role of mast cells in tumor formation, particularly a molecule on the cells' surface called c-kit, which controls many functions, including migration and proliferation.





The mice engineered to develop tumors were given the drug imatinib mesylate, also known as Gleevec. The drug, known to inhibit c-kit, currently is used to treat chronic myelogenous leukemia and other cancers.

Positron emission tomography scans showed that Gleevec halved the metabolic activity of the tumors, while later examination confirmed that the tumors were much smaller than in placebo-treated mice.

"We found there was a requirement from the immune system to interact with the tumor for the tumor to grow," Dr. Parada said. "When mast cells are blocked, the tumor cannot grow."

During the course of these experiments, the researchers learned about a girl who had a large neurofibroma that could not be removed surgically because too many blood vessels were involved. Because Gleevec is already approved for other conditions, the girl's doctor treated her under "compassionate use" guidelines.

The girl's tumor shrank by 70 percent with no apparent side effects during the first three months of a six-month treatment under "compassionate use" regulations. The mass has remained dormant in the six months afterward, the researchers reported.

While this was only a single case, it was consistent with the one-year study of the tumor and its action in mice, Dr. Parada said, and the child's treatment was tailored to reflect the findings from the animal study.

A phase 2 clinical trial of this treatment in people with neurofibromatosis has been approved and is under way.

Dr. Parada cautioned, however, that further research is needed. A single human case, while encouraging, is not enough to prove the long-term effectiveness of the treatment, and Gleevec might be exerting other actions in addition to inhibiting mast cells.

Other UT Southwestern researchers involved in the study were Dr. Yuan Zhu, former instructor of developmental biology, and Dr. Dennis Burns, professor of pathology. Researchers from Indiana University School of Medicine, including co-senior author Dr. D. Wade Clapp, also participated.

The study was funded by the Department of Defense and the National Institutes of Health.

Adapted from materials provided by [UT Southwestern Medical Center](http://www.sciencedaily.com/releases/2008/10/081030123945.htm).

<http://www.sciencedaily.com/releases/2008/10/081030123945.htm>



Drinking Milk To Ease Milk Allergy? Oral Immunotherapy Study Shows Promise -- But Do Not Try This At Home

A new study suggests that giving children with milk allergies increasingly higher doses of milk over time may ease, and even help them completely overcome, their allergic reactions. (Credit: iStockphoto/Christi Tolbert)

ScienceDaily (Oct. 31, 2008) — Giving children with milk allergies increasingly higher doses of milk over time may ease, and even help them completely overcome, their allergic reactions, according to the results of a study led by the Johns Hopkins Children's Center and conducted jointly with Duke University.

Despite the small number of patients in the trial – 19 – the findings are illuminating and encouraging, investigators say, because this is the first-ever double-blinded and placebo-controlled study of milk immunotherapy. In the study, the researchers compared a group of children receiving milk powder to a group of children receiving placebo identical in appearance and taste to real milk powder. Neither the patients nor the investigators knew which child received which powder, a rigorous research setup that minimizes the chance for error and bias.



The findings of the study are reported online ahead of print, Oct. 28, in the *Journal of Allergy & Clinical Immunology*

"Our findings suggest that oral immunotherapy gradually retrains the immune system to completely disregard or to better tolerate the allergens in milk that previously caused allergic reactions," says Robert Wood, M.D., senior investigator on the study and director of Allergy & Immunology at Hopkins Children's. "Albeit preliminary and requiring further study, these results suggest that oral immunotherapy may be the closest thing yet to a 'true' treatment for food allergy."

Currently, food allergy management involves complete avoidance of the trigger foods, waiting for the child to outgrow the allergy or treating allergic reactions if and when they occur. The latter could be dangerous, investigators say, because these common foods are difficult to avoid and some reactions can be severe and even life-threatening.

In a report released Oct. 22, the Centers for Disease Control and Prevention estimates that food allergies are on the rise with three million children in the United States now having at least one food allergy, an 18 percent jump from 10 years ago. Milk allergy is the most prevalent type of food allergy.

"Given that the quality of life of a child with a food allergy is comparable to the quality of life of a child with diabetes, we urgently need therapies that go beyond strict food avoidance or waiting for the child to outgrow the allergy," Wood says.

Researchers followed allergic reactions over four months among 19 children with severe and persistent milk allergy, 6 to 17 years of age. Of the 19 patients, 12 received progressively higher doses of milk protein, and seven received placebo. At the beginning of the study, the children were able to tolerate on average only 40 mg (.04 ounces or a quarter of a teaspoon) of milk.

At the end of the four-month study, both groups were given milk powder as a "challenge" to see what dose would cause reaction after the treatment. The children who had been receiving increasingly higher doses of milk protein over a few months were able to tolerate a median dose of 5, 140 mg (over 5 ounces) of milk without having any allergic reaction or with mild symptoms, such as mouth itching and minor abdominal discomfort. Those who had been getting the placebo remained unable to tolerate doses higher than the 40 mg of milk powder without having an allergic reaction. In the group receiving milk protein, the lowest tolerance dose was 2, 540 mg (2.5 ounces) and the highest was 8,140 mg (8 ounces). Lab tests showed the children who regularly drank or ate milk had more antibodies to milk in their blood, yet were able to better tolerate milk than those who took the placebo. Researchers say, tolerance in children treated with milk continued to build over time, and recommend that these children continue to consume milk daily to maintain their resistance. The researchers caution that it remains unclear whether the children would maintain their tolerance once they stop consuming milk regularly. "It may very well be that this tolerance is lost once the immune system is no longer exposed to the allergen daily," Wood says.

The Hopkins group is currently studying oral immunotherapy in children with egg allergy to determine whether increasingly higher doses of egg protein can help resolve their allergy, and have recently started another study of milk immunotherapy.

Wood emphasizes the findings require further research and advises parents and caregivers not to try oral immunotherapy without medical supervision.

Other Hopkins investigators in the study: Justin Skripak, M.D., Hannah Rowley, R.D., Nga Brereton, R.D., Susan Oh, R.D., Robert Hamilton, M.D., Elizabeth Matsui, M.D. M.H.S. Duke University co-investigators: Scott Nash, M.D., and A. Wesley Burks, M.D.

The research was funded by the National Institutes of Health and The Eudowood Foundation.

Journal reference:

1. Justin M. Skripak, Scott D. Nash, Hannah Rowley, Nga H. Brereton, Susan Oh, Robert G. Hamilton, Elizabeth C. Matsui, A. Wesley Burks, Robert A. Wood. **A randomized, double-blind, placebo-controlled study of milk oral immunotherapy for cow's milk allergy.** *The Journal of Allergy and Clinical Immunology*, 28 October 2008 DOI: [10.1016/j.jaci.2008.09.030](https://doi.org/10.1016/j.jaci.2008.09.030)

Adapted from materials provided by *Johns Hopkins Medical Institutions*.
<http://www.sciencedaily.com/releases/2008/10/081030192851.htm>

Clicker U.



ORLANDO — To some academics, clickers are a great new technology, allowing professors to measure instantly whether students in a large class are grasping new concepts (or are even in class). To others, clickers represent a depersonalizing influence.

At the annual meeting of Educause, an organization of college technology officials, the former appeared solidly in the majority. Indeed, at a session on the use of clickers, officials of three large universities reported that once professors start to use clickers, the devices' popularity took off, and not just in mammoth lecture classes. To these officials, the questions about clickers weren't of the "Should we use them or not?" variety but of the policy variety: Should institutions support only one model on campus or whatever professors pick? Who is responsible for training professors in their use? Should certain uses of clickers be discouraged or encouraged?

To inform the discussion, officials of the Universities of Delaware, Maryland at College Park, and Pittsburgh each conducted surveys of students and faculty members on clicker use. The findings and their implications were discussed here Friday at the Educause meeting.

Why click: By far, the top reason cited by faculty members using clickers was to see instantly whether students were understanding a concept. Every Maryland professor identified that as a reason while more than 80 percent of those at Pitt and Delaware cited that use. Measuring student opinion and obtaining anonymous responses from students were other reasons cited. Smaller percentages were using clickers to monitor attendance (about half at Delaware and less than 40 percent at other institutions) or to administer quizzes (popular at Delaware but rare elsewhere). Whatever their reasons, the survey data suggest that professors are repeat users of clickers, with large majorities reporting that they have used them previously and are continuing to do so.

Clicking and attendance: Officials of all three universities generally spoke more enthusiastically about the use of clickers to promote student understanding than to check up on students. Christopher Higgins, manager of learning technologies at Maryland, said that while professors report that using clickers for attendance tends to get students to class more consistently, he's not sure that's "the best practice" for the technology. One concern is students will trade off, and one student may show up in class with clickers for a few friends and click them all present. Nancy J. O'Laughlin, instruction designer at Delaware, said that the student code of conduct there was specifically amended to make it a violation to click for someone other than yourself. There haven't been many problems, but "we felt it was important to give the faculty confidence" that there would be a way to deal with clicker abuse, she said.

Large classes and small: When the clicker concept started to attract attention, it was generally discussed in terms of large lecture courses, but the use of clickers appears to extend beyond that. More than a quarter of the courses using clickers at Pitt and Maryland have at least 200 students. But at Delaware more than a quarter of clicker classes enroll fewer than 50 students, and at Pitt, more than 20 percent of courses using clickers have fewer than 25 students. At Delaware, the courses with the greatest clicker use are in chemistry, biology, physics, psychology, nursing and political science. At Maryland,



clickers are most prominent in the sciences and business. At Pitt, clickers are most commonly used in the biological sciences, nursing and pharmacy.

Critical mass: At these universities, clickers have in the past few years changed from being something used by a few professors to becoming, if not standard, certainly not unusual. Maryland has more than 12,000 students using clickers in at least one course, for example.

Training and support: While students typically are comfortable with clickers from day one, not all professors are. O’Laughlin said that “students know some faculty who are not comfortable with any technology, let alone clickers,” and that students “want their faculty to be prepared and comfortable.” Michael Arenth, assistant director for instructional media services at Pitt, said faculty members need training not just on how to use clickers, but on security and privacy issues, so that they are used in ways that don’t create problems. All three officials said that if colleges want to encourage clicker use, it is important to have designated staffers available for support, especially just prior to the start of the semester and the first few weeks of the semester.

Uniformity vs. personal preference: At Maryland and Delaware, once more professors started to use clickers, the universities created committees to try to make clicker use more consistent. IT departments didn’t want to support multiple systems, and students didn’t want to have to buy multiple clickers to satisfy the preferences of different professors. At Pitt, however, Arenth said that “we didn’t succeed in mandating a standard.” Even with standardized systems, however, there are pressures on campus technology officials when, for example, a system works well with a PC but not a Mac or vice versa.

One reason that clickers are likely here to stay is that students are generally pleased with them. While there were complaints that some professors didn’t know how to use them or take full advantage of them, support was high and enthusiastic when faculty members knew what to do. In many cases, students reported that clickers transformed their student experience.

A quote from a Delaware student: “I absolutely loved using the clickers. It encouraged me to go to class every day and truly enhanced my overall learning experience in this class,” the student wrote. “I’m the kind of person who never raises their hand to talk during a class whether it’s to ask a question or to answer a teacher’s question, so with the clickers being individual and anonymous (to my classmates), it allows me to be able to participate in class without being in front of anyone... I hope all of my classes from now on will use this clicker system!!!”

— Scott Jaschik

*The original story and user comments can be viewed online at
<http://insidehighered.com/news/2008/11/03/clicker>.*



Professors' Liberalism Contagious? Maybe Not

By PATRICIA COHEN



An article of faith among conservative critics of American universities has been that liberal professors politically indoctrinate their students. This conviction not only fueled the culture wars but has also led state lawmakers to consider requiring colleges to submit reports to the government detailing their progress in ensuring “intellectual diversity,” prompted universities to establish faculty positions devoted to conservatism and spurred the creation of a network of volunteer watchdogs to monitor “political correctness” on campuses.

Just a few weeks ago Michael Barone, a fellow at the conservative American Enterprise Institute, warned in *The Washington Times* against “the liberal thugocracy,” arguing that today’s liberals seem to be taking “marching orders” from “college and university campuses.”

But a handful of new studies have found such worries to be overwrought. Three sets of researchers recently concluded that professors have virtually no impact on the political views and ideology of their students.

If there has been a conspiracy among liberal faculty members to influence students, “they’ve done a pretty bad job,” said A. Lee Fritschler, a professor of public policy at George Mason University and an author of the new book “Closed Minds? Politics and Ideology in American Universities” (Brookings Institution Press).

The notion that students are induced to move leftward “is a fantasy,” said Jeremy D. Mayer, another of the book’s authors. When it comes to shaping a young person’s political views, “it is really hard to change the mind of anyone over 15,” said Mr. Mayer, who did extensive research on faculty and students.

“Parents and family are the most important influence,” followed by the news media and peers, he said. “Professors are among the least influential.”

A study of nearly 7,000 students at 38 institutions published in the current PS: Political Science and Politics, the journal of the American Political Science Association, as well as a second study that has been accepted by the journal to run in April 2009, both reach similar conclusions.

“There is no evidence that an instructor’s views instigate political change among students,” Matthew Woessner and April Kelly-Woessner, a husband-and-wife team of political scientists who have frequently conducted research on politics in higher education, write in that second study.

Their work is often cited by people on both sides of the debate, not least because Mr. Woessner describes himself as politically conservative.

No one disputes that American academia is decidedly more liberal than the rest of the population, or that there is a detectable shift to the left among students during their college years. Still, both studies in the peer-reviewed PS, for example, found that changes in political ideology could not be attributed to proselytizing professors but rather to general trends among that age group. As Mack D. Mariani at Xavier University and Gordon J. Hewitt at Hamilton College write in the current issue, “Student political orientation does not change for a majority of students while in college, and for those that do change there is evidence that other factors have an effect on that change, such as gender and socioeconomic status.”

That may be, said Daniel Klein, an economist at George Mason, but those results don’t necessarily mean there isn’t a problem. Mr. Klein, whose research has shown that registered Democrats vastly outnumber Republicans among faculty in the humanities and social sciences at American colleges and universities, maintains that the focus on the liberal-conservative split is misdirected. Such terms are vague and can be used to describe everything from attitudes about religion and family to the arts and lifestyles, he said.

The real issue, said Mr. Klein, who calls himself a libertarian, is that social democratic ideas dominate universities — ideas that play down the importance of the individual and promote government intervention.

Such “academic groupthink” means that the works of such thinkers are not offered enough, he argues. “A major tragedy is that they’re not getting exposed to the good stuff,” he said, citing the works of John Stuart Mill, Adam Smith, Friedrich Hayek and Milton Friedman.

“Even if we had hard, definite evidence that students weren’t influenced by their professors, there is still reason for great concern about the composition of the faculty,” Mr. Klein added.

K. C. Johnson, a historian at the City University of New York, characterizes the problem as pedagogical, not political. Entire fields of study, from traditional literary analysis to political and military history, are simply not widely taught anymore, Mr. Johnson contended: “Even students who want to learn don’t have the opportunity because there are no specialists on the faculty to take courses from.”

“The conservative critics are inventing a straw man that doesn’t exist and are missing the real problem that does,” he added.

Anne Neal, the president of the American Council of Trustees and Alumni, which closely follows this issue, agrees that “it is not about left and right.”

Many researchers and critics also agree that a better grounding in American history and politics is important. “It wasn’t too long ago that schools and universities required civic education and American history,” Mr. Fritschler noted. “Almost all of those requirements have evaporated.”



A number of organizations that have a large base of conservative supporters, like Ms. Neal's council and the National Association of Scholars, have been promoting a return to traditional courses in western civilization and American history.

Mr. Fritschler said that perhaps the most insidious side effect of assumptions about liberal influence has been an overall disengagement on campus from civic and political affairs, and a reluctance to promote serious debate of political issues. If anything, he added, the problem is not too much politics, but too little.

http://www.nytimes.com/2008/11/03/books/03infl.html?_r=1&th&emc=th&oref=slogin



Mud eruption 'caused by drilling'

By James Morgan

Science & Environment reporter, BBC News



The eruption of the Lusi mud volcano in Indonesia was caused by drilling for oil and gas, a meeting of 74 leading geologists has concluded.

Lusi erupted in May 2006 and continues to spew out boiling mud, displacing around 30,000 people in East Java.

Drilling firm Lapindo Brantas denies a nearby well was the trigger, blaming an earthquake 280km (174 miles) away.

Around 10,000 families who have lost their homes are awaiting compensation, which could run as high as \$70m (£43m).

This is the data we wanted to get out - the data I have never been able to show before. It clearly shows that the well failed. It was the driver for the eruption

Professor Richard Davies Durham University

After debating new evidence at a conference in South Africa, most geologists voted drilling as the cause.

Correspondents describe the result a significant development in the tug-of-war to establish liability for the disaster.

Mud slinging

The debate on the cause of the eruption took place at a meeting of the American Association of Petroleum Geologists, in Cape Town.

It was the first time the two opposing sides had agreed to debate before an international conference of independent experts.

The contest was chaired by a professional football referee - Professor John Underhill, an Edinburgh University geologist, who is also a match official in the Scottish Premier League.

We presented clear and indisputable facts that none of the four required factors for the well to have been responsible for triggering the eruption occurred.

Lapindo Brantas spokesman

The dispute centres on some newly released data - measurements taken from the Banjar-Panji-1 exploration well during the final 24 hours leading up to the eruption.

Professor Richard Davies, of Durham University in the UK, argued that these readings clearly point to a build up of pressure, causing fractures which propagated from the bore hole to the surface 150m away, resulting in the eruption.

However, Rocky Sawolo, senior drilling adviser of Lapindo Brantas, used the same primary data to argue the opposite - the pressure within the well was within acceptable limits.

His colleague Dr Adriano Mazzini, of the University of Oslo, testified that the fracture was triggered by a magnitude 6.3 earthquake two days earlier, centred on Yogyakarta, some 280km away.

But these claims were directly contradicted by Dr Mark Tingay from Curtin University, Australia, a geological pressure and rock mechanics expert.

The earthquake "was at least an order of magnitude too small," he said, stressing that the force felt at the Lusi site would have been "very small" - comparable to the effect of a heavy truck passing overhead.

Judgment call

When the vote was called, 42 out of the 74 scientists in the audience were convinced that the drilling was the trigger of the eruption.

Only three voted for the earthquake.

A further 16 scientists believed the evidence was inconclusive, and the remaining 13 felt that a combination of earthquake and drilling was to blame.

"The geologists voted overwhelmingly that drilling was the most likely cause," said Prof Underhill.

"The atmosphere was very tense, so all credit to them for not sitting on their hands.

"Hopefully this will be a catalyst for taking things forward. To my mind the result demonstrates that at the very least, the drilling company have a case to answer."

Prof Davies said: "I remain convinced that drilling was the cause of the mud volcano.

"The opinion of the international scientists adds further weight to my conviction."

For two years, the Lusi crater has been oozing mud - enough to fill 50 Olympic size swimming pools every day.

The eruption began at 0500 on 29 May 2006 in the Porong subdistrict of Sidoarjo, Eastern Java, close to Indonesia's second city of Surabaya.

All efforts to stem the flow have failed - including a network of dams; channelling into the sea; and an ambitious plan to plug the crater with concrete balls.

Some geologists believe Lusi could continue to erupt for decades.

The mud flow has razed four villages and 25 factories. Thirteen people have died, as a result of a rupture in a natural gas pipeline underneath one of the holding dams.

THE AFTERMATH

A police investigation is underway to identify the trigger and to determine whether the drillers are liable for compensating 10,000 families, amounting to 700 billion Indonesian Rupias (US\$77m; £47m).

If the earthquake is judged responsible, as claimed by Lapindo, then the Indonesian government will have the burden of supporting the victims.

There is no dispute that seismic activity can provoke mud volcanoes, and both are common in East Java.

Nevertheless, in June 2008 Prof Davies published a paper in the journal *Earth and Planetary Science Letters*, in which he concluded with "99% certainty" that Lapindo's drilling caused the mudflow.

He argues that the 2,500m-deep bore hole ruptured limestone rock, containing pressurised water. As the lower part of the borehole was not protected by casing, this forced water and mud into the rocks surrounding the well.

At the conference, he produced fresh records of the changes in pressure in the 24 hours leading up to Lusi's eruption.

The pressure plots were introduced by drilling engineer Susila Lusiaga, who works with the Indonesian police investigation team.

"The pressure in the well went way beyond what it could tolerate... and it triggered the mud volcano," he said.

The new records "provide a compelling tape recording of the well as it started to leak," said Prof Davies.

"This is the data we wanted to get out - the data I have never been able to show before.

"It clearly shows that the well failed. And this failure was the driver for a the breakdown of the rocks - it was the trigger for the mud volcano."

The well took a huge influx of fluid the day before the eruption, he said, resulting in intolerable pressures, and fractures which propagated until the surface was breached.

"We see the pressure building, then suddenly we see a massive drop at 9.30pm on May 28th - the night before the eruption began.



"This is evidence that a fracture has opened up. It's like a tyre bursting - the pressure inside bleeds away.

He added: "This may be evidence that Lusi actually started at 9.30pm the night before - not 5am the next morning.

"Now the data has been released, I would like to get it out to independent drilling experts, who can then go through it," said Prof Davies, a geologist.

"We are particularly grateful to Lapindo, who were widely applauded at the meeting for their willingness to take part. We are now starting to make some headway."

However, despite the vote, the drilling firm strenuously denies that its activities were in any way responsible for the disaster.

From the same primary data, they calculate that the pressures under the ground did not go beyond critical levels.

"We presented clear and indisputable facts that none of the four required factors for the well to have been responsible for triggering the eruption occurred," a spokesman for Lapindo Brantas said.

"Specifically: there was no uncontrolled 'kick'. The casing shoe was not breached and the well was intact.

"There was no underground blowout. There was no sustained pressure to propagate a fracture."

Story from BBC NEWS:

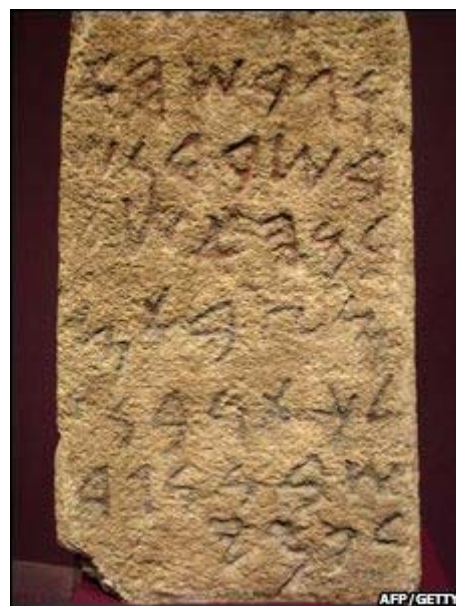
<http://news.bbc.co.uk/go/pr/fr/-/2/hi/science/nature/7699672.stm>

Published: 2008/11/01 08:02:42 GMT



DNA legacy of ancient seafarers

By Paul Rincon
Science reporter, BBC News



Scientists have used DNA to re-trace the migrations of a sea-faring civilisation which dominated the Mediterranean thousands of years ago.

The Phoenicians were an enterprising maritime people from the territory of modern-day Lebanon.

They established a trading empire throughout the Mediterranean Sea in the first millennium BC.

A new study by an international team has now revealed the genetic legacy they imparted to modern populations.

The researchers estimate that as many as one in 17 men from the Mediterranean may have Phoenician ancestry.

When we started, we knew nothing about the genetics of the Phoenicians

Chris Tyler-Smith Wellcome Trust Sanger Institute

They employed a new analytical technique to detect the subtle genetic imprint of historical migrations in present-day people. The study included DNA data from more than 6,000 men from around the Mediterranean.

From their base in present-day Lebanon, the Phoenicians spread out across the sea, founding colonies and trading posts as far afield as Spain and North Africa, where their most powerful city - Carthage - was located.

Carthage spawned the audacious military commander Hannibal, who marched an army over the Alps to challenge the Roman Republic on its own territory.

The Phoenicians have been described as the world's first "global capitalists". They controlled trade throughout the Mediterranean basin for nearly 1,000 years until finally being conquered by the Romans.

Over subsequent centuries, much of what was known about these enigmatic people was lost or destroyed.

Digging deep

"People have not really looked at this heritage, and I think we ought to be looking more," Dr Pierre Zalloua, from the Lebanese American University in Beirut, Lebanon, told BBC News.

Chris Tyler-Smith, co-author of the paper from the Wellcome Trust Sanger Institute in Cambridge, UK, commented: "When we started, we knew nothing about the genetics of the Phoenicians. All we had to guide us was history.

"We knew where they had and hadn't settled. But this simple information turned out to be enough, with the help of modern genetics, to trace a vanished people."

The new findings have emerged from the Genographic Project, a multi-million-dollar effort to trace human migrations using genetics. Details appear in the prestigious American Journal of Human Genetics.

The study focused on the Y, or male, chromosome, a package of genetic material carried only by men that is passed down from father to son more or less unchanged, just like a surname.

But over many generations, the chromosome accumulates small changes, or copying errors, in its DNA sequence.

These can be used to classify male chromosomes into different groups (called haplogroups) which, to some extent, reflect a person's geographical ancestry.

They looked at the genetic signatures carried on the Y chromosomes of men from former Phoenician colonies across the Mediterranean. The sites included coastal Lebanon, Cyprus, Crete, Malta, eastern Sicily, southern Sardinia, Ibiza, southern Spain, coastal Tunisia and the city of Tingris in Morocco.

They then compared the Y chromosomes of these men with those of males from nearby places where the Phoenicians had never lived.

This focussed approach uncovered a small number of recurring genetic signatures in men from the Phoenician sites. These genetic lineages also led back to the Levant region - the Phoenician homeland.

Genetic 'jacuzzi'

But several human migrations - both historic and prehistoric - have started in the Eastern Mediterranean and spread out to Europe and North Africa.

These include the migrations of early farmers from the Near East after 10,000BC, the expansion of the ancient Greeks who - like the Phoenicians - established outposts around the Mediterranean, and the Jewish diaspora.

Because of their geographical proximity, the people involved in these expansions may have carried similar genetic signatures to the Phoenicians.

Teasing apart something that's specifically Levantine, or Phoenician, from the background of the general Neolithic expansion, or Greek colonisation, is actually quite tough

Spencer Wells Genographic Project director

However, the team devised special analytical methods which they say can distinguish the Phoenician input from other possibilities.

"The issue here is that the Mediterranean is a genetic jacuzzi, if you will, it's had people moving around all over the place for millennia," said Spencer Wells, director of the Genographic Project.

"Teasing apart something that's specifically Levantine, or Phoenician, from the background of the general Neolithic expansion, or Greek colonisation, is actually quite tough.

"That's why we needed this formalised approach and obviously the (large) sample sizes to detect this signal."

This strategy revealed six candidate "Phoenician" lineages. Overall, these made up 6% of genetic lineages found in modern populations from former Phoenician colonies around the Mediterranean.

That means one in 17 men from these sites could trace their male ancestry to a Phoenician, the researchers said.

Co-author Daniel Platt, from IBM's Computational Biology Center at the TJ Watson Research Center, said the study "proves that these settlements, some of which lasted hundreds of years, left a genetic legacy that persists to modern times".

Dr Wells explained that the technique used in this study could be applied to track other migrations which had subtle genetic impacts.

He cited the expansion of Celtic-speaking people from their homeland in the Harz mountains of Germany into Western and Eastern Europe during the first millennium BC.

The Genographic Project was launched in 2005, and involves National Geographic, IBM, the Waitt Family Foundation and Applied Biosystems.

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Story from BBC NEWS:

<http://news.bbc.co.uk/go/pr/fr/-/2/hi/science/nature/7700356.stm>

Published: 2008/10/31 01:26:29 GMT

PC users to invent ideal machine

By Maggie Shiels

Technology reporter, BBC News, Silicon Valley



Intel and manufacturer ASUS have launched a project asking people to say what they would like to see in a PC.

The companies are asking people to "dream the impossible" to help design the first community-designed PC.

A website, WePC.com, has been set up to allow people to share and comment on ideas to "enable a global conversation about the ideal elements of a PC."

Both companies insist the project is not simply cheap talk, saying there is a commitment to building the machine.

"The spark for innovation can come from anywhere," said Intel's Mike Hoeffinger.

He added that both companies have joined together "to tap into the creative energy of consumers...and give people a voice in the design of technology they use every day."

Technology companies have always asked for customer feedback, but this is being billed as a new approach to product design and to customer involvement, says Lillian Lin, the director of marketing and planning at ASUS.

"By empowering WePC.com users to play a role in the design process, we expect to deliver cutting-edge community-designed products that address a consumer vision of the dream PC," said Ms Lin.

"Ghetto blaster laptop"



The mission statement for WePC.com is simple : "You dream it. ASUS builds it. Intel inside it."

"Your designs, feature ideas and community feedback will be evaluated by ASUS and could influence the blueprint of an actual notebook PC built by ASUS with Intel inside," said the website.

"Everyone is very aware there is a commitment from everyone involved," said Josh Mattison of Federated Media, which is involved in the marketing campaign.

"If you start a conversation with your customers, the first step is knowing their voices will be heard and incorporating that into those companies' larger thought processes. That is absolutely something you can expect to see."

The community will be divided into what Intel has called three "conversation groups". They will address three of the most popular consumer PC categories: netbooks, notebooks and gaming notebooks.

WePC.com has urged users to let their imagination run wild.

"There is no limit to creativity," said Mr Mattison.

"And there is no forum quite like this for expressing that. Let those ideas flow, whether it's concerning something purely functional like battery life or something a bit more 'out there' like a computer needing a haircut every two weeks," he said.

Some of the suggestions for the community-designed PC already include a ghetto blaster laptop with woofers and tweeters and a "happy laptop" that would wake the user up in the morning.

It is unlikely that any consumer-inspired PC will make the market any time soon and it could be well into 2009 before the "dream PC" is turned into reality.

Story from BBC NEWS:
<http://news.bbc.co.uk/go/pr/fr/-/2/hi/technology/7704709.stm>

Published: 2008/11/02 09:45:59 GMT



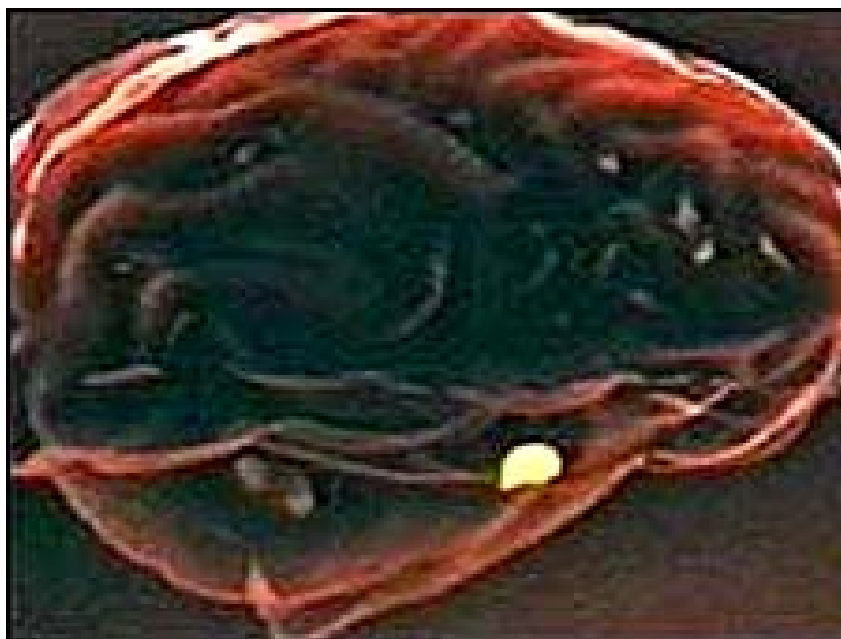
Lithium tested for impact on MND

By Adam Brimelow
BBC health correspondent

British scientists are embarking on a major new trial to assess the impact of the mood stabiliser lithium as a treatment for motor neurone disease.

They say the research is necessary because positive findings from a small-scale Italian study were "too dramatic to ignore".

But they are urging patients with the disease not to take the treatment in advance of their results.



They warn that some side-effects of lithium are potentially dangerous.

You don't always get the answer you expected

Professor Nigel Leigh, King's College London

There are about 5,000 people in the UK living with motor neurone disease (MND).

At the moment there is no effective cure or treatment. It is often rapidly progressive and always fatal, usually within two to five years.

The disease can affect any adult at any age, although it is more commonly found in men, and is most likely to strike between the ages of 50 and 70.

Caution urged

Lithium, a naturally occurring element, has long been used as a treatment for some forms of depression, such as bipolar disorder.

But recent laboratory tests and animal trials have suggested that it may also have a protective effect with MND.

The recent trial of 16 people in Italy reported encouraging results.

But the MND Association said the study was small and poorly designed, and that its findings should be treated with caution.

The association's president, Professor Sir Colin Blakemore, said: "If you read the publication optimistically it might be taken to mean that lithium literally cures this disease.

"But it's very important, against the background of patient hopes and expectations, to stand back and ask whether the trial was large enough to make the claims that it did."

Side-effects

The director of the MND Care and Research Centre at King's College London, Professor Nigel Leigh, says patients are asking him every day whether they should be trying lithium, but that only a "tiny minority" are taking it.

"I'm a bit surprised. I thought more would do it.

"I think it's because everybody's discussing this openly on online sites and there's a very balanced discussion, and people are aware that there are side-effects."

These include tremors, stiffness, confusion, kidney damage and harm to the thyroid.

Professor Leigh says the only ethical approach is to do a full clinical trial, where people are randomised "blind", so neither they nor the researchers know if they are taking lithium or a dummy pill.

The 18-month study involving 220 patients who have had MND for between six months and three years will start at 10 centres across the UK.

Patients will be monitored closely for side-effects.

'Bear with us'

Professor Leigh stressed that GPs and patients with MND should wait for the results before taking Lithium.

"We've been here many times before, with drugs that have been promoted as being a fantastic answer. You don't always get the answer you expected.

Safety is paramount. Yes, it's tempting, but please bear with us.

"If you can take part in a trial that's great. We realise otherwise it's patience, and patience can be short in this condition. But it's much safer to wait."

The president of the Royal College of GPs, Professor Steven Field, backed the advice.

He said "While the information is encouraging, it's important to await results of clinical trials because the medicine has serious side-effects which could potentially make some of the symptoms worse."

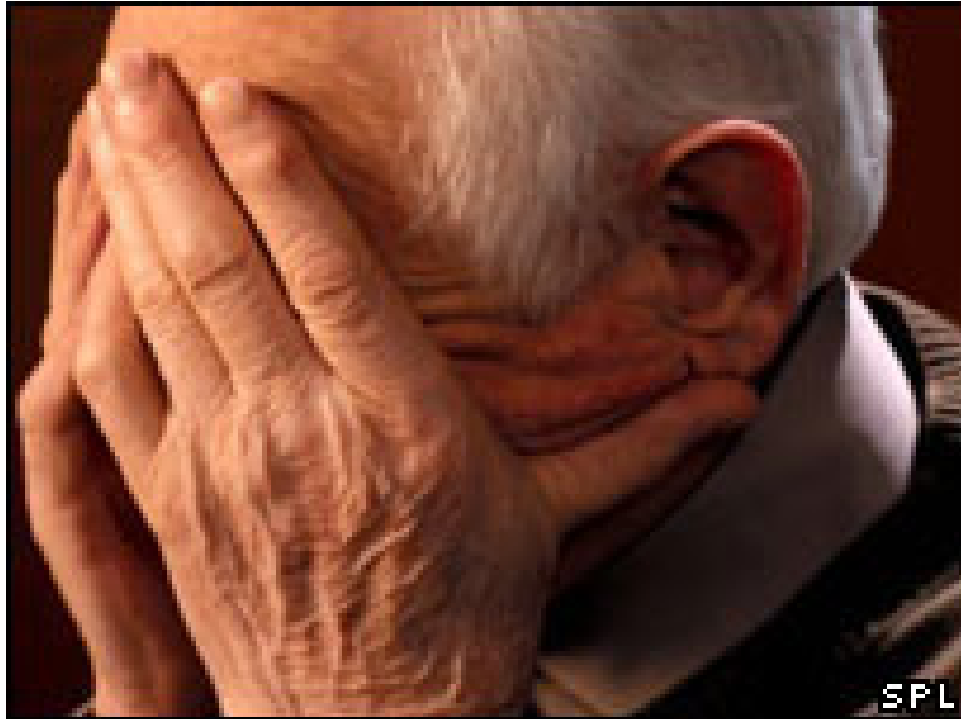
Story from BBC NEWS:

<http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/7702022.stm>

Published: 2008/11/03 00:30:48 GMT

Tougher mental health rules begin

A controversial reform of mental health laws allowing compulsory treatment in the community has been launched.



Patients released from hospitals in England and Wales could be forced back if they do not take their medication.

Mental health charities say the powers are excessive, will not improve people's health and could be misused.

But the government's mental health "czar" said they had been successfully introduced in other countries and would raise the standard of care.

'Revolving door patients'

The changes in the Mental Health Act are an extension of the powers which already allow people whose mental illness makes them a threat to themselves or others to be detained and, if necessary, forcibly treated.

Some people have been termed "revolving door patients", as once allowed home, they stop taking their medication, and their symptoms worsen again.

They must not become the easy option or replace good mental health services that people want to use

Simon Lawton-Smith
Mental Health Foundation

From Monday, once someone detained under the act is sent home, they can be subject to "supervised community treatment".

While they cannot be forcibly treated in their own homes, if they do not comply with the recommended treatment, they can be recalled to hospital immediately without the need for a fresh order under the act.

A more extensive system is already in place in Scotland, where patients do not even need to be detained in hospital before compulsory treatment becomes an option.

Ethical question

Critics, however, have claimed the changes could be used to justify the closure of psychiatric beds in hospitals to save money.

They also suggest that the scheme is ethically dubious, and has not been shown to work in other countries.

Simon Lawton-Smith, of the Mental Health Foundation, said: "This may help a small number of individuals with complex needs to stay well rather than lose touch with services and become ill again - but taking away anyone's right to refuse treatment is questionable.

"No-one with a physical health problem is compelled to take their medication, even if not taking it might be life-threatening."

This is about how, as a responsible society, we can ensure that some of the vulnerable members of society receive the treatment they need

Professor Louis Appleby
National Clinical Director, Mental Health

He added: "There is no conclusive research to suggest this helps people with mental health problems to stay well any more than good local services.

"It will be important to keep a very close eye on how these new powers are being used. They must not become the easy option or replace good mental health services that people want to use."

However, Professor Louis Appleby, the national clinical director for mental health, and the man driving the introduction of the new powers, said it was "completely untrue" to suggest potential financial savings might have motivated them.

He said: "This is about how, as a responsible society, we can ensure that some of the vulnerable members of society receive the treatment they need."

He said the changes could improve the experience of some patients by giving psychiatrists the confidence to discharge them earlier, in the knowledge that they were more likely to take their medication.

The need to force mental health patients to take their drugs could not be compared to the physically ill who disregarded medical advice, he added.



Professor Appleby said: "Mental illness is different because it impairs your very ability to make a rational decision about your treatment.

"In other places where this kind of order has been introduced, it has been welcomed by clinicians, by the families of patients, and by patients themselves."

Marjorie Wallace of SANE said: "With the new Mental Health Act now in place, it is urgent that the government turns its attention to providing good quality mental health services so that crises are better prevented and coercion used only as a last resort.

"We do not yet know how often and in what ways supervised community treatment will be used, but we are aware of a number of people for whom it could provide a more acceptable means of providing sustained care and preventing self-neglect and suicide."

Story from BBC NEWS:

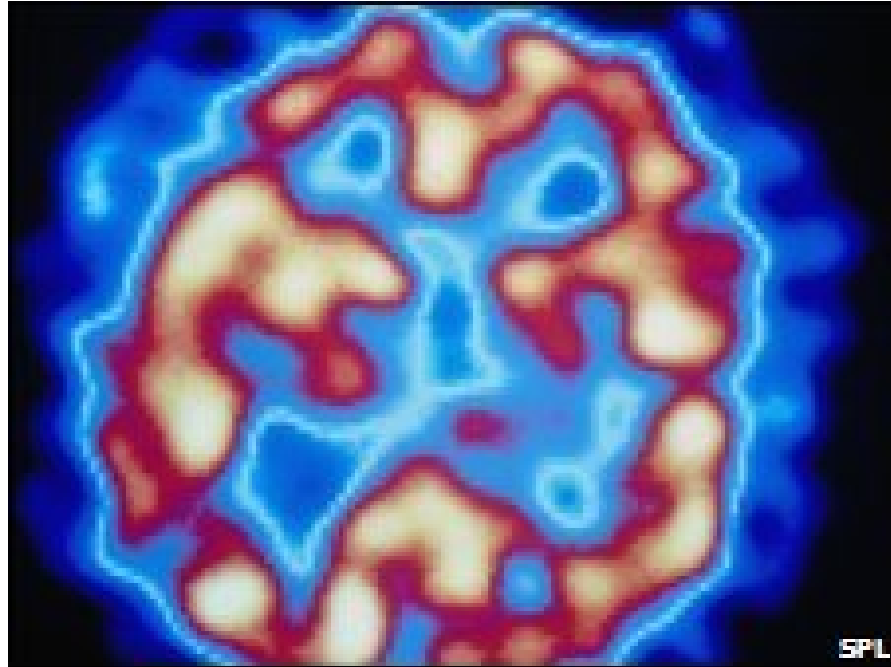
<http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/7702616.stm>

Published: 2008/11/03 01:05:51 GMT



Brain receptor schizophrenia clue

Scientists say they may have found why people with schizophrenia have abnormal electrical waves in their brains.



The Newcastle University team believes schizophrenics lack the vital brain receptor cells which control them.

When the receptors in rats were switched off using a drug, the waves changed frequency.

The researchers hope the work, detailed in the Proceedings of the National Academy of Sciences journal, could point to new treatments.

While the origins of schizophrenia are thought to be both environmental and genetic, the precise cause is unknown.

It's some of the first evidence of what might actually be going on to produce changes in electrical activity in the brain in people with schizophrenia

Dr James Stone
Institute of Psychiatry

Scientists have been looking more closely at some of the differences between the brain function of people with and without the condition.

One difference found by earlier researchers is in the "gamma frequency oscillation", a pattern of electrical activity which is different in schizophrenia patients.

The Newcastle researchers aimed to home in on the cause of this alteration.



They used a drug called ketamine - which, as a recreational drug in humans, has been known to cause some of the symptoms of schizophrenia, including hallucinations.

When applied to rat brain cells, they found the drug changed the frequency of its electrical activity by blocking the NMDA brain receptor.

This could mean that people with schizophrenia either do not have enough of these receptors, or they are not working properly.

Long-term hopes

Dr Mark Cunningham, who led the research, said: "We have shown that by selectively targeting receptors we can modify the dynamics of the brain.

"Our hope would be that in the long term this could lead to a method for actually improving brain function, not only for people with schizophrenia, but potentially for many other brain conditions."

Dr James Stone, from the Institute of Psychiatry at King's College London, said the research added to other work implicating the receptor, or something associated with it, with schizophrenia.

However, he said that ketamine did not entirely reproduce the symptoms of the condition, and so it could not be certain that the same cause and effect was present in humans.

He said: "It's interesting and certainly deserves to be researched further.

"It's some of the first evidence of what might actually be going on to produce changes in electrical activity in the brain in people with schizophrenia."

Story from BBC NEWS:

<http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/7693850.stm>

Published: 2008/11/03 01:23:53 GMT



Cambridge students 'plagiarising'

Almost half of students admitted to plagiarism in a poll carried out by a students' newspaper at the University of Cambridge.



The Varsity newspaper reported that students admitted to copying material found on the internet and submitting it as their own.

The survey also claimed that only one in 20 students had been caught.

The University of Cambridge says that it has policies in place to prevent this serious disciplinary offence.

But the university also says that "in spite of these provisions we acknowledge that plagiarism is a significant issue and an increasingly complex one in the new internet era, for all universities to deal with".

'Poor scholarship'

The survey from the Cambridge newspaper examines what has proved a difficult problem for higher education, particularly with the accessibility of material from the internet and the growth of commercial essay writing services.

The online student survey found that 49% of respondents had admitted to a range of different types of plagiarism, including handing in someone else's work, copying and pasting from the internet, buying an essay or else paying someone else to edit work.



Varsity carries anonymous interviews with students representing different attitudes to plagiarism - including one student who routinely copies material, another who is very opposed to such cheating and another who says that "low level plagiarism is fairly institutionalised".

Among the concerns from the survey was an over-reliance on sources such as the online encyclopedia Wikipedia, with 82% of plagiarists admitting to taking material from the website.

The University of Cambridge says that it is working with faculties and the students' union to make sure that all students understand that plagiarism is unacceptable - "both poor scholarship and a breach of academic integrity".

It also uses software to detect plagiarism in submitted work.

But the survey - based on anonymous admissions - highlights the uncertainty surrounding the extent of plagiarism.

There have also been concerns about whether plagiarism is really taken as seriously as university regulations suggest.

A report this year from the Higher Education Academy and Joint Information Systems Committee found that even repeat offenders were unlikely to be thrown off courses for cheating.

Only 143 students caught cheating were expelled out of 9,200 cases - despite almost all universities threatening expulsion as a sanction. The study found that the most common penalty was to have to re-submit work.

Story from BBC NEWS:

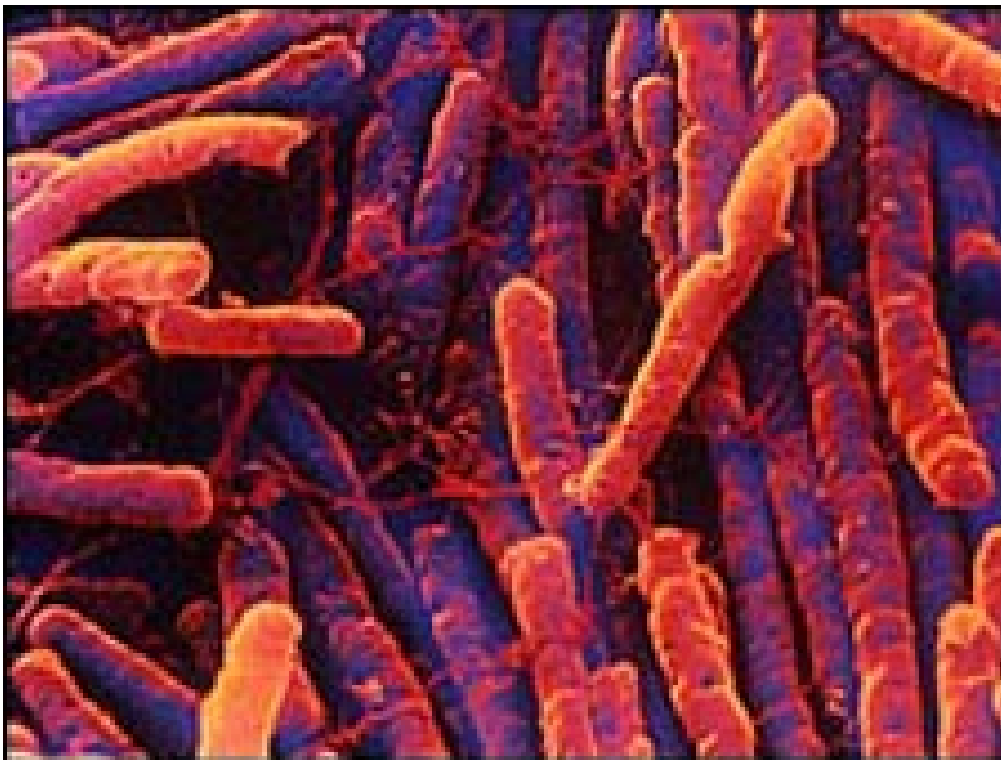
http://news.bbc.co.uk/go/pr/fr/-/2/hi/uk_news/education/7701798.stm

Published: 2008/10/31 11:51:32 GMT



C. diff testing 'is often wrong'

Many carriers of the potentially lethal *Clostridium difficile* bug are missed by unreliable tests, researchers say.



Analysis of 18 studies by St George's, University of London, found one test had wrongly given the all-clear to a quarter of those infected.

The variation in performance between the six tests studied could mean misleading infection rate comparisons between different hospitals.

The study was published in the *Lancet Infectious Diseases* journal.

Bacteria balance

While deaths related to the "superbug" MRSA have shown falls in recent years, those related to *Clostridium difficile* are rising fast.

The bug is found naturally in the gut of approximately 3% of adults, and presents no threat as long as the normal balance of gut bacteria is maintained.

A false negative result could mean that infected patients don't get the right treatment and could pass the infection on to others

Dr Timothy Planche
St George's Healthcare NHS Trust

However, in weak or frail patients, particularly those on antibiotics, which can disrupt this balance, the bacterium can cause diarrhoea and severe inflammation of the bowel, which can be fatal.

Quick and accurate diagnosis is key, so that patients can be isolated, and other measures taken to try to control the spread of the bug to other vulnerable people.

Currently, a single test is used on a stool sample from the patient, looking for higher levels of a toxin produced by the active bacteria.

However, the London analysis suggests this may not be enough to find the right patients.

While most tests produce a small proportion of "false positives" and "false negatives", the percentage of cases missed ranged from 5% to just over 24.3%, and the percentage of "false positives" ranged from 3% to 45%.

Double test

Dr Timothy Planche, a clinician at St George's Healthcare NHS Trust, who led the study, said: "A false negative result could mean that infected patients don't get the right treatment and could pass the infection on to others.

"Conversely, patients receiving a false positive result may receive inappropriate treatment and be placed in wards along with infected patients, putting them at risk of contracting the infection."

Please turn on JavaScript. Media requires JavaScript to play.

As many as one in five test results could be wrong

He recommends improving the performance of the tests by using a second test to check the first one.

Most hospitals would tend to rely on just one variety of test, and this could skew any comparisons of C. diff rates between trusts.

Professor Richard James, from Nottingham University, said the "deficiencies" of current tests were a "serious problem".

He added: "Rapid molecular tests have recently been introduced for MRSA and will become available for C. difficile shortly, but they are more costly than the current tests used in the NHS.

"NHS microbiology laboratories have been under-resourced for many years, and will find it difficult to perform these more rapid tests unless the NHS takes a more holistic economic view that the benefits in reducing infections to both the NHS and society justify the extra costs of more rapid tests for serious infections such as C.difficile and MRSA."

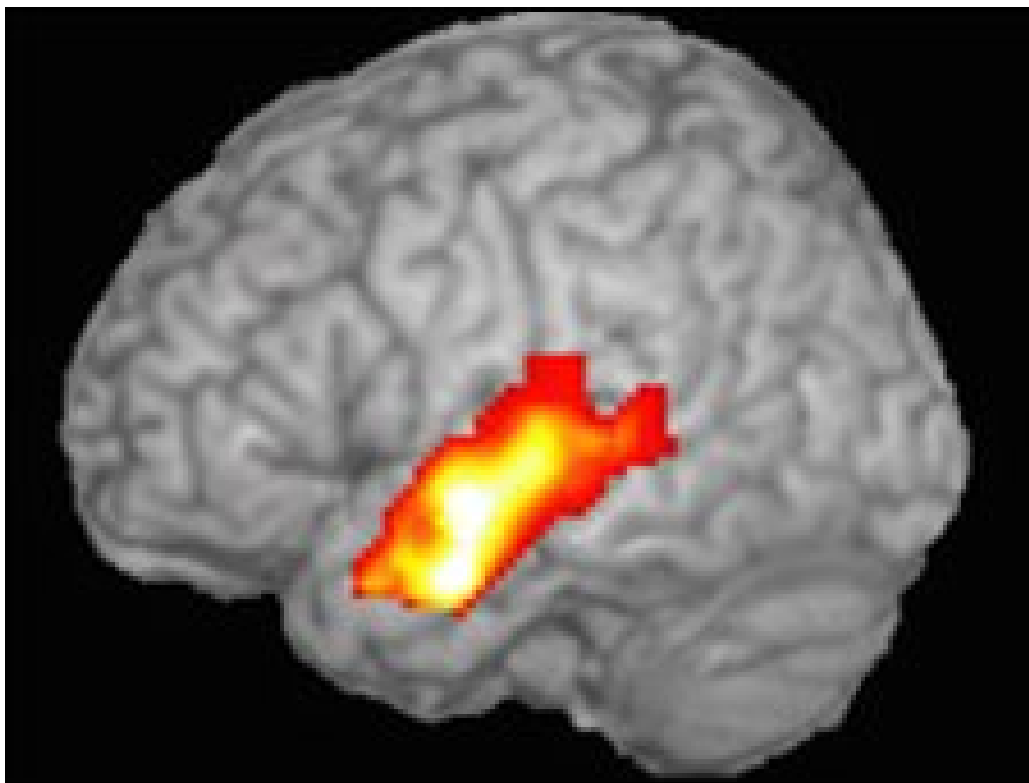
Story from BBC NEWS:

<http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/7702814.stm>

Published: 2008/11/01 00:24:04 GMT

DNA clue to child brain tumours

Scientists at Cambridge University have made a major breakthrough researching brain tumours in children.



For the first time a sequence of DNA present in around two-thirds of the most common tumour has been pinpointed.

Pilocytic astrocytomas is diagnosed in 145 children from five to 19 every year, with nearly 40 cases untreatable.

As little is known about the causes and genetics of brain tumours, it is hoped the findings could lead to better treatment.

Professor Peter Collins, who led the research at Cambridge University, carried out genetic scans on 44 pilocytic astrocytoma and found a DNA sequence rearranged on a chromosome in the majority of the samples.

We think this important finding will be vital in guiding our future research

Dr Lesley Walker

The rearrangement creates a fusion gene, a hybrid created from two separate genes.

It is the first time fusion activity has been associated with a brain tumour.



Professor Collins said: "If we can diagnose exactly which type of brain tumour a child has as early as possible, the tumour is more likely to be treated successfully.

"We also hope the findings will mean it is possible to create therapies in the future that block the activity of the fusion gene and halt the growth of tumour cells."

Dr Lesley Walker from Cancer Research UK said: "Any discovery that adds to our understanding of the pathways that cause these tumours to form is quite exciting news.

"We think this important finding will be vital in guiding our future research."

Cancer Research UK and Samantha Dickson Brain Tumour Trust funded the project.

Paul Carbury, chief executive of the Samantha Dickson Brain Tumour Trust, said a major breakthrough had been achieved with a "world class piece of research".

Story from BBC NEWS:

http://news.bbc.co.uk/go/pr/fr/-/2/hi/uk_news/england/cambridgeshire/7701985.stm

Published: 2008/11/01 03:38:36 GMT



30 Seconds to Boot Up? That's 29 Too Many

By **RANDALL STROSS**

NEW laptops that boot up in 30 seconds? Too slow for me. Five seconds? Better, but what I want is a machine that's ready in about a second, just like my smartphone.

I'm fully aware that expressing any impatience with a computer's boot time invites derision. When the entire globe is engulfed in an economic crisis, measuring the seconds required to start different computers may seem the most trivial of concerns.

Still, I'm not alone. Unhappiness with boot times, which commonly run 45 to 60 seconds, is shared by many computer users, as reflected in much online discussion of the issue.

I've come to believe that the unhappiness does not illustrate impatience. Rather, it reflects an important shift in computing, as we increasingly rely on our laptops not as machines that we use for long stretches at a time, but as machines for using the Internet, often and briefly, and not much else. We don't tolerate, and have never tolerated, long wait times that are disproportionate to the activity that follows them. If we need to spend only a few seconds looking up something on the Web, it's only natural that we want the preparatory time to be as close to zero as possible. It's not impatience, just proportionality.

Smartphones provide access to e-mail and the Web. And now a fast-growing category of notebook computers, called netbooks, do the same, but with bigger displays and keyboards than the phones. Netbooks are lightweight and inexpensive — around \$400 for many models — but to be truly useful, they need to be on and ready to go immediately, the way smartphones are.

We hear computer manufacturers promoting laptops that can boot faster than ever, but they prudently avoid direct comparisons with smartphones. The manufacturers have speeded up boot times by equipping some Windows machines with a separate subsystem that contains its own central processing unit. If you choose to use this when you turn on the machine, Windows is bypassed and a mini-operating system is loaded instead, along with a limited set of applications that include a Web browser and a few other software odds and ends.

Limited functionality doesn't bother me: a browser and e-mail will keep me happy. But these machines take too long to reach a state of usefulness. At present, the only way to bring a laptop to life quickly is to summon it not from a cold state, nor from deep hibernation (suspend-to-disk), but from standby mode (suspend-to-RAM), in which the last session is stored in memory. Network connections are lost, however, and holding the data in memory drains the battery.





One manufacturer whose ultralightweight netbooks have helped to create the category is Asus, based in Taiwan. To achieve faster boot times, Asus equips its Windows machines with Express Gate, a subsystem that it says can boot up in as few as eight seconds, depending on the speed of the processor and hard drive. The company sent me a 6.2-pound G50V gaming machine for a test drive. I found that, in Express Gate mode, it took only eight seconds to boot up, as promised, but this was only a preparatory step. In checking my e-mail, 43 seconds elapsed before the browser loaded, my Wi-Fi connection was established and Gmail opened.

A wholly different approach is taken by Arjan van de Ven and Auke Kok, engineers at the Intel Open Source Technology Center, who set out to create versions of Linux that boot up in only five seconds, instead of the 45 normally required. They were also determined to boot up with the main system, without relying on a special subsystem like Express Gate. They succeeded, demonstrating their feat at the Linux Plumbers Conference in September with an Asus Eee PC 901, equipped with a solid-state drive, which helps, but a slow Atom C.P.U., which does not.

Mr. van de Ven has since used the same techniques to reduce the boot time to only three seconds on laptops with the much faster Core 2 Duo C.P.U.'s. The time needed to connect to the network and load a browser, however, was not included.

Still another approach, and to me the most intriguing, is being readied by Dell for release by year-end. Its Latitude On feature will not try to claim the fastest boot time on the block: it will still take 40 to 45 seconds to get its special non-Windows subsystem up and running. But once it is on, it can stay on indefinitely because it's engineered with a low-voltage processor to conserve battery power between charges. A Dell spokesman said the laptops in the lab were getting "almost four days" of use on a single charge.

HERE'S what catches my interest: When you're not using a Latitude On laptop, its screen will go dark, but it's not in standby mode — it's in a "low-power state," as Dell terms it. This permits it to keep network connections alive, including Wi-Fi and 3G mobile broadband and even virtual private networks, while it continuously loads e-mail in the background. With a touch, the screen lights up in 1 to 2 seconds, Dell says, just as a smartphone does.

That's exactly what I'd like to have. In fact, that's all I want: I don't want to lug around the main system; I want just the subsystem that's engineered for unbroken Internet connections and frequent, brief looks. Dell, however, is not offering this as an inexpensive netbook. Latitude On will be packaged as one feature on a fully loaded notebook marketed to corporate executives; Dell has not announced pricing but currently those models begin at \$1,999.

More bad news: its intended customers, corporate I.T. departments, have directed Dell to require a password from a user every time the machine returns to full power.

No, thanks. I will wait, then, for the next generation of instant-on machines, maintaining Internet connections even when the screen is darkened, serving uncomplainingly for days on a single charge and priced inexpensively — and with passwords made optional. If that takes a while, fine. I'm patient.

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<http://www.nytimes.com/2008/11/02/business/02digi.html?th&emc=th>



'I Write Entirely for You'**By WILLIAM LOGAN****WORDS IN AIR****The Complete Correspondence Between Elizabeth Bishop and Robert Lowell**

Edited by Thomas Trivisano with Saskia Hamilton

Illustrated. 875 pp. Farrar, Straus & Giroux. \$45



A poet should never fall in love with another poet — love is already too much like gambling on oil futures. Two poets in love must succumb to the same *folie à deux* as the actor and the actress, the magician and the fellow magician, because each knows already the flaws beneath the greasepaint, the pigeons hidden in top hats, all the pockmarked truth beneath illusion. Real lovers, Shakespeare long ago reminded us, have reeking breath and hair like a scouring pad.

Lovers may be permitted an exception to this ironclad rule, if they never achieve the bliss of consummation — and therefore never have to wake to the beloved's morning breath the morning after. Many would-be lovers have been divided by family, law or plain bad luck; before the days of long-distance phone calls or e-mail, the sublimated affair was conducted by postage stamp. The letters of Nietzsche and Lou Andreas-Salomé, Pirandello and Marta Abba, Gautier and Carlotta Grisi show that, though literature has always been good for love (think how many seductions may be chalked up to Shakespeare's sonnets), love was even better for literature if there was a mailbox nearby.



“Words in Air” collects the letters between Robert Lowell and Elizabeth Bishop, from a few months after they met at a dinner party in 1947 to a few weeks before his death of a heart attack 30 years later, a correspondence conducted across continents and oceans as their poetry drove them together and their lives kept them apart. As poets, Lowell and Bishop could not have been more different. His heavy-handed youthful verse, solemnly influenced by Allen Tate, laid down a metrical line like iron rail. (If Lowell’s early poems seem stultified now, they were boiled in brine and preserved in a carload of salt.) Her whimsical eye and wry, worried poems condemned her to be treated like a minor disciple of Marianne Moore. Bishop for much of her life was a poet’s poet, which means a poet without an audience.

Lowell and Bishop felt drawn to each other’s poetry from the start. Though wary of being seduced by an alien style (Bishop, after reading one of Lowell’s poems: “It took me an hour or so to get back into my own metre”), they were soon exchanging their work and, sometimes by return mail, sending back fond but exacting criticism. Lowell was a poet trying to get out of his own skin — he changed styles the way some men change socks — while Bishop was desperate to vanish into her words. (The two poets went from not being quite sure who they were to grousing mildly at what they had become.) It doesn’t take a Viennese doctor to suggest that the artist’s relation to art reveals something about childhood — Lowell’s poems were often an act of vengeance upon his parents, while Bishop’s concealed her anguish over a childhood best forgotten (she described herself as “naturally born guilty”).

Poetry can be a surprisingly lonely art — you end up wishing that Emily Dickinson had discovered someone livelier than Colonel Higginson, someone who showed a little more rapport. It’s so rare for a writer to find the perfect sympathetic intelligence, we think sadly of Melville and Hawthorne, Coleridge and Wordsworth, whose hothouse friendships came to grief, in part because of the fatal attunement of their imaginations — not all harmonies survive the wear and tear of character. Bishop and Lowell passed almost immediately from awkward introduction to rapturous intimacy. Though they were delighted by that most valuable specie of literary life, gossip, it was soon apparent what necessary company these brittle, gifted intelligences were.

Their surviving 459 letters, some surprisingly long (Bishop might elaborate hers over weeks, at times swearing she had written Lowell in her imagination), give us the closest view of these wounded creatures — his muscular, bull-in-a-china-shop intellect; her pained shyness and abject modesty, and a gaze like the gleam off a knife. She brought out the boyishness in him. They worked out in verse the terms of their fragility — its character, its allowance, its burden. It is not, not just, that their sympathies were nearly absolute (letters, however adoring, begin with an affinity of prejudices), but that each poet proved a nearly ideal audience — “I think I must write entirely for you,” Lowell told her.

Sometimes falling in love is as much an act of criticism as criticism is an act of love. Before, during and after his marriages, Lowell took lovers, from students to a Washington socialite (his poems were charged with an intensity no earthbound lover could match). At the outset of one of his “enthusiasms,” as he called his shadowy attacks of manic depression, he often fixed his attention on some starry-eyed young woman. Bishop was not starry-eyed. Lowell was so much in love with her poems, however, it must have seemed logical to fall in love with her. After a near disastrous visit in 1957 (their meetings, long planned and longed for, did not always go well), he wrote her that asking her to marry him was the great might-have-been of his life.

Bishop, who comes across as the more sensible and insightful of the pair, placidly ignored this revelation (she remained somewhat coquettish, from a distance); and their friendship proceeded as before — they continued to address each other as “Dearest,” and once Lowell called her “Dear Heart.” It is to the advantage of these letters that this love was impossible, as he must have known. Bishop was an alcoholic and a lesbian, as well as half a dozen years older. We owe the brilliance of their letters not to the love that dared not speak its name, but to the love whose name — except once — Lowell dared not speak. Eight years before he died, he wrote, “I seem to spend my life missing you!”





By 1951, Bishop had moved to Brazil, more or less by accident, or the accident of love. She fell in love during a stopover on a long freighter cruise, while being nursed through an allergic reaction to a cashew fruit. She adored the frankness of Brazilians — they took no notice of her shyness. Bishop was charmed by the exotic (perhaps one day, when she has ceased to be their darling, academic critics will accuse her of imperialist fantasies). Through coup and countercoup, through the yearly snarl of Brazilian politics, she wrote lighthearted poems that kept their darkness buried in the interior. She was always good at concealing what she felt.

Lowell became her lifeline to the literary world left behind. They discussed the books they read, their motley illnesses, how many poems they were writing (Lowell) or not writing (Bishop), their hopes of seeing each other (half a century ago, almost every visit was preceded by protracted negotiation by letter). If they shook their heads over the antics of Richard Eberhart or the later poems of Marianne Moore, we're amused, because we shake our own heads over Eberhart and the later poems of Marianne Moore. Their peers — John Berryman, Randall Jarrell, Theodore Roethke, Delmore Schwartz — were not exactly dismissed, but only coolly embraced (Bishop and Lowell admired Jarrell, but were not so fond of his poems). Younger poets, if mentioned at all, were mentioned for their faults.

Yet in this avid chatter there is nothing like braggadocio, nothing as bold as Keats's quiet remark to his brother, "I think I shall be among the English Poets after my death." At one point Bishop says, more in sorrow than in pride, "I feel profoundly bored with all the contemporary poetry except yours, — and mine that I haven't written yet." Their mutual praise is as affecting as the way they would shyly enclose some stray poem like "The Armadillo" or "Skunk Hour," described as trifling and now an indispensable citizen of our anthologies.

Their admiration even made them light fingered — they borrowed ideas or images the way a neighbor might steal a cup of sugar. Lowell was especially tempted by this lure of the forbidden, using one of Bishop's dreams in a heartbreaking poem about their might-have-been affair, or rewriting in verse one of her short stories. They were literary friends in all the usual ways, providing practical advice (the forever dithery and procrastinating Bishop proved surprisingly pragmatic), trading blurbs, logrolling as shamelessly as pork-bellied senators (Lowell was adept at dropping the quiet word on her behalf). There was a refined lack of jealousy between them — that particular vice never found purchase, though in letters to friends they could afford the occasional peevish remark about each other. The only time Bishop took exception to Lowell's poems was when, in "The Dolphin" (1973), he incorporated angry letters from his ex-wife Elizabeth Hardwick — "Art just isn't worth that much," Bishop exclaimed. She flinched when poets revealed in their poems too much of themselves, once claiming that she wished she "could start writing poetry all over again on another planet."

These poets, in short, inspired each other. Lowell always seems to be stuffing her newest poem into his billfold, so he can take it out later like a hundred-dollar bill. Bishop saw immediately how strange and even shocking "Life Studies" (1959) was (its confessional style caused as violent an earthquake in American poetry as "The Waste Land"); but he noticed something more subtle, that she rarely repeated herself. Each time she wrote, it was as if she were reinventing what she did with words, while he tended to repeat his forms until he had driven them into the ground, or driven everyone crazy with them. Bishop was loyal enough to admire, or pretend to, even Lowell's mediocre poems.

If Lowell and Bishop often seem to love no poems more than each other's, as critics perhaps they were right. A hundred years from now, they may prove the 20th century's Whitman and Dickinson, an odd couple whose poems look quizzically at each other, half in understanding, half in consternation, each poet the counter-psyche of the other. Their poems are as different as gravy from groundhogs, their letters so alike — so delightfully in concord — the reader at times can't guess the author without glancing at the salutation.

These lives were marked by terrible sadness. Bishop's Brazilian lover committed suicide; the poet continued drinking until she started falling down and injuring herself. Lowell's degrading seizures of



manic depression, during which he often behaved contemptibly, left him in a permanent state of semi-apology. His three marriages, each time to a novelist, ended badly. Though sometimes blocked or depressed, as a poet Lowell would suddenly bull his way forward; Bishop, timid as a turtle, often terribly lonely, slowly produced small masterpieces, finishing only one or two poems a year (she said, “I’ve always felt that I’ve written poetry more by not writing it”). The interstices of their lives were remade as art; but that is not enough, if you have to live the life afterward. Even in their 40s, they sound worn out.

The pleasures of this remarkable correspondence lie in the untiring way these poets entertained each other with the comic inadequacies of the world. Letters offer the biographical hour — though in some phrase you may see the germ of a poem, you possess all the brilliant phrases that didn’t make their way into poems, whether it’s Lowell saying that he, his wife and his mother were all “fuming inside like the burning stuffings of an overstuffed Dutch chair” or Bishop describing the baptism of some babies: “The god-parents holding them shook them up & down just like cocktail shakers.” Their remarks about writing have, in his case, a self-amused detachment (“I like being off the high stilts of meter”); in hers, deadpan modesty (“I have only two poetic spigots, marked H & C”). He: “Psycho-therapy is rather amazing — something like stirring up the bottom of an aquarium.” She: “I bought a small wood Benedito, the crudest kind of whittling and painting. . . . He’s holding out the baby, who is stuck on a small nail, exactly like an hors d’oeuvres.” In her mid-30s, Bishop, who called herself a “poet by default,” had not read Chaucer; in his late 40s, Lowell had to look up the words gesso, echolalia and roadstead.

Admittedly, in this concrete block of a volume there are long stretches of nattering, antique gossip, ideas that come to nothing (Bishop habitually started things she could never finish). The late letters often confine themselves to worries over age, money and dentistry. As the poets grow older, there come the premature revelations of death: Dylan Thomas, then Roethke, Jarrell, Schwartz, Berryman — many of their generation died too young. Comically, Lowell and Bishop more or less adopt the younger poet Frank Bidart, who catered to Lowell during his endless revisions (or perhaps encouraged his manic over-revision — “spoiling by polishing,” Lowell called it) and proved Johnny-on-the-spot after Bishop moved to Boston. If at times the poets treated him as a mere factotum, Bidart served as the surrogate son they could gossip about and fuss over.

The editing of this immense volume is so genially meticulous, it reveals that Robert Giroux’s selection of Bishop’s correspondence in “One Art” (1994) grossly altered her punctuation. Nonetheless, “Words in Air” is marred by a raft of typos and a sketchy, inadequate glossary of names. The editors confidently announce that the poets’ spelling has been corrected — all a reader can say is, would that they had corrected more of it.

This long, leisurely correspondence seems now of another world, a fading reminder of the golden age of letter writing. For some two decades, Bishop and Lowell have divided postwar American poetry between them, a shared dominion the more remarkable because their manners, their styles and their philosophies of imagination are so different. Though Bishop was not always highly rated in a generation of poets given to Sturm und Drang, she was worshiped by Lowell; and his is the taste we share now. Their devotion was crucial to their literary life, perhaps more than any of their love affairs. These star-crossed lovers found the muse in each other.

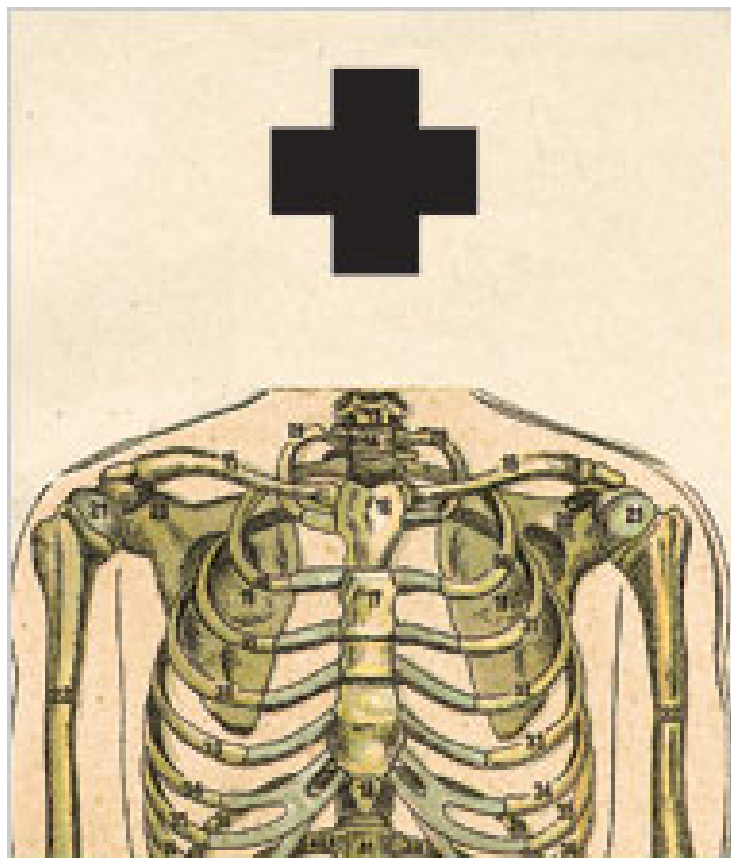
William Logan is a poet and critic whose most recent books are “The Whispering Gallery” and “The Undiscovered Country.”

<http://www.nytimes.com/2008/11/02/books/review/Logan-t.html?8bu&emc=bu1>

Body of Knowledge**By GARY ROSEN****DESCARTES' BONES****A Skeletal History of the Conflict Between Faith and Reason**

By Russell Shorto

Illustrated. 299 pp. Doubleday. \$26



Making the case for one or another historical moment as the starting point of modernity is a familiar hook for writers of grand chronicles. Was the transformative event World War I, with its fateful consequences for 20th-century warfare, ideology and identity? Or perhaps Einstein's "miracle year" of 1905, when he published his universe-shattering papers? The appearance of Darwin's "Origin of Species" offers a bright dividing line, as do the (take your pick) French and American revolutions. The literary critic Harold Bloom reaches still farther back, crediting Shakespeare with the "invention of the human" in its various modern modes. Others find the deepest roots of modernity in the bleak realism of Machiavelli.

Russell Shorto's "Descartes' Bones" is a smart, elegantly written contribution to this genre. For Shorto, the pivot upon which the old world yielded to the new was the genius of Descartes, the philosopher who gave us the doubting, analytical, newly independent modern self. The Frenchman's most famous phrase,



“I think, therefore I am,” may strike our own ears as a coffee-mug cliché, but in the 17th century it was a revolutionary declaration. Shorto’s achievement is to complicate this picture, and with it our understanding of modernity, by also describing the religious context of the philosopher’s ideas. Though Descartes’s name has come to be associated with unrelenting rationalism, he was “as devout a Catholic as anyone of his time,” Shorto writes, and looked to theology to support his system. As Shorto recognizes, our own fundamentalists, religious and secular alike, might draw some useful lessons in modesty from Descartes’s example.

Descartes made a cameo appearance in Shorto’s previous book, *“The Island at the Center of the World”* (2004), a richly detailed revisionist history of 17th-century Dutch Manhattan and its liberalizing influence on America’s British colonies. In those pages, we encountered the philosopher as a celebrity in Holland, where he lived for almost two decades and, in 1637, published his seminal “Discourse on the Method.” Descartes takes center stage in Shorto’s new book, but not in the way one might expect. The action opens in the winter of 1650, with the hapless Frenchman on his deathbed in faraway Stockholm, cursing the fate that had lured him to the Swedish court of Queen Christina. By Page 40, after an instructive synopsis of his controversial career, exit Descartes, a corpse — and enter a large, motley cast of Cartesians, determined to do right by their teacher’s ideas and by his moldering, displaced bones.

Shorto makes deft use of the centuries-long to-and-fro over Descartes’s remains, a tale that involves three different burials, events in six countries and lingering questions, partly resolved by the author himself, about the authenticity of the skeleton, or rather of its scattered parts. As it turns out, the skull of the philosopher was separated mysteriously, at an early date, from the rest of his bones. This macabre fact provides Shorto with the makings of a detective story but also with an irresistible metaphor. Descartes’s chief contribution to modern science and philosophy was his radical focus on epistemology, on defining the boundaries of what we are capable of knowing with certainty. At the center of this project was his assertion of mind-body dualism, the notion, as Shorto explains, that “the mind and its thoughts exist in a different category or somehow on a different plane from the physical world.” For his admirers and for a latter-day scientific establishment aware of its debt to him, what could be more urgent than identifying and uniting the deceased philosopher’s own head and body?

The parade of colorful figures taking part in this drawn-out effort forms the heart of Shorto’s narrative. We meet Hugues de Terlon, a militant Catholic and the French ambassador to Sweden, who in 1666 had Descartes’s bones repatriated, seeing in the philosopher’s famed “method” a superior window into God’s handiwork. Another central character is the waifish, ethereal Alexandre Lenoir, a rationalist aesthete and supporter of the French Revolution who spent the years after 1789 fighting to preserve the artistic and architectural heritage of the old regime, including the Parisian church of Ste. Geneviève, where Descartes was (ostensibly) buried. A number of early-19th-century scientific notables also play significant roles in the story, including Jöns Jacob Berzelius, the Swede who invented modern chemical notation; Jean-Baptiste-Joseph Delambre, an important contributor to the development of the metric system; and Georges Cuvier, a pioneer in comparative anatomy and paleontology.

The religious quarrels in which Descartes’s ideas embroiled both himself and his followers are too numerous to count, ranging from the character of transubstantiation in the Eucharist to the possibility that the animal kingdom might exhibit something other than the Bible’s apparent “fixity of the species.” Most of these disputes concern, in one way or another, the challenge posed by the new mechanistic science to classical notions of nature and its ends — that is, to the teleology inherited from Aristotle and codified by churchmen. But, as Shorto emphasizes, there was another side to Descartes’s project. The philosopher thought he had succeeded not in overturning the true faith but in protecting it from the crumbling edifice of ancient natural science. His mind/body distinction, Shorto notes, has long been invoked in defense of “an eternal realm of thought, belief and ideals that can’t be touched by the prying fingers of science.”

Whether Shorto himself falls into this camp is hard to say, but he offers welcome sympathy to those of us who would like to see today’s discussion of the relationship between science and religion placed on a more civil, informed footing. It is a mistake, he writes, to think that the Enlightenment “set reason firmly



against faith and the two have ever since been locked in a death struggle.” Radicals among the trailblazing modern thinkers were more than equally matched by moderates who believed that “reason would function alongside faith to increase human happiness and life span, end disease, reduce suffering of all kinds and give people greater power over nature and greater freedom in their lives.” If the founders of the modern sensibility could bridge this divide, perhaps we can, too.

Shorto overreaches at times in the interest of advancing a strong thesis and weaving an engaging tale. Descartes’s influence was immense, to be sure, but it is a stretch to credit him, as Shorto does, with laying the ground for modern ideas of equality, individual rights and self-government. On the scientific side of the ledger, Shorto’s eagerness to set apart Descartes as a system-builder leads to his unfortunate assertion that the celebrated experimenters and empiricists of early modern science — Galileo, Bacon, Harvey, Kepler — initially sowed “more confusion than clarity.” Melodrama also occasionally intrudes into Shorto’s account, particularly in his sleuthing about Descartes’s skull and his speculation about the philosopher’s feelings for his working-class mistress and their illegitimate daughter.

None of this detracts much, ultimately, from Shorto’s feat of intellectual story-telling. If pressed, he would probably concede that his philosophical hero was not so single-handedly responsible for modernity; Descartes had many capable partners, even peers. But Shorto is right about certain enduring aspects of Descartes’s thought. As he observes in the book’s epilogue, in an especially eloquent passage about dualism: “We are all philosophers because our condition demands it. We live every moment in a universe of seemingly eternal thoughts and ideas, yet simultaneously in the constantly churning and decaying world of our bodies and their humble situations. . . . The result is a nagging need to find meaning.”

Gary Rosen is the chief external affairs officer of the John Templeton Foundation.

<http://www.nytimes.com/2008/11/02/books/review/Rosen-t.html?8bu&emc=bua2>

They Didn't Name That Lake for Nothing**By MAX BOOT****CHAMPLAIN'S DREAM**

By David Hackett Fischer

Illustrated. 834 pp. Simon & Schuster. \$40

Is there a finer student of American history writing today than David Hackett Fischer? If so, I don't know who it would be.

This veteran professor of history at Brandeis has turned out one dazzling study after another. He won a Pulitzer Prize for his 2004 book "Washington's Crossing," which used the dramatic thrust by the Continental Army across the Delaware River on Christmas night, 1776, as the focal point for an illuminating study of the American Revolution. He adopted a similar approach in his earlier work, "Paul Revere's Ride."

But his true masterpiece was "Albion's Seed: Four British Folkways in America," published almost 20 years ago. It argued that much of the regional variation in American culture since the 17th century can be explained by the different geographical origins of various groups of early British settlers. First to arrive were the Puritans, who traveled from East Anglia to Massachusetts. They were followed by "a small Royalist elite" that moved from southern England to Virginia; Quakers who came from the northern Midlands of England and Wales to the Delaware Valley; and finally the Scots-Irish who came "from the borders of North Britain and northern Ireland to the Appalachian backcountry." Each group, he argued, brought its own "folkways" — everything from "distinctive dialects of English" to "different conceptions of order, power and freedom" — and those folkways have left an indelible impression even on the majority of Americans whose ancestors did not come from the British Isles.

Fischer's latest work is not quite as novel or daring but, in a smaller way, it helps to shed light on what, to most of us, remains a relatively obscure corner of our continent's history: the settlement by the French in what became Canada. Although the French lost any hopes of political dominance after Wolfe's defeat of





Montcalm on the Plains of Abraham in 1759, their progeny continue to play an important role not only in Canada but as far away as Louisiana. “Progeny” is not just a figure of speech in this case: Fischer writes that more than two-thirds of the French inhabitants of North America today “are descendants of 1,100 French women who came to Quebec between 1630 and 1680.”

Such success the French had was due, Fischer argues, in large measure to one man: Samuel de Champlain. He was never the senior official of New France; that job always fell to a titled viceroy safely back in France. But during the pivotal years from the founding of Quebec in 1608 until his death in 1635, he was the senior man on the spot. Thus he became known as the father of New France, as well as a soldier, mariner, cartographer, writer, artist, naturalist and ethnographer of renown. But he wasn't just a man of the frontier. Some of his most important achievements, Fischer suggests, occurred not in the North American wilderness but in the gilded salons of Paris, where his incessant lobbying kept alive royal support for the daring American enterprise. Not the least of his achievements was surviving 27 crossings of the North Atlantic in 37 years without losing a major ship, at a time when every voyage risked disaster.

For all of Champlain's achievements, few biographers have ever chosen a tougher subject. His papers were lost, and little is known about his early life or inner life. What year was he born? Was he the illegitimate son of the lascivious King Henri IV? Was he originally a Protestant or Catholic? No one knows for sure. It's not even clear what he looked like, since, as Fischer, notes, only a single “authentic likeness . . . is known to survive from his own time” — and that is a tiny self-portrait in a larger engraving depicting a battle scene.

Fischer responds to this challenge the way any careful researcher would. He scours the record, archaeological as well as historical, to find out what we can reliably conclude, and then fills in the holes with some informed speculation. Because he is a rigorous historian, not a historical novelist, he is always scrupulous about drawing a firm line between facts and inferences, and he presents a wide variety of views. He even includes appendixes to examine competing theories about Champlain's birth date, the scene of some of his most famous victories, the accuracy of his published writings and other matters of dispute.

Fischer is not a prose stylist to rival the great popular historians — the Barbara Tuchmans, Shelby Footes and David McCulloughs. Arguably he is not a popular historian at all but simply an academic who has reached a wide audience. Yet even when he writes books of doorstep heft, as he invariably does, his plain, unadorned style is never dry or boring, in part because he so often sprinkles intriguing ideas into the narrative.

His thesis in “Champlain's Dream,” which these days might be considered daring, is that Champlain was an admirable, heroic figure — a stance that runs counter to the recent trend in historiography to debunk and demean most “dead white males,” especially those who were explorers and settlers. Many of them richly deserve this opprobrium for slaughtering and otherwise mistreating the indigenous peoples they encountered. But Champlain was different. He was more interested in learning from and cooperating with Indians than in exploiting them. He treated most of those he met with “dignity, forbearance and respect,” and, Fischer writes, they largely reciprocated: “He had a straight-up soldier's manner, and Indian warriors genuinely liked and respected him.”

That does not mean he was able to avoid conflict altogether. By drawing closer to certain tribes, notably the Montagnais, Algonquin and Huron, he incurred the wrath of their enemies in the Iroquois League. Champlain and a handful of other Frenchmen went along with war parties of allied Indians in three campaigns in 1609, 1610 and 1615. He and his men, although few in number, made a crucial difference with their arquebuses, which scattered the terrified Iroquois who had never before seen a “thunderstick.” Even then, Fischer writes, Champlain “did not intend a war of conquest.” Rather, his objective was to deliver “one or two sharp blows” that would deter Iroquois attacks “by raising the cost of raiding to the north.” He largely succeeded in keeping the Iroquois from attacking the French until 1640 — after his death.





Champlain was considerably more enlightened in his attitude toward the Indians than most of his contemporaries. He did use the word *sauvage*, but in the 17th century it simply meant “forest-dweller.” He did not believe Indians to be inferior to Europeans. He found them, Fischer writes, “to be the equal of Europeans in their intelligence, and superior in physical strength and the proportion of their bodies.” Not that Champlain ever “went native.” He censured his Indian friends for not having a king, a monotheistic religion or a body of laws — and for torturing their captives. Fischer concedes that he was “ethnocentric in some of his attitudes,” but argues that “his thinking was more generous and large-spirited than some of the judgments that have been made against him” in our time.

Champlain’s relatively tolerant attitude was the product, Fischer argues, of his upbringing. Champlain was born to an *haute-bourgeois* seafaring family in Brouage, a “cosmopolitan town” whose traders sailed to the farthest reaches of the globe. It also lay in a region of western France contested by Protestants and Catholics, who, in the late 16th century, were often at each other’s throats. As a young man, Champlain fought in France’s costly wars of religion, giving him his fill of violence and intolerance. He also visited Spain’s New World colonies from 1599 to 1601, where he was revolted by the abuses inflicted on African slaves and Indian laborers. “Champlain strongly favored the spread of Christianity in the New World, but not by cruelty and violence,” Fischer writes. He wound up dreaming “of a New World where people lived at peace with others unlike themselves,” and tried to make New France the realization of his dream.

Thanks in no small part to Champlain’s humanistic philosophy, the French were able to establish more amicable relations with local tribes than were the Spanish, Dutch or English. In fact many Frenchmen wed Indian women with the encouragement of their leaders, who “were more tolerant of marriages with Indians than of unions with Protestants.” These intermarriages spawned a whole population of French-Indians, the *Métis*, with their own distinctive culture.

Although Fischer does not mention it, the close French-Indian connection would be viewed in a more sinister light by New Englanders, who were subject to vicious attacks in the 17th and 18th centuries by what Cotton Mather described with horror as the “half-Indianized French, and half-Frenchified Indians.” Those Anglo-French conflicts were prefigured by an English expedition in 1629 that drove Champlain and his small cohort out of Quebec. (The settlement was returned in 1632 following a peace treaty with France.)

That the English ultimately triumphed in the battle for North America was due mostly to the fact that they vastly outnumbered the French. There are many explanations for this disparity, but surely it had something to do with the fact that most of the English settlements offered greater freedom. Although he insisted on tolerance for Protestants, Champlain imposed severe restrictions on speech and press, and he did not create any analogue to the elected assemblies in the English colonies. “The habitants of Canada were not encouraged to think of themselves as free people,” Fischer writes. “In New France, limits on liberty and freedom were imposed by the will and judgment of an absolute ruler who was accountable only to another absolute ruler in Paris.”

Thus, for all his achievements, Champlain’s blind spot may have proved fatal to the ultimate realization of his dream.

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<http://www.nytimes.com/2008/11/02/books/review/Boot-t.html?8bu&emc=bua2>



Entangling Alliances

By JOSEF JOFFE

FROM COLONY TO SUPERPOWER

U.S. Foreign Relations Since 1776

By George C. Herring

Illustrated. 1,035 pp. Oxford University Press. \$35



This is an ambitious work and a steal — a thousand pages for \$35. Such heft is rare these days, and such ambition is even rarer: a single-volume history of American foreign policy from George Washington to George W. Bush. For a similar try, you have to go back half a generation to Eugene V. Rostow's "Breakfast for Bonaparte" or to the four-volume (and four-author) "Cambridge History of American Foreign Relations."

Professionals and interested laymen will always want such a book: an up-to-date, two-inch-thick repository of facts and quotations, with the what, when and wherefore of, say, Manifest Destiny laid out at your fingertips. Or, who first warned against "entangling alliances"? No, it wasn't Washington but Jefferson.

True, you can also find that in Wikipedia, but minus the imprimatur of the Oxford History of the United States series, of which "From Colony to Superpower" is the seventh volume. And wouldn't you rather rely on an established historian who is also the former editor of the journal *Diplomatic History*?

The strength of this book is the author's Herculean power of synthesis. Ours is the age of merciless specialization — no grand prizes for grand sweeps. Yet Herring recaptures a quarter-millennium of American foreign policy with fluidity and felicity. Wisely or warily, he avoids taking sides in the great controversies; a good teacher, he presents the “on the one hand” along with the “on the other,” copious references included.

Though the book lacks original research, and rarely cites primary sources, it is not a textbook — or if so, it is a very sophisticated one with about a hundred footnotes per (short) chapter and a 31-page bibliographic essay. Neither is it an interpretative, let alone argumentative history of American diplomacy. For that, a reader will have to go to Walter A. McDougall's “Promised Land, Crusader State” or Walter Russell Mead's “Special Providence.”

Herring's argument comes rather by way of indirection. From the first to the last page, this book whispers that the conventional narrative of America insulata is dead wrong. Never did the United States follow as a “great rule of conduct” the advice laid out in Washington's Farewell Address: “to have . . . as little political connection as possible” with Europe. Isolationism has been a myth and a fighting word, but not a policy.

The ex-colonists could never have won the war against the British without the French. When Jefferson doubled the country's size through the Louisiana Purchase, he was playing diplomatic hardball with the best of them, pitting France, Britain and Spain against one another. “Regime change” is not W.'s invention. During the four-year war against the pirate-extortionists of Tripoli, Jefferson and Madison launched the “first U.S. attempt to replace a hostile foreign government” by trying to topple the Pasha and install his exiled brother. Did Americans really despise power politics as a corrupt game of princes? By 1851, Secretary of State Daniel Webster crowed that America would eventually “command the oceans, both oceans, all the oceans.”

Americans think the Civil War was all theirs; in fact, both sides “recognized that their success or failure” depended on the “European great powers.” During the Gilded Age, the nouveau riche Republic felt cocky enough (in the words of *The New York Herald*) to tell Britain: “She need not bother with this side of the sea. We are a good enough England for this hemisphere.” At the end of the century, hyperbole knew no limits. “We are . . . a great imperial Republic destined to exercise a controlling influence upon the actions of mankind,” a pundit of the period declared.

Even in the post-1919 heyday of “isolationism,” America's foreign entanglements actually thickened. Direct investment in Europe more than doubled in the 1920s; some 1,300 American companies were established there. Though the Senate vetoed membership in the League of Nations, American financiers and diplomats saved postwar Europe from economic disaster (see the Young and Dawes Plans).

Another between-the-lines argument is about the interconnectedness of it all. This is not as trite as it sounds because a vast majority of the literature on American diplomacy focuses on specific regions and countries. Herring diligently draws out the global dimensions of the nation's foreign relations. Still, when he takes a jab at “Eurocentricity,” he loses his balance. About the 1920s he complains: “In a strange, almost surreal way . . . the postwar world remained Eurocentric.” Considering what followed — Stalin, Fascism, Hitler, World War II — the problem, one would think, was rather too little “Eurocentrism.”

And this problem is symptomatic of a larger failing. “From Colony to Superpower” is a tale without a theory. Herring writes about the grand sweep of history without providing even a middling idea about its drivers; it's like composing music without themes, tempos and crescendos. The fateful progression toward war with Japan gets about the same amount of space as do relations with Latin America.

Worse, because the book lacks a conceptual framework, the titanic power struggle of states dwindles into a string of all-too-human mishaps. Japan's ambassador to the United States, Kichisaburo Nomura, and Secretary of State Cordell Hull “often talked past each other” in the run-up to the war, Herring reports.

“They spoke without an interpreter, and Nomura’s limited understanding of English at times misled him regarding the progress that had been made.” Get your English right or get an interpreter is apparently the wide-eyed moral of this story.

Personalization leads easily to demonization, as when Herring invokes a naval clash in the Atlantic three months before Hitler declared war to claim that “an opportunist F.D.R. used an allegedly unprovoked attack to escalate the naval war” against Germany. Gee, if Roosevelt had been a bit nicer, he could have kept the country out of war. And let Hitler have Britain and all of Europe?

Herring takes the same approach to the cold war, ever so softly fingering Truman as culprit with suggestive sentences like: His “first moves did not mark Truman’s abandonment of F.D.R.’s effort to cooperate with the Soviet Union.” Hmm, is that to say he did abandon the effort? Yes, 32 pages later: “The dramatic initiatives of 1947-48” like the Marshall Plan “hardened the division of Europe.”

This is a mildly revisionist version of history that authors like Gar Alperovitz began to push full blast in the 1960s. But the issue here is trying to distinguish between contingency and necessity. Thucydides wrote about the foibles of the players in the Peloponnesian War, but in the light of an overarching theme — that the growth of Athenian power had made war with Sparta inevitable. And so too, regarding wars in modern times, with Japan and Nazi Germany (hot) and the Soviet Union (cold).

The closer Herring comes to the present, the shakier the ground on which he walks. There are some classics he seems not to have read, like Robert E. Osgood’s “NATO: The Entangling Alliance,” the standard account of coalition-building in the cold war. Or Samuel Huntington’s monumental volume “The Common Defense.” Curiously, he uses “Gulliver’s Troubles” as the title for his chapter on Kennedy and Johnson, but he does not cite Stanley Hoffmann’s study with the same name.

We have long been waiting for a single-volume history like this one, and “From Colony to Superpower” deserves a place on the bookshelf, if only for sheer effort and sweep. But it won’t replace the volumes of the Cambridge History, or a few dozen of the classic authors from Samuel Flagg Bemis to Norman Graebner, from George F. Kennan to John Lewis Gaddis. Sometimes more is less.

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<http://www.nytimes.com/2008/11/02/books/review/Joffe-t.html?8bu&emc=bua2>

Looking at Students and P2P — With Data

ORLANDO — Between the deluge of litigation from the entertainment industry and defiant opposition from college students, is there a way out of the deadlock surrounding the debate on peer-to-peer file sharing?

Researchers now conducting an in-depth study of students' downloading habits — and how they respond to policy changes — think there is, and the magic bullet isn't a call for a restructuring of the industry or a punitive approach to music theft. It's data.

So much data, in fact, that banks of computers at Carnegie Mellon University are still processing the reams of numbers collected last year. Although the full extent of the study's conclusions isn't known yet, those involved in the project shared some results of the data analyzed so far: students' Internet activity during the full month of April, 2007, on Illinois State University's campus network.

The university, a major producer of K-12 teachers and home of the [Digital Citizen Project](#), which funded the study with support from both higher education associations and industry, allowed its IT specialists to monitor the Internet use of all students who live on campus for three separate months: April of last year, September of last year and April of this year. The last two months are still being analyzed.

The unprecedented scope of the project — complicated by the sheer amounts of data, not to mention the privacy concerns that had to be addressed before multiple institutional review boards — has allowed, and will continue to allow, researchers an in-depth peek at students' downloading habits. Some of the results — such as that iPods dominate in students' choices for portable music players or that peak downloading times are around 1 a.m. — confirm conventional wisdom. Others upend it, while data soon to be released could provide new insights into what kinds of interventions can reduce illegal file sharing on campus.

Perhaps most surprising for some will be the finding that not all students, in fact, are born technological geniuses. Many of them, in fact, aren't aware of the difference between peer-to-peer file sharing (using clients such as LimeWire and Kazaa) and sharing files over instant messaging clients or Facebook. That highlights what the researchers believe is the most important way to approach the problem of illegal downloading: education.

“The one thing we do know is that we cannot assume the students know more than they know,” said Warren Arbogast, the founder and president of Boulder Management Group, a consulting firm, who is also on the Digital Citizen Project's management team.

Arbogast and others from the university presented their findings thus far [at the annual Educause conference](#), still under way here in Orlando.

One point Arbogast stresses is that file sharing shouldn't be thought of as a technological issue — one that can be solved by installing the right monitors or blocking the right addresses. As he pointed out, the end result of that mindset is a kind of “technological whack-a-mole,” an [arms race](#) in which students and industry (with higher education caught in the middle) are constantly trying to outdo each other with new, innovative ways to share music and video.

Sure, campuses can block peer-to-peer file sharing completely, but then again, students could just as easily swap music videos freely available on YouTube or stream music from perfectly legal Web sites, and even install a [browser plug-in](#) to convert that streaming media into formats downloadable to their iPods. In other words, there's always going to be the next method of sharing music, movies and TV, a fact that's been true ever since the advent of cassette mix tapes and VHS.

“I think the bottom line for me is that this ... now is less an IT issue than it is an education issue. We've got a problem with theft, and I think the question is do we want to try and do something about it?” said Arbogast in an interview.



To illustrate that point, the study found that in April of last year, 51 percent of students living on campus were detected using the peer-to-peer protocol, legal or not. Forty-two percent of students living on campus transferred material that was copyrighted — in other words, they were illegally downloading or uploading files. On average, there were six copyrighted titles transferred per student per week.

So that means a lot of students share copyrighted music, movies and TV shows — but also that a lot don't. The remaining question, Arbogast said, was to investigate the “moment of truth” — in the seventh or eighth grade, when downloading habits are first formed — when some students decide to start sharing files and others don't.

To collect the massive amounts of data for the study, the university used what is called deep packet inspection technology through a system called Audible Magic, which can identify the signatures of files being transferred on a network and compare them to known copyrighted works. During the study, the researchers concluded that DPI technology was effective in limited ways — for example, it cannot detect encrypted peer-to-peer traffic, which students can easily employ with the click of a button.

The technology, they concluded, was a useful diagnostic tool to detect activity and target specific students for educational outreach programs. But if used as part of a more punitive approach, the researchers warned, students could just alter their behavior for a short time or switch to encrypted methods or torrents, which can't easily be tracked. “If you threaten us, we'll respond,” Arbogast said, likening the response to a driver passing a police car. “Not the way you think.”

The study began after a period in which the university received hundreds of “takedown” notices issued by the entertainment industry under the Digital Millennium Copyright Act, in addition to four subpoenas. At that moment, Arbogast quipped during the session, he realized “we had a research project on our hands.”

Even after data collection ended, the university is learning more about how to respond to students' downloading habits. It now blocks all peer-to-peer file traffic on campus, except for students who read and agree to an online pledge that they will only use it for legal purposes (such as the popular game World of Warcraft, not the smallest source of P2P traffic on many campuses).

The results are striking: After collecting data showing that over half of 5,600 or so on-campus students share files, only 112 students are now signed up for the ability to use the P2P protocol. Of those, two have been caught using the network for illegal purposes. “This really comes down to an education issue and a responsibility issue,” Arbogast said.

Other campuses have tried similar awareness-based interventions, mainly with success. Whether such efforts will catch on may depend on future research. The computers at Carnegie Mellon are still chugging away.

— Andy Guess

*The original story and user comments can be viewed online at
<http://insidehighered.com/news/2008/10/31/p2p>.*



Museum as Romantic Comedy

By **ROBERTA SMITH**



Librado Romero/The New York Times

A few minutes into “NY. 2022,” a performance piece at the [Guggenheim Museum](#) last Friday night, a young man and woman stripped naked, stepped into a frosted-glass shower stall and started pouring water on each other. As if on cue, two audience members got up and left the museum’s theater, huffily.

Too bad. They missed 45 minutes of ineffably touching, occasionally sentimental vignettes, music and seemingly mundane yet profound life lessons, culminating in the joyous first movement of [Beethoven’s Sixth](#). It was played by an orchestra whose members rose, one by one, and disappeared into the wings as the music progressed, until the last few bars were played by a lone bassist. Suddenly, the sweetness of art, life and even death seemed rolled into one.

The performance — a collaboration between the French artist Dominique Gonzalez-Foerster and the musician Ari Benjamin Meyers — was performed twice last weekend and, sadly, won’t be repeated. But it provides valuable viewing advice for the exhibition that occasioned it: the Guggenheim’s barely there, sometimes invisible exhibition, “[theanyspacewhatever](#).” Namely, don’t leave early. And take it as a romantic comedy in six levels. After all, the show begins with a bridal-white movie marquee and ends with a revolving hotel room, complete with double bed and black silk sheets.

In between await works that may initially seem trifling, glib or unpromising, when you can find them. There are non sequiturs to read, jokes to get, videos to watch, shoes to kick off, colored lights to see, recorded sounds to hear and, yes, the bed, part of a hotel room by the German artist Carsten Höller. For a price and with a reservation, up to two people can spend the night. (Like so many must-dos in New York, it is sold out.) Yet as you move up the museum’s great spiraling ramp, just about everything here sneaks up on you in some way, expands in pleasure and meaning and also starts overlapping and ricocheting with everything else.

The exhibition “theanyspacewhatever” takes its title from a cinematic term coined by the French philosopher Gilles Deleuze to describe anonymous shots of things you look at every day but don’t see, used as transitions in movies.

However, the Guggenheim’s rotunda, a Frank Lloyd Wright masterpiece, is not exactly “any space.” If you’re going to make elusive art that often looks like life, it certainly helps to do it inside a powerful work of art. You also could question the decision by Nancy Spector, the museum’s chief curator and the show’s organizer, to reconvene a group of usual suspects, who are also something of a clique, to represent a widespread, complex phenomenon sometimes put under the scary chapter heading “relational aesthetics.”

The 10 artists here — Angela Bulloch, Maurizio Cattelan, Liam Gillick, Douglas Gordon, Pierre Huyghe, Jorge Pardo, Philippe Parreno and Rirkrit Tiravanija, along with Ms. Gonzalez-Foerster and Mr. Höller — have exhibited and sometimes collaborated together since a show that Mr. Gillick and Mr. Parreno organized in Dijon, France, in 1995. In Ms. Spector’s defense, if you give 10 artists the run of the place, at least relatively speaking, perhaps they need to know one another and already have a working relationship.

The goal of “relational aesthetics” is less to overthrow the museum than to turn it upside down, wreaking temporary havoc with its conventions and the visitor’s expectations of awe-inspiring objects by revered masters. The larger point is to resensitize people to their everyday surroundings and, moreover, to one another in a time when so much — technology, stress, shopping — conspires against human connection.

The artists in this show and others like them extend a tradition of museum subversions that began with Conceptual Art in the 1970s and gained savvy and momentum with the institutional-critique phenomenon of the late 1980s. Emerging in the mid-1990s, the relational artists favored a more carefree approach that featured ephemeral situations, functional objects (often involving seating), architectural follies, amusing signage, elegant or arcane graphic design, performances, freebies (including food) and loosely planned group events.

At the Guggenheim relations begin with Mr. Parreno’s emblem of romantic comedy above the museum’s entrance: a gorgeous white-on-white movie marquee of neon and fluorescent lights hanging from white, lighted chains. It blinks wildly, like an excited crowd, but has no message and is open to interpretation. It suggests you are entering a palace of pleasure and purity, art and life, aesthetics and entertainment.

Once you’re inside, the next thing you may notice is a sculpture by Mr. Cattelan, tinged with his usual sarcasm. It is a large, full-color figure resembling Disney’s beloved Pinocchio, floating face down in the Guggenheim’s elliptical pool. Next comes the first phrase of an elaborate word piece by Mr. Gordon that winds its way up the ramp, exploiting every twist and turn in different fonts and type sizes. The opening salvo, in enormous letters on the rotunda floor, is “Are We Evil,” with a period rather than the comfort of a question mark. This may not be the movie the dazzling marquee prepared you for, but soldier on. Things start to add up. Mr. Gordon’s words in particular coalesce into a web of shifting emotions, intimacies and pronouns.

Also winding up the ramp are barn-red, S-shaped benches designed by Mr. Gillick, along with hanging metal signs that may refer to their locations, the show or the building. The benches provide respite and echo the spiral, especially if you are listening to the show’s half-hour audio guide, another work by Mr. Parreno. On the audio guide Boris Konrad, a world-champion memorizer, recites something he read just once: a selected chronology of works and exhibitions by the artists in this show. He pauses often, as if retrieving data from some nether part of his brain, and the alternating sound and silence become a kind of metaphor for the show.

Ms. Gonzalez-Foerster, who is represented by a light-and-sound installation using the dwindling Beethoven performance from “NY. 2022,” has also walled in one level of the ramp with a canvas screen,



creating a white, tunnel-like space where you hear the sounds of flowing water. (This evokes another Wright masterpiece, the weekend house Fallingwater, built above a gushing stream.)

Mr. Pardo has turned one level into a labyrinth by erecting cardboard screens perforated with circles that echo the rotunda's curves and create an elaborate porthole effect. The screens are hung with prints by all the show's participants and strange little shapes, some lighted, that are actually the outlines of a plucked chicken.

Mr. Tiravanija, who started his career with installations that consisted of his cooking and serving large pots of Thai curry to gallery visitors, has teamed with Mr. Gordon in a work titled "Cinéma Liberté." It consists of a dozen films once banned in the United States, starting with "The Red Kimona," directed by Walter Lang in 1925, in an area customized with beanbag chairs and a functioning espresso bar. Even if you don't join in, you may find yourself reflecting on the way art creates freedom by overcoming, sooner or later, the opposition it first meets.

A parting caveat: the claims by these artists and advocates that their work can help heal human relations and create a sense of community, any more than any other art does, are hard to prove. Do I really need to take off my shoes and plop down on white pillows strewn on an orange carpet to watch "Chew the Fat," Mr. Tiravanija's surprisingly engrossing interviews with his co-exhibitors and other artists?

Or don a little miner's light along with hundreds of other visitors while the museum turns down the lights for an hour for a group event by Mr. Huyghe (repeated on Nov. 17 and Dec. 8)? It was fun for the first few minutes, but the concept looks better in a book of smoky drawings of works in the show commissioned by Mr. Huyghe. The book sells for \$10 in the gift shop, and the images can be ironed on to T-shirts. Definitely relational, this effort constitutes one of the best and most hidden visual moments in "theanyspacewhatever."

It is invigorating to see a high-profile New York museum submit to such an experimental form of institutional loosening up, and in its premier, signature space. It feels like change. For the show's duration those big letters on the front of Wright's rotunda should read, "The Guggenheim Museum, Temporarily an Alternative Space, Inclusive and User-Friendly."

"theanyspacewhatever" runs through Jan. 7 at the Guggenheim Museum, 1071 Fifth Avenue, at 89th Street; (212) 423-3500, guggenheim.org.

<http://www.nytimes.com/2008/10/31/arts/design/31gugg.html?th&emc=th>



Miró, Serial Murderer of Artistic Conventions

By **HOLLAND COTTER**



Amputate tradition, torture the past, terrorize the present. The impulse to destroy was part of what made early Modern art the guerrilla movement it was.

Cubism sentenced illusionistic art to the Death by a Thousand Cuts. Dada unleashed an anti-aesthetic Reign of Terror: Beauty? Off with its head. Decay? Let's have more. Surrealism, a slippery business, let the killer instinct run amok. Tossing manifestos, dreams and libidos like bombs, it aimed to bring Western civilization to its knees and keep André Breton in the news.

So in 1927, when Joan Miró said, "I want to assassinate painting," he wasn't saying anything new. What was new was the way he carried out his cutthroat task. That process is the subject of "Joan Miró: Painting and Anti-Painting 1927-1937," an absorbing, invigorating and — Miró would be mortified — beautiful show at the Museum of Modern Art.

The exhibition illustrates, step by step, exactly how Miró stalked and attacked painting — zapped its conventions, messed up its history, spoiled its market value — through 12 distinct groups of experimental works produced over a decade. If, in the end, painting survived, that's neither here nor there. The story's the thing. Crisp, clear and chronological, the show reads like a combination of espionage yarn and psychological thriller set out in a dozen page-turning chapters.

In 1927 Miró was 34. He was a successful artist and an early devotee of Surrealism, working in a polished, fantastical-realist mode. But he had a restless temperament and lived in provoking times. The high-flying 1920s were winding down, the political climate was growing tense. Surrealism, he discovered, had limitations. He was ready for a radical change in art, but he realized that he would have to



create it himself. He decided it would take the form of a crime. Painting would have to go. He would deliver the blow.

How to start? With dissection, which entailed taking painting apart, piece by piece, and throwing out essential things. This is what we see happening in the seven stark abstract paintings that open the show, all done in Paris in January to mid-February of 1927. The pictures look intact enough, with their handwritten phrases and clouds filled with dots, until you notice that something is missing: paint, or all but a minimal amount of it. Most of each picture is raw, untouched canvas on which the words and clouds drift like flotsam from a ship gone down.

A year later Miró gets rid of something else: skill. The wood panel used as a support in a piece called "Spanish Dancer I" is covered with a sheet of colored paper. A small rectangle of plain sandpaper is tacked on top of it. Glued to the sandpaper is a tiny cutout image of a woman's shoe. That's about it: no paint, almost no image, almost no artist.

Then in a third series the hands-on painter comes back with a vengeance to demolish art history. In a work called "Dutch Interior," Miró takes an image of a lover serenading his lady, from a 17th-century painting, and turns it into a hostile clash of bloated, sluglike forms. So much for the golden age of Dutch realism. And you can kiss Renaissance idealism goodbye. In Miró's version of the famous picture "La Fornarina," Raphael's beauteous sitter becomes a big brown blob with a leering red mouth and one yellow cat's eye.

At least these paintings, with their bright colors and sharp outlines, are recognizably Miró-ish, which is not true of the collages that come next. If you happened to wander into this section cold, you'd think, "What drab, funky artist is this?" Not that the collages aren't wonderful; they are, with their holes and glued-on circles, and stretches of industrial tar paper, which looks as if it might smell bad, yet suggests a starry sky.

By this point a certain pattern to Miró's aggression becomes clear. In a rhythm of thrust and feint, he alternates direct attack on painting with turning his back on it, as if wishing it would go away. After the collages, he's in attack mode again, wielding ridicule as a weapon in five oil paintings of preposterous size, seven feet high, the scale of altarpieces or imperial portraits but covered with scribbles, as if they were made by some cretinous child.

Who, in 1930, would have bought such daft things? Nobody, and the pictures went into storage. We can appreciate them now because they look so new and because we can see what Miró was up to. In these giant doodles, Kandinsky's music-of-the-spheres abstraction takes a hit and falls to Earth.

There it is met — why not? we've seen everything else — by sculptures: squat, homely, nailed-wood things from 1931 and 1932. Although touched with grace notes of delicate painting — Miró was a fabulous brush technician — they are mostly about their baser accouterments: screws, chains, machine parts, sequins, a piece of bone, a single chickpea painted cobalt blue and encased in a tiny shrine.

By 1934, collage, assemblage, drawing and painting had blurred together into freakish hybrids that seem products less of objective experiment than of pathological obsession. Two drawing-collages on reflective paper from this time have an unhinged, fun-house look. A third, of uncertain date, combines ripped paper-doll figures with tied-on cardboard paint tubes resembling cartridge shells.

The whole piece looks derelict and must have even when new. That it survives is a miracle, though I wonder if Miró intended it to. Durability — timelessness, art is eternal and all that — was yet another aesthetic myth that he took pains to trash.



As Miró doggedly continued his assault on art in the 1930s, the world was assailing him. Fascism was on the rise across Europe. Events that would lead to the Spanish Civil War were brewing. At this time, he was living in the Catalan town of Montroig, a favorite retreat, but his anxiety was building. And as it grew, he returned to painting as if seeking solid ground.

In the fall of 1934 he finished a series of 15 extraordinary pastels on paper, most of them of single scowling, extravagantly sexualized figures so luridly colored and amorphously shaped that they look like walking cancers and oozing sores.

They were succeeded by small narrative paintings. Done in tempera on Masonite, and in oil on copper plates, like "The Two Philosophers," their diminutive scale and assertive color gives them the toothsome innocence of fairy-tale illustrations. But they are not sweet or innocent: they are battle scenes from a psychic hell. They are also formally exquisite. For them Miró summoned all the virtuosity that in the cause of revolution he had labored so hard to suppress.

He makes just one more murderous lunge at tradition, in a series of paintings on Masonite panels from 1936. The attack is very physical and feels a bit desperate. In many ways this series brings him back to 1927. The pictures are abstract; he leaves the Masonite surface mostly bare. But what he adds has changed: oil stains, vomitlike substances and fecal-looking hunks of tar and dirt. In addition he hacks away at the surface, stabbing and gouging and leaving deep ruts and splintery scars.

At that point, with Spain in chaos, he leaves for Paris. The final picture in the show was done there. Titled "Still Life With Old Shoe," it is in a conventional oil-on-canvas medium, in semi-realist style, on a traditional theme. The search-and-destroy is over. Painting has survived and won. Miró as master painter, the new, oddly adorable artist of popular fame, more or less starts here.

He must have been exhausted. I was when I reached the last gallery, but exhilarated too because I felt I'd been through something: not the blockbuster slog but the experience of one artist's creative process and the experience of an exhibition as a form of thinking. Like reading a book, the process makes you part of the trip, not just a witness to it.

In this case the trip is fairly demanding but one I suspect that audiences with even a casual interest in how art is conceived and made will enjoy. From beginning to end, the particular audience I had in mind was a special one, art students.

For them the show could serve as a manual of anti-authoritarian moves. Unpopular Mechanics of Painting, you might call it. But it could also be a guide to living a creative life. This is particularly true for students who are under pressure to choose a single medium (painting, say) and stay with it; to firm up a signature style and stay with it; to get to the market early and stay there.

To these requirements, the Miró show says: no, no, no. Change mediums, like habits, as often as possible. Make your signature look a no-look or every-look, and keep changing that. Get to the market early if you want, but then go home and stay there awhile and work. Then stay longer. Destroy the artist you think the world thinks you're supposed to be, and you'll start to find the artist you are.

"Joan Miró: Painting and Anti-Painting 1927-1937" opens on Sunday and remains through Jan. 12 at the Museum of Modern Art; (212) 708-9400, moma.org.

<http://www.nytimes.com/2008/10/31/arts/design/31miro.html?th&emc=th>

The War on Dengue Fever

By THOMAS FULLER



BANGKOK — There was little that doctors could do for a 3-year-old boy brought to Bangkok's main children's hospital two weeks ago with dengue fever. Like thousands before him, he had reached the most dangerous phase of the disease, dengue shock syndrome, and he died of internal bleeding and organ failure three days after being admitted.

Directly across the street, in the United States Army's largest overseas medical research laboratory, military scientists are offering hope for future generations: a vaccine. Developed after decades of trying, it is one of two experimental vaccines that experts believe may be commercially available by the middle of the next decade.

Dengue (pronounced DENG-ee), a mosquito-borne illness once known as breakbone fever for its intense joint and muscle pain and crushing headaches, has a relatively low death rate — about 2.5 percent of hospitalized patients, the World Health Organization reports.

But because patients can require constant, careful monitoring, it is one of the costliest diseases in tropical countries. Each year, it leads to about 500,000 hospitalizations around the world.

Dengue is seldom seen in the United States or Europe, though it is the second-most common cause (after malaria) of feverish symptoms for Western tourists returning from developing countries.

But it is important to the Army: American soldiers have contracted dengue as recently as the 1990s, on missions in Haiti and Somalia. So it is one of the tropical diseases that are the focus of research here at the Armed Forces Research Institute of Medical Sciences, which the Army has operated with the Royal Thai Army for five decades.

The research facility, which employs several hundred people, is housed in an unremarkable 1960s building alongside a greasy alley where food vendors hawk fried grasshoppers and freshly mashed papaya salad.

“There’s no dengue in Kansas,” said Col. James W. Boles, the commander at the laboratory. “No malaria, either. That’s why we are here.”

In wars past, disease has often proved a greater foe than opposing armies. During the Anglo-Boer War in South Africa in the late 19th century, more soldiers died of typhoid than in battle. Thousands of cases of hepatitis during the Vietnam war among soldiers spurred Army researchers to help develop two of the vaccines now in use to prevent hepatitis A and B.

“All we care about is that we get a vaccine that protects soldiers,” said Lt. Col. Stephen J. Thomas, a medical doctor who is director of dengue vaccine development in the Bangkok laboratory. “Fortunately a lot of our concerns are also global health concerns.”

For many years, the leading drugs used to treat malaria were developed by the Army. Today research on tropical diseases is spread across a broader constellation; in the hunt for a dengue vaccine, money and research have come from the Thai government, nonprofit organizations like the Bill and Melinda Gates Foundation, and drug companies like GlaxoSmithKline, which is working with the Army.

The other vaccine at an advanced stage of development is being jointly developed by the French drug company Sanofi-Aventis and a Thai university on the same Bangkok street as the Army lab.

“We’re further along with the dengue vaccine than we’ve ever been,” said Duane J. Gubler, director of the emerging infectious diseases department of the Duke-N.U.S. Graduate Medical School in Singapore. “There’s a good possibility that we’ll have a vaccine in five to seven years.”

The dengue virus is transmitted mainly by a mosquito called *Aedes aegypti*, which survives on human blood. *Aedes* rarely travels more than about 100 yards from its birthplace and thrives in populated areas.

The mosquito can breed in something as small as a soda bottle, but its ideal breeding conditions are large containers common in many parts of Southeast Asia to store drinking water. (Unlike other mosquitoes, *Aedes aegypti* prefers clean water, according to Thomas W. Scott, a professor at the University of California, Davis, who is a leading expert on the species.)

The mosquito cannot survive freezing weather, and though it is endemic to some parts of the United States, mainly the South, experts say good sanitation practices have kept it from spreading the dengue virus. It commonly lives inside people’s homes, lingering in closets or curtains.

The World Health Organization estimates that 50 million people are infected every year. But most of those infected, perhaps as many as 90 percent, experience only minor flulike symptoms or none at all.

In more serious cases, like that of the boy who died here last month, symptoms include severe headaches, rapid onset of a high fever, debilitating joint and muscle pain, nausea, vomiting and internal bleeding. Generally, though, dengue is considered treatable as long as patients are brought to the hospital on time and the disease is properly diagnosed.

Scientists believe the disease has existed for centuries — an outbreak appears to have occurred in Philadelphia in 1780 — but dengue has become more common and more virulent over the past half-century.

In 1970, only nine countries were known to have had epidemics of the most serious form of the disease, dengue hemorrhagic fever. By the mid-1990s that number had quadrupled, and experts say a quirk makes the disease particularly well adapted to an age of air travel and international trade.



There are four types of dengue virus. Patients who have been infected with one of them are believed to develop immunity to that type only — and, paradoxically, are more vulnerable to dengue hemorrhagic fever if they are exposed to a second type.

The four types have intermixed as people carried them on airplanes to far-flung places; outbreaks of the hemorrhagic fever have been traced to specific flight paths and trade routes.

“What we’ve done is provided the ideal mechanism for these viruses to move around the world,” said Dr. Gubler, who has researched dengue for nearly four decades.

It was probably soldiers who caused the original spread of dengue hemorrhagic fever around Southeast Asia, during World War II.

“You had a movement of soldiers from England, the U.S., Australia and Japan,” said Dr. Suchitra Nimmanitya, a pioneer in dengue research who developed a handbook on how to treat the disease. “Soldiers flew from city to city.”

A Japanese scientist first isolated the virus during the war, and a United States Army physician, Albert Sabin, made the discovery that there were distinct virus types. (Dr. Sabin went on to help develop the polio vaccine.)

“Dengue is very unique,” said Dr. Harold S. Margolis, formerly of the Centers for Disease Control and Prevention and now director of the Pediatric Dengue Vaccine Initiative, a nonprofit organization based in South Korea. “I’ve done a lot of infectious-disease work over the years, and dengue is probably one of the most complicated.”

The development of a vaccine is especially difficult because it will need to counter all four types of virus.

“If dengue was a single virus we would have had a vaccine already, for sure,” said Dr. Jean Lang, director of research and development at Sanofi’s emerging vaccine program.

Sanofi’s dengue vaccine, which will undergo trials in 4,000 children in Thailand in a few months, is one of the first vaccines to be produced using genetic engineering.

The Army’s vaccine, which is at a similar stage of development and has been tested on volunteers in the United States, Puerto Rico and Thailand, was produced using live attenuated viruses, a more traditional technique. The two or three doses, spaced months apart, are administered by injection.

Experts say the wide array of researchers involved — some with profit motives and others without — increases the chances of success and could help make the vaccine affordable to people in developing countries.

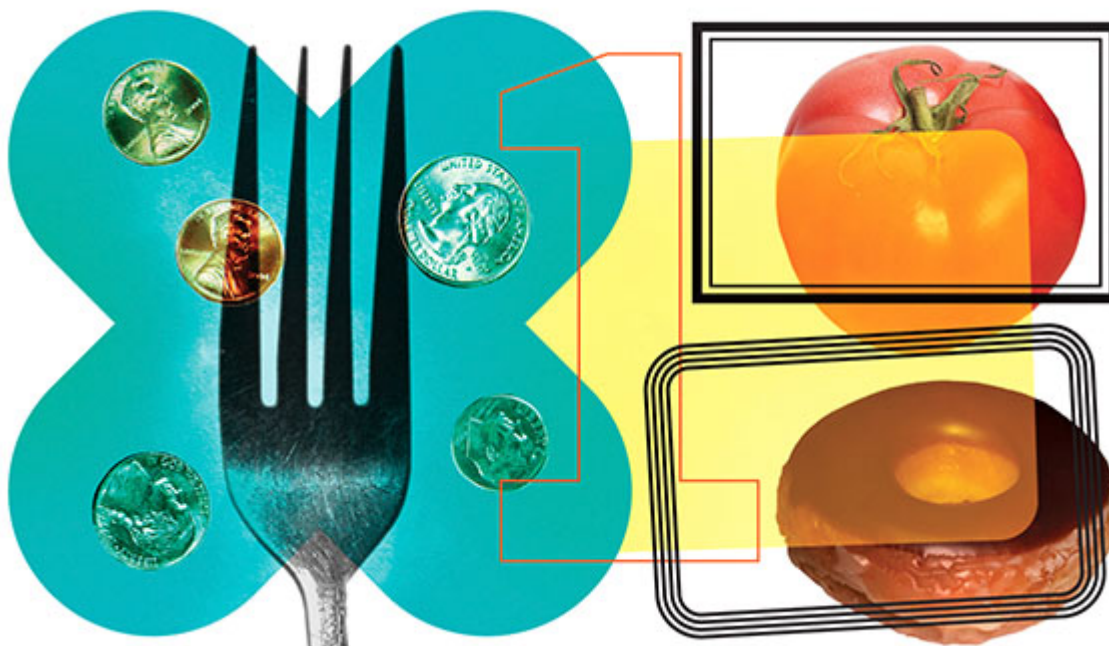
“We have always tried to broaden the R.&D. base,” said Joachim Hombach, who coordinates vaccine research at the World Health Organization in Geneva. “At the end of the day, what drives down the price of the product is competition.”

http://www.nytimes.com/2008/11/04/health/04denguefever.html?_r=1&nl=8hlth&emc=hltha1&oref=slogin



Money Is Tight, and Junk Food Beckons

By TARA PARKER-POPE



How much does it really cost to eat a healthy diet?

Economists, health researchers and consumers are struggling to answer that question as food prices rise and the economy slumps. The World Bank says nearly a billion people around the world live on a dollar a day, or even less; in the United States, the daily food-stamp allowance is typically just a few dollars per person, while the average American eats \$7 worth of food per day.

Even middle-class people struggle to put healthful food on the table. Studies show that junk foods tend to cost less than fruits, vegetables and other healthful foods, whose prices continue to rise.

This fall a couple in Encinitas, Calif., conducted their own experiment to find out what it was like to live for a month on just a dollar a day for food. Overnight, their diets changed significantly. The budget forced them to give up many store-bought foods and dinners out. Even bread and canned refried beans were too expensive.

Instead, the couple — Christopher Greenslate, 28, and Kerri Leonard, 29, both high school social studies teachers — bought raw beans, rice, cornmeal and oatmeal in bulk, and made their own bread and tortillas. Fresh fruits and vegetables weren't an option. Ms. Leonard's mother was so worried about scurvy, a result of vitamin C deficiency, that they made room in their budget for Tang orange drink mix. (They don't eat meat — not that they could have afforded it.)

Breakfast consisted of oatmeal; lunch was a peanut butter and jelly sandwich. Dinner often consisted of beans, rice and homemade tortillas. Homemade pancakes were affordable, but syrup was not; a local restaurant gave them a few free syrup packets.

One of the biggest changes was the time they had to spend in meal preparation.

“If you’re buying raw materials, you’re spending more time preparing things,” Mr. Greenslate said. “We’d come home after working 10 to 11 hours and have to roll out tortillas. If you’re already really hungry at that point, it’s tough.”

While he lost weight on the budget diet, Mr. Greenslate said, the larger issue was his lack of energy. During the experiment he was no longer able to work out at the gym.

A few times they found a bag of carrots or lettuce that was within their budget, but produce was usually too expensive. They foraged for lemons on the trees in their neighborhood to squeeze juice into their water.

Ms. Leonard said that after the 30-day experiment, one of the first foods she ate was a strawberry. “I almost cried,” she said.

The couple acknowledged that the experiment was something of a luxury, given that many people have no choice about how much to spend on food.

“People in our situation have the leisure to be concerned about issues like this,” Ms. Leonard said. “If we were actually living in this situation, I would not be taking the time to be concerned about what I could and could not have; I’d be worried about survival.”

Researchers say the experiment reflects many of the challenges that poor people actually face. When food stamps and income checks run low toward the end of the month, they often do scrape by on a dollar a day or less. But many people don’t know how to prepare foods from scratch, or lack the time.

“You have to know how to cook beans and rice, how to make tortillas, how to soak lentils,” said Adam Drewnowski, director of the Center for Public Health Nutrition at the [University of Washington](#). “Many people don’t have the knowledge or the time if they’re working two jobs.”

Last year, Dr. Drewnowski led a study, published in *The Journal of the American Dietetic Association*, comparing the prices of 370 foods sold at supermarkets in the Seattle area. The study showed that “energy dense” junk foods, which pack the most calories and fewest nutrients per gram, were far less expensive than nutrient-rich, lower-calorie foods like fruits and vegetables. The prices of the most healthful foods surged 19.5 percent over the two-year study period, while the junk food prices dropped 1.8 percent.

Obesity researchers worry that these trends will push consumers toward less healthful foods. “The message for this year and next year is going to be affordable nutrition,” Dr. Drewnowski said. “It’s not the food pyramid, it’s the budget pyramid.”

The experiment in California was hardly the first of its kind, though the teachers’ budget was tighter than most. Last month Gov. [Jennifer M. Granholm](#) of Michigan and her family took a weeklong “food stamp challenge,” spending only \$5.87 per day per person on food — the Michigan food stamp allotment. She told reporters that she ended up buying a lot of macaroni and cheese. Last year Gov. Theodore R. Kulongoski of Oregon lived for a week on his state’s \$3-a-day food stamp allocation.

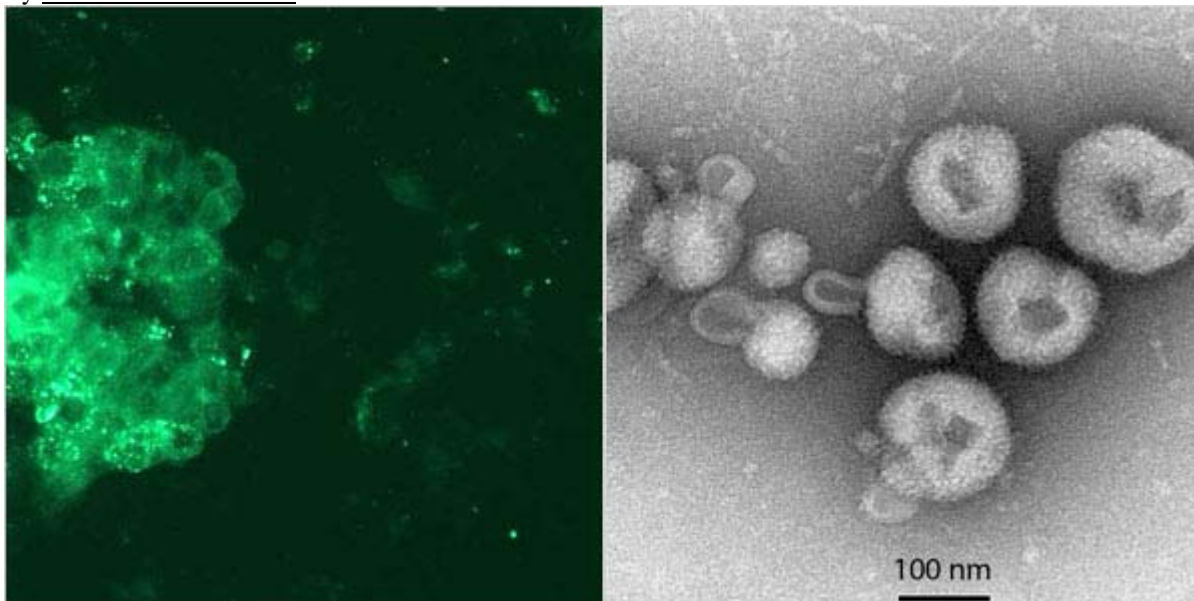
Ms. Leonard and Mr. Greenslate, who chronicled their dollar-a-day experience on their blog, [onedollardietproject.wordpress.com](#), say they are looking at other ways to explore how difficult it is for people with limited income to eat a healthful diet. “I challenge anyone to try to live on a dollar a day and eat fresh food in this country,” Mr. Greenslate said. “I would love to be proven wrong.”

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<http://www.nytimes.com/2008/11/04/health/nutrition/04well.html?nl=8hlth&emc=hltha1>

Deadly New Virus Thought to Be Contained

By DONALD G. MCNEIL JR



A new virus that causes fatal hemorrhagic fevers has been discovered in southern Africa. It killed four people in South Africa and sickened a fifth, but health authorities believe the outbreak has been contained.

The virus is a member of the arenavirus family, which also includes the causes of Lassa fever in West Africa and several South American fevers. While new viruses are often found in animals — a new blue-tongue virus was found in Swiss goats last month, for example — it is relatively rare to discover one fatal to humans, like the SARS coronavirus in 2002 or the sin nombre hantavirus in 1993.

How the first victim was infected is unknown, but arenaviruses are common in rodents; their dried urine, inhaled while sweeping, can transmit infection.

Confirmation that it is a new virus was made by the National Institute for Communicable Diseases in South Africa and by the Centers for Disease Control and Prevention in Atlanta.

The first victim was Cecilia Van Deventer, a safari tour booker in Lusaka, Zambia, who fell ill on Sept. 2 and was airlifted to Johannesburg. She apparently infected Hannes Els, the paramedic who accompanied her, and Gladys Mthembu, a nurse tending her at the Morningside Medi-Clinic in a Johannesburg suburb.

The fourth to die was Maria Mokubung, who cleaned the room where Ms. Van Deventer died on Sept. 14. According to South African news reports, the last death was originally misdiagnosed because the victim had tuberculosis and meningitis and was hemorrhaging and confused when her family sought medical care.

A fifth victim, a nurse who cared for Mr. Els, was in critical condition but responded to early treatment with the antiviral drug Ribavirin.

The disease progresses from flu symptoms to diarrhea and a measles-like rash and then to respiratory and circulatory collapse.



The authorities said they knew of no new cases but would wait until 21 days from the last infection to declare the outbreak over.

Disease detective work was difficult, South African news media said. Because Ms. Van Deventer feared needles, little blood was drawn from her in Zambia; also, her body was cremated before the alarm was raised. Tissue samples from later victims had to be taken carefully in a high-security laboratory that was under renovation and had to be reopened.

Arenaviruses are named for their round sandy granules; “arena” is Latin for sand. A name for the new virus is being debated; Zambian authorities do not want one that will hurt tourism.

According to a government news service, Zambia’s first response to the outbreak was to close its border with Congo, the former Zaire, where Ebola fever, which is not related, originated.

<http://www.nytimes.com/2008/11/04/health/research/04global.html?nl=8hlth&emc=hltha2>



Stretching: The Truth

By GRETCHEN REYNOLDS



WHEN DUANE KNUDSON, a professor of kinesiology at California State University, Chico, looks around campus at athletes warming up before practice, he sees one dangerous mistake after another. “They’re stretching, touching their toes. . . .” He sighs. “It’s discouraging.”

If you’re like most of us, you were taught the importance of warm-up exercises back in grade school, and you’ve likely continued with pretty much the same routine ever since. Science, however, has moved on. Researchers now believe that some of the more entrenched elements of many athletes’ warm-up regimens are not only a waste of time but actually bad for you. The old presumption that holding a stretch for 20 to 30 seconds — known as static stretching — primes muscles for a workout is dead wrong. It actually weakens them. In a recent study conducted at the University of Nevada, Las Vegas, athletes generated less force from their leg muscles after static stretching than they did after not stretching at all. Other studies have found that this stretching decreases muscle strength by as much as 30 percent. Also, stretching one leg’s muscles can reduce strength in the other leg as well, probably because the central nervous system rebels against the movements.

“There is a neuromuscular inhibitory response to static stretching,” says Malachy McHugh, the director of research at the Nicholas Institute of Sports Medicine and Athletic Trauma at Lenox Hill Hospital in New York City. The straining muscle becomes less responsive and stays weakened for up to 30 minutes after stretching, which is not how an athlete wants to begin a workout.

THE RIGHT WARM-UP should do two things: loosen muscles and tendons to increase the range of motion of various joints, and literally warm up the body. When you’re at rest, there’s less blood flow to muscles and tendons, and they stiffen. “You need to make tissues and tendons compliant before beginning exercise,” Knudson says.



A well-designed warm-up starts by increasing body heat and blood flow. Warm muscles and dilated blood vessels pull oxygen from the bloodstream more efficiently and use stored muscle fuel more effectively. They also withstand loads better. One significant if gruesome study found that the leg-muscle tissue of laboratory rabbits could be stretched farther before ripping if it had been electronically stimulated — that is, warmed up.

To raise the body's temperature, a warm-up must begin with aerobic activity, usually light jogging. Most coaches and athletes have known this for years. That's why tennis players run around the court four or five times before a match and marathoners stride in front of the starting line. But many athletes do this portion of their warm-up too intensely or too early. A 2002 study of collegiate volleyball players found that those who'd warmed up and then sat on the bench for 30 minutes had lower backs that were stiffer than they had been before the warm-up. And a number of recent studies have demonstrated that an overly vigorous aerobic warm-up simply makes you tired. Most experts advise starting your warm-up jog at about 40 percent of your maximum heart rate (a very easy pace) and progressing to about 60 percent. The aerobic warm-up should take only 5 to 10 minutes, with a 5-minute recovery. (Sprinters require longer warm-ups, because the loads exerted on their muscles are so extreme.) Then it's time for the most important and unorthodox part of a proper warm-up regimen, the Spider-Man and its counterparts.

"TOWARDS THE end of my playing career, in about 2000, I started seeing some of the other guys out on the court doing these strange things before a match and thinking, What in the world is that?" says Mark Merklein, 36, once a highly ranked tennis player and now a national coach for the United States Tennis Association. The players were lunging, kicking and occasionally skittering, spider-like, along the sidelines. They were early adopters of a new approach to stretching.

While static stretching is still almost universally practiced among amateur athletes — watch your child's soccer team next weekend — it doesn't improve the muscles' ability to perform with more power, physiologists now agree. "You may feel as if you're able to stretch farther after holding a stretch for 30 seconds," McHugh says, "so you think you've increased that muscle's readiness." But typically you've increased only your mental tolerance for the discomfort of the stretch. The muscle is actually weaker.

Stretching muscles while moving, on the other hand, a technique known as dynamic stretching or dynamic warm-ups, increases power, flexibility and range of motion. Muscles in motion don't experience that insidious inhibitory response. They instead get what McHugh calls "an excitatory message" to perform.

Dynamic stretching is at its most effective when it's relatively sports specific. "You need range-of-motion exercises that activate all of the joints and connective tissue that will be needed for the task ahead," says Terrence Mahon, a coach with Team Running USA, home to the Olympic marathoners Ryan Hall and Deena Kastor. For runners, an ideal warm-up might include squats, lunges and "form drills" like kicking your buttocks with your heels. Athletes who need to move rapidly in different directions, like soccer, tennis or basketball players, should do dynamic stretches that involve many parts of the body. "Spider-Man" is a particularly good drill: drop onto all fours and crawl the width of the court, as if you were climbing a wall. (For other dynamic stretches, see the sidebar below.)

Even golfers, notoriously nonchalant about warming up (a recent survey of 304 recreational golfers found that two-thirds seldom or never bother), would benefit from exerting themselves a bit before teeing off. In one 2004 study, golfers who did dynamic warm-up exercises and practice swings increased their clubhead speed and were projected to have dropped their handicaps by seven strokes over seven weeks.

Controversy remains about the extent to which dynamic warm-ups prevent injury. But studies have been increasingly clear that static stretching alone before exercise does little or nothing to help. The largest study has been done on military recruits; results showed that an almost equal number of subjects developed lower-limb injuries (shin splints, stress fractures, etc.), regardless of whether they had performed static stretches before training sessions. A major study published earlier this year by the



Centers for Disease Control, on the other hand, found that knee injuries were cut nearly in half among female collegiate soccer players who followed a warm-up program that included both dynamic warm-up exercises and static stretching. (For a sample routine, visit www.aclprevent.com/pepprogram.htm.) And in golf, new research by Andrea Fradkin, an assistant professor of exercise science at Bloomsburg University of Pennsylvania, suggests that those who warm up are nine times less likely to be injured.

“It was eye-opening,” says Fradkin, formerly a feckless golfer herself. “I used to not really warm up. I do now.”

You’re Getting Warmer: The Best Dynamic Stretches

These exercises- as taught by the United States Tennis Association’s player-development program – are good for many athletes, even golfers. Do them immediately after your aerobic warm-up and as soon as possible before your workout.

STRAIGHT-LEG MARCH

(for the hamstrings and gluteus muscles)

Kick one leg straight out in front of you, with your toes flexed toward the sky. Reach your opposite arm to the upturned toes. Drop the leg and repeat with the opposite limbs. Continue the sequence for at least six or seven repetitions.

SCORPION

(for the lower back, hip flexors and gluteus muscles)

Lie on your stomach, with your arms outstretched and your feet flexed so that only your toes are touching the ground. Kick your right foot toward your left arm, then kick your leftfoot toward your right arm. Since this is an advanced exercise, begin slowly, and repeat up to 12 times.

HANDWALKS

(for the shoulders, core muscles, and hamstrings)

Stand straight, with your legs together. Bend over until both hands are flat on the ground. “Walk” with your hands forward until your back is almost extended. Keeping your legs straight, inch your feet toward your hands, then walk your hands forward again. Repeat five or six times. G.R.

<http://www.nytimes.com/2008/11/02/sports/playmagazine/112pewarm.html?nl=8hlth&emc=hltha4>

Grave Warnings of Disease, With the Adman's Flair

By AMANDA SCHAFFER



The woman could be the girl next door, posing for a portrait or selling cereal or soap. Her hair is neatly parted. Her earnest eye and smile seem to telegraph innocence.

Beware.

“She may look clean,” the poster warns. But “pick-ups, ‘good-time girls,’ prostitutes spread syphilis and gonorrhea.”

The poster, one of many created by the Public Health Service during World War II to warn the troops about the dangers of casual sex, is on display as part of a retrospective of 20th-century health posters from the permanent collection of the National Library of Medicine.

Titled “An Iconography of Contagion,” the exhibition features work from numerous countries on an array of diseases, among them syphilis, malaria, tuberculosis and AIDS. The posters are on display at the National Academy of Sciences in Washington through Dec. 19.

Much of the exhibition suggests a mash-up of advertising and public health. The posters tried to convey the danger of disease and get people to change their behavior, said the curator, Michael Sappol, a historian at the library of medicine, part of the National Institutes of Health.

But “they’re also about the pleasure of the image,” he continued, adding, “There have been some very sexy, colorful, playful posters about some very serious diseases.”

The visual world underwent rapid changes in the late 19th and early 20th centuries. Newspapers featured larger headlines and more drawings and photographs. The advertising industry integrated text and images, and it turned to behavioral science to sharpen its pitches.

At the same time, public health groups like the National Tuberculosis Association, founded in 1904, took some cues from advertising and began to rely on mass communication, with pamphlets, posters and, later,

films and radio spots. For diseases like tuberculosis that lacked effective treatments, efforts to promote screening and change people's behavior were especially important. "Media campaigns were themselves seen as magic bullets," Dr. Sappol said. In an iconic poster from around 1940, a mother and two children gather around an armchair, smiling, as the father reads a newspaper. An urban throng, in monochromatic red, appears in the background. "Tuberculosis Undiscovered Endangers You: Discover the Unknown Spreaders!" reads the caption.

"At the time, many people who had TB, including some who were contagious, were unaware that they were infected," said Dr. Mary E. Wilson, an associate professor of global health and population at the Harvard School of Public Health. A large number of them were identified through mass screening using X-rays. (Many were exposed to large doses of radiation that would be unacceptable today, she added.)

Another poster, created in China in 1935, was intended to discourage spitting, which could spread TB. The image shows a man in traditional dress walking past a group of playing children. A line extends from the man's mouth to a clump of spittle on the ground; from there, an arrow points to a pool of pink bacteria magnified under a microscope. The caption reads, in part: "TB is rampant in our country because of the error of spitting anywhere. This is unforgivable!" It continues: "Spit into a handkerchief and boil it, or spit into paper and burn it. This not only ensures virtue but is a gift to mankind."

The poster includes a symbol that resembles that of the National Tuberculosis Association in the United States — a vertical line with two horizontal crosses. In the Chinese version, the edges of the cross are curved upward, resembling a pagoda. A similar message was promoted in many countries. In a Danish poster from 1947, the emphasis is on screening. A couple, shown as a shadowy form with green and red highlights, strolls arm in arm, wearing hats that could be merry or devilish. "Tuberculosis examination — a citizen's duty," reads the text.

The poster has "a beautiful, creamy texture" and was "part of the Danish enchantment with modernity, both in health infrastructure and in aesthetics," Dr. Sappol said. "It seduces you into paying attention."

In the 1960s, the enchantment with health posters declined, at least in the United States. "There was a general feeling among the public that we've got the polio vaccine, penicillin, DDT and other magic bullets, and that's going to conquer disease," Dr. Sappol said. But that confidence plummeted in the 1980s and 1990s with H.I.V./AIDS, which brought about a renaissance of public health posters, said John Parascandola, a former historian for the Public Health Service. Activist groups like Act Up and Gran Fury in the United States and the Terrence Higgins Trust in Britain campaigned to raise awareness about the disease.

One poster from the mid-1980s shows a muscular man leaning down to perform oral sex on a partner of ambiguous gender. A tattooed tiger bulges on his shoulder. The poster, which reads "Discover safer sex," is from the Terrence Higgins Trust's "Love Sexy, Love Safe" campaign. The text notes that safer sex can also prevent unwanted pregnancy, suggesting that the campaign hoped to draw in heterosexuals.

AIDS posters tended to be less moralistic than many earlier ones, said Dr. Wilson, who noted that the World War II campaigns against syphilis and gonorrhea often treated the woman "as the villain, the temptress, and men almost as innocent bystanders."

By contrast, she said, while AIDS patients were often stigmatized in the broader society, the major public health campaigns "tried very hard to work against that stigma."

Ultimately, the posters tried to sell ideas to specific audiences, Dr. Parascandola said. They were a compelling form of advertising — and perhaps they still are.

<http://www.nytimes.com/2008/11/04/health/04post.html?nl=8hlth&emc=hltha8>

A Writer in a Living Novel

By CHARLES McGRATH



PARSONSFIELD, Me. — The novelist Carolyn Chute doesn't have a working phone, a fax or a computer. She writes on a washtub-size electric typewriter that was probably state of the art in the '70s. Ms. Chute (pronounced CHOOT) and her husband, Michael, live in a small compound at the end of an unpaved road in this rural Maine village near the New Hampshire border. There are stacks of old tires in the yard, a rusted bedstead, a pen full of Scottish terriers and an assortment of well-used vehicles. A bumper sticker on Mr. Chute's pickup reads, "School Takes 13 Years Because That's How Long It Takes to Break a Child's Spirit."

Mr. Chute, who looks like a 19th-century hunting guide, spends most of his time drawing and making sculptures in an unfinished, uninsulated building he calls the security office. He has a beard of ZZ Top proportions, wears checked shirts and round felt hats, and in Down East fashion frequently uses "wicked" as an adverb.

Ms. Chute, 61, a wry, direct and earthy woman who favors bandannas, peasant skirts and stout hiking boots, works in their home, which is guarded by a sign that reads: "Woa. Visitors Turn Back." Neither building is heated, except by wood stove, or has hot water. The compound's sole toilet is a tin-roofed outhouse.

The Chute home does have an industrial-size copying machine, however, and nearby she keeps her AK-47 rifle, which she likes because it has a gas piston that dampens recoil. “It’s very gentle, very soft,” she said. Ms. Chute, whose fourth novel, “The School on Heart’s Content Road,” comes out on Friday, had a surprise hit in the mid-’80s with her first book, “The Beans of Egypt, Maine,” about a hard-luck, occasionally incestuous clan that some critics compared to Faulkner’s Snopeses.

“If it runs, a Bean will shoot it,” she wrote. “If it falls, a Bean will eat it.” The book’s empathy and precise observation derived, it turned out, from personal experience. Ms. Chute, who grew up in Cape Elizabeth, Me., dropped out of school at 16 and supported herself and a young daughter by working as a charwoman, driving a school bus and plucking chickens.

Mr. Chute, her second husband, is illiterate and used to work as a woodcutter and gravedigger. They married in 1978 and later lost a child at birth because, she says, they were too poor to afford adequate medical and prenatal care.

Ms. Chute has been working on “The School on Heart’s Content Road” since the early ’90s. It’s part of what she calls a “5-o-gy,” a projected series of five interlocked novels about a communal Maine settlement led by a polygamous visionary named Gordon St. Onge, sometimes known as the Prophet. The story is told from multiple points of view, each introduced with a little pictorial icon, that include those of God, Mammon, the C.I.A. and television, which periodically babbles advice like: “These flavorful burgers, these potato-flavored salt strips, these fizzy syrupy brown-flavored drinks in tall cups are waiting just for YOU. Go to it! NOW!”

There are so many characters that there is a little guide at the end, with biographies — like the ones that Sinclair Lewis used to write for his characters — so complete that they sometimes go into more detail than the book itself.

The series comprises, in effect, an entire Down East Yoknapatawpha: hunters, snowmobilers, bikers, loggers, militia men, journalists, secret agents, wives, girlfriends and, in the case of “The School on Heart’s Content Road,” two deserted children who find a home for themselves in St. Onge’s off-the-grid settlement. There is even a thinking dog — a Scottish terrier, naturally. Ms. Chute says she got the thinking dog idea from Tolstoy.

The original manuscript was some 2,600 pages long — “with a lot of white space,” Ms. Chute said recently — and so capacious was her vision for the project that she was initially resistant to condensing it. The manuscript sat for a while in a box in the office of Cork Smith, a venerable editor who had been Ms. Chute’s discoverer and champion.

“I knew it was too long and rangy,” Ms. Chute said. “But Cork was right — I had to work through it in my head.” Mr. Smith died in 2004, and with the encouragement of her agent, Jane Gelfman, and her new editor, Elizabeth Schmitz of Grove/Atlantic, Ms. Chute began to restructure her mega-novel into self-contained, book-size chunks.

“Sometimes a manuscript is like bread dough,” she said. “You have to abuse it.”

For most of the time that she has been working on the book, Ms. Chute has also been greatly occupied with an organization called the 2nd Maine Militia, of which she is the founder and, as she says, “secretary of offense, or offensiveness.”

The copier in her living room is used to churn out tracts and fables, mostly written by Ms. Chute and illustrated by her husband, that set out the group’s political philosophy, which is essentially one of cheerful, nonpartisan economic populism.



The 2nd Maine Militia, or Your Wicked Good Militia, as it's sometimes known, is progun, against corporate lobbying and campaign contributions, and opposed to tax subsidies for big business. The group has been known to meet in a hired hall, but more often it assembles in the woods behind the Chutes' home, where the members shoot at cans and other targets, talk about what's wrong with the world and dine on potluck.

In 1996, in an incident recreated in "The School on Heart's Content Road," the militia invaded the State Capitol in Augusta, carrying placards that read, "Smash Corporate Tyranny." Many of the militia children were in costume, and Mr. Chute wore a Revolutionary War uniform. There were some kazoo-playing and a little shouting, and someone duct-taped a piece of cardboard over a portrait of Joshua Chamberlain, the Maine governor and Civil War hero.

The 2nd Maine Militia is a no-wing organization, Ms. Chute likes to say, with a membership that is "very right, very left and very shy." At the first meeting, in the mid-'90s, she explained: "We had libertarians, greens, guys in camo, white supremacists, hippies off the land, anarchists, people from Communist organizations. All these people were people that someone had tried to take something away from. They all knew something was wrong."

The coalition mostly got along, she said, except that for a while it became necessary to have separate meetings for the white supremacists and some of the more militant gun-toters. "The guys with the camo, after 9/11 happened, they became great patriots," she said. "They started carrying the flag and shooting at targets of bin Laden and goofball stuff like that. We kind of saw less of those guys after that."

"The 2nd Maine Militia has been a real learning experience for me," Ms. Chute said. "Sort of like a living novel. I do feel like I'm on Pluto sometimes, just watching how people treat each other. And when I write, I just let my characters go, the way I let life go."

She paused for a minute, looking out the window at the leaf-strewn woods. "I love people," she went on, "but I don't do so well in a system. We're poor, and we lead a very different kind of life. We depend on other people so much. They come and bring us vegetables or whatever, and sometimes they tell us their secrets. They love Michael because he doesn't look down his nose. If we're in town, we'll just sit in the parking lot all day, talking to people. That's the way we see life: your community is your survival. And if you live in a small community like this, even the people you hate you have as friends."

<http://www.nytimes.com/2008/11/04/books/04chut.html?th&emc=th>



PROSPECT.1**Kaleidoscopic Biennial for a Scarred City**By **ROBERTA SMITH**

NEW ORLEANS — Biennials are a virus that has spread across the globe. Embraced by cities as tourist magnets and branding tools, they often seem to be stocked by a standard jet set of curators, artists, collectors and advisers who touch down, in slightly different configurations, at nearly every stop.

New Orleans has joined the biennial rush with Prospect.1, the sprawling exhibition that opened across the city over the weekend. With a roster of nearly 80 artists, this show has an unsurprising mix of good, bad and phoned-in art. But it is also a testing ground with little in the way of way of superstars, big curatorial egos and elaborately produced works, and none of the vast, chilling art halls endemic in biennials.

It proves that biennials can be just as effective when pulled off without bells, whistles, big bucks and the usual suspects. Maybe even more effective, especially if the local cultural soil is spectacularly fertile, and if there's a citywide need for uplift.

Under these conditions something magical can happen: a merging of art and city into a shifting, healing kaleidoscope. Sometimes this occurs in works that are unrelated to New Orleans, like the glittery wall hangings El Anatsui fashions from the foil of liquor bottles or Yasumasa Morimura's ranting, riveting video performance as a series of 20th-century dictators.

Sometimes it occurs in site-specific works, like Nari Ward's "Diamond Gym," a sculpture of a giant gem filled with weight-lifting machines on view in the hulk of the historic Battle Ground Baptist Church, ruined but still standing in the Lower Ninth Ward.

Dan Cameron, a veteran curator and the founder of Prospect.1, came to New Orleans after Hurricane Katrina and didn't want to leave. He seems to have sensed that in the city's rawness a different kind of biennial was waiting to break free. Because New Orleans lacked an obvious site for the event or the



means to build one, Mr. Cameron has distributed his selections in about 30 locations: several museums and alternative spaces, as well as public buildings, old houses and empty lots stripped bare by the hurricane.

As a result, you are rarely viewing artworks in isolation, but rather measuring them against their contexts. On one level the show is a lively competition between so-called site-specific art and portable art objects whose meanings are expanded by their settings. On another, it is a tour of the city's rich past, recent trauma and often struggling arts organizations. And it didn't hurt that Prospect.1 opened the weekend before the presidential election, with everybody on pins and needles.

Again and again, New Orleans more than meets the biennial halfway. Take the humbling, intoxicating beaded costumes of Victor Harris, called "suits," on view at the New Orleans Museum of Art. One of several local artists who adds heft to Prospect.1, Mr. Harris is the Big Chief of the Fi-Yi-Yi, a group of Mardi Gras Indians, as well as a practicing shaman. Profuse with hallucinatory patterns and colors and evocations of African masks, his suits derail any closed definition of art or artist, as does seeing him in them, in action, on video and in photographs.

Made at the rate of one a year and unveiled during Mardi Gras, the suits are worn whenever the occasion demands that Mr. Harris call forth a spirit he has named Fi-Yi-Yi. The garments leave no doubt about the high levels of creativity in a city where French, French Canadian, African and American Indian cultures have mixed for centuries.

In one of the most haunting matchups of art and site, works by Rico Gatson, William Kentridge and the duo Bradley McCallum and Jacqueline Tarry have been installed at the New Orleans African American Museum, a beautiful Creole house on Governor Nicholls Street. Working in drawing, photography and animation, the artists explore often painful moments of racial violence, from World War I to the civil rights era to the Rolling Stones' Altamont concert.

Some site-specific efforts are simply based on received ideas. Takashi Horisaki's latex cast of a house wrecked by the storm, on view at the Hefler Warehouse on Magazine Street, is inhabited less by the ghosts of Katrina than by Robert Overby and Rachel Whiteread's casts of domestic architecture.

Sebastián Preece's work is more effective, even if it borders on urban archaeology. He has taken the concrete slabs and footings from a house in the Lower Ninth Ward lost to the hurricane, sliced them up and displayed them, bottom side up, on the water-damaged lower floor of the Tekrema Center for Art and Culture. Some resemble topographical maps, others abstract sculptures. On the undamaged second floor the New York painter Adam Cvijanovic has painted the walls with lavish, slightly oppressive vistas of Louisiana swamps, exaggerating the traditions of wallpaper and mural painting to suggest that nature is ever invasive and always capable of eradicating any human effort.

Seeing Mark Bradford's enormous "Noah's Ark" provides a firsthand experience of the eradication in the Lower Ninth Ward, where nothing remains of many houses except lonely stoops and empty lots. Made of old pieces of poster-plastered plywood, the ark rises from one of these lots, forlorn yet indomitable. Its ancient hulk, with its cacophony of decaying advertisements, seems to ridicule the overwrought, seemingly marooned houses commissioned by the actor Brad Pitt that dot the neighborhood.

Sometimes, touring the show, you can see hints of the city's possible comeback. To reach the big, vampy photos by the French artists Pierre et Gilles in a building that was a furniture store before the hurricane, you must walk through a lively exhibition of work by local artists — one of several shows piggybacking on Prospect.1 — as well as the front desk of a police precinct.



There are some unfortunate miscalculations. The talented Katharina Grosse has sprayed orange and yellow paint all over the facade and front yard of a dilapidated house in the Lower Ninth. It may be intended to symbolize the fire next time, but it seems to humiliate one of the storm's survivors.

The effect is more organic in a double-screen video by the Brazilian artist Rosângela Rennó, which can be seen in the French Quarter in a house recently acquired by the Historic New Orleans Collection, a museum and research society. The video shows older men and women, black and white, from the New Orleans area ostensibly discussing Cajun cooking. The real subject is the bonds and boundaries among the races in New Orleans, as well as a potential loss of identity should the Cajun language and customs wither away.

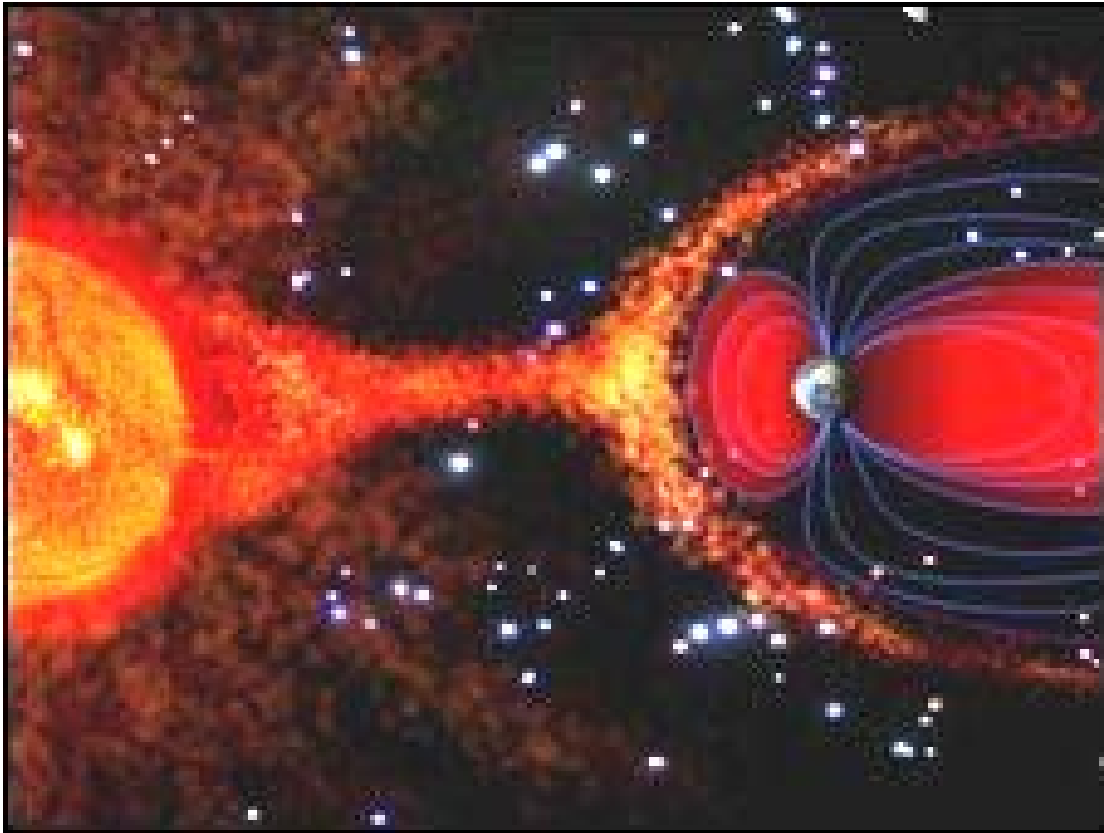
Several works pull back to show the larger picture, reminding us that the tragedy of Hurricane Katrina is not unique. These include Marcel Odenbach's video meditation on the Rwandan massacres and Fiona Tan's on the vulnerable flood plains of the Netherlands; both works are being screened at the Contemporary Arts Center. At the New Orleans Center for Creative Arts, a high school, the Bulgarian artist Nedko Solakov has covered the walls of one classroom with a tragicomedy, mostly handwritten, suggesting that both Hurricane Katrina and a deadly flood in Bulgaria resulted from the wrath of the competing ghosts of two 13th-century Bulgarian kings.

Site-specific in the national, temporal sense is an elaborate, viciously on-target installation by Stephen G. Rhodes depicting a messy, deserted campaign headquarters post-election. Strewn with balloons, voting machines, ballots and doctored videos of the robot figures that play the American presidents at Disney World, it only intensified the pins-and-needles atmosphere of the opening weekend. Prospect.1 will remain on view until Jan. 18, two days before the new president takes office.

Prospect.1 continues through Jan. 18 at locations around New Orleans; prospectneworleans.org.

<http://www.nytimes.com/2008/11/04/arts/design/04pros.html?th&emc=th>

Magnetic shield for spacefarers



Lab tests show how to produce a protective 'hole' in the plasma

Future astronauts could benefit from a magnetic "umbrella" that deflects harmful space radiation around their crew capsule, scientists say.

The super-fast charged particles that stream away from the Sun pose a significant threat to any long-duration mission, such as to the Moon or Mars.

But the research team says a spaceship equipped with a magnetic field generator could protect its occupants.

Lab tests are reported in the journal *Plasma Physics and Controlled Fusion*.

The approach mimics the protective field that envelops the Earth, known as the magnetosphere.

Astronauts' risk

Our star is a constant source of charged particles, and storms that arise on the Sun's surface result in huge numbers of these particles spilling into space.

As well as this plasma, or "solar wind", high velocity particles known as cosmic rays also flood through our galaxy.

The Earth's magnetosphere deflects many of these particles that rain down on the planet, and our atmosphere absorbs most of the rest.

The first time we switched it on, it worked

Ruth Bamford

International space agencies acknowledge that astronauts face a significant risk of ill health and even death if they experience major exposure to this harsh environment.

And even the spacecraft themselves are not immune to the effects. A solar flare crippled the electronics on Japan's mission to Mars, Nozomi, in 2002, for example.

But researchers from the Rutherford Appleton Laboratory (RAL), the Universities of York and Strathclyde, and IST Lisbon have shown how it might be possible to create a portable mini-magnetosphere for spaceships.

People scale

In its experimental set-up, the team simulated the solar wind in the laboratory and used magnetic fields to isolate an area inside the plasma, deflecting particles around the "hole".

It was not initially clear the idea would work, said Ruth Bamford, who led the research.

"There was a belief that you couldn't make a little hole in the solar wind small enough to do this at all," Dr Bamford, from RAL, told BBC News.

"It was believed that you had to have something very large, approaching planetary scale, to work in this way."

The team has had to take into account the physics of plasmas at the comparatively tiny human scale. To create its metre-sized trial, the team used a plasma jet and a simple \$20 magnet.

"The first time we switched it on, it worked," said Dr Bamford.

What is more, the trial field seems to adjust itself automatically. "It does have the capacity to be somewhat self-regulating, just like the Earth's magnetosphere is," Dr Bamford explained.

"When it gets a strong push from the solar wind, the bubble gets smaller. The video shows us increasing the pressure of the solar wind, and the shield gets smaller but brighter."

Power issues

Many more experiments are needed, Dr Bamford admits, to understand how best to harness the effect; and a practical implementation is probably 15 to 20 years away.

To protect a spaceship and its crew, she said, the craft itself might carry the magnetic field generator. Alternatively, it was possible to envisage a constellation of accompanying ships dedicated to the purpose of providing the umbrella where it was needed most.



The approach will probably also work with a field that is not on constantly, but cycles on and off - conserving the power that is precious on long-term missions. The details of how to cycle the field and control its shape must be hammered out, however.

"There're a lot of things to work out, like control, reliability, weight to launch, and so on," said Dr Bamford.

"I don't think it'll come down to as little as sticking fridge magnets on the outside of the spacecraft."

Story from BBC NEWS:

<http://news.bbc.co.uk/go/pr/fr/-/2/hi/science/nature/7706844.stm>

Published: 2008/11/03 23:57:22 GMT



Scientists clone from frozen mice

Japanese scientists have managed to create clones from the bodies of mice which have been frozen for 16 years.



Cloning has largely been done using just live donor cells, transferring their DNA to recipient eggs.

Using previously frozen cells runs the risk of ice damage to the DNA unless carefully handled.

The scientists in Kobe, Japan, said their technique raised the possibility of recreating extinct creatures, such as mammoth, from their frozen remains.

Many of the successful clones since Dolly the sheep was born in 1996 have been created by a method where the nucleus of a cell has been removed, placed in an empty egg and kick-started into replicating by chemicals or electricity.

It is not the only cloning technique, and Australian researchers reported cloning a pig in 2001 from cells that had been frozen for two years. The Adelaide-based team said its cloning method differed from the Dolly approach in important respects.

Frozen bodies

The Japanese research was undertaken at Kobe's Centre for Developmental Biology and is reported in the journal Proceedings of the National Academy of Sciences (PNAS).

The work extends the time frozen material can be held before it is used to clone an animal.

The scientists said they created their mice from the brain cells of rodents that had been kept in laboratory conditions at -20C.

Obviously, these are ideal conditions - far removed from the uncontrolled conditions of the Siberian steppe where mammoth remains dating back 40,000 years have emerged from the permafrost.

DNA previously removed from such animals has been found to be highly degraded.



Even if good material were available major obstacles would have to be overcome before such a technique could be used on extinct or even endangered animals - such as finding a suitable species to provide recipient eggs and surrogate mothers.

Professor John Armitage is director of tissue banking at the Bristol Eye Hospital, UK.

He commented: "Mitochondrial and some nuclear DNA fragments have previously been isolated from mammoths frozen in permafrost, but the key question is whether sufficiently intact nuclei could be extracted from mammoth cells, which will have been frozen for at least 10,000 years at relatively high sub-zero temperatures.

Professor Armitage added: "-20C, the temperature at which the mice used in these experiments were stored, is insufficient to stop physical and chemical reactions of biological significance - even food in a domestic freezer has a limited storage time based on changing texture and taste.

"To achieve long-term storage of viable cells, including embryos, requires far lower temperatures of at least -140C in the presence of cryoprotectants."

It is conceivable the techniques being developed might have some application in future stem cell therapies in humans where a cloning process was used to generate particular tissues for transplantation.

Viable eggs, sperm and embryos are already retrieved from the frozen state for use in in vitro fertilisation (IVF).

Story from BBC NEWS:

<http://news.bbc.co.uk/1/hi/science/nature/7707498.stm>

Published: 2008/11/04 02:46:42 GMT



Rainfall autism theory suggested

Increased rainfall, or something linked to it, may be connected to the development of autism, scientists say.



The theory is based on child health and weather records from three US states, but has been given an icy reception by UK experts.

The US study found autism rates were higher among children whose states experienced higher rainfall in their first three years.

The work appears in Archives of Pediatrics and Adolescent Medicine.

In recent years autism has been linked to factors as varied as older aged fathers, early television viewing, vaccines, food allergies, heavy metal poisoning, and wireless technology, to name just a few

Mark Lever

National Autistic Society

The rising rate of autism - up, by some measures, from one in 2,500 to one in 150 - has been attributed mainly to improvements in the way doctors are able to recognise the disorder.

However, scientists from Cornell University say this does not exclude a factor which may be independently increasing the number of children growing up with the condition.

They calculated average annual rainfall for California, Oregon and Washington State between 1987 and 1999, then looked at autism prevalence rates in the children growing up during this period.

They found that rates could be linked to that amount of precipitation in their state between these dates.

They added: "Autism prevalence was higher for birth cohorts that experienced relatively heavy precipitation when they were younger than three years."

The reason for the link, if it exists, might not be directly related to rainfall, although the scientists said it was possible that the process of rainfall might affect the chemicals to which children were exposed.

Indoor theory

They also suggested that being forced to stay indoors for longer periods could affect development, perhaps by increased exposure to television, or to household chemicals, or even through a lack of vitamin D, produced by being out in sun.

However, they made it clear that none of these was more than a theory, and called for further research to see if the link was a real one.

Mark Lever, chief executive of The National Autistic Society said the latest theory would join a succession of others advanced about the condition and its origins.

He said: "In recent years autism has been linked to factors as varied as older aged fathers, early television viewing, vaccines, food allergies, heavy metal poisoning, and wireless technology, to name just a few.

"Some of these theories are little more than conjecture or have been discredited, others seem more promising and are in need of further study. As yet, however, very few have been substantiated by scientific research."

He said: "We don't yet understand what causes autism, although scientists do believe that genetic factors might play a part.

"People with autism and their families are naturally concerned to get the right information and there is a lot of confusion and concern over the conflicting theories put forward."

Dr Michael Fitzpatrick is a GP in London and author of the book 'Defeating Autism: A Damaging Delusion'.

He said: "The notion that autism is caused by higher rainfall is manifestly absurd.

"It is about time we recognised that autism has largely genetic causes and devoted our energies to providing the best possible education and care services for people with autism and their families."

Story from BBC NEWS:

<http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/7703072.stm>

Published: 2008/11/04 00:07:56 GMT