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New York City, Tear Down These Walls

By NICOLAI OUROUSSOFF

EVEN the most majestic cities are pockmarked with horrors. The knowledge that every shade of architectural experience, from sublime to excruciating, can exist in such compressed space is part of a city's seductive pull. Yet there are a handful of buildings in New York that fail to contribute even on these grounds. For them the best solution might be the wrecking ball.

Not a day goes by, I would guess, that a Parisian strolling through the Luxembourg Gardens doesn't glance up at the lifeless silhouette of the Montparnasse Tower and wish it away. The endlessly repeated joke is that the tower offers the best views in the city because it is the only place from which you cannot see it.

Many New Yorkers feel the same way about the MetLife Building (formerly the Pan Am Building), whose dull gray concrete facade punctuates the southern end of Park Avenue like an anvil, blotting out a once-glorious view of Grand Central Terminal. In my own neighborhood near Union Square I'll occasionally catch people shaking their heads as they pass by a bizarre confection decorated with a vulgar pattern of gold rings on 14th Street.

So here's what I propose. True, the city is close to broke. But even with Wall Street types contemplating the end and construction of new luxury towers grinding to a halt, why give in to despair? Instead of crying over what can't be built, why not refocus our energies on knocking down the structures that not only fail to bring us joy, but actually bring us down?

Ugliness, of course, should not be the only criterion. There are countless dreadful buildings in New York; only a few (thankfully) have a traumatic effect on the city.

For this reason buildings that I've often ridiculed failed to make my list. I toyed with the idea, for example, of including the AT&T Building (now the Sony Building). I've disliked it since 1984, when it appeared (in miniature) cradled in the arms of its architect, Philip Johnson, on the cover of Time magazine. Its farcical Chippendale top was an instant hit, and a generation of architects grew up believing that any tower, no matter how cheap and badly designed, could be defended if you added a pretty fillip to the roof. Yet Johnson's building also represents a turning point in architectural history. And I eventually came to the conclusion that destroying it would be cultural censorship.

Nor have I included the MetLife Building, although it is one of the most resented structures in New York. (The name change made things worse. Pan Am evoked the glamour of 1960s air travel; MetLife makes you think of life insurance and car crashes.) The tower's chiseled concrete exterior does create a nice tension with Warren & Wetmore's 1929 Helmsley Building. And while the lobby was callously renovated in the 1980s, it could be restored, amplifying the flow of movement from 45th Street down into the station.

So the list will not include affronts that are merely aesthetic. To be included, buildings must either exhibit a total disregard for their surrounding context or destroy a beloved vista. Removing them would make room for the spirit to breathe again and open up new imaginative possibilities.

Here, then, are my top candidates for demolition.

MADISON SQUARE GARDEN AND PENNSYLVANIA STATION No site in New York has a darker past than this one. The demolition of the old Pennsylvania Station, the monumental McKim, Mead & White Beaux-Arts gem that stood on this site until 1964, remains one of the greatest crimes in American architectural history. What replaced it is one of the city's most dehumanizing spaces: a warren of cramped corridors and waiting areas buried under the monstrous drum of the Garden.

Over the years the city has entertained dozens of proposals to improve the station, but none have amounted to much of anything. A decade ago Senator Daniel Patrick Moynihan unveiled a multibillion-dollar plan to relocate the entrance at the grand old Farley Post Office Building, a McKim, Mead & White treasure on Eighth Avenue, which would free up more space underground. But the plan became entangled in New York's byzantine development politics and fizzled.

A few years ago two of New York's biggest developers, Vornado Realty Trust and the Related Companies, came up with an ambitious plan to move Madison Square Garden to a site west of the Farley Building. New towers would rise on valuable land above and around Penn Station, but the plan would also have opened up enough space above the station that light and air could filter into the waiting areas below. Unfortunately that all unraveled when a scandal brought the resignation of Gov. Eliot Spitzer, who had been a supporter of the project. With little room to maneuver, the state and city are now desperately trying to patch together a modest proposal that would create a new entrance to the station from Eighth Avenue.

The lesson from all this? Demolish the Garden. As arenas go, it is cramped and decrepit. And with it gone we could begin to imagine what a contemporary version of the old Penn Station might look like, with

light and airy spaces and cavernous entry halls. In short, it could be a monumental gateway to the 21st-century metropolis. Any other plan is just fiddling around.

TRUMP PLACE Several years ago I had the opportunity to peer into Donald Trump's heart over a brief lunch. The meal was pretty sedate until Mr. Trump seized on the topic of Mar-a-Lago, his palatial estate in Palm Springs, Fla. "Have you ever watched craftsmen apply gold leaf?" he asked, his eyes lighting up. I hadn't. "You really have to see it," he said. "The sheets are so thin that if you hold one up to the ceiling and blow, it takes the shapes of the molding. It just sticks there."

Extending his fingertips in front of his lips as if they were supporting a sheet of gold, he blew into the air.

The moment summed up the magic of Donald Trump. You may find his Trump Tower on Fifth Avenue gaudy, but doesn't its cockiness makes you grin?

So how to explain Trump Place? A cheap, miserable contribution to an area of the city already in need of some mending, this luxury residential complex is about as glamorous as a toll plaza.

Viewed from the West Side Highway its regimental rows have the mind-numbing regularity of Soviet-style housing. A few concrete planters try to soften the complex's relationship to the elevated highway, but the effect only makes the buildings look more inhuman. On a recent visit I watched a nanny pushing a stroller up the sidewalk and found myself wondering what effect such a dehumanizing environment would have on the little creature bundled up inside.

It could be that Mr. Trump was out of his element on the Upper West Side, which until recently at least was culturally distant from the glitzy boutiques of Midtown. But what is more likely is that it was a cynical effort to cash in on the Trump name. One answer is more gold leaf. A better one is to demolish the complex and start again.

JACOB K. JAVITS CONVENTION CENTER Pei Cobb Freed & Partners' Javits Center was never considered one of the firm's best designs. Many of its most graceful features, like a glittering entry hall that would have opened up to the Hudson River, were eliminated because of budget constraints. And the black glass exterior gives it the air of a gigantic mausoleum.

Javits officials, meanwhile, have been complaining for more than a decade that the building is too small to compete with bigger convention centers. The city has considered several expansion plans, but there was never money to pay for them.

It wasn't until a few years ago that a number of planners pointed out the obvious: With the continuing redevelopment of the Hudson River, the convention center stands on some of the most promising — and valuable — land in the city. As is, it cuts Midtown off from the waterfront. The site would serve better as housing than as a shed for dog shows and car fanatics.

ANNENBERG BUILDING, MOUNT SINAI MEDICAL CENTER What inspires architects? Central Park, conceived as a place of social healing, is one place to start. The pledge of medical workers to do no harm could be another.

So what were the designers at Skidmore, Owings & Merrill thinking when they created the Annenberg Building? Completed in 1976, this towering structure, clad in rusted Cor-Ten steel, looks like either a military fortress or the headquarters of a sinister spy agency. The narrow horizontal bands of bronzed windows add to the sense of hostility.

But what's more disturbing is the tower's savage effect on its surroundings. The tower anchors a sprawling complex that extends from Fifth to Madison Avenue, just north of 98th Street. Seen from

Central Park the complex bears down on pedestrians with brutal indifference. To the east it faces the grim towers of the George Washington Carver public housing development. Together the two complexes break the rhythm of low brick prewar buildings as they march up Madison Avenue from Midtown, creating a silent barrier between the world of the moneyed classes to the south and East Harlem to the north. It's a vision conceived without compassion.

375 PEARL STREET During the 1970s AT&T built several towers to house wiring systems. The giant windowless boxes, clad in panels of pink granite or limestone, added nothing to the skyline.

But the New York Telephone Company (now Verizon) tower at 375 Pearl Street is a unique kind of horror. Seen from the Brooklyn Bridge's elevated walkway it blots out one of the world's greatest urban vistas, from the neo-Gothic crown of the Woolworth Building down to City Hall Park and across to the massive Beaux-Arts Municipal Building — a "wedding cake" building in the mold of Moscow's Stalin-era apartment towers. Each time I cross the East River, I find myself wanting to throw my cellphone at the building.

So when I learned a few months ago that a proposal was in the works to transform the building into an office tower, I went to take a look. Could anything possibly save this horror? The plan was not only elegantly conceived; it also demonstrated a keen understanding of the tower's singular qualities. The design, by Cook & Fox, would strip away the tower's gray limestone cladding and rewrap it in glittering sheets of glass. The location of the elevator core at the building's west side would allow for big open floors inside, and office workers would have some of the most stunning views of the city, from the Brooklyn Bridge and its tangle of offramps across to Wall Street and up to the Midtown skyline.

Unfortunately, what is needed is beyond the capacity of an upbeat developer and an enthusiastic architect. Anywhere else, the proposed redesign of this building would be a revelation.

ASTOR PLACE Some patches of earth are cursed. Nearly a decade ago Cooper Union had ambitious plans for a small parking lot between the school's main building and Lafayette Street. Ian Schrager, the hotelier, agreed to develop the site and hired two of architecture's brightest stars: Rem Koolhaas and Jacques Herzog. Their collaboration led to a likable wedge perforated by round windows, giving it the look of a slab of Swiss cheese. But the budget quickly spun out of control, and Mr. Schrager eventually fired his architects.

A few years later he tried again, hiring Frank Gehry, who designed a hotel with an elaborate glass skin that resembled a woman's billowing skirt. But then came the World Trade Center attack. The hotel business died, and Gehry too was dumped.

Frustrated, the school turned to the Related Companies, one of the city's biggest developers, which hired the New York firm Gwathmey Siegel & Associates to design a luxury residential tower.

Though the tower's curving glass-and-steel skin is an obvious reference to one of the masterpieces of early Modernism, Mies van der Rohe's unbuilt 1922 Glass Skyscraper project, the crude quality of its execution is an insult to Mies's memory. His vision was slender and refined. Gwathmey's tower is squat and clumsy. Clad in garish green glass, it rests on a banal glass box that houses — what else? — rows of A.T.M.'s inside a Chase bank.

But lack of taste is not the point here. Neighborhoods are fragile ecosystems. And while enlightened designs can challenge the past, that is not the same as being oblivious to it. Astor Place would seem more comfortable in a suburban office park.

The East Village is saturated with memories of youthful rebellion. In recent years it has emerged as a crossroads between the world of would-be punks, awkward students and rich Wall Street types. The

Gwathmey building serves only the last camp: it's a literal manifestation of money smoothing over the texture of everyday life.

2 COLUMBUS CIRCLE Edward Durell Stone's building, which opened as the Gallery of Modern Art in 1964, incited one of the most bitter preservation battles in recent memory. Its defenders, who ranged from the writer Tom Wolfe to youthful preservation groups like Landmarks West, hailed its faux Venetian exterior as a slap against the prevailing standards of mainstream Modernism. Detractors, who would have been happy to see it leveled, mostly held up their noses, denouncing its swanky décor and cramped galleries as an urban eyesore.

The result? Everybody lost. The New York City Landmarks Preservation Commission was too cowardly to render a verdict and never reviewed the case. The building was turned over to the Museum of Arts and Design, which gutted it to make room for new galleries and stripped away its white marble exterior.

If the city had chosen to preserve it, a key historical landmark would still be intact. If the building had been torn down, a talented architect might have had the opportunity to create a new masterpiece on one of the choicest sites in the city. Instead we get the kind of wishy-washy design solution that is apt to please no one: a mild, overly polite renovation that obliterates the old while offering us nothing breathtakingly new.

http://www.nytimes.com/2008/09/28/arts/design/28ouro.html?ref=arts

Project aims to harness sea power

The sea around Orkney has been identified as having potential

A major tidal energy project is being planned for waters off the coast of Scotland and Northern

Scottish Power has identified the Pentland Firth, Sound of Islay and Antrim coast to test sea turbines which could power thousands of homes.

It comes as Scotland's first minister, Alex Salmond, visited the far north and the Crown Estate opened up the Pentland Firth seabed for leasing to developers.

Projects on the firth could be operational by 2020.

The sea off the Caithness and Sutherland coasts and around Orkney have been identified by the Crown Estate as having potential for generating energy.

Mr Salmond said the firth could be seen as "the Saudi Arabia of marine energy".

Scottish Power has been working on the Lanstrom device, which is said to be the world's most advanced tidal turbine.

Please turn on JavaScript. Media requires JavaScript to play.

How the tidal turbine works The Scottish and Irish sites would host up to 60 of the turbines - 20 at each site - generating 60 megawatts of power for up to 40,000 homes.

The company is expected to apply for planning permission next year.

The device, similar to an underwater wind turbine, has been tested in a Norwegian fjord.

Scottish Power insists there is no threat to marine life, but the Marine Conservation Society said it would want to look closely at the proposals and see a rigorous environmental impact assessment.

LANSTROM TIDAL TURBINES
Turbines stand 30m tall on three legs and can work as deep as 100m below sea level
Ability to turn to harness tide movements
Turbine zones would be banned to trawlers for safety reasons

The director of Scottish Power's renewable arm, Keith Anderson, said: "The rapid technological advancement of tidal power has enabled us to progress plans for this substantial project which has the real potential to deliver significant environmental and economic benefits."

Speaking during his visit to Caithness, Mr Salmond said opening the firth for energy generation on a commercial scale was "exciting news" for Scotland's renewables sector, environment and economy.

He said: "These developments are a significant step forward in Scotland's journey to become a world leader in the development of renewable energy."

Mr Salmond added: "The Pentland Firth is the Saudi Arabia of marine power.

"Our seas alone could provide 25% of Europe's tidal power and 10% of wave power. The vast potential of the Pentland Firth will mean more investment, more jobs and more opportunities for the Caithness area."

Generating power from the sea could also be key to supporting the far north economy as jobs are reduced at Dounreay, a former nuclear power complex.

The first minister joined 150 delegates and representatives from about 20 marine energy developers at the Caithness Regeneration Conference.

Creating work in the area has become increasingly important because of the decommissioning of Dounreay.

The Thurso conference - taking place for the second time - will discuss progress on an action plan drawn up to steer the region through the effects of the plant's wind-down and eventual closure.

Highlands and Islands Enterprise (HIE), Highland Council, the Nuclear Decommissioning Authority, Scottish Government and local community are involved in the project.

Eann Sinclair, of Caithness and North Sutherland Regeneration Partnership, said: "Proposals are under way for projects such as the Pentland Firth Tidal Energy project and the development of Scrabster and Wick Harbours, as well as the creation of new jobs in the engineering sector."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/uk_news/scotland/highlands_and_islands/7638242.stm

Published: 2008/09/29 10:57:14 GMT

Statins 'prevent artery ageing'

Drugs given to heart patients to lower cholesterol may have an additional benefit - keeping their blood vessels feeling younger.

Advanced heart disease patients have arteries which have effectively aged faster than the rest of their bodies.

University of Cambridge scientists, writing in the journal Circulation Research, say statins may be able to hold back this process.

They hinted the same drugs might also prevent damage elsewhere in the body.

It's an exciting breakthrough to find that statins not only lower cholesterol but also rev up the cells' own DNA repair kit
Professor Martin Bennett
Cambridge University

Statins are seen as a key tool in the fight against heart disease, and in low doses have been made available "over-the-counter" at pharmacies.

While it has been known for some time that they can lower cholesterol levels, this did not fully account for the benefits experienced by some patients, and evidence is growing that they can boost the function of the cells lining the heart arteries.

The Cambridge study adds to this evidence, and may shed light on how statins do this.

Cells in the body can only divide a limited number of times, and in patients with heart disease, the rate of division in these arterial cells is greatly accelerated - dividing between seven and 13 times more often than normal.

As the cells "run out of " divisions, they can suffer DNA damage, and do not work as well.

One of the important roles of these cells is to keep the artery clear of fatty "plaques" which can expand and block them, causing angina or heart attack.

Cancer clue

The research found that statins appear to increase levels of a protein called NBS-1, which is involved in the repair of DNA within cells. This means they may be able to hold off the effects of old age in the artery wall for a little longer.

Professor Martin Bennett, who led the research, said: "It's an exciting breakthrough to find that statins not only lower cholesterol but also rev up the cells' own DNA repair kit, slowing the ageing process of the diseased artery.

"If statins can do this to other cells, they may protect normal tissues from DNA damage that occurs as part of chemotherapy and radiotherapy for cancer, potentially reducing the side-effects."

Professor Peter Weissberg, the British Heart Foundation's medical director, added: "Too much cholesterol in the blood induces a repeated cycle of damage and repair in the blood vessel wall which results in a heart attack if the repair mechanism is inadequate.

"Statins protect against heart attacks by reducing cholesterol levels and subsequent damage to the vessel wall - this research has shown they may also enhance the blood vessels' natural repair mechanisms."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/7637937.stm

Published: 2008/09/28 23:13:23 GMT

Genetic clues to sleep disorder

Genetic research could shed light on what is happening in people with the mysterious sleep disorder narcolepsy.

The condition causes extreme daytime sleepiness, and sudden muscle weakness.

Japanese researchers found a genetic variant linked to a much higher risk of narcolepsy, publishing their results in the journal Nature Genetics.

It is linked to genes involved in regulating sleep, and the scientists say their finding could help unravel narcolepsy's causes.

The condition is an uncommon and distressing one - people with it can suffer "sleep attacks" without any warning during any normal activity.

In addition, some people can experience "cataplexy", where strong emotions such as anger, surprise, or laughter can trigger an instant loss of muscle strength, which, in some cases, can cause collapse.

> **We hope that the discovery of the present susceptibility gene(s) might contribute to the establishment of novel therapeutic approaches**
> University of Tokyo researchers

The causes are still not completely clear, although some scientists believe they revolve around a shortage of a chemical called hypocretin which sends signals to the brain about sleeping and waking up.

There is strong evidence that the condition can run in families, so the University of Tokyo team are looking for the genetic differences which may be involved.

They looked at the genetic code of hundreds of volunteers, some with narcolepsy, some without, to look for differences.

The variant they found was linked to an 79% higher chance of narcolepsy in Japanese people, and a 40% increased chance in other ethnic groups.

It is found close to two genes, CPT1B, and CHKB, which have already been singled out as candidates for involvement in the disorder - as they both have a role in regulating sleep.

Better understanding

The researchers said they believed that while current treatments focused on dealing with the symptoms of narcolepsy, their genetic find could help point the way to understanding the underlying mechanisms responsible - in particular what was causing the shortage of hypocretin.

"We hope that the discovery of the present susceptibility gene(s) might contribute to the establishment of novel therapeutic approaches," they wrote.

UK sleep specialist Dr Renata Riha, from Edinburgh's Royal Infirmary, said the variant was unlikely to provide the sole explanation for narcolepsy in patients.

She said: "The findings are very interesting but preliminary - the exact function of the genes has been largely determined in mice, which may not necessarily translate to human biology.

"This suggests that they as individuals may be more susceptible to the development of narcolepsy, but in no way explains why others develop the disease and why some of those carrying the abnormal allele (variant) don't."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/7637947.stm

Published: 2008/09/28 23:14:12 GMT

Children's web watchdog launched

A new internet watchdog has been launched to help protect children from "harmful" web content, such as cyber-bullying and violent video games.

The UK Council for Child Internet Safety (UKCCIS) brings together social networking sites and technology firms.

It aims to teach children about web dangers, target harmful net content and establish a code of conduct for sites featuring material uploaded by users.

Gordon Brown said the move was a "landmark" in child protection.

'Minimum restrictions'

The prime minister said the growing importance of the internet in young people's lives meant the task for government and society was to strike a balance between safety and freedoms on the web.

"The challenge for us is to make sure young people can use the internet safely and do so with the minimum of restrictions but the maximum of opportunities," he said.

He went on to say the internet offered "a world of entertainment, of opportunity and knowledge" to children.

This is the first in the world - it will be path-breaking and already I have been talking to prime ministers in other countries who are interested in this
Gordon Brown

"But just as we would not allow them to go out unsupervised in playgrounds or in youth clubs or in swimming pools, so we must put in place the measures we need to keep our children safe online," he said.

Mr Brown added that the responsibility for protecting children from online danger lay with the whole of society.

Home Secretary Jacqui Smith, also at the launch, said: "We are determined to do all we can to ensure that the internet environment is safe for children to use."

The council, which will report to the prime minister, will have a membership of more than 100 organisations, including technology companies such as Microsoft and Google, websites such as Facebook and mobile phone companies such as O2.

They will work together to create a child internet safety strategy to be published next year.

The strategy will:

- Establish a public awareness safety campaign
- Establish measures to protect children and young people, such as taking down illegal internet sites
- Promote responsible advertising to children online
- Establish voluntary codes of practice, with an an examination of how websites handle videos or messages posted by users.

The move follows a government-commissioned report by psychologist Tanya Byron earlier this year, which called for the setting up of a child safety council, as part of a drive to protect children using the internet and digital technologies.

'Path-breaking'

Mr Brown praised Dr Byron's report and her efforts in bringing the diverse organisations together as one council.

"This is the first in the world. It will be path-breaking and already I have been talking to prime ministers in other countries who are interested in this," he said.

John Carr, from UKCCIS, told the BBC the council offered a last chance for the online world to police itself.

All social networking companies and internet companies have very stringent terms of service
Camille de Stempel AOL Europe

"There are continuing levels of anxiety amongst parents, teachers and so on, about kids getting access to material they really shouldn't be seeing on the internet.

"If the internet industry doesn't respond and do this - clean up its act on a voluntary basis - they're going to get legislation and compulsion."

But Camille de Stempel, policy director of AOL Europe, which owns social networking site Bebo, told the BBC the industry was already doing a lot to protect children.

HAVE YOUR SAY As a parent you can only do your best - tell your children the rules, block websites and check what they are surfing Su, Manchester

"You install a lot of things like parental controls, education programmes, easy reporting mechanisms so people can report easily disturbing content, so it can be taken down.

"All social networking companies and internet companies have very stringent terms of service."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/uk_news/education/7638492.stm

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Writers who write about writing are stuck in a dead end. Why not get out and see the world?

- Mark Ravenhill
- The Guardian,
- Monday September 29 2008

A friend recently pointed out to me that artists of all kinds often make their discoveries early in their working lives. Writers, painters and musicians, he suggested, frequently know what they want to say and how they want to say it by the time they are 30. The rest of their careers are then spent refining these initial discoveries.

It's an idea that has a great deal of truth. Look at the retrospective of Francis Bacon that has just opened at Tate Modern, and you see an artist who discovered as a relatively young man a small but resonant set of images that spoke to him. He then refined this personal iconography over decades. Major events in his life may have rearranged the furniture a little, but the twisted bodies in the little rooms remain essentially the same.

Samuel Beckett is perhaps the starkest example of a writer whose work was not about discovering new perspectives as he got older, but about refining his vision; his diminishing word count is evidence of this. After emerging from the shadow of Joyce, Beckett moved from the novel to the theatre, and his theatre work gradually became shorter and sharper. The four rootless adults, the boy and the tree in the two-act Waiting for Godot, seem recklessly extravagant compared with the stark images of his later work: the isolated, babbling mouth in Not I, the brief glimpse of litter and the sound of exhalation that constitute the tiny play Breath.

Great artists such as Bacon and Beckett distil; lesser artists become self-referential and self-conscious as their work goes on. A personally defined landscape can easily become an enclosed and introverted prison, referring only to itself.

I like to think I'm open to new experiences and new ways of writing, even though I am now, by anyone's definition, middle-aged. It gets harder to encounter new people and new experiences as you get older - not just for artists, but for all of us. The wide network of friends that I moved in as a young person has now become a handful of familiar faces. When I was in my 20s I worked in the laundry of a mental hospital, a building society and a drug rehabilitation centre. Now I sit at a desk all day and write.

Whenever a novel starts with the character of a writer sitting in a Hampstead kitchen, struggling to finish a novel, I throw the book straight in the bin. I recognise where that impulse to write about writing comes from. From time to time, I find myself thinking of ideas for plays about screenwriters working in Hollywood, or actors putting on a play. This terrifies me. There has been some great writing about writing, terrific films about films, brilliant television about television. There's an inevitability about the fact that Ricky Gervais began by telling us stories about an ordinary workplace (The Office), and then, once he was massively successful, moved on to stories about showbusiness (Extras). But this seems to me something of a dead end. If it's a struggle to stay connected to the world as you get older and more established, I think it's worth it.

It's not as though the outside world isn't ready to embrace artists. Recently, I ventured out into north London with a group of young actors, stopping Camden market-goers and asking them about their lives. We started nervously, assuming that approaching strangers with the opening line, "Hello, I'm a writer and this is an actor and we're researching a play," would meet with a frosty response. But almost everyone wanted to talk to us, often at great length. We were humbled by the way many of these people told us deeply personal and often painful things about their lives. We came away with a great sense of responsibility for the complex and difficult insights into other existences we had been given, often within minutes of meeting people.

No doubt a Freudian would tell me that the outside world only reflects back to me my own inner conflicts. They may be right: work that seems objectively researched when I'm writing it is often surprisingly autobiographical when I look back at it later. Still, I remain committed to seeking new experiences to inform my writing. If you'd like to invite a writer to your factory, or mosque, or family get-together, please get in touch. Kafka once advised writers to sit in a room and wait for the world to reveal itself to them. Right now, I'd rather get out and explore.

http://www.guardian.co.uk:80/commentisfree/2008/sep/29/7

Times Art School: Leading artists reveal how they got started

ll this week, the Times Art School will tell you all you need to know to make it in the art world, from creating to collecting. Today, top artists tell Louise Cohen how they fulfilled their ambitions

Grayson Perry, Turner prizewinner 2003

I drew boy stuff when I was a kid - I had notebooks full of plans for my imaginary world, maps and designs for aeroplanes and cars and houses. I think that making work is very much connected to how you are as a child. I didn't see art as a career when I was young, I just liked doing it, and I think that was the key to everything. I wanted to make art first, and be an artist second. Even when I left art school I didn't know anybody who had sold a painting, and I didn't make a living from it for another 15 years or so. I just enjoyed making it.

After art school I just came to London and stayed in a squat, then I put a few slides together and walked round a few little galleries that I found in Time Out, and luckily I actually did get a show out of that. But I didn't get any where, really. I sold work, but never enough to make a living.

Until I was about 30 I had this back-up plan to go into advertising. For each exhibition I had I would set myself a target of how much I would sell, and I'd always make that amount and about £1. So I kept going - even when things blew up in the kiln! I did odd jobs, and my partner supported me, and in 2000, stuff took off. I was in the British Art show and Charles Saatchi bought a large amount of my work. I had stuck to my guns, and I think the art world had come round to accepting me.

Today I still make my own work - I'm in the studio four days a week. I find that the social life is a big plus of being an artist in London too - I'm not one of these people who hangs out in bohemian parts of Hoxton or anything, but I've built up a lot friends in the art world over the years, and I go to a lot of parties and openings. Exhibition openings are convenient occasions -arly evening so no horrible noisy music, free drinks usually, and the lights are on so you can admire each other's outfits.

Grayson's tip Hone your personal skills. You can have all the technique and all the originality in the world, but if you're not much fun to be around, nobody will want to work with you. Go to openings if you can, and meet people.

Sue Webster, mixed-media artist, collaborates with her husband Tim Noble

I never knew I wanted to be an artist - it was just a sort of burden that I was born with. I always wondered, “When will this thing, this disease, go away?” I dressed differently from all my friends, and spent my teens wondering why I wasn't like everyone else.My dad was always telling me to grow up and get a proper job. I went I enjoyed art at school, but there was no art world at this point. Once we did one of those career programmes on the computer, and it told me I should be a cobbler. It was a teacher who took me to one side and said: “Have you ever thought about going to college?” I hadn't.

I went to college, and I met a lot of phonies - people were always in the library, getting inspiration from books, which I found weird, because my inspiration was always in my head. But I met other people who were like me, too.

When I met Tim [Noble] and we started collaborating, we were always asking ourselves what we were doing, is it any good? That is how I learnt to make good work - by questioning everything all the time. We lived with this doubt and discomfort, and it gave our work an edge.

Tim nearly died when we did our first piece. We were filming him with is head in a tank of water, trying to make him look like the ornament in a fish bowl, and then his tube got clogged and he almost drowned - he went blue. Sometimes you don't research things properly when you're young and stupid.

Our break came just after the last recession. We did a show in a cheap space on Rivington Street, and Saatchi bought two out of three of the works. Things went on from there, but we've never stopped contemplating the same questions. Am I any good? There are so many opportunities now that I wonder if that doubt is lacking among many younger artists.

Sue's tip Retain some doubt and discomfort. Always be asking: “Is this good? Will this be successful?”

Michael Landy, mixed media artist

I didn't get in the first time I applied to Goldsmiths. Michael Craig-Martin was on the board and they said no because I was rambling. On my foundation course I had started doing textiles because, coming from a working-class background, I suppose I thought I could get a job out of it. I didn't really like fabric, but I couldn't quite get to grips with what fine art was because it's not a secure job.

A year later, I think I had come round to it. I realised that I liked working with patterns, but that I was interested in making things out of found objects and materials. I went back to Goldsmiths and I got Michael again. This time they thought I made more sense in my interview, so they took me on.

Goldsmiths ethos was that you could do more or less do whatever you wanted - we did a lot of drinking, and eventually worked out how to break into the pool table without paying.

When I graduated, Craig-Martin recommended me to Karsten Schubert gallery and it was all going well for a while. Then the economic recession of the early 1990s hit, and suddenly I wasn't selling any work any more. I did odd jobs, painting and decorating. I had to do some thing to dig myself out of this hole. I actually found that I make my best work when things are going badly. I invented Scrapheap Services, a fictitious cleaning company that got rid of unwanted people, of which I was one, and sold it to the Tate.

Now I find the hardest bit is generating ideas - sitting there and thinking things through makes me feel lazy if I don't come up with stuff. It was much easier when I smoked 40 a day, but I've quit now. To relax I watch America's Next Top Model instead.

Michael's tip Be patient. Young people often have bigger expectations now and it's probably unrealistic. Success happens to people at different times of their lives.

Anya Gallaccio, Turner Prize nominee 2003

Before college I used to work at the Royal Court Theatre doing wardrobe and stage management, but all my teachers told me that I couldn't be a designer because I didn't work to people's briefs, I just did what I wanted. I was making lots of "stuff" and it wasn't really sculpture or painting, and Goldsmiths was the only place that I could go at that time where I didn't have to know the answer first.

But I was always concerned about being an artist, because I am quite pragmatic and I didn't know how I would support myself, and in a way I learnt to approach making work driven by my experience of working in a theatre. I needed to work to a brief, and take into account other people's opinions - I sort of thrive on restrictions, it gives me something to push against.

But while I was at art school I still wasted a lot of time wrestling with what the hell I thought I was doing. Richard Wentworth persuaded me to stay, convincing me that being at art school was the best education "for life".

I suppose I owe some of my success to Damien [Hirst], too. I don't know him any more, but early on we were friends and he had an amazing energy and enthusiasm, which was contagious. He put my work in Freeze, and unwittingly gave me the confidence to believe that I could achieve anything.

Until fairly recently I felt anxious about calling myself an artist because I always felt it was going to stop. I have finally had to concede that this is it now.

I've just moved to California with my partner Kelly, and taken up a professorship. I'm 45 now, and I felt that if I didn't shake things up now I never would.

Anya's tip Be true to yourself, and resist pleasing the market. It's easy now to make things that look like art, but actually making art is a totally different thing.

Susan Hiller, mixed-media artist

I grew up in the States, where you can study art alongside other courses, which I did, but at that time there weren't really any well-known women artists, so I didn't see it as a career. Instead I did a PhD in anthropology because I was inspired by a lot of famous women anthropologists that I'd heard of and it seemed exciting. But I became frustrated because it wasn't really me, and eventually I dropped out and became more committed to art practice.

I came to the UK and started with minimalist painting, but in the end I wasn't comfortable with it. I just couldn't accept the constraints. I was interested in minimalism and conceptualism, but I was always interested in the unconscious and the irrational elements of life, and I somehow had to combine that with the very ordered and logical way that they worked.

So I made a promise to myself that I wouldn't censor out anything that I wanted to do. I started doing different things, such as making live events with groups of people, and after five or six years I developed a way of working that I felt totally comfortable with.

It took some time for my work to take off, and I struggled financially for years doing jobs on the side, but as a result of that promise to myself, which gave me complete freedom in working, I really did do some of the first installations in this country, such as multiscreened video work.

Susan's tip Don't pursue being artist unless it's the only way you can express yourself creatively. If you can be a designer or an illustrator, or something else then do that instead, because being an artist is not an easy life. It's a last resort.

David Shrigley, cartoonist and mixed-media artist

Once I had given up on becoming an astronaut or footballer, I thought about art. I remember coming home from secondary school and seeing the bigger kids from the community college with their portfolio cases, and thinking they were really cool, but I didn't know what was in them really.

I graduated in 1991 and leaving was quite a big shock, suddenly having to start the rest of my life - and it was still in the halcyon days where you left without any debt. I couldn't really draw or paint, and I didn't know what to do.

I made a panic decision to be a cartoonist, but I was kind of a failure at that - I wanted to be a cartoonist for The Guardian, which I actually am now, but at the time I didn't really know anything about it.

I started making these books to disseminate my work to newspapers and magazines, but I realised that what I enjoyed most was the process of making books themselves, and that really I just wanted to be left alone to make art for a living. So I published my books and just sold them to friends and in pubs and local shops, and people really liked them.

Eventually, Michael Bracewell wrote about me in Frieze and that was it - once you're on the cover of Frieze, you're famous. It was ridiculous really, because I'd done one solo exhibition in an artist-run space and a group exhibition, and suddenly I was being discussed in an important art magazine. But it was a self-fulfilling prophecy. If people think you're big and famous, you become big and famous.

David's tips It doesn't matter whether you're 20 or 50. Get a website and keep making work - if it's good, it will find a place.

Doris Salcedo, sculptor

I didn't enjoy my studio training as an undergraduate in Colombia nor as a postgraduate in New York. The quality of the teaching was really low. The part of it that was absolutely essential was art history. We studied it in a very serious manner for five years. Isaac Newton said that he was able to see farther because he stood on the shoulder of giants, and for me art school did that.

When I returned to Colombia, I was teaching and never intended to show my own work. For me, making it for myself was enough.

It has never been an easy life. Because I am a Third World artist, and because of the issues my work deals with, I am constantly in touch with death, physical violent death or social death. I have become so aware of the terrible things that go on around me that at times it feels so heavy it is unbearable. But it became part of my life, and the now every time I finish a work, it is worth it.

When I make that very last detail on the installation or sculpture and I realise I have been truthful to the issue I set myself, that moment is absolutely extraordinary. It's like an epiphany - everything reveals to me unexpectedly in that moment, and to me that is success..

Now I'm always working in my studio, sometimes 20 hours a day. I live in Bogotá, Colombia, which is out of the way of the art world, and that's very convenient because it allows me peace and quiet. It doesn't matter where you are, the most important thing is the work. Some artists spend so much energy playing this ridiculous role of half artist, half showbiz person, they waste their talent and intelligence.

Doris's tips I believe the most important thing is to be truthful to what you want to do, to your work, no matter what, no matter which obstacles you encounter on your way.

Jonathan Monk, mixed media-artist

At school I could do art, but I didn't really do much else. Still, back then, art school seemed like an odd choice, and not at all a career move as it does now. I went to Glasgow and did a foundation course and a BA, but it never felt like being trained. We were taught how to weld two bits of metal together, but I think the training of how to be an artist came afterwards.

It was the usual signing on the minute you leave art school - and it still wasn't necessarily possible to survive and pay the rent that easily. But there was quite a crowd of people who left at the same time with not a great deal to do, so we banded together. There was no system of galleries in Glasgow yet, so we had to kind of invent our own scene. We started showing our work in small, artist-run spaces, and that's how it all started.

People didn't really start buying my work until a fair bit later. I started making copies of adverts for cheap holidays, such as "Tenerife, two weeks, £199" - so you could either go on holiday for £199, or you could buy my painting for the same. I think most people went on holiday. It did change slowly, people started taking an interest in the Glasgow scene and my work began to sell, but it's only in the past five or six years that it has become comfortable.

I lived in Glasgow for nine years, then I lived in LA for two years. I moved there for love, I suppose, and then I and my wife moved to Berlin, where we live with our two kids. I love it here - lots of artists are here now, but it's much more relaxed here than it is in London or New York.

Jonathan's tip: People who really want to go to art school should go - it doesn't matter whether they're good or bad. You take your A levels at 17 or 18, and the art education you get to that level is not really similar to what you get at art school. Afterwards, hang out with lots of other artists, go and work in an exhibition context, and something will turn up.

New works by Jonathan Monk will be exhibited on the Lisson Gallery stand at Frieze Art Fair (Oct 16-19) http://www.friezeartfair.com/

http://entertainment.timesonline.co.uk:80/tol/arts_and_entertainment/visual_arts/article4832580.ece

Fast forward

Martin Creed's early works were minimal, low-key and made from everyday materials. As a major exhibition opens in Birmingham, Nicholas Blincoe charts the artist's turn towards bigger, brasher, more joyous projects

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- **Nicholas Blincoe**
- The Guardian,
- Saturday September 27 2008

Martin Creed's Work No. 232: the whole world + the work = the whole world (2000). Photograph: Tate

Martin Creed and Tate Britain have developed an unlikely double act over the years. With its mass of architectural accessories - domes, pillars, porticos, steps and statuary - the gallery is, in the kindest possible sense, a fat drag queen of a building. Creed, in contrast, is resolutely slimline. Yet Tate Britain has provided the setting for three of his greatest triumphs. There was the night that Madonna presented him with the 2001 Turner prize, for a work that consisted of the lights going on and off in one of the gallery's rooms. Then there is *Work No 850*, staged throughout this summer, for which teams of runners have sprinted through the gallery's long central hall. But the key piece in this odd-couple relationship is the first: *Work No 232* (1999), a garish neon sign spelling out the words "the whole world + the work = the whole world" across the building's façade. This slogan had previously been regarded as Creed's manifesto. Before its unveiling at Tate Britain, it had appeared on two other pieces, though in such low-key forms that it made far less of an impression. The new, neon version seemed to mock these small-scale versions. It was evident that Creed's work had taken a strange turn, towards a bigger and brasher personality.

1. **Martin Creed**
2. **A retrospective**
3. Ikon gallery,
4. Birmingham

1. Until November 16
2. Details:
   0121 248 0708
3. Venue info

The evolving ambition of Creed can be gauged at the Ikon Gallery in Birmingham, which is staging a career-long survey of his work. This is a first chance to see the blossoming of an extrovert; indeed, anyone willing to look at Creed's films - Sick, Shit and Sex (as self-explanatory titles as any that could be conceived) - will see far, far more than they would ever wish to. The difference from his earliest pieces is unmistakable. These were so modest as to be invisible.

In 1993, I visited two friends, Keiko Owada and Fiona Daly, and caught myself staring at a small paper cube built from layers of one-inch masking tape. When I asked what it was, Fiona handed me a piece of A4 paper with the typed instructions, *Work No 74: As many 1 inch squares as are necessary cut from 1 inch masking tape and piled up, adhesive side down, to form a inch cubic stack.* The paper was signed Martin Creed. Intrigued, I began visiting his shows. In those days, his best-known piece was a small bit of Blu-Tack - *Work No 79: Some Blu-Tack kneaded, rolled into a ball and depressed against a wall (*1993) - so all the fun was in failing to find the art. In a disused office block north of Oxford Street, I remember pausing to wonder why the door was jammed at an uncomfortable angle, and then toured a room that was empty of everything except the dust that infects old workspaces. Defeated, I turned to the catalogue and read: Work *No 115: A doorstop fixed to a floor to let a door open only 45 degrees* (1995).

Creed's works can be divided into two categories. Pieces in the first category - such as the doorstop, or the bell-shaped plaster bulge that first appeared as *Work No 102: A protrusion from a wall* and has periodically resurfaced in different dimensions or quantities, as in *Work No 188: Two protrusions from a wall* - come with specific instructions, invariably typed on to A4 paper. These instructions must be carried out if the work is to be exhibited or sold (or even performed: Creed created a band with Owada on bass and Daly on drums, and came to rehearsals with ready-typed instructions - play a scale, play a chord, start, stop, and so on). The instructions do not necessarily result in uniform pieces. For instance, Work No 100: *On a tiled floor, in an awkward place, a cubic stack of tiles built on top of one of the existing tiles* looks different in the Bern Kunsthalle than in a toilet cubicle in a disused office space. However, the end result flows smoothly from the original instruction and revolves around repetition and multiples. Perhaps this is why there could never be a work - *Work No 2001*, say - described as: *Madonna handing the Turner prize to Martin Creed*. It is an event that could never be repeated.

A second category of Creed's works revolve around general statements, the most well-known being "the whole world + the work = the whole world". This has been interpreted as a despairing comment on art's impact, but in the years before its appearance at Tate Britain it seemed more plausible that Creed was making a plea for economy in art. His work always involved everyday materials, whether Blu-Tack or A4 paper, seen also in *Work No 140: A sheet of A4 paper torn up* and *Work No 88: A sheet of A4 paper crumpled into a ball*. In a Q&A session organised by the curator Matthew Higgs, Creed sounded self-deprecating as he described his work as "extra stuff in the world" and seemed at pains to cut down on waste. Then came the Tate Britain piece, with its gas and its glass and electricity. Gazing up at the brightly illuminated letters, it seemed that a low-key, zero-emission artist had been transformed. What exactly was the new Creed trying to say?

A possible clue lies in the word "whole". At first glance, it appears redundant; after all, the world is the world. Perhaps he is claiming that this wholeness becomes apparent only with the arrival of his art, which is bold to the point of megalomania, in contrast to the modesty associated with his earlier works. Is it

significant that the slogan is expressed as a sum - in effect, X + 0 = X? Clearly, Creed likes numbers: he numbers everything he does. The equation first appeared in 1996, typed on to A4 paper, and is a kind of companion piece to *Work No 149: Half of anything multiplied by two*. Both set up ideas of wholeness, division and the preservation or restoration of value, though given that *Work No 149* is a piece of black paper, its actual value is ambiguous: one cannot say whether it is already whole or still awaiting restoration (though its dimensions - half the size of A4 - give some clue).

In fact, "the whole world + the work = the whole world" was always intended as both a joke and a zen-like paradox. While the majority of Creed's works depend on the performance of an instruction to be completed, this short typed statement on an A4 page was already complete. There was no further stage, the work was as whole or as lacking in wholeness as it was ever likely to be. However, once he emblazoned this statement across Tate Britain, the joke was lost. His equation took on the aspects of a grand belief system, as though he were lobbying to join the pantheon of superstars - Madonna, Tom Cruise, George Harrison - whose celebrity cannot be contained by established religion.

The latter half of the 1990s brought a decisive change in Creed's work. What was small became large. What had once been domestic now filled galleries. True, the piece Creed submitted for the Turner prize dated from his small-scale past, suggesting that he was still a dour minimalist. But by 2001, the new Creed had been around for several years. The key piece is *Work No 200: Half the air in a given space*. On the surface, it has all the attributes of his earliest work. It is mathematical. It sounds formal and repetitive. But what it is, in all its joyfulness, is a room filled with hundreds and hundreds of balloons. It was as though, after years of following orders, the artwork had finally discovered a loophole. Work No 200 turns art galleries into fun parks.

Another way of talking about the change in Creed's work is to say that he was once depressed, but he is no longer. The slogan "the whole world + the work = the whole world" is not economic, or philosophic, or even spiritual. It is psychological. After all, who really worries about the world, except those who cannot cope with it? Who worries about the inevitable uselessness of their actions, other than those slumped in inertia? Creed spent much of the 90s depressed. It is not a secret. If I had not already known it, the Q&A organised by Higgs would have provided proof, as it revealed the artist belittling his work and struggling to make the simplest decisions. Yet this in no way diminishes the work's quality. There is a more complex reason why the work cannot simply be reduced to biography: his melancholia somehow allowed objects the freedom to speak for themselves. If this sounds loopy, Creed believes it is true. Earlier this year, we took a walk and I recounted my serial failures to find his art. When I spoke about the doorstop, Creed nodded and told me this was a passive-aggressive piece. Not that he is passive-aggressive: only the doorstop.

Creed's earliest work gives instructions and then steps back. Freud said this is a symptom common to both depressives and the bereaved. Mourners retreat from the world because death has robbed the world of value. Melancholics feel only that the world has lost value; they are forced to create a fictional scenario that allows them to withdraw emotionally. As Creed staged his disappearance from the world, the work stepped forward to fill the vacuum. Doorstops were revealed as passive-aggressive; masking tape as obsessive-compulsive; A4 paper as tetchy, continuously issuing orders yet strangely submissive.

From the late 1990s, Creed has thrown himself back into the world, yet his talent for allowing the world to reveal itself has continued to bloom. *Work No 200* - the balloons - is wonderful not only because the balloons are so frivolous (surely we knew this), but because the work lends personality to air. Who would have thought that air could be so pushy, given the opportunity to party? The running piece at Tate Britain uncovers the pathology of the least often noted objects in a gallery: the viewers. As they become obstacles to Creed's sprinters, the art lovers' self-effacement is revealed as a kind of narcissism. Even the extrovert new films aim only to give personality to the activities and products involved: the repetitiveness of sex, for instance, or the luminosity of sick. Creed has joked that, at least in his part of east London, vomit is as much an everyday material as the A4 paper of his early work.

The new, more joyous Creed continues to write music (though Daly has retired her drum kit, Owada remains Creed's bassist). Rather more bizarrely, he has taken to writing for classical music ensembles, up to and including orchestras. The invitation to Creed's exhibition at the Ikon Gallery includes a detour to the Symphony Hall to hear a piece that he has written specially for the City of Birmingham Symphony Orchestra. Speaking before the September 23 performance, he was both nervous and excited. The work starts with a drum roll, a theatrical curtain-raiser, and then slows as it draws in each of the orchestra's voices in an even-handed score that places equal weight on each instrument. The problem was, Creed had no idea how this unusually democratic composition would sound. He had been playing the piece on keyboards, using orchestra software to approximate the instruments, but was awaiting the first rehearsal with the CBSO conductor, the highly regarded young Latvian Andris Nelsons. "If it sounds terrible, I'll have to change it," Creed said.

Creed's relationship with the Ikon Gallery began when he crafted an earlier musical piece for the museum: *Work No 409*, better known to its fans on YouTube as the "Singing Lift". Step inside the Ikon elevator and one's journey is accompanied by the voices of the Birmingham choir Ex Cathedra, rising as the lift rises and descending as it falls. Like his relationship with the Tate, the support of the Ikon Gallery has encouraged Creed to refine and amplify an ambition that has become ever more exuberant.

· In addition to the Birmingham exhibition, Martin Creed's Work No 850 continues at Tate Britain, London SW1, until November 16. Details: 020 7887 8888; tate.org.uk

http://www.guardian.co.uk/artanddesign/2008/sep/27/art.martin.creed

Banksy refuses to back art sale

Guerrilla artist Banksy has refused to authenticate five works up for auction in London this weekend.

A group called Pest Control, endorsed by Banksy, was set up earlier this year to authenticate the artist's canvasses and prints after a spate of fakes.

But Pest Control said Banksy does not like his art being removed from its original setting and will not approve any street pieces.

Auctioneer Lyon and Turnbull said it had no doubt the pieces were genuine.

A spokesman for the auctioneers said: "Banksy hasn't said they are fake. I don't know why he's not authenticated them... He's saying that street art should stay on the streets."

The firm's Ben Hanly said it would go ahead with Saturday's sale without official verification.

'Extreme caution'

He added that the pieces had been authenticated by an unauthorised organisation, Vermin.

On its website, Pest Control said that since its creation in January, 89 street pieces and 137 screen prints attributed to Banksy had turned out to be fake.

"Pest Control does not authenticate street pieces because Banksy prefers street work to remain in situ and building owners tend to become irate when their doors go missing because of a stencil," Pest Control said.

"He would encourage anyone wanting to purchase one of his images to do so with extreme caution, but does point out that many copies are superior in quality to the originals."

Mr Hanly insisted the five works up for sale - worth between £200,000 and £275,000 in total - were genuine.

They include Refuse Rat, which is expected to fetch £20,000, and Fungle Junk £150,000, consisting of three panels painted on to the side of a trailer at a festival in Cornwall in 1999.

"They are Banksy's. They are in all the literature and everything. And Vermin's authentication service gives all the provenance for each piece listed as clear as day," he said.

"The market will decide."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/entertainment/7638493.stm

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Deactivating Radioactive Waste In Hundreds, Not Millions, Of Years

Labeled equipment in n_TOF facility. The n_Tof facility is operative at CERN (Genf), and is suitable for measuring the reactions of radioactive materials when bombarded with neutrons. (Credit: Image courtesy of Vienna University of Technology)

ScienceDaily (Sep. 23, 2008) — It may be possible to dramatically reduce the radioactive waste isolation time -- from several million years to as little as 300 - 500 years. In order to decrease the isolation time for radioactive waste, first of all, the actinides - elements whose nuclei are heavier than uranium (i.e. curium, actinium) - must be removed from the waste by processing (transmutation) into short-lived nuclei.

"The core concept of transmutation – which was formulated as early as mid 20th century – consists of irradiating the actinides by fast neutrons. The highly stimulated nuclei that are generated this way suffer a fission, which leads to relatively short-lived nuclei, which in turn rapidly disintegrate into stable isotopes. Then, they cease to be radioactive," explains Professor Helmut Leeb from the Atomic Institute of the Austrian Universities. Thus, the required radioactive waste isolation time of several millions years could be decreased to 300 and up to 500 years. The technological progress made in the last decades has made the transmutation possible at the industrial level.

An efficient transmutation of radioactive waste requires the development of new facilities. In addition to specially designed fast reactors, the Accelerator-Driven Systems (ADS) present a new potential concept. This is an undercritical reactor, which cannot sustain any chain reaction. The neutrons necessary for stationary operations are supplied by a proton accelerator with a spallation target located in the reactor core.

"During the spallation, the atomic nuclei of the target (mainly lead) are broken with high-energy protons, while a large number of neutrons are normally released, neutrons which are necessary for the stationary

operation of the reactor. If the accelerator is turned off, the chain reaction ceases," added Leeb. Worldwide studies are based on the assumption that at least two decades will be necessary to transfer this concept to the industrial level, a concept which is fully understood at the scientific level.

An essential prerequisite for this development is a thorough knowledge of the neutrons' interaction and reactions with other materials as available to date. Therefore, in the year 2000, the n_Tof facility became operative at CERN (Genf), which is a unique facility in the world, suitable especially for measuring the reactions of radioactive materials when bombarded with neutrons. Between 2002 and 2005, a large number of radiative captures and fission reactions, previously insufficiently known, were measured as part of an EU project, in which nuclear physicists from TU Vienna were considerably involved.

After the conditional pause occasioned by the construction of the Large Hadron Collider at CERN, now at the end of September 2008, the consortium will start the operations at the upgraded n_TOF facility with a new target. The first series of experiments are neutron radiative captures on iron and nickel, which are analyzed by Viennese nuclear physicists (from TU Vienna and the University of Vienna). In addition to accurate reaction data for transmutation facilities, the results are also of interest for astrophysics.

An alternative nuclear fuel, which leads to a reduced incidence of radioactive waste, is the "thorium-uranium cycle." Leeb: "Thorium is a potential nuclear fuel, which may be incubated into a light uranium isotope, whose fission generates basically no actinide. Furthermore, thorium can be found approximately five times more often than uranium. However, special reactors must be still developed for this, reactors that would be appropriate for the reaction pattern and for the somewhat harder gamma radiation. India is one of the countries that already host experiments with thorium in reactor cores."

Adapted from materials provided by Vienna University of Technology.

http://www.sciencedaily.com:80/releases/2008/09/080922100148.htm

Beaked whales - into the abyss

By Richard Black
Environment correspondent, BBC News website, the Canary Islands

Most articles about scientific subjects start by telling you what people have discovered about something.

This one is mainly about what people have not discovered about something.

"There's not much known about these creatures - where they live, their lifestyle," says Ted Cranford from San Diego State University in California, US.

"In fact, they might be the least understood group of large mammals on Earth."

The creatures in question are beaked whales - rarely seen, elusive, private, yet the subject of some attention in recent years because of the damage that military sonar systems appear to inflict on them.

This summer, the research vessel Song of the Whale is attempting to fill in some of the gaps in our understanding as it sails in and around the Canary Islands, home to several beaked whale species.

Operated by the International Fund for Animal Welfare (Ifaw), the yacht's main research tools are hydrophones - underwater microphones - that listen for and track the whales' characteristic high-frequency clicks.

And there is much to discover.

Please turn on JavaScript. Media requires JavaScript to play.

Scientist Oliver Boisseau explains how to listen out for beaked whales

"Some species have never been seen alive, and these are animals as big as an elephant," says Vassili Papastavrou, a whale biologist with Ifaw who is on board Song of the Whale.

Just about the most obvious question you could ask about any kind of animal is "how many of them are there?".

Well, we have no idea - for any of the beaked whale species.

So let us take another obvious question: how many species are there?

Once again, the answer is unclear.

The 2002 reference work Sea Mammals of the World book, written by leading lights in the cetacean academic world, lists 21.

But, it says, Arnoux's beaked whale may actually be the same as Baird's, while DNA analysis suggests the apparently single species of southern bottlenose whale could be two.

The International Union for the Conservation of Nature (IUCN), in its Red List of Threatened Species, lists 17.

And, to drive the point home, the list says that for 15 of those species, there is simply not enough data to know whether they are threatened with extinction to any degree or not.

Fat bodies

The kind of data gathered by Song of the Whale and other missions around the world gives snapshots of how the animals behave.

But for most beaked whale species, more data has come down the years from examination of dead animals - for some species, corpses are the only source, as they have never been seen alive.

Sea Mammals of the World notes dryly that the northern bottlenose whale is the best understood of all the species because it used to be commercially hunted; and some hunters kept good records of what they caught and what they found.

From a well-preserved corpse - even better, from many corpses - scientists can determine an animal's size, gain clues to its diet and longevity and take DNA samples for analysis.

They can also look at how species have adapted to the environment they live in.

And perhaps the best understood and most fascinating adaptation of beaked whales is in their heads.

Head gear

Over millennia of evolution, this family has developed an acoustic echo-location system that uses windpipes to generate sound, fat to focus it and bone structures that help channel reflections back to the ears.

The basic structure has been known for decades; but last year Ted Cranford had a unique opportunity to get a closer view.

A Cuvier's beaked whale washed up on the shores of Oregon. The people who found it managed to get the head quickly frozen; and Dr Cranford persuaded those in charge of Hill Air Force Base nearby to let him put it through a scanner routinely used for examining rocket motors.

The scan, which took several days, showed that the conventional view of sound production was about right.

Clicks are generated when a structure just below the blowhole known as "monkey's lips" smacks together.

That generates a wave radiating spherically outwards, which is transformed into a directionally forward-focussed plane wave as it passes through a fat "melon" - an acoustic lens.

So the sound - too high-pitched for a human to hear - shoots out in front of the whale, and if it hits food, such as a squid, a portion is reflected.

The reflection was thought to travel to the whale's ears, via its lower jawbone. But the scan suggested a more important route is under the bone.

Air sacs are perfect acoustic mirrors
Ted Cranford

Top of head for transmitting, bottom of head for receiving; a neat system.

The sound reception part appears to be very complex, involving fat bodies that focus sound and air sacs that reflect it.

"Air sacs are perfect acoustic mirrors," says Ted Cranford.

"The whales need to be able to isolate their ears from each other in order to maintain their directional sense, and one of the best ways to do that is through air sacs."

The use of air sacs is almost incredible when you think that the whales are diving as deep as 2km (1.2 miles), where the pressure equates to 20 megapascals (about 200 atmospheres).

The whales' lungs collapse as they dive, a defensive mechanism against damage from the huge disparity of water pressure outside and air pressure inside; yet somehow the air sacs channelling sound, which appears to be key to the whales' hunting success, stay operational.

First light?

What we know about beaked whales may be fascinating; but it is dwarfed by our ignorance.

Ifaw believes its line of research, concentrating on observing animals in the wild, can answer questions about their behaviour that autopsies of dead whales cannot address.

"This kind of work led to the beginning of our understanding of social structures, such as with the sperm whale," says Mr Papastavrou.

"But then, sperm whales are incredibly loud. Beaked whales use such high frequencies that you can't even hear them without specialised equipment."

As I sit in Song of the Whale's cabin, the specialised equipment is deployed behind the boat, and sounds of beaked whales are being registered.

Scientists now understand the clicks well enough to distinguish between the various species seen here, such as Cuvier's and Blainville's beaked whales and the northern bottlenose whale.

But that is a far cry from what we perhaps ought to know - how they live, where they go, how many there are and what threats they face.

I wonder how much luck we will have filling in the gaps.

Richard.Black-INTERNET@bbc.co.uk

Do you have a question about beaked whales or the research project? Send us your questions for environment correspondent Richard Black using the form 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/science/nature/7641537.stm

Published: 2008/09/29 10:54:46 GMT

Penicillin bug genome unravelled

Dutch researchers have decoded the DNA sequence of the fungus which produces penicillin.

It is hoped that uncovering the genome of Penicillium chrysogenum will boost the development of new antibiotics to overcome problems of resistance.

The findings come just in time for the 80th anniversary of the discovery of penicillin by Sir Alexander Fleming.

Full details of the 13,500-gene sequence will be published in Nature Biotechnology in October.

Penicillium chrysogenum is used in the production of antibiotics such as amoxicillin, ampicillin, cephalexin and cefadroxil.

If we understand the genome we might be able to manipulate the genes
Professor Hugh Pennington

Its use in killing bacteria was discovered in 1928 after mould spores accidentally contaminated a petri dish in a laboratory.

Further work discovered it was safe for use in humans.

About one billion people are thought take penicillin every year around the world.

But antibiotic resistance is becoming an increasingly serious problem, as for example has been shown with MRSA.

UK experts have repeatedly cautioned against overuse of antibiotics and warned there is an urgent need for industry to develop new drugs.

Surprises

Researchers said in addition to combating resistance, the genome sequence may also help to improve the manufacturing of antibiotics.

Dr Roel Bovenberg, a researcher at DSM Anti-Infectives, the biotechnology company behind the genome sequencing, said the four-year project had thrown up "several surprises" which they were investigating further in collaboration with academics.

"It provides insight into what genes encode for, know-how in terms of manufacturing and new compounds to be identified and tested.

"There are genes and gene families we did not think would be involved in biosynthesis of penicillins - they weren't on our radar so that is our follow-up work."

Professor Hugh Pennington, an expert in bacteriology at the University of Aberdeen, said the genome sequence might well lead to the development of new antibiotics.

"If we understand the genome we might be able to manipulate the genes."

He said traditionally antibiotics had been found just from looking at what fungi produce, but in recent years scientists had been trying to modify existing treatments.

"All the easy targets have been hit by one drug or another so it's proving very difficult to find new compounds and we're going to need some lateral thinking.

"If the genome helps to do antibiotic development quicker, then that can only be a good thing."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/7638379.stm

Published: 2008/09/29 23:05:15 GMT

Big babies 'risk breast cancer'

Baby girls who are of larger than average length and weight at birth grow up being at increased risk of breast cancer, analysis suggests.

The analysis of 32 studies involving more than 600,000 women provides the strongest evidence yet of such a link.

The London School of Hygiene and Tropical Medicine team says birth size might explain 5% of all breast cancers.

It could point to some link between cancer and the environment of the baby before birth, PLoS Medicine reports.

> **There are some things a woman can do to help reduce her risk of developing breast cancer such as maintaining a healthy weight, eating a balanced diet and limiting her alcohol intake**
> Dr Sarah Cant of Breakthrough Breast Cancer

One theory is that a larger baby may be exposed to more oestrogen and other hormones in the womb.

The data analysed by Professor Isabel dos Santos Silva showed birth weight, length and head circumference were all linked with breast cancer risk.

A 0.5kg (1.1lb) increment in birth weight was associated with an estimated 7% increase in the risk of breast cancer.

But birth length appeared to be the strongest independent predictor of risk.

The risk of developing breast cancer by the age of 80 was 11.5 in 100 for the women who measured more than 51cm (20in) in length at birth, compared with 10 in 100 for those who had measured less than 49cm (19.3in).

Hostile womb

This increase in risk, although modest, is of a similar magnitude to that of other more established risk factors for breast cancer, such as alcohol consumption, say the authors.

Professor dos Santos Silva said: "Little is known on how the pre-natal environment may affect breast cancer risk in later life. Further research is needed."

> **It is vital that all women remain breast aware throughout their lives and accept regular invitations to routine screening**
> Breast Cancer Care

Dr Sarah Cant of Breakthrough Breast Cancer said: "Breast cancer is a complex disease that can be influenced by many factors throughout a woman's life.

"We don't yet know what all of these factors are, so it is very interesting that birth size may be one of them.

"This research could add to our increasing knowledge about the causes of breast cancer - possibly helping us to better predict breast cancer risk and potentially prevent the disease in the future."

She added that although there was nothing a woman could do about her size at birth, she could help reduce her risk of developing breast cancer with actions such as maintaining a healthy weight, eating a balanced diet and limiting her alcohol intake.

A spokeswoman for Breast Cancer Care said: "We would urge all women, particularly new mothers who may be worried by this study, to remember that gender and age are by far still the biggest known risk factors for developing breast cancer, with the majority of cases occurring in women aged over 50.

"Therefore, it is vital that all women remain breast aware throughout their lives and accept regular invitations to routine screening."

Around 46,000 cases of breast cancer are diagnosed every year in the UK. The disease kills an estimated 12,400 women annually.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/7641880.stm

Published: 2008/09/29 23:04:02 GMT

Mother Nature's Sum

Scientists are working to put economic value on the natural world, hoping to create ecosystem-services markets that protect the environment. But are they really just putting out a contract on Mother Nature?

- By: Matt Jenkins | September 24, 2008 | 07:00 AM (PDT)

Illustrations by Charles Waller

Even though economics and ecology both trace their origins back to the Enlightenment, they have always had an uncomfortable and antagonistic relationship. Today, however, Stanford University ecologist Gretchen Daily and a host of other scientists and economists are trying to finally bridge the gap between the two disciplines by attempting to put a price on nature — and not surprisingly, their endeavor has caused a little heartburn. Depending on how you view things environmental, the project is either breathtaking in its ambition or absolutely terrifying.

Whatever your ideological leanings, you'd be hard pressed to argue that nature counts for much now, at least in traditional economic calculations. Ecologists — and, more and more, economists — have elaborated on the idea that the Earth's ecosystems constitute "natural capital," a kind of ecological "principal" that, when managed properly, generates a sustainable flow of interest that supports life on the planet. But traditional economics is infamous for ignoring the real environmental cost of doing business.

"It doesn't even appear on the balance sheet when you're doing a cost-benefit analysis," Daily says. "Natural capital never shows up there: It's implicitly valued at zero."

Daily and her associates think that determining the monetary value of "ecosystem services" — like carbon absorption, flood control, water filtration and all the other good things nature does — is the first step toward a truly sustainable human presence on the planet. Only by putting a price on nature, they argue, can we truly appreciate it — and know what parts of it are most important to pay to preserve.

But critics see an economic gloss on ecology as heretical, the opening of a Pandora's box that would set the stage for a host of greedy owners of natural capital — from timber and energy companies to Florida swampland dealers — to extort more and more money from the government for each attempt to protect the environment.

Daily isn't shy about acknowledging criticisms of her efforts to popularize the idea of ecosystem services. But she says *something* needs to be done to change the status quo — and quickly. "We're in a desperate situation," she says. "Nature's always been kind of an all-you-can-eat buffet. We need to set prices, because without a price, it's going to be a mad free-for-all and a race to the bottom."

Though it may have been born in the realms of academia, the idea of ecosystem services is well on its way out of the academy gates. The Nature Conservancy, which spends about $700 million a year on conservation, has partnered with Daily and endorsed the concept. The U.S. Department of Agriculture already spends nearly $2 billion a year on farm conservation programs that help maintain ecosystem services, and it, too, is an emerging champion of ecosystem services. In 2005, then-U.S. Agriculture Secretary Mike Johanns announced efforts "to broaden the use of markets for ecosystem services (so that) credits for clean water, greenhouse gases or wetlands can be traded as easily as corn or soybeans." Even China, the world's last great Communist stronghold, has announced a $95 *billion* payments-for-ecosystem-services program.

As the market for carbon credits heats up, the concept of ecosystem services is clearly in ascendancy. Yet there is also a quiet debate about the ultimate consequences of the idea's growing popularity — and whether it may, in the end, raise more snakes than it kills.

The idea of natural capital has been around since the late 1940s, and perhaps earlier. But it is only in the last two decades that the field of ecological economics has come into its own, its practitioners beginning to tease apart and put values on the various landscape-scale processes and functions of the natural world.

If a single year marks the real arrival of the concept of ecosystem services, it was 1997, when a paper titled "The Value of the World's Ecosystem Services and Natural Capital" was published in the journal *Nature* by Robert Costanza and 12 other researchers. The group estimated the economic value of 17 discrete ecological benefits — from carbon sequestration in forests to water filtering in wetlands to wildlife habitat and ecotourism.

The point, Costanza says, was "to counter (the idea that) nature was really just a pretty picture, and we should preserve it because it's pretty. There are all these other, more functional reasons that we hadn't realized til fairly recently." When the researchers added it all up, they arrived at an average of $33 trillion a year in value produced by the natural world — a total that was at the time nearly twice the global gross product.

The paper set off several debates in academia. Some economists criticized the authors' methodology. But others raised moral concerns about the quest to value nature. In a special issue of *Ecological Economics*, University of California, Berkeley economist Richard Norgaard and several colleagues asked, "Will ecological economists bring us the value of God next?" They went on to ask just whom humankind might sell the Earth to "and what we might be able to do with the money, sans Earth."

That was just one of the many critiques of the paper, but the second big event of 1997 — and the one that would ultimately generate the most press — was the publication of a book, edited by Gretchen Daily, called *Nature's Services: Societal Dependence on Natural Ecosystems*.

The book became a lodestar for the ecosystem-services movement. It was the first attempt to lay out a systematic framework for inventorying and valuing the entire range of ecosystem services across the

landscape. "Even imperfect measures of their value," Daily wrote, "are better than simply ignoring ecosystem services altogether, as is generally done in decision making today."

The book gave conceptual form to the emerging discipline. And the growing focus on the various processes that might be found on any given piece of land mirrored a larger shift, from the traditional conservation approach — which focused on protecting pristine ecological preserves — to a broader, landscape-scale approach that tried to keep the essential ecological process of larger ecosystem webs intact.

"Conservation's becoming more complex than it was in the past, when you could go to a remote site, draw lines on a map and call it protected," Daily says. "Most reserves are set up in rocks and ice, the places least contested for human enterprise. They're too small, too few, too far apart, and things like climate change are going to maroon a lot of species in these kinds of areas."

That realization has led to increasing attention being paid to conservation on privately owned lands. In fact, ecosystem services offer a more sophisticated way to do what environmental groups like The Nature Conservancy have long been doing: Putting conservation easements on private land, or even buying it outright, to prevent development and preserve important ecological functions on the land.

The ecosystem-services framework offered the possibility of even-more-finely targeted investments in environmental protection. It let government natural-resource agencies and conservation groups be more selective about the particular services they were trying to get and — theoretically — would allow them to focus on the lands that would yield the highest return on investment.

In the decade or so since 1997, the effort to quantify and promote ecosystem services has become increasingly sophisticated. It has also become much less theoretical and attracted more and more attention from major conservation organizations.

In 2001, more than 1,300 scientists began work on the Millennium Ecosystem Assessment, a globe-spanning effort that its participants called "the first comprehensive audit of the status of Earth's natural capital." The assessment — the results of which were released in 2005 — looked at the health of 24 ecosystem services and, not surprisingly, found many of them severely degraded.

Then, in 2006, The Nature Conservancy and World Wildlife Fund — the world's two biggest environmental organizations —teamed with Daily and Stanford's Woods Institute for the Environment to create the Natural Capital Project. It is the first concerted effort to put practical meat on the bones of ecosystem-services theory and brings together a number of demonstration projects in California, Oregon, Hawaii, Mexico, Ecuador, Colombia, Tanzania and China.

In Tanzania's Eastern Arc Mountains, for example, a team is assessing ecosystem services, including water supply, carbon sequestration, landscape preservation for ecotourism and forest products. The goal is to devise a framework under which local residents can be paid to maintain those services by, for example, protecting the forests that are essential for guaranteeing water supplies.

Perhaps even more important, the Natural Capital Project collaborators are developing a software system called InVEST, which is short for Integrated Valuation of Ecosystem Services and Tradeoffs. InVEST can analyze a particular area and "light up" portions of the landscape that can provide the highest ecosystem-services returns.

"If you badly need flood-control or storm-surge protection, where do you make your investment to have the highest payoff?" Daily asks. "We have a very quantitative approach that lays out, in biophysical terms, what you would get if you invested in the lit-up part of the landscape."

The U.S. Environmental Protection Agency, meanwhile, has partnered with a competing effort, based at the University of Vermont's Gund Institute for Ecological Economics, which Robert Costanza heads. There, a team is developing an analytical tool called MIMES, for Multi-scale Integrated Models of Ecosystem Services.

But such tools are just a start, Daily says, and it's not enough to simply quantify the value of the ecosystem services that a particular piece of land provides. "You have to figure out a way of letting people realize those values and actually get paid to supply ecosystem services," she says, "the way they get paid to grow food."

That means creating some sort of market in which ecosystem services can be bought and sold — a market that, in its most highly developed form, might look similar to commodities markets for crops like corn and soybeans. Broadly, the concept goes by the name "payments for ecosystem services," or PES, though such schemes have been proposed under a variety of different titles. The advocacy group Environmental Defense, for instance, refers to them as conservation incentives; they've also been called "green payments" in the context of various Farm Bill programs.

Daily and many others point out that ecosystem-services payments can meld human development and natural protection —particularly in poorer countries, where there may not be many options besides, for instance, cutting down all the trees on your land and selling them to a lumber mill.

Indeed, one of the most widely cited success stories for ecosystem-services payments is Costa Rica's *Pagos por Servicios Ambientales*, or Payments for Environmental Services. In 1997, that country began signing five-year contracts with landowners who help sequester carbon, maintain water quality and protect biodiversity and the scenic beauty on which ecotourism is dependent — primarily by practicing sustainable forestry on their land. China, as well, has established a massive new program that, at least in one variation, provides grain to farmers who would otherwise hack cropland from heavily forested slopes and unleash eroded sediment into streams and rivers below.

But the largest, longest-running ecosystem-services payment program on the planet is the U.S. Department of Agriculture's Conservation Reserve Program. In the wake of the Dust Bowl, the government began paying farmers not to farm poor, erodible land. The program has ebbed and waned ever since, spawning several variants that pay farmers to preserve certain types of wildlife habitat on their lands and not to drain and farm important wetlands. Today, the program covers about 35 million acres of land in the U.S. at a cost of $1.8 billion.

Many observers say that ecosystem-services payments can attain an even-more-evolved state of being. The latest twist is "stacking" multiple services — and payments for them — together on a single parcel of land.

Ralph Heimlich is a former deputy director of the U.S. Department of Agriculture's Economic Research Service who now runs a consulting firm called Agricultural Conservation Economics.

"There's only so much money you can attract to golden-cheeked warbler conservation," Heimlich says, referring to an endangered Texas bird. "But if you can stack that on top of whitetail deer hunting, on top of reducing (fertilizer) runoff to the Guadalupe Reservoir, you have a bigger pool of bucks to work with.

"There's a private market for carbon. In certain places, there's going to be a private market for water. There are markets for specific kinds of wildlife habitat — for pheasants or endangered species," he says. "The trick is to think of them as all saleable commodities so you can grow a long meadow rotation and get corn, soybeans, hay and carbon and wildlife, *and* you can conserve water, *and* you can reduce nutrient pollution to a nearby stream."

Heimlich is as quick as anyone to acknowledge criticisms of payments for ecosystem services. But, he says, the concept has — at least to some degree — a rustic antecedent.

"In some sense, it's actually an old model," he says. "A farm is more than cropland: Most farmers have some woodland and some meadow and pastures and maybe even some native grassland. And originally, it was a portfolio-optimization decision as to what to plow, what to leave and what to harvest as timber. This is just a more complicated version of that."

While efforts like the Natural Capital Project have pressed forward, some critics have greeted the notion of paying for ecosystem services with outright derision — albeit largely confined to the literature of academia.

The most acerbic critic is Mark Sagoff, an environmental ethicist at the University of Maryland. "The force of gravity is what keeps us all from floating into space," Sagoff says, "but it's free. Its value, in the sense of how much it benefits us, has nothing to do with its price."

In the wake of the much-publicized collapse of honeybee populations and amid fears of an impending pollination crisis, insect pollination has become a particularly mediagenic example of the importance and value of ecosystem services. But Sagoff isn't buying it: "We couldn't have wine without wind because grapes are self-pollinated — but does that mean we want to put a price on wind?"

Earlier this year, in a paper published in the journal *Environmental Values*, Sagoff — who concedes that he's made himself "a pariah" because of the stridency of his criticisms of ecosystem services — mercilessly deconstructed the honeybee example. "Ecological economists view the work of the insectival classes (along with that of nature's other servitors) as Marxist economists regard the work of the labouring classes," he wrote. "Both the insect worker and the human worker, on this general approach, produce ... the surplus value that accrues to the capitalist but is truly earned by the labouring masses (in this instance, of insects). The sentimentally appealing but intellectually empty effort to ascribe economic value to nature's services may at bottom constitute little more than the labour theory of value *redivivus*.

"Marx," Sagoff continued, "had a recommendation: [T]he workers of the world should unite to throw off their chains. What recommendation do ecological economists offer the labouring insectival classes?"

Sagoff may be a singularly bombastic critic of the ecosystem-services concept, but he is not alone. David Ehrenfeld, the Rutgers biologist perhaps best known for his 1978 book, *The Arrogance of Humanism*, has long championed a purely moral rationale for conservation in the face of "utilitarian" views of nature. "I've been in a running battle with people who say you've got to save the Amazon because (it may hold) a cure for cancer — or baldness," he says. "I've been fighting that battle for a long, long time.

"The mind-set that pushes ecosystem services is the same mind-set that has caused the need for conservation in the first place, that sees nature as something to exploit. It's an exploitative approach. We save nature because it's good for us."

And, Ehrenfeld says, the environment is something beyond economics. "There is more to the environment," he says, "than economics can ever express."

There are other moral dimensions to the issue. John Echeverria is the director of the Environmental Law & Policy Institute at Georgetown University. He has written extensively about the two main competing ways to protect nature — through outright government regulation or by paying landowners to do what's best for the environment — and he has warned that payments can erode a societal sense of environmental responsibility.

"It's one thing to value ecosystem services," Echeverria says. "It's another to say, 'And, the public ought to pay to preserve them.'

"It's one thing to pay people in Borneo. It's another thing to pay Weyerhaeuser."

That, in fact, points to yet another twist in the debate. In the U.S. in particular, the notion of environmental ethics has a long history that, in this instance, traces back most directly to Aldo Leopold. Leopold wrote about a "land ethic," or what has also been referred to as a "duty of care" for landowners.

And — as Eric Freyfogle, a University of Illinois law professor, has pointed out — Leopold wrote: "The average citizen, especially the landowner, has an obligation to manage his land in the interest of the community, as well as his own interest. The fallacious doctrine that government must subsidize all conservation not immediately profitable for the private landowner will ultimately bankrupt either the treasury or the land or both."

Echeverria says that payments for ecosystem services not only undermine the land ethic but also play into the hands of the property rights movement. "A payment approach sends the message that you're entitled to whatever you can get from the public, and you can do whatever you want with your land, the public and your neighbors be damned," he says. "The more widespread payments program(s) become, the louder that message is."

(Sagoff puts it a little more pungently: "The thing becomes completely corrupt as every single person who might be able to control carbon by farting less demands a credit.")All of that raises the possibility that widespread payments for ecosystem services will open a Pandora's box: Incentives for conservation could actually become perverse incentives, and farmers, for instance, may farm in eco-friendly ways only if someone pays them to do it. In a 2005 law review article, Echeverria considered the "risk that repeated efforts to resolve land conflicts with the handy lubricant of public money could eventually convert environmental protection into a hostage beyond the reach of our elected representatives in any way other than paying for it."Environmental economists have themselves vividly described the phenomenon in the literature as "ransom behavior." Echoing a sentiment expressed by others, Duke University professor of law and environmental policy James Salzman put it this way: "One might argue that farmers should not be paid to reduce their water pollution any more than I should be paid to stop mugging people."

Even economically — and morally — rational behavior can lead to the same sort of problems as ransom behavior. In fact, the Department of Agriculture's Conservation Reserve Program may well be Exhibit A. Rising commodity prices — particularly for corn, driven in large part by the exploding demand from new ethanol refineries and by this summer's Midwest flooding — is putting serious strain on the program.

Farmers who enroll and agree to idle their land sign 10-year contracts, but a consortium of agribusinesses and Sen. Charles Grassley, R-Iowa, have been lobbying for Agriculture Department Secretary Ed Schafer to allow farmers to leave the program early, with no penalties. If Schafer agrees, it would effectively torpedo the whole point of the program.

Daily concedes that gaming the system is a genuine concern — and one doomily portended by the appearance of books with titles like *Green Wealth: How to Turn Useless Land Into Moneymaking Assets (and Save the World)*. In fact, she says, she's seen the gaming — literally — firsthand.

One staple at ecosystem-services conferences consists of role-playing exercises designed to simulate ecosystem markets. "Invariably, people figure out how to manipulate the system to their advantage," Daily says. "I don't have a magical answer there."

But her position is, nonetheless, rooted in a tough-minded sort of pragmatism. "The ethical argument only goes so far when there's such intense pressure on nature as there is today, and if we cling to traditional

approaches alone, we're dooming ourselves," Daily says. "There are ethical reasons to destroy forests, too — like to feed your children."

Costanza has weathered plenty of criticism for suggesting that a price can be put on nature, or at least on her constituent components. "People are in a certain state of denial about that," he says. "The analogy is that of human life: People say you can't put a value on that, but we do it all the time — implicitly, in the decisions we make." Federal highway safety standards, for example, are based on a tradeoff between the value of a statistical life and the increased cost that would come with building safer bridges and installing more guardrails alongside highways. "It's not like we value an individual life; we value a statistical life," Costanza says. "We don't know *who* it's going to be."

Costanza says people are constantly making the same kinds of tradeoffs with the environment, whether they think about them or not. Elsewhere, he has written, "The decisions we make as a society about ecosystems *imply* valuations. ... I believe that society can make better choices about ecosystems if the valuation issue is made as explicit as possible."

Among the many questions being raised about ecosystem services, one, in particular, has barely been addressed. Ecosystem services are clearly a product — but will there be a buyer? That, after all, is what it will take to make the concept really go. Costa Rica's *Pagos por Servicios Ambientales*, for instance, has primarily been funded by a large World Bank loan, rather than a true market in which Costa Ricans who benefit from, say, clean water pay landowners who sustainably manage their upstream forests.

In the U.S., nothing will do more to turn ecosystem services into widespread reality than a cap-and-trade framework for greenhouse gases. This year's Climate Security Act, sponsored by Joe Lieberman, I-Conn., and John Warner, R-Va., would have established such a system. Even though it failed to pass this year, there is growing consensus that a similar climate law is not far off. But if a cap-and-trade system for carbon would certainly bring lots of money into the mix, it's far less clear where the deep pools of money will be found to pay for other ecosystem services like pollination.

For all the moralizing surrounding the notion of ecosystem services, however, an interesting hybrid approach is emerging. "The Europeans," Ralph Heimlich says, "have a stoplight analogy. The red part is: Here's some things you can do to your land that are so bad" — say, dumping leaking car batteries in prime golden-cheeked warbler habitat — "that we're gonna take you to prison.

"The yellow light is: Here's some things you can do and get away with, but we're not happy about it, or here's some minimal stuff that you really ought to do."Then the green light is: Here's some stuff that's above and beyond the stewardship obligation, and we're going to pay you for doing it, because it's to the benefit of society."The idea makes intuitive sense, and it seems an elegant fusion of the two doctrines: It suggests that there is at least a basic duty of care, some minimal land ethic. It also suggests that the public (or *someone*) might be well served by financially encouraging an improvement over the ecological status quo — whether the payoff comes in the form of carbon credits or tax write-offs or good PR.

From a public policy perspective, the stoplight model seems promising, but to become reality, it will require real public involvement. "The average Joe Citizen doesn't know he's being affected by this stuff," Heimlich says. "He knows the bay is dirty, or he knows he got flooded out, but he doesn't really understand why."The guys who really understand it are the guys who are either going to pay or get paid. And they've got the time and the interest, and they're there in the halls of Congress."

http://www.miller-mccune.com/article/677#

The Approaching World Oil Supply Crisis

Analysis: Two prominent energy thinkers suggest a direction for what to do as the spigots start trailing off -- which they feel is much closer than do most in the industry.

- By: James Mason and Bill Bailey | September 22, 2008 | 02:29 PM (PDT)

A world oil supply crisis is looming in the near future, according to a growing number of energy analysts. This summer, Christophe de Margarie, CEO of the French oil company Total (one of the world's top 10 oil companies), said it will be difficult to raise world oil production above 95 million barrels per day by 2020.

This is the first time a top executive of a major oil company has stated a maximum world oil-production level this low. But it is consistent with maximum world oil-production estimates provided by prominent peak oil forecasters such as Chris Skrebowski, editor of London's Petroleum Review, and Colin Campbell, founder of the Association for the Study of Peak Oil.

Margarie's projection is a cause for alarm since current world oil consumption is 86 million barrels per day. World oil demand is increasing at an annual rate of 1.3 percent, which is a little more than 1 million barrels a day. At this growth rate, world oil demand will surpass the 95 million barrels per day production level by 2016.

The approaching world oil supply crisis can be summed up by what's happening in just two countries — China and India. These are the world's two most populous countries with a combined population of 2.5 billion people. Both countries are experiencing strong, sustained economic growth. In recent years, China's oil consumption has increased at an average annual rate of 7 percent and India's at a 4 percent annual rate. These two countries account for more than 50 percent of the annual increase in world oil consumption.

China and India are newly industrialized countries, and they have literally just begun building a middle class and have huge population bases experiencing rising economic expectations and hungry for improved

lifestyles such as car ownership. It is important to keep in mind that a constant percentage growth rate results in exponential growth, which means that the actual quantity increase gets greater each year at an increasing.

For example, if the above stated growth rates in oil consumption for China and India continue to 2020, the oil consumption in the two countries will grow from the current 10 million barrels per day to 28 million barrels per day, which is almost a tripling in the combined oil consumption for these two countries.

And get this, China and India will be consuming more oil in 2020 than the U.S.

Something has to give. Who has the right to tell the Chinese and Indian people that they cannot buy their first car? They probably would reply by telling us to give up at least one of our cars per family. The simple fact is the world does not have enough oil to sustain growth in global oil demand.

As global oil supplies tighten, bidding wars will intensify, and there will be a significant increase in political tensions between the developing nations and the developed Western nations, if not war. The developing situation is explosive and needs to be acknowledged.

What is to be the U.S. response? It is now becoming clear that internal U.S. oil reduction policies, such as increasing vehicle fuel economy, will have little impact on future world oil-demand levels or prices. Also, we are not going to be able to solve the problem with domestic drilling.

Drilling for oil in the Alaska National Wildlife Refuge and U.S. outer continental shelf is unable to address the problem because it takes 10 years to develop oil fields for production. Also, oil-production levels from these fields will meet only a small portion of U.S. need and will not reduce our dependence on foreign oil. Projected oil production from these fields is less than 5 percent of current U.S. oil supply, of which we import 70 percent.

T. Boone Pickens has offered a plan to reduce oil consumption by transferring the use of natural gas for electricity generation to fuel transportation. Pickens proposes replacing the use of natural gas for electricity generation with electricity from wind farms and then to use the natural gas to fuel cars and trucks.

However, the quantity of natural gas for electricity generation that can be replaced with wind electricity will only reduce transportation oil consumption by an amount equivalent to 20 percent of our oil imports. For natural gas to fuel all light cars and trucks would require increasing U.S. natural gas production by 30 percent, which would be difficult if not impossible since U.S. natural gas production is currently struggling to return to the 2001 high production level.

In fact, the U.S. needs to become concerned about increasing natural gas imports and the possibility that we will become increasingly dependent on foreign natural gas supplies over the next decade.

Before the U.S. can solve the oil supply problem, it must first accept the inevitability of the problem and its consequences. The good news is availability of technologies that can solve problem. Most significantly, advanced electric vehicles are entering production, which means that we can rapidly reduce oil consumption since cars and trucks account for about 50 percent of total U.S. oil consumption.

Two types of all electric vehicles are emerging — fuel cell electric vehicles and plug-in hybrid electric vehicles. Fuel cell electric vehicles are powered by electricity produced from hydrogen gas passing through a fuel cell. Plug-in hybrid electric vehicles are powered by ion-lithium batteries for 40 miles. When the batteries become discharged, a small engine seamlessly kicks in to run a generator that produces electricity in place of the batteries.

Earlier this year, Honda began leasing the Clarity fuel cell electric car in Los Angeles. All car companies are developing fuel cell electric vehicles. Daimler and General Motors have announced that they will be ready to join Honda in the production of fuel cell vehicles by 2010. The availability of fuel cell vehicles is contingent on the availability of hydrogen at filling stations since fuel cells employ hydrogen to produce the electricity for the electric engine. Extensive testing of fuel cell vehicles indicates that hydrogen is as safe as gasoline, and there are zero tailpipe emissions, just small amounts of water vapor.

The hydrogen for fuel cell electric vehicles can be produced by gasification plants. Gasification is a 150-year-old technology, and plants could be built rapidly in all 50 states to produce low-cost hydrogen. The best feedstock for gasification plants is "cellulosic" biomass. But a cellulosic biomass production and distribution system does not exist in the U.S. Therefore, the initial feedstock for gasification plants will have to be Western lignite coal until it can be replaced through the development of a cellulosic biomass production and distribution system.

GM, Toyota and Nissan have announced plans to have plug-in hybrid electric cars in showrooms by 2010 with driving ranges of more than 300 miles and fuel economies of more than 100 miles per gallon. The electricity used to recharge batteries can be supplied by wind farms, which can be built in the high wind areas of the Midwest and Northwest to support growth in the plug-in electric vehicle market. Since fuel consumption of plug-in hybrid electric vehicles is only 20 percent that of conventional gasoline vehicles, biofuels can replace gasoline.

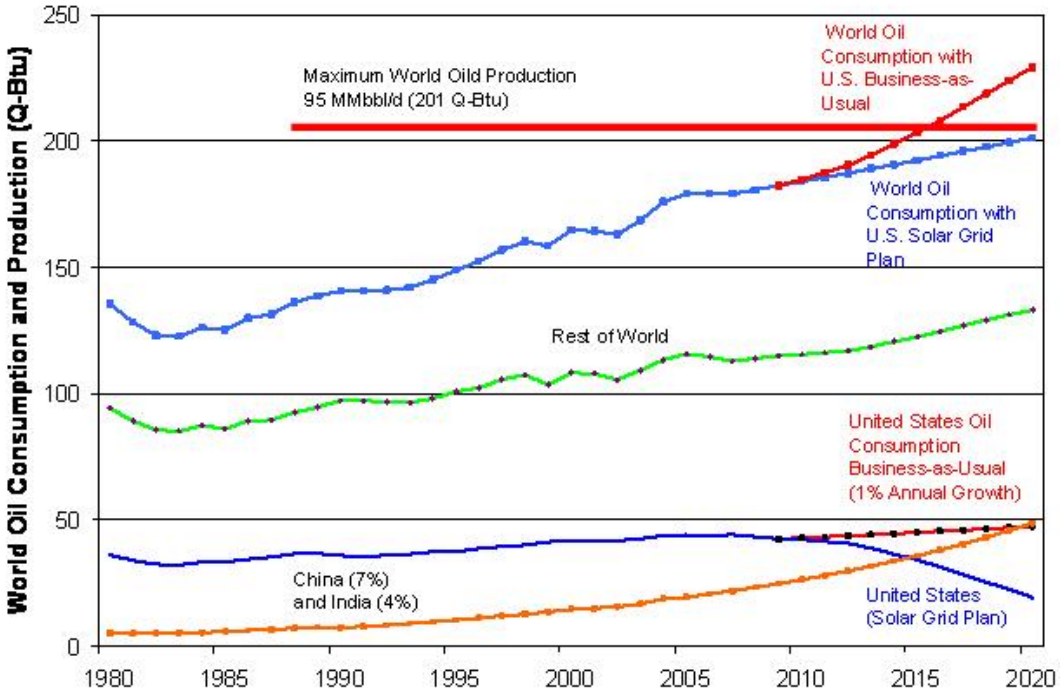
The fuel cost of electric vehicles, whether it is grid electricity or hydrogen, will be less than what we are currently paying for gasoline. The emerging electric cars will have comparable if not superior driving performance to conventional gasoline cars. And electric vehicles can be large or small in styles similar to the cars we drive today.

While a complete transition to electric light cars and trucks by 2020 will not completely solve our foreign oil import problem, it will reduce oil imports by 60 percent. To realize a complete elimination of oil imports will require expanding fuel production by gasification plants for heavy transportation.

But before the U.S. can exploit its vast wind and solar resources on a large scale, the U.S. will have to build a national electricity transmission grid to distribute wind electricity from the Midwest and solar electricity from the Southwest to local markets nationwide. The construction of a national transmission grid will require a congressional mandate on the scale of the Eisenhower interstate highway project.

In addition to the production of fuel from cellulosic biomass, low-cost solar and wind electricity can be applied to electrolysis plants to produce hydrogen from water. Dependable electrolysis plants have been producing large quantities of hydrogen for fertilizer production in Norway for the past 100 years. With adoption of electric vehicles, development of a national wind and solar electricity production system, and a national electricity transmission system the U.S. can end foreign oil dependence by 2020 and build a truly sustainable and affordable 21st-century energy system by 2050.

In conclusion, the transition from oil in a timely fashion will be a difficult task to accomplish given the enormity of the U.S. energy system and the power of vested oil interests. To become independent from foreign oil by 2020 will require strong political leadership, public commitment and a World War II-scale mobilization of resources. The question is: Do we possess the foresight, leadership and public will to make this historic transition before the global oil supply crisis strikes home?



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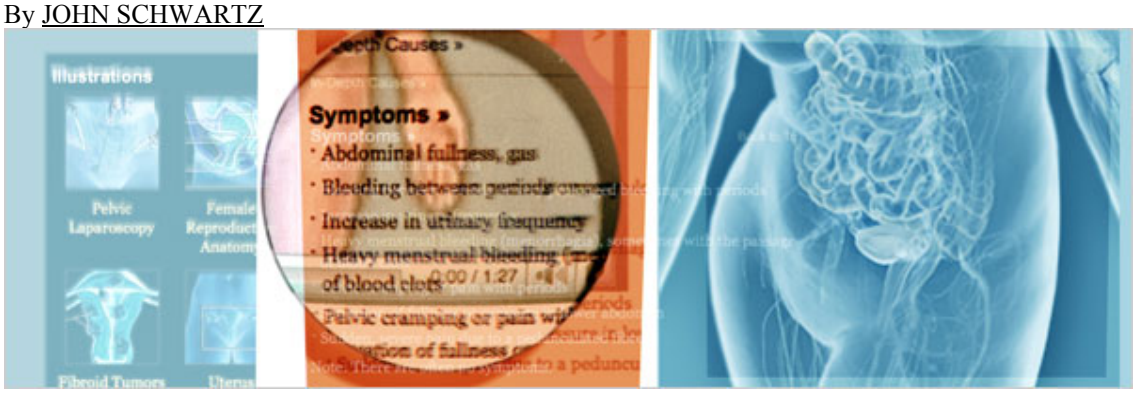
Logging On for a Second (or Third) Opinion

By JOHN SCHWARTZ



When Terri Nelson learned she had a large fibroid tumor in her uterus, she went online.

There is nothing new in that, of course. The intrepid and the adept were going to the Web for health information as long ago as the 1980s, well before Google and other search engines made it accessible to a wider audience.

These days, that is pretty much everyone. At least three-quarters of all Internet users look for health information online, according to the Pew Internet and American Life Project; of those with a high-speed connection, 1 in 9 do health research on a typical day. And 75 percent of online patients with a chronic problem told the researchers that "their last health search affected a decision about how to treat an illness or condition," according to a Pew Report released last month, "The Engaged E-Patient Population."

Reliance on the Internet is so prevalent, said the report's author, Susannah Fox, the associate director at Pew, that "Google is the de facto second opinion" for patients seeking further information after a diagnosis.

But paging Dr. Google can lead patients to miss a rich lode of online resources that may not yield to a simple search. Sometimes just adding a word makes all the difference. Searching for the name of a certain cancer will bring up the Wikipedia entry and several information sites from major hospitals, drug companies and other providers. Add the word "community" to that search, Ms. Fox said, and "it's like falling into an alternate universe," filled with sites that connect patients.

As a result, said Dr. Ted Eytan, medical director for delivery systems operations improvement at the Permanente Federation, "patients aren't learning from Web sites — they're learning from each other." The shift is nothing less than "the democratization of health care," he went on, adding, "Now you can become a national expert in your bedroom."

These expanded capabilities allow people to share information easily, upending the top-down path of information between doctors and patients. Today, said Clay Shirky, an expert in the evolving online world, patients are "full-fledged actors in the system."

And they have plenty of company. Benjamin Heywood, the president of PatientsLikeMe.com, a site that allows patients to track and document their conditions and compare notes with other patients, says that with a growing online population, it becomes possible to research highly specific conditions — say, being a 50-year-old with multiple sclerosis who has leg spasms and is taking a certain combination of drugs.

"We are really about measuring value in the real world," he said.

There are so many sites today and the landscape is changing so rapidly that it would take an encyclopedia rather than a newspaper to list them. But they can be grouped into five broad, often overlapping, categories:

GENERAL INTEREST Sites like WebMD (webmd.com), Discovery Health (health.discovery.com) and The New York Times (nytimes.com/health) provide information about disease, news and lifestyle advice, as do medical institutions like the Mayo Clinic (mayoclinic.com).

MEDICAL RESEARCH SITES offer access to the published work of scientists, studies and a window into continuing research. Examples include PubMed (ncbi.nlm.nih.gov/pubmed) from the National Library of Medicine; clinicaltrials.gov, which tracks federally financed studies; psycinfo (apa.org/psycinfo), with its trove of psychological literature; and the National Center for Complementary and Alternative Medicine (nccam.nih.gov), the government's registry on alternative medicine research.

PATIENT SITES for groups and individuals are booming — so much so that they are increasingly used by researchers to find patients for studies. These include the Association of Cancer Online Resources (acor.org) and e-patients (e-patients.net), as well as Patients Like Me and Trusera (trusera.com), which provide a bit of Facebook-style social connectivity for patients, along with the ability to share their stories in clinical, data-laden detail.

DISEASE-SPECIFIC SITES focus on a particular condition and are often sponsored by major organizations like the American Heart Association (americanheart.org), the American Cancer Society (cancer.org) and the American Diabetes Association (diabetes.org). But smaller groups can put together extensive resources as well, with sites like breastcancer.org and Diabetes Mine (diabetesmine.com), which calls itself the "all things diabetes blog."

WEB TOOLS These sites help people manage their conditions — for example, sugarstats.com for diabetes, Destination Rx (drx.com) for comparing drug prices, and YourDiseaseRisk.com, a service of the Washington University school of medicine that helps patients determine their risk for various problems.

All of the changes in the Internet and the ways people use it help explain why Terri Nelson's experience in 2008 is very different from what it might have been in 1998.

Ms. Nelson, who lives in Portland, Ore., received her diagnosis on Aug. 11. She had two weeks before a follow-up visit with her surgeon. Ms. Nelson and her husband, Stewart Loving-Gibbard, used the time to research fibroids and the most common treatments.

Ms. Nelson started with straightforward information gathering, checking the articles on fibroid tumors at sites that included the Mayo Clinic and PubMed. Then she reached out to the community of people with fibroid tumors at ACOR and other sites. ("Those had to be evaluated carefully," she said, "to find the nuggets of valid information in the vast sea of online hypochondria.")

Having spent many years trolling roisterous online forums, however, she had developed that essential Internet tool: what might be called a personal baby/bathwater algorithm that helps people to sift through mountains of information to find what is relevant. She found a blog for the layperson, "Inquisitive Geek With Fibroid Tumors," that featured wide-ranging discussions and, she said, "was really useful" and specific to her condition.

By the time she went into the consultation with her surgeon, she knew that the old-school way of dealing with her grapefruit-size tumor would probably have been a hysterectomy. But that can impair sexual response, among other side effects; a growing number of doctors prefer abdominal myomectomy, which leaves the uterus intact. The surgeon laid out the options and recommended that approach as well, confirming Ms. Nelson's research.

During the surgery and recovery, Mr. Loving-Gibbard used Twitter, the short-message communication service, to keep friends and family apprised of her condition. Twittering an operation might seem frivolous, but when Ms. Nelson's teeth began chattering after the procedure, a friend following the updates suggested it could be a potentially hazardous side effect, tardive dyskinesia, that can occur with one of the antinausea drugs Ms. Nelson was taking. Mr. Loving-Gibbard, who had been researching that very point when the message from the friend, Ken Yee, came in, was able to get the medication changed.

After the procedure, they posted photographs of the surgery and tumor on the photo-sharing site Flickr.com under the heading "Extracting a Pound of Flesh" (flickr.com/photos/littlecrumb/sets/72157607218121

711/). They are not for the squeamish, but as Ms. Nelson said, "My husband's family is mostly doctors, so they were all interested in seeing the photos, and most of my friends are morbidly fascinated."

As patients go online to share information and discuss their care, they are becoming something more: consumers. Amy Tenderich, the creator of Diabetes Mine has turned her site into a community for diabetes patients and an information clearinghouse for treatments and gadgets — even going so far as to publish an open letter last year to Steven Jobs, the Apple Computer co-founder, challenging him to design medical devices like insulin pumps that are as sleek and easy to use as an iPod.

Dr. Talmadge E. King Jr., chairman of the department of medicine at the University of California, San Francisco, says doctors are coming around to seeing the value of a patient who has gone online for information.

Patients in his pulmonary practice, he said, sometimes come into his office holding medical journal articles he has written "and quiz me." The better-educated patient might stump the doctor, he went on, but these days "it's much easier for me to look them straight in the eye and say, 'I don't know' " and promise to get back to them. "Patients know you're not all-knowing," he said. "They're not upset by that."

Can online information be trusted? The answer, increasingly, is yes. In a study earlier this year, a report in the journal Cancer looked at 343 Web pages about breast cancer that came up in online searches. The researchers found 41 inaccurate statements on 18 sites — an error rate of 5.2 percent. Sites promoting alternative medicine were 15 times as likely to offer false or misleading health information as those sites that promoted conventional medicine, the study found.

Matthew Holt, who with Indu Subaiya created a conference, Health 2.0, that showcases innovation, says the marketplace in information can correct itself over time.

"In the end," he said, "the more people you have in the conversation, the better information drives out the worse information."

http://www.nytimes.com/2008/09/30/health/30online.html?_r=1&th&emc=th&oref=slogin

The Genius of Little Things

By CAROL KINO

ON a recent afternoon at the Pace Prints workshop in Chelsea, the artist Tara Donovan was hard at work with two master printers. They had already completed four pieces that day, and now they were assembling the plate for the fifth, a thickly inked sheet of tempered glass measuring 40 by 48 inches. Once Ms. Donovan had prepared it, the glass would be used to create a single monotype, or unique print — although she prefers to call it a drawing.

After placing a wooden frame around the plate the printers stepped back a few feet while Ms. Donovan donned a pair of safety goggles. Then she picked up a hammer and chisel. “This is the fun part,” she said. Placing the blade precisely near one edge of the glass, she delivered a sharp whack with the hammer. The pane broke neatly, as if on command, sending out jagged rays from the point of impact.

“I’m getting good at this,” she crowed. “First try!” As the team gathered around to look at her handiwork, which remained contained in a neat rectangle by the wooden frame, the broken glass began to crackle and pop, like thousands of Rice Krispies.

For Ms. Donovan the visit to Pace offered a welcome break from two long-term projects. Her first monograph was published this month by Monacelli Press and her first major museum show, a traveling retrospective, opens on Oct. 10 at the Institute of Contemporary Art/Boston. “It’s nice to have a surge of new work,” she said of her printmaking at Pace. “So much of the last seven months has been spent thinking about the past.”

Ms. Donovan, 38, who recently won a $500,000 MacArthur Foundation “genius” award, has drawn attention over the last decade for her ability to transform huge quantities of prosaic manufactured materials — plastic-foam cups, pencils, tar paper — into sculptural installations that suggest the wonders of nature. The retrospective will include many of the works that made her name, like the series “Bluffs” (2006), which she created by gluing hundreds of thousands of clear shirt buttons together into craggy peaks that recall white coral reefs or stalagmites.

To construct “Untitled (Plastic Cups)” (2006), which must be freshly built each time it is shown, she stacks millions of transparent plastic cups in a tight, rigorous grid and sculptures the swaying piles into gentle waves that suggest a cross-section of a pixilated landscape. (Like much of her work, it can be expanded or contracted to fit the space.)

"Nebulous," an installation Ms. Donovan first created in 2002, initially brings to mind an expanse of translucent moss or a bank of fog hovering near the floor. It is built with 100 rolls of Scotch Tape, Magic and Invisible. (The Institute recently acquired a variant of the piece for its permanent collection.)

Though Ms. Donovan's new prints won't be on view, her glass-shattering talents will be: she intends to recreate "Untitled (Glass)," a process-oriented sculpture that she first made in 2004. It involves stacking sheets of tempered glass into a perfect cube, then working carefully one by one from bottom to top, striking a single corner of each pane with a hammer. As with the print, Ms. Donovan will contain the glass with a wooden frame while she works. Once the mold is removed, the cube "stays in place," she said. "You can still see the layers, but everything's really broken into itty-bitty teeny-weeny shards."

Unlike some of the installations, which are fabricated by Ms. Donovan and her assistants in her studio and reassembled on site, the glass cube must always be built from scratch — and perhaps more than once during a single showing. "If you bump into this and knock a corner off it, it can't be repaired or remade with the same materials," said Ms. Donovan, who tends to speak in short staccato bursts. "It has to be made over again."

And when the show is over, she added, matter of factly, "it gets taken away with a shovel."

To some in the art world, the appeal of Ms. Donovan's work lies in its relationship to Minimalism, as propounded by the likes of Carl Andre, Sol LeWitt and Eva Hesse. "When most artists of the current generation refer to Minimalism, it's usually in quotation marks, as appropriation or perhaps critique," said Nicholas Baume, the Institute of Contemporary Art's chief curator, who instigated the retrospective. "Tara's work isn't ironic. It actually takes up the discourse of Minimalism. It's about creating a system, using a structure, and repeating incremental units that can go from the finite to the seemingly infinite."

Yet where many classical Minimalists adhered to a strictly rectilinear grid, Mr. Baume noted, Ms. Donovan's work expands well beyond it. "The work has the pragmatic rigor of that earlier American period," he said, "but it brings it into our own period by suggesting digital, cellular, emergent networks. It seems to speak to the systems that are shaping our lives."

Another consistent thread is Ms. Donovan's ability to uncover unexpected qualities in the most commonplace materials and objects. One of the earliest pieces in the show is a version of "Moiré," which she originally made for her 1999 master of fine arts thesis exhibition at Virginia Commonwealth University. It comprises several giant rolls of adding-machine tape that she molds and layers into an undulating shape whose surface appears to ripple. To make the rolls, she said, she and her assistants tape hundreds of normal-size rolls together, end on end, rerolling them "really loosely so they're really malleable."

Yet while Ms. Donovan seems quite willing to explain how she makes a piece, she is considerably less voluble about the genesis of her ideas. Press her on how an installation began, and she's likely to respond with something vague, like "I don't remember specifically" or "It was a matter of identifying transparent materials."

She divulged more about an untitled installation in the Boston show that she will be making on a large scale for the first time. A block of translucent, apparently honeycombed, material within a 24-by-4-foot rectangular cutout in a wall, it consists of 2,500 pounds of plastic sheeting loosely folded over and over onto itself until the material's fugitive color and texture emerge. Viewers will be able to walk around the piece and see through it into the next room. "You can see people moving on either side," she said. "It actually creates a very kaleidoscopic sort of effect."

Like many of her pieces, this one began with a visit several years ago to an industrial surplus store where Ms. Donovan bought a roll of plastic sheeting, hundreds of pounds worth, for about $10, she said, because "I thought it might be handy around the studio."

Eventually "I needed a bunch of the plastic for something else I was doing, she recalled. "I was probably using it as a drop cloth. I was spooling it off, and I thought, 'Oh, that's actually really interesting, the way it folds on itself.' A lot of times, things are discovered in accidental ways."

Ms. Donovan's career trajectory has been similarly haphazard, though also quite swift. After her work was chosen for the 2000 Whitney Biennial, she moved back to New York, her hometown, and got a job waiting tables at Savoy, a SoHo restaurant where one lunchtime regular was the painter Chuck Close. She didn't tell him that she was also an artist until she won a residency at the Marie Walsh Sharpe Art Foundation studios in SoHo, where Mr. Close is on the board. Soon afterward she left Savoy to work on her first show at Ace Gallery in Los Angeles, but the two stayed in touch.

In 2003 — several waitressing jobs later — Ace offered Ms. Donovan her first major New York show, in the 25,000-square-foot branch it then maintained in SoHo. Ms. Donovan, given only a month to assemble a crew and create seven installations to fill the space, still leapt at the opportunity because she already had a show planned out in her head. "I tend to make things in the studio on a relatively small scale and then imagine them big," she said. "So I'd sort of compiled all of this work and just needed the real estate to make it properly." She has not waited tables since.

Mr. Close visited the show and came away an ardent fan. "I thought it was such an incredible alchemy that she had pulled off with these really simple materials that transcend their physical reality," he said. "I dragged everybody I knew" to see it.

That included most of the top brass from his gallery, PaceWildenstein, which was about to start representing younger artists. Ms. Donovan joined the gallery two years later.

Since then, she said, her life has changed considerably. "I feel I have a lot more recognition," she said. Although she said she was thrilled about receiving the MacArthur grant, she added: "I don't really know that the money is really going to change anything. I'm going to keep doing what I'm doing."

Her method has long remained consistent. She spends hours experimenting with materials until she happens on something that works. She spends more hours devising a system for creating and assembling the individual elements that will make up the overall piece, so that others can help her fabricate it.

Underpinning it all is her capacity for absorption. "So much about the art-making process is about paying attention," Ms. Donovan said. "It's about looking and noticing things."

http://www.nytimes.com/2008/09/28/arts/design/28kino.html?ref=design

Face to Face With Stalinist Horrors

By BENJAMIN GENOCCHIO

Has any artist captured human misery with more shocking clarity than Boris Sveshnikov? None that I can think of. His Vetlosian series of drawings, ink on yellowed paper, humble things really, are brutally simple: They bring us face to face with the horrors of life in a Stalinist labor camp in the 1950s.

Sveshnikov (1927-1998) is the subject of an unsettling two-part retrospective at the Jane Voorhees Zimmerli Art Museum. The show's title is ominous and to the point: "Painting for the Grave: The Early Work of Boris Sveshnikov." It comes from a quote from the artist, who once remarked cryptically to an interviewer that his works were "dedicated to the grave."

The show draws from more than 300 works by the artist in the Zimmerli Museum's Norton and Nancy Dodge Collection of Nonconformist Art From the Soviet Union. The current presentation, and the first part of the retrospective — no date has been set for the second part — focuses on drawings and oil paintings from the 1940s to the 1960s.

The exhibition begins with the artist's student works and early experiments in various styles. He wasn't the most consistent painter: A handful of his early portraits are good; others are hopelessly overworked.

What is also apparent from the few early paintings assembled here is an inclination toward Surrealism and fantasy. His style and subject matter are often reminiscent of paintings by the 15th- and 16th-century artist Hieronymus Bosch, a mysterious figure known for imaginative scenes filled with bizarre imagery. One of Sveshnikov's works is titled "In Memory of Hieronymus Bosch" (1948-49).

Following the 1940s paintings, the show jumps forward in time to the late ’50s and early ’60s. This is a bit confusing, because while the later paintings are similar in style they are often darker, frequently showing skeletons and corpses. One wonders what happened in the interim. What is out of order in the chronology — what the viewer sees at the end of the exhibition — is work from the period of almost a decade that the artist spent as a political prisoner in a Stalinist labor camp.

In 1946, while Sveshnikov, then 19, was enrolled at the Moscow Institute of Applied and Decorative Arts, he was falsely accused of engaging in terrorist activity. He was arrested by the secret police, imprisoned without trial for a year, then packed off to a labor camp in remote rural Russia. He remained in exile until 1954.

Sveshnikov served most of his eight-year sentence in Vetlosian, one of the labor camps near the town of Ukhta, located northeast of St. Petersburg in the Ural Mountains. After spending two years living outdoors felling trees and digging trenches for oil and gas pipelines, he was transferred through the help of a friend to a safer indoor job as a night watchman.

It is hard to imagine the horrors experienced by the artist during this time. In the forced labor system developed under Stalin’s rule, winter clothing, food and shelter were either badly insufficient or lacking. Those who didn’t freeze or starve to death faced the threat of being killed by other prisoners, or tortured and beaten by the guards.

In Sveshnikov’s drawings of that period, we see vast, desolate landscapes inhabited by small figures, toiling away in arduous conditions. In other images we see cloaked figures performing strange experiments on people hanging from ropes; women being violated; and men being hung, beaten and crucified. Dead bodies are everywhere; nobody pays them any attention.

Perhaps the strangest drawings are those depicting groups of rat-faced figures in cavernous interiors mutilating or groping naked men and women. In one horrifying untitled drawing, dating to the earliest days of the artist’s incarceration, a headless body hangs from a chain while rat-faced figures perform some sort of experiment on a bound naked woman. It gives you the chills.

How Sveshnikov obtained the materials for his drawings and paintings, and how he concealed his artwork from guards and other prisoners, is not known. By his own estimation, he made hundreds of drawings and dozens of paintings, though few now survive. The bulk of what remains was smuggled out of the camp by visiting family and friends and kept in safe storage until his release. It is a miracle anything survived at all.

No doubt the artist was traumatized by his experiences. It is tempting to read this into his 1960s paintings, where you again find minute figures engaged in cruel and bizarre behavior. But his post-camp works are also more surrealistic, filled with imaginative images and visions. It is almost as if, in order to deal with the horrors of incarceration, Sveshnikov drifted more and more into fantasy.

“Painting for the Grave: The Early Work of Boris Sveshnikov,” Jane Voorhees Zimmerli Art Museum, 71 Hamilton Street, New Brunswick, through Oct. 12. Information: (732) 932-7237 or zimmerlimuseum.rutgers.edu.

http://www.nytimes.com/2008/09/28/nyregion/new-jersey/28artsnj.html?ref=design

The Big Picture

By ALIX BROWNE

The same week that scientists at the CERN laboratory outside Geneva were getting ready to fire up the Large Hadron Collider, the artist Josiah McElheny was conducting a test of his own ideas on the Big Bang theory at Andrea Rosen Gallery in New York City. Inspired by the Lobmeyr chandeliers at the Metropolitan Opera House and informed by logarithmic equations devised by the cosmologist David H. Weinberg, McElheny's chrome, glass and electric-light sculpture "The End of the Dark Ages" is part of a four-year investigation into the origins of the universe. What began with "The End to Modernity," a sculpture commissioned by the Wexner Center for the Arts at Ohio State University, will culminate next month in a massive installation titled "Island Universe" at White Cube in London. "I had this quixotic idea to do modernized versions of the Lobmeyr chandeliers as sculpture with secret information behind it," says McElheny, who upon first encountering these "gilded age/space age" objects immediately thought they looked like pop renditions of the Big Bang.

According to McElheny, physicists continue to struggle with the question "is the world this way because it must be, or is it just random?" In 1965, the year that the Lobmeyr chandeliers were designed, it was suddenly evident that our world is not in fact the center of the universe. This idea that there could be an infinite number of possible narratives was becoming popular not just in science but also in literature and art — so why not in interior design, too? As it turns out, Wallace K. Harrison, the architect for the Met, having rejected the original design for the chandeliers, gave Hans Harald Rath of Lobmeyr, the Vienna-based glassmaker, a book about galaxies and sent him back to the drawing board.

"The End of the Dark Ages" is a scientifically accurate model: the shortest rod represents 100 million years, the longest about 1.3 billion; the clusters of glass stand for galaxy formations, the lights for quasars. Still, McElheny is less concerned with the conceits of exact science than the limits of reason and knowledge. (The White Cube show proposes a "multiverse" and "speaks to what Kant describes so well as an endless world made of imperfection, complication and specificity.") "Politically, I'm against finding the single answer," McElheny insists. "I'm more interested in what these questions mean to our sense of who we are.

http://www.nytimes.com/2008/09/28/magazine/28Style-t.html?ref=design

A Hawaiian Modernist, by Way of Russia

By BENJAMIN GENOCCHIO

Architectural models, drawings, site plans, photographs and assorted documentation by the celebrated Hawaiian Modernist architect Vladimir Ossipoff (1907-1998) are the subject of an overhung but nonetheless extraordinarily interesting exhibition at the Yale School of Architecture in New Haven. The show celebrates the reopening of the Art and Architecture Building after a $126 million restoration and addition, designed by the New York firm Gwathmey Siegel & Associates.

Russian-born, Mr. Ossipoff was raised in Japan before immigrating to California with his family in 1923; in 1931 he moved to Hawaii in search of work following the onset of the Great Depression. He thrived as an architect in his new environment. Within a few months of taking up residence in Honolulu, he found work with the architect Charles W. Dickey working on the Immigration Station at Honolulu Harbor. In 1936 he founded his own architectural practice in his home and never looked back.

The current show, organized by Dean Sakamoto, director of exhibitions at Yale School of Architecture, is the first to focus on this important but overlooked architect's career. The displays, divided into five sections and showcasing more than 30 architectural projects, show how, from the 1950s through the '70s, Mr. Ossipoff pioneered and promoted the novel idea of site-sensitive planning and design, along with the concept of sustainable building using local materials. He was an early environmental architect.

In the excellent and beautifully illustrated exhibition catalog. Mr. Sakamoto explains that each of the five sections relate to design strategies that underlie Mr. Ossipoff's design practice. They are "The Living Lânai," "Native Materials, Modern Tectonics," "Darkness and Air," "Hawaiian Modern" and "Revealing Site." Some of these strategies are more original than others, for Mr. Ossipoff's early buildings are in the vein of international Modernism, a major architectural style of the 1920s and 1930s characterized by the simplification of forms to geometric shapes, a minimum of ornament and the use of glass, steel and concrete as preferred materials.

The Hawaiian Life Insurance Building in Honolulu, completed in 1951, is typical in many ways of the international style. This six-story L-shaped structure was Hawaii's tallest new building and the architect's first really big independent project. And yet it is also pluralistic in its influences, the architect adapting

Modernist forms and ideas to the Hawaiian way of life, indigenous materials and aspects of the local tropical climate. For example, vertical aluminum fins on the exterior redirect sunlight throughout the day, while a lower wing buffets the entry area from wind, sun and traffic noise.

The adaptation of Modernist building forms to Hawaiian living conditions was to become more pronounced in Mr. Ossipoff's later buildings, and also eventually evolve into his signature style. It is particularly evident in his numerous residential projects for the island's wealthy and influential residents, like the house designed for Marshall and Ruth Goodsill, completed in 1952. Mr. Ossipoff's design employs deep overhangs, carefully oriented windows and vents to create a naturally ventilated structure that is permeable to the powerful Pacific trade winds yet protected from rain and excessive sunlight.

Mr. Ossipoff drew inspiration for his design for the Goodsill house from several quarters, including the traditional Japanese house, with its shaded interiors and natural ventilation. Photographs displayed of the interior of the Goodsill house reveal low levels of filtered daylight falling upon natural, local wood or stone surfaces to create shadowy, mysterious spaces. This subtle manipulation of elements of shade, light and air within interiors was to become a trademark of Mr. Ossipoff's designs, and is everywhere apparent in the residential and civic designs that are profiled throughout the show.

Mr. Ossipoff's other source of inspiration was Hawaiian architecture, in particular the lânai, an open-sided, freestanding and lightly roofed structure usually buffered from the weather by foliage. His floor plan for the Goodsill house, also on display, reveals the use of a shaded lânai as the primary living area, creating an inviting indoor-outdoor space around an intimate garden. Mr. Sakamoto regards the transformation of the indigenous lânai into a building type as Mr. Ossipoff's most innovative contribution to modern architecture.

Mr. Ossipoff's design for the Honolulu International Airport Terminal, completed from 1970 to 1978, manifests his lânai concept on the scale of grand civic architecture. It is an open, airy post-and-beam concrete structure that takes full advantage of Hawaii's year-round trade winds as a form of natural air conditioning. There are very few inner walls and a long flat roof that blocks out the sunlight. Still in use today, this gateway to the islands for thousands of visitors each year stands as a testament to Mr. Ossipoff's brilliant adaptation of Modernism to Hawaiian conditions.

"Hawaiian Modern: The Architecture of Vladimir Ossipoff," Yale School of Architecture, New Haven, through Oct. 24. www.architecture.yale.edu or (203) 432-2288.

http://www.nytimes.com/2008/09/28/nyregion/connecticut/28artsct.html?ref=design

Parental Warning: Second-hand Smoke May Trigger Nicotine Dependence Symptoms In Kids

Second-hand smoke may trigger symptoms of nicotine dependence in children, a new study has found. (Credit: iStockphoto/Thomas Pullicino)

ScienceDaily (Sep. 30, 2008) — Parents who smoke cigarettes around their kids in cars and homes beware – second-hand smoke may trigger symptoms of nicotine dependence in children.

The findings are published in the September edition of the journal Addictive Behaviors in a joint study from nine Canadian institutions.

"Increased exposure to second-hand smoke, both in cars and homes, was associated with an increased likelihood of children reporting nicotine dependence symptoms, even though these children had never smoked," says Dr. Jennifer O'Loughlin, senior author of the study, a professor at the Université de Montréal's Department of Social and Preventive Medicine and a researcher at the Centre Hospitalier de l'Université de Montréal.

"These findings support the need for public health interventions that promote non-smoking in the presence of children, and uphold policies to restrict smoking in vehicles when children are present," adds Dr. O'Loughlin, who collaborated with researchers from the Université de Sherbrooke, the Université de Moncton, the University of British Columbia, McGill University, Concordia University and the Institut national de santé publique du Québec.

Study participants were recruited from 29 Quebec schools as part of AdoQuest, a cohort investigation that measures tobacco use and other health-compromising behaviours. Some 1,800 children aged 10 to 12 years old, from all socioeconomic levels, were asked to complete questionnaires on their health and behaviours. Researchers also asked questions about symptoms of nicotine dependence and exposure to second-hand smoke.

"According to conventional understanding, a person who does not smoke cannot experience nicotine dependence," says Mathieu Bélanger, the study's lead author and the new research director of the Centre de Formation Médicale du Nouveau-Brunswick of the Université de Moncton and Université de Sherbrooke. "Our study found that 5 percent of children who had never smoked a cigarette, but who were exposed to secondhand smoke in cars or their homes, reported symptoms of nicotine dependence."

Dr. O'Loughlin added that this inter-university investigation builds on previous findings: "Exposure to second-hand smoke among non-smokers may cause symptoms that seem to reflect several nicotine withdrawal symptoms: depressed mood, trouble sleeping, irritability, anxiety, restlessness, trouble concentrating and increased appetite."

Journal reference:

1. Fiammetta Cosci, Annalisa Corlando, Edo Fornai, Francesco Pistelli, Paolo Paoletti, Laura Carrozzi. **Nicotine dependence symptoms among young never-smokers exposed to secondhand tobacco smoke**. *Addictive Behaviors*, 2008; DOI: 10.1016/j.addbeh.2008.07.011

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

http://www.sciencedaily.com:80/releases/2008/09/080929123937.htm

Robotic Surgery Lowers Risk Of A Rare But Serious Complication Of Gastric Bypass, Study Suggests

ScienceDaily (Sep. 30, 2008) — The use of a robot to assist with the most commonly performed weight-loss surgery appears to significantly lower a patient's risk of developing a rare but serious complication, according to a study published in the most recent edition of the Journal of Robotic Surgery.

Minimally-invasive surgeons at The University of Texas Medical School at Houston statistically analyzed operative times, length of hospital stay and complications in 605 patients who either underwent laparoscopic Roux-en-Y gastric bypass or the same procedure with the assistance of a robot at Memorial Hermann – Texas Medical Center.

The one significant difference that stood out was the gastrointestinal leak rate. None of the patients in the robotic-assisted surgery group experienced a gastrointestinal leak, while six in the laparoscopy group suffered this complication within 90 days after their surgery.

Other results were similar. Robotically-assisted surgery took only 17 minutes longer than the laparoscopic procedure. Hospital stays were an average of three days in both groups, and the overall complication rate was 14 percent, with fewer than 4 percent being classified as major complications among the two groups of patients.

"While robotic surgery may take slightly longer and be more costly to use than traditional laparoscopy, we believe that the improved outcome and decreased leak rates may offset the cost to some extent," said Erik B. Wilson, M.D., the study's senior author and director of the UT Medical School at Houston's Minimally Invasive Surgeons of Texas group.

A gastrointestinal leak, which can occur when the small intestine is reconnected to a small pouch created in the stomach, often produces symptoms of abdominal and chest pain, shortness of breath, fever, nausea, vomiting and rarely death. In this five-year study, there were no deaths in either group, and the rate for both gastrointestinal leaks and other complications was slightly lower than what has previously been reported in scientific journals.

Lead author Brad E. Snyder, M.D., assistant professor in the Department of Surgery, said the robotic technique offers numerous advantages to bariatric surgeons, and these advantages may play a role in the reduced leak rate.

"The most important advantage is that the robot allows for precise, ambidextrous forehand and backhand suture placement," Snyder said. "The angles encountered during a laparoscopic gastric bypass are sometimes awkward and can make the surgical technique challenging. With the robot, this additional challenge is minimized and the bariatric surgeon can suture the area between the stomach and the section of the small intestine with confidence."

Wilson, medical director of the bariatric surgery program at Memorial Hermann – TMC, said another advantage of robotics is the clear, three-dimensional view of the operative field which allows the surgeon to better visualize tissue planes and place more precise sutures.

"As a result, there is improved surgical performance and lower leakage rates," Wilson said. "We believe this is the most important factor contributing to our zero percent leak rate. In addition, the robot allows us to work in tighter spaces, control our own camera and have a very steady operative view even when magnified. Overall, we feel that this attribute gives us the ability to offer the safest, most effective surgery results for our patients who want to achieve successful, long-term weight loss."

Wilson and Snyder conducted the study with minimally-invasive surgery fellow Todd Wilson, M.D., and former UT Medical School at Houston faculty members Terry Scarborough, M.D., and Sherman Yu, M.D.

For information about robotic-assisted Roux-en-Y gastric bypass or an appointment with a surgeon who specializes in weight-loss procedures, call 713-892-5500.

Adapted from materials provided by University of Texas Health Science Center at Houston.

http://www.sciencedaily.com/releases/2008/09/080924151013.htm

Zeroing In On Wi-Fi 'Dead Zones' To Inexpensively Fill Gaps In Wireless Networks

ScienceDaily (Sep. 30, 2008) — Rooting out Wi-Fi "dead zones" in large wireless networks that cover whole neighborhoods or cities is an expensive proposition. Pre-deployment testing is so costly that most WiFi providers simply build their networks first and fill in the gaps later. But even that isn't easy, due to the paucity of inexpensive techniques for mapping out precisely which areas lack coverage.

Now, using an award-winning technique developed at Rice University and Hewlett-Packard Laboratories (HP Labs), Wi-Fi architects can test and refine their layouts using readily available information. The research, which recently won best-paper honors at the annual MobiCom '08 wireless conference in San Francisco, promises to make it cheaper and easier to get proper wireless coverage.

"In the real world there are many things than can interfere with signals and limit coverage," said lead researcher Edward Knightly, professor in electrical and computer engineering at Rice. "Our goal was to efficiently characterize the performance of urban-scale deployments, and our techniques can be used to either guide network deployment or to assess whether a deployed network meets its performance requirements."

The new technique uses a small number of measurements to predict how well a wireless transmitter will cover a particular portion of a neighborhood. The only information required is basic topography, street locations and general information about land use.

Knightly and research collaborators Ram Swaminathan, senior research scientist at HP Labs, and Joshua Robinson, Rice graduate student, demonstrated their new method on two high-profile networks -- Google's system in Mountain View, Calif., and TFA-Wireless, an experimental network designed and built by Rice and owned and operated by Houston-based nonprofit Technology For All. TFA-Wireless provides high-speed Internet access to more than 4,000 users in a working-class neighborhood in east Houston.

Adapted from materials provided by Rice University.

http://www.sciencedaily.com/releases/2008/09/080925114126.htm

Solar Cell Sets World Efficiency Record At 40.8 Percent

John Geisz and Mark Wanlass outside the Solar Energy Research Facility (SERF). Wanlass invented the original inverted cell, which recently won a R&D 100 award. His design was modified by a team led by John Geisz that further optimized the junction energies by making the middle junction metamorphic as well as the bottom junction. (Credit: Pat Corkery / Courtesy of NREL)

ScienceDaily (Sep. 30, 2008) — Scientists at the U.S. Department of Energy's National Renewable Energy Laboratory (NREL) have set a world record in solar cell efficiency with a photovoltaic device that converts 40.8 percent of the light that hits it into electricity. This is the highest confirmed efficiency of any photovoltaic device to date.

The inverted metamorphic triple-junction solar cell was designed, fabricated and independently measured at NREL. The 40.8 percent efficiency was measured under concentrated light of 326 suns. One sun is about the amount of light that typically hits Earth on a sunny day. The new cell is a natural candidate for the space satellite market and for terrestrial concentrated photovoltaic arrays, which use lenses or mirrors to focus sunlight onto the solar cells.

The new solar cell differs significantly from the previous record holder – also based on a NREL design. Instead of using a germanium wafer as the bottom junction of the device, the new design uses compositions of gallium indium phosphide and gallium indium arsenide to split the solar spectrum into

three equal parts that are absorbed by each of the cell's three junctions for higher potential efficiencies. This is accomplished by growing the solar cell on a gallium arsenide wafer, flipping it over, then removing the wafer. The resulting device is extremely thin and light and represents a new class of solar cells with advantages in performance, design, operation and cost.

NREL's Mark Wanlass invented the original inverted cell, which recently won a R&D 100 award. His design was modified by a team led by John Geisz that further optimized the junction energies by making the middle junction metamorphic as well as the bottom junction. Metamorphic junctions are lattice mismatched – their atoms don't line up. The material properties of the mismatched semiconductors allows for greater potential conversion of sunlight.

NREL is the U.S. Department of Energy's primary national laboratory for renewable energy and energy efficiency research and development. NREL is operated for DOE by Midwest Research Institute and Battelle.

Adapted from materials provided by DOE/National Renewable Energy Laboratory.

http://www.sciencedaily.com/releases/2008/09/080929220900.htm

A Robot In Every Home?

Justin, one of the humanoid robots in the the European Network of Robotic Research (EURON), is even capable of making coffee. (Credit: Justin Project / Courtesy of ICT Results)

ScienceDaily (Sep. 30, 2008) — Observers like Bill Gates believe that by 2025 we could have robots in every home. In labs across Europe, researchers are creating designs that could become the robo-butler of the future.

Bill Gates likens the current state of robotics research to the earliest days of personal computing history when he formed the then fledging company Microsoft. Like the 1970s personal computer market, robotics designs and breakthroughs are following one another rapidly, and consumers are beginning to take an interest, too.

In Europe, as the rest of the world, there is s surge in robotics research, reflected in part by the European Network of Robotic Research (EURON), an EU-funded network of excellence that completed its work in May 2008.

It was an important network. The dozens of research programmes united by EURON represent a state-of-the-art in robotics, and a tantalising glimpse of the future.

That glimpse shows that researchers across Europe are creating new designs and tackling fundamental problems that eventually could lead to a world standard for domestic robots. Already enthusiasts are buying kits, making and programming their own robots.

In Japan, every year sees a new toy robot, while in the USA commercial robot vacuums like the Roomba are readily available.

But what will the robot butler of 2025 look like? Bruno Silciliano, a European robotics researcher and dissemination officer for EURON, believes there will be many different types of robots adapted to different purposes.

"In robotics, we have a whole taxonomy of robotics, differentiating field, service and industrial robots, and in the future there will be many designs for each of these domains," he says.

In the domestic sphere, robot designs will range from the discreet vacuum cleaner that hides under a chair until required, to the fully realised mechanical maid. Current European research reflects this variety.

For example, the TASER created by the 'informatics' department of Hamburg University is an unwieldy but powerful creation that is helping researchers to develop robots that can grasp objects, operate light switches or open a door.

"One of the most interesting aspects of the TASER is that it coordinates mobility with two moving arms. With most robots, either the whole platform moves or their arms move, not both at once. But the TASER robot can move itself and its arms at the same time. This is a non-trivial problem and their work is very interesting," explains Siciliano.

Quirl the windows please

The Quirl is a precursor of the robotic appliance. It looks nothing like a robot that one would imagine. Like the Roomba vacuum robot it is a simple, flat device that moves in a two dimensional world.

But it moves vertically, along glass, and cleans the windows as it goes along. It may not look like C3P0, but it indicates just how useful robots could be in the home or office of the future, particularly given the fact that, for example, solar panels work much more effectively when they are clean.

The Quirl is truly a breakthrough for the designers, the Fraunhofer Institute for Manufacturing Engineering and Automation IPA in Stuttgart. When they began the quest for a window-cleaning robot, their first design weighed 6.5kg and was A3 in size. But the Quirl is the size of a postcard and weighs an incredible 600g. And it still cleans windows effectively.

With Quirls, Roombas and lawn-cutting robots multiplying, there will be a need to organise the mechanical workforce, and the Applied Autonomous Sensor Systems Lab at the Orebro University Sweden is working on an Ecology of Physically Embedded Intelligent Systems (PEIS).

The PEIS ecology coordinates a wide variety of robots, whether it is artificial intelligence in a refrigerator or a roaming butler. That researchers are already working on a 'field marshal' for the mechanical workforce is an indication of how rapidly domestic robotics is developing in every direction.

James the robot

James is a robot butler that looks like a mechanical version of 'the hand' from the movie and TV series of the Adams Family, but it can negotiate its way around obstacles and can grasp objects. It could lead to the development of assistive robots for the tetraplegic, for example.

Robots that work with and around humans will need to obey Asimov's laws of robotics, and European researchers are working toward that end. The Kuka lightweight robotic arm is the first robot to obey

Asimov's first law of robotics: A robot may not injure a human being or, through inaction, allow a human being to come to harm.

The Kuka is safe in several respects. It is incredibly lightweight for its power, it weighs just 13kg, and it can lift its own weight. "Normally a robot arm that can lift 13kg would weigh 100 kilos or more," explains Siciliano. So the Kuka is passively safe, in that it does not have the mass that usually causes injuries.

But the Kuka goes further; it carefully tracks its motion, using sensors in its joints. Finally, if the robot comes into contact with an object or person, its motors immediately start reversing direction, an impressive active safety system.

Systems like these will be absolutely essential if robots are to acquire the safety and reliability needed for widespread acceptance in the domestic sphere. Fortunately, European researchers are turning their attention to every aspect of domestic robotics.

Many of these robots have been funded through a variety of EU programmes. All of them benefited from networking.

This is part three of a special series of features exploring European robotics research, from humanoids friends, to functional home help, to just plain odd-bots.

Adapted from materials provided by ICT Results.

http://www.sciencedaily.com/releases/2008/09/080924085551.htm

Getting Lost: A Newly Discovered Developmental Brain Disorder

Feeling lost every time you leave your home? You may not be as alone as you think. (Credit: iStockphoto/Eliza Snow)

ScienceDaily (Sep. 29, 2008) — Feeling lost every time you leave your home? You may not be as alone as you think.

Researchers at the University of British Columbia and Vancouver Coastal Health Research Institute recently documented the first case of a patient who, without apparent brain damage or cognitive impairment, is unable to orient within any environment. Researchers also believe that there are many others in the general population who may be affected by this developmental topographical disorder.

The study, published in the journal Neuropsychologia, and led by Giuseppe Iaria, a UBC Faculty of Medicine and VCH postdoctoral fellow, used functional magnetic resonance imaging (fMRI) together with behavioural studies to assess and characterize the navigational deficiencies of the patient, who is completely unable to orient within the environment, getting lost even within the neighborhood where the patient lived for many years.

"Imagine not being able to do the simplest of tasks such as finding your way home from the grocery store," says Iaria, who is affiliated with the Brain Research Centre. "Navigating and orienting in an environment are complex cognitive skills, involving parts of the brain used for memory, attention, perception, and decision-making. It also requires using at least two distinct types of memory systems."

The procedural memory system involves using landmarks, distances, or following stereotyped movements to move between locations. The spatial memory system is more complex. When moving through an environment – familiar or not – a person creates a mental representation of the environment, called a

cognitive map. It is the ability to "create" and "read" these cognitive maps that enables a person to navigate by following a route without getting lost.

Brain malformations or lesions in parts of the brain important for navigation are known to cause navigation difficulties. However, no such defects or lesions in the patient's brain were detected. Moreover, a series of behavioural tests revealed that patient's problem was due to a specific inability to form cognitive maps.

"We suspect that this patient is not unique, and that there are others suffering varying degrees of selective developmental topographical disorientation," says Dr. Jason Barton, Canada Research Chair and director of the Human Vision and Eye Movement Laboratory where the patient was studied. "They might have a lifelong story of episodes like getting lost in their own house or neighbourhood, at school or at work, and having to rely on others for directions. In extreme circumstances, this can even lead to social isolation."

The researchers are now reaching out to the public, with a website specifically designed to inform people about orientation skills and reach others who experience topographical disorientation. This will help researchers to better understand the disorder and to develop rehabilitation treatments that may help affected individuals develop orientation skills. More information is available at http://www.gettinglost.ca

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Adapted from materials provided by University of British Columbia.

http://www.sciencedaily.com/releases/2008/09/080922135227.htm

Ancient Arctic Ice Could Tell Us About Future Of Permafrost

Duane Froese examines an ancient ice wedge. (Credit: Image courtesy of University of Alberta)

ScienceDaily (Sep. 29, 2008) — Researchers have discovered the oldest known ice in North America, and that permafrost may be a significant touchstone when looking at global warming.

"Previously it had been thought that permafrost completely melted out of the interior of Yukon and Alaska about 120,000 years ago, when climate was warmer than today," said Duane Froese, an assistant professor in the Department of Earth and Atmospheric Science and lead author of the study.

"What we found is that even within the discontinuous permafrost zone-the area where permafrost is warm and within a few degrees of 0C and shallow, only a few to tens of metres thick-it has survived at some locations for more than 700,000 years." Because of the potential longevity of the permafrost, it tells the story of climate changes over the course of hundreds of thousands of years, which Froese says is immeasurably valuable.

When permafrost thaws, much of the carbon that was formerly locked up becomes available for decomposition in thawed soil or beneath lakes and is released as carbon dioxide or methane. "Based on the incredible antiquity of the ice wedges we documented, we think that permafrost that is more than several metres below the surface is more resilient to climate warming that previously thought," said Froese.

However, Froese and his colleagues emphasize that their study is not an invitation to ignore the potentially serious impacts of climate warming, particularly in the North.

"Permafrost is like the glue that holds the Arctic together," said University of Alberta graduate student Alberto Reyes. "Widespread deep thaw would be bad news for northern infrastructure and economic development, and may have dramatic effects on ecosystems that are adapted to the presence of shallow permafrost."

Adapted from materials provided by University of Alberta. Original article written by Jamie Hanlon.

http://www.sciencedaily.com/releases/2008/09/080922184922.htm

Microscopic Version Of CT Scan Reveals Secrets Of Bone Formation

A juvenile snail shell of Biomphalaria glabrata, 4 weeks after hatching with a shell diameter of 3 mm. (Credit: American Chemical Society)

ScienceDaily (Sep. 29, 2008) — A new version of the computerized tomography (CT) scan, which revolutionized medical imaging during the last 25 years, is giving scientists precious new information about how Mother Nature forms shells, bones, and other hard structures in animals ranging from guppies to mice.

That information on "biomineralization" could form a knowledge base for understanding bone loss in humans and even snaring the Holy Grail of regenerative medicine — discovering how newts, starfish and other animals regrow amputated body parts.

Those are the observations in a recently published overview of the field. In the article, Matthias Epple and Frank Neues describe ongoing research in which scientists use X-ray microcomputer tomography to study biomineralization, the process in which animals form bones, shells, and other hard structures. Microcomputer tomography is the high-resolution version of conventional CT. Like a CT microscope, it constructs three-dimensional images of structures in bones and shells too small for viewing with regular CT.

The article provides a sweeping overview of current research involving X-ray microcomputer tomography, and the implications for medicine, design of new materials, and other fields. "It is of interest in modern materials science to synthetically mimic these inorganic structures to create new coatings, materials or instruments for practical application," the article states. "We are convinced that this method will be of high future value to study the spatially different mineralization processes in mineralizing animals and plants."

Journal reference:

1. Neues et al. **X-ray Microcomputer Tomography for the Study of Biomineralized Endo- and Exoskeletons of Animals**. *Chemical Reviews*, November 12, 2008 DOI: 10.1021/cr078250m

Adapted from materials provided by American Chemical Society.

http://www.sciencedaily.com/releases/2008/09/080929084259.htm

No Oxygen In Eastern Mediterranean Bottom-water

A sediment sample used for this research. The dark-green bed is organic-rich sediment from sapropel S1. (Credit: Image courtesy of Netherlands Organization for Scientific Research)

ScienceDaily (Sep. 29, 2008) — Research from Utrecht University shows that there is an organic-rich bed of sediment in the floor of the Eastern Mediterranean. This bed formed over a period of about 4000 years under oxygen-free bottom-water conditions.

A wet climatic period was responsible for the phenomenon. According to climate scenarios, the climate may become wetter in this area, potentially giving rise again to a period of oxygen-free bottom-water.

Alternating organic-rich and organic-poor beds have been deposited on the floor of the Eastern Mediterranean. These deposits coincide with the alternation of wet and dry climatic periods. Researchers believe that the organic-rich beds, called sapropels, can originate in two ways:

1. More organisms live in the surface water because, for example, rivers introduce more nutrients. As a result, more organisms sink to the bottom when they die.
2. The organic material is better preserved. If dead organisms sink to an oxygen-free bottom, the organic material breaks down less well.

Gert de Lange investigated the most recently developed bed, sapropel S1.

This bed formed between 9800 and 5700 years ago. At that time, an increased influx of fresh water during a wet climatic period led to the formation of this organic-rich bed. This formation occurred simultaneously over the entire Eastern Mediterranean at water depths of more than 200 metres. During this 4100-year period, the deep Eastern Mediterranean was found to be devoid of oxygen at water depths below 1800 metres. Going upward from this depth level, the organic content of sapropel S1 decreases corresponding to an increasing average oxygen content and concomitant breakdown of the organic material.

This research shows that there is a high chance of finding organic-rich deposits in an environment devoid of oxygen. Climate change may contribute to the formation of organic-rich beds. Besides sequestering large quantities of CO_2, these separated beds can also be converted into oil over the course of time.

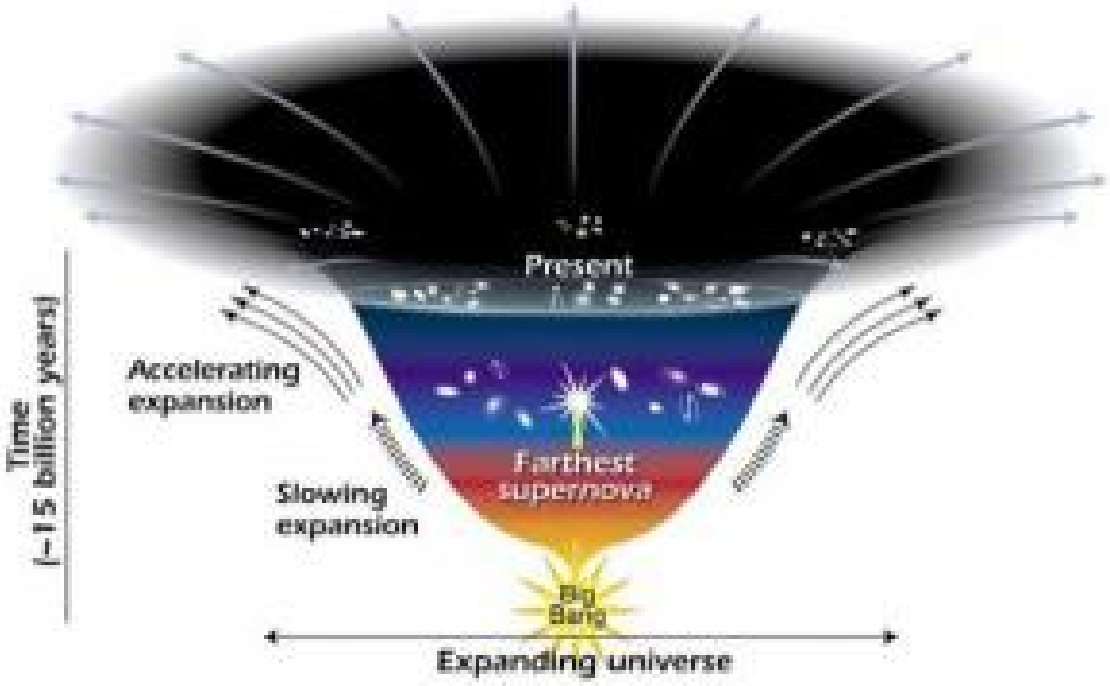
This research forms part of the PASS project, a marine programme in the Eastern Mediterranean. NWO Earth and Life Sciences financed the necessary logistics, such as ship and equipment lease via the National Research Cruise Programme.

These results are published in the September issue of Nature Geoscience.

Adapted from materials provided by Netherlands Organization for Scientific Research.

http://www.sciencedaily.com/releases/2008/09/080926100642.htm

Dark Energy: Is It Merely An Illusion?



Changes in the rate of expansion since the universe's birth 15 billion years ago. The more shallow the curve, the faster the rate of expansion. The curve changes noticeably about 7.5 billion years ago, when objects in the universe began flying apart at a faster rate. Astronomers theorize that the faster expansion rate is due to a mysterious, dark force that is pulling galaxies apart. (Credit: Image courtesy of NASA/STScI/Ann Feild)

ScienceDaily (Sep. 29, 2008) — Dark energy is at the heart of one of the greatest mysteries of modern physics, but it may be nothing more than an illusion, according physicists at Oxford University.

The problem facing astrophysicists is that they have to explain why the universe appears to be expanding at an ever increasing rate. The most popular explanation is that some sort of force is pushing the accelerating the universe's expansion. That force is generally attributed to a mysterious dark energy.

Although dark energy may seem a bit contrived to some, the Oxford theorists are proposing an even more outrageous alternative. They point out that it's possible that we simply live in a very special place in the universe - specifically, we're in a huge void where the density of matter is particularly low. The suggestion flies in the face of the Copernican Principle, which is one of the most useful and widely held tenets in physics.

Copernicus was among the first scientists to argue that we're not in a special place in the universe, and that any theory that suggests that we're special is most likely wrong. The principle led directly to the replacement of the Earth-centered concept of the solar system with the more elegant sun-centered model.

Dark energy may seem like a stretch, but it's consistent with the venerable Copernican Principle. The proposal that we live in a special place in the universe, on the other hand, is likely to shock many

scientists. The maverick physicists at Oxford conclude their paper by pointing out that forthcoming tests of the Copernican principle should help us sort out the mystery in the next few years.

Journal reference:

1. Timothy Clifton, Pedro G. Ferreira, and Kate Land. **Living in a Void: Testing the Copernican Principle with Distant Supernovae**. *Phys. Rev. Lett.*, 101, 131302 (2008) DOI: 10.1103/PhysRevLett.101.131302

Adapted from materials provided by American Physical Society, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com/releases/2008/09/080926184749.htm

Voice-Commanded Robot Wheelchair Finds Its Own Way

Nicholas Roy, left, assistant professor of aeronautics and astronautics, and Seth Teller, professor of computer science and engineering, stand next to the robotic wheelchair they co-designed, which can be navigated by vocal command. (Credit: Photo / Patrick Gillooly)

ScienceDaily (Sep. 29, 2008) — MIT researchers are developing a new kind of autonomous wheelchair that can learn all about the locations in a given building, and then take its occupant to a given place in response to a verbal command.

Just by saying "take me to the cafeteria" or "go to my room," the wheelchair user would be able to avoid the need for controlling every twist and turn of the route and could simply sit back and relax as the chair moves from one place to another based on a map stored in its memory.

"It's a system that can learn and adapt to the user," says Nicholas Roy, assistant professor of aeronautics and astronautics and co-developer of the wheelchair. "People have different preferences and different ways of referring" to places and objects, he says, and the aim is to have each wheelchair personalized for its user and the user's environment.

Unlike other attempts to program wheelchairs or other mobile devices, which rely on an intensive process of manually capturing a detailed map of a building, the MIT system can learn about its environment in much the same way as a person would: By being taken around once on a guided tour, with important places identified along the way. For example, as the wheelchair is pushed around a nursing home for the first time, the patient or a caregiver would say: "this is my room" or "here we are in the foyer" or "nurse's station."

Also collaborating on the project are Bryan Reimer, a research scientist at MIT's AgeLab, and Seth Teller, professor of computer science and engineering and head of the Robotics, Vision, and Sensor

Networks (RVSN) group at MIT's Computer Science and Artificial Intelligence Laboratory (CSAIL). Teller says the RVSN group is developing a variety of machines, of various sizes, that can have situational awareness, that is, that can "learn these mental maps, in order to help people do what they want to do, or do it for them." Besides the wheelchair, the devices range in scale from a location-aware cellphone all the way up to an industrial forklift that can transport large loads from place to place outdoors, autonomously.

Outdoors in the open, such systems can rely on GPS receivers to figure out where they are, but inside buildings that method usually doesn't work, so other approaches are needed. Roy and Teller have been exploring the use of WiFi signals, as well as wide-field cameras and laser rangefinders, coupled to computer systems that can construct and localize within an internal map of the environment as they move around.

"I'm interested in having robots build and maintain a high-fidelity model of the world," says Teller, whose central research focus is developing machines that have situational awareness.

For now, the wheelchair prototype relies on a WiFi system to make its maps and then navigate through them, which requires setting up a network of WiFi nodes around the facility in advance. After months of preliminary tests on campus, they have begun trials in a real nursing home environment with real patients, at the Boston Home in Dorchester, a facility where all of the nearly 100 patients have partial or substantial loss of muscle control and use wheelchairs.

As the research progresses, Roy says he'd like to add a collision-avoidance system using detectors to prevent the chair from bumping into other wheelchairs, walls or other obstacles. In addition,Teller says he hopes to add mechanical arms to the chairs, to aid the patients further by picking up and manipulating objects -- everything from flipping a light switch to picking up a cup and bringing it to the person's lips.

The research has been funded by Nokia and Microsoft.

Adapted from materials provided by Massachusetts Institute Of Technology.

http://www.sciencedaily.com/releases/2008/09/080922185547.htm

You Can Find Dr. Right, With Some Effort

By RONI CARYN RABIN

When Molly McGowan needed a pediatric urologist for her daughter, she found one the old-fashioned way: she asked around. Her sister, a nurse, didn't know of anyone in Binghamton, N.Y., their hometown, but a friend who lived next door to a urologist passed along the name of a specialist in Rochester.

It was a three-hour drive each way, but it was worth it. "He was at the top of his field, but he didn't act like it," Ms. McGowan said. "He never seemed rushed, and he explained everything without talking down to us."

Most people wouldn't buy a new car without checking consumer ratings, but they still rely largely on word of mouth to select a physician. Yet with more patients having to choose from a health plan's list, there is growing demand for information that is more reliable than a friend's recommendation and goes beyond the rudimentary details available online: a doctor's hours, educational background and ZIP code.

Unfortunately, it is very hard to get. There are very few good quality measures available to assess individual doctors, so consumers must be prepared to do some research if they want to find a physician they can work with comfortably.

"The truth of the matter is that people are hard pressed to make well-informed decisions when they choose a doctor, and they're doing it blind," said Joyce Dubow, a senior adviser in the office of policy and strategy at AARP. "We don't have objective data, so we use family and friends. And that's not objective."

Businesses, health plans and government agencies have developed rating systems for hospitals in recent years, but they have lagged in developing quality measures for doctors.

"We are really in the early days of physician-specific reporting," said Dr. Carolyn Clancy, director of the Agency for Healthcare Research and Quality. "The challenge is to do it well, so that it's accurate, so that it gives consumers good information about making choices and gives doctors information about how and where to improve."

One problem, she explained, is figuring out how to compensate for different outcomes from different doctors because they treat different patient populations, not because they provide inadequate care.

For now, patients cannot get their hands on a wealth of information about physicians that is compiled by government agencies but off limits to the public. A national practitioner database compiles reports of health care providers who have been fired, for example, but the list is open only to hospitals and select other groups. The Medicare program recently started a physician quality reporting initiative, but it is in its infancy and the information is not yet public.

And last year, after the nonprofit group Consumers' Checkbook won a lawsuit granting it access to Medicare's doctor records, the government appealed the decision. The group wanted to look at the database to see how often doctors perform procedures like knee replacements or prostate surgery, because volume is often associated with proficiency.

The bottom line is that patients who want to make sure their doctor is competent have a lot of work to do. And the work should be done on the front end: experts emphasize that people should find a doctor and establish a relationship while they are in good health, so they don't have to scramble when they come down with bronchitis or find a suspicious lump.

Studies have found that it is hard to get an appointment at short notice when cold-calling, and that patients with a regular source of care get better care, even when they are uninsured.

First, figure out what your needs are, suggests Dr. Pamela F. Gallin, the author of "How to Survive Your Doctor's Care" (LifeLine, 2003).

"Do you have special medical needs, such as cardiac problems or rheumatology problems, or do you just need routine checkups?" she asked. "Do you have diabetes? Does your lifestyle put you in a certain category of risk?"

While some internists have additional training in cardiology or rheumatology, she went on, primary care physicians also have a network of trusted specialists for referrals.

Many women choose a gynecologist as their regular doctor, Dr. Gallin said, but should probably have a relationship with an internist as well.

Next, review the list of doctors in your health plan. Consider their location as well as their hospital affiliations. You may want to cross-check your health plan's list with a top doctors list for your area; these lists (often published in regional magazines like New York and New Jersey Monthly) are usually generated by surveying physicians.

Check with your health plan to see whether it has good information on individual physicians (most don't, but many are working on it). Good quality measures include National Committee on Quality Assurance accreditation about whether doctors meet criteria for care for specific conditions like back pain or diabetes, and the Healthcare Effectiveness Data Information Set, which focuses on adherence to clinical guidelines, like prescribing a beta blocker after a heart attack. Some health plans also offer networks of high-performing or "honor roll" physicians; ask about the criteria.

Check with your state medical board to make sure the physician's license is valid, and whether he or she has faced disciplinary action. Those are minimal requirements, however; a higher standard is board certification, which means the doctor has passed a rigorous exam in a specialty like internal or family medicine.

You may also want to check whether the physician is certified in his or her subspecialty, like treating heart disease or arthritis. Some specialties require recertification every six or eight years. You can check on certification status with the American Board of Medical Specialties, the organization that oversees 24 specialty boards (www.abms.org), and at Web sites like HealthGrades.com and Docfinder (docboard.org).

If you're uninsured, you may be able to negotiate with a doctor and agree on a reduced fee, but remember that you will also be responsible for the cost of lab tests, blood work, X-rays, procedures and medications. These costs are more likely to be covered or charged on a sliding scale at a community health center or hospital clinic. (To find a location, see www.hrsa.gov under "Find Help," or the Families USA Web site, www .familiesusa.org, under "Resources for Consumers.")

Other factors to consider are whether the doctor has evening and weekend hours, whether the office leaves time open to schedule same-day appointments for urgent care, whether waiting times are reasonable and whether the doctor is in solo practice or a group practice. (Some experts say that group practices tend to be more efficient and that doctors in groups are more likely to stay up to date on current medical practice.) If the doctor uses electronic records, that's a plus, some experts say.

On the crucial question of whether you are comfortable with the doctor you've chosen, you won't know that until you meet with the doctor. Pediatricians will usually agree to an interview; busy internists often won't.

Some physicians are posting video clips of themselves on the HealthGrades Web site, so patients can get a feel for their personal style; Angie's List (angieslist.com) has started consumer ratings of A to F for doctors; and Consumers' Checkbook (checkbook.org) provides detailed consumer ratings of physicians in seven metropolitan areas. (All of these sites require payment.)

"Do your research," said Dr. Samantha Collier, the chief medical officer for HealthGrades. "Don't assume all physicians are equally skilled. More importantly, they need to be a good match for you. I hear so many patients tell me they really don't like their doctor or trust their doctor but they keep going back. That is ridiculous. This is one of the most important relationships you're ever going to have — you need to feel completely comfortable."

http://www.nytimes.com/2008/09/30/health/30find.html?_r=1&nl=8hlth&emc=hltha1&oref=slogin

Searching for Clarity: A Primer on Medical Studies

By GINA KOLATA

Everyone, it seemed, from the general public to many scientists, was enthralled by the idea that beta carotene would protect against cancer. In the early 1990s, the evidence seemed compelling that this chemical, an antioxidant found in fruit and vegetables and converted by the body to vitamin A, was a key to good health.

There were laboratory studies showing how beta carotene would work. There were animal studies confirming that it was protective against cancer. There were observational studies showing that the more fruit and vegetables people ate, the lower their cancer risk. So convinced were some scientists that they themselves were taking beta carotene supplements.

Then came three large, rigorous clinical trials that randomly assigned people to take beta carotene pills or a placebo. And the beta carotene hypothesis crumbled. The trials concluded that not only did beta carotene fail to protect against cancer and heart disease, but it might increase the risk of developing cancer.

It was "the biggest disappointment of my career," said one of the study researchers, Dr. Charles Hennekens, then at Brigham and Women's Hospital.

But Frankie Avalon, a '50s singer and actor turned supplement marketer, had another view. When the bad news was released, he appeared in an infomercial. On one side of him was a huge stack of papers. At his other side were a few lonely pages. What are you going to believe, he asked, all these studies saying beta carotene works or these saying it doesn't?

That, of course, is the question about medical evidence. What are you going to believe, and why? Why should a few clinical trials trump dozens of studies involving laboratory tests, animal studies and observations of human populations? The beta carotene case is unusual because much of the time when laboratory studies, animal studies and observational studies point in the same direction, clinical trials confirm these results.

There are exceptions, notably the Women's Health Initiative, a huge study begun in 1991 by the National Institutes of Health. It asked, among other things, if estrogen or estrogen and progestin could protect postmenopausal women against heart disease. As with beta carotene, the evidence said the drugs would work. But the clinical trial showed that women who took the drugs had slightly more heart disease and an increased risk of breast cancer. As with beta carotene, researchers were shocked. And again the Frankie Avalon question arose: What are you going to believe — this clinical trial or everything that preceded it?

Experts agree that there are three basic principles that underlie the search for medical truth and the use of clinical trials to obtain it. The first, says Dr. Steven Goodman, an epidemiologist and biostatistician at Johns Hopkins University School of Medicine, is that it is important to compare like with like. The groups you are comparing must be the same except for one factor — the one you are studying. For example, you should compare beta carotene users with people who are exactly like the beta carotene users except that they don't take the supplement.

By contrast, observational studies that ask what happens to people who act a certain way in their everyday lives rather than in an experiment are not as tightly controlled. For example, if people who eat fruits and vegetables or take beta carotene are compared with those who don't, the two groups are quite likely to be different from the start. Fruit and vegetable eaters and vitamin takers tend to be more health-conscious in general, more likely to exercise, less likely to smoke. So scientists try to adjust for these differences with statistical modeling.

The problem, according to David Freedman, a statistician at the University of California, Berkeley, who studies the design and analysis of medical studies, is not so much the differences that are known. Instead, it is the differences that scientists are not aware of.

Cynthia Pearson, executive director of the National Women's Health Network, has a favorite example of how easy it is to be fooled. Study after study found that women taking estrogen had less heart disease than women who did not. But, Ms. Pearson says, it turns out that women who faithfully take any medication for years — even a sugar pill — are different from women who don't. The compliant pill-takers tend to be healthier, perhaps because they follow doctor's orders. So when scientists said they were comparing two equal populations, the estrogen users and the nonestrogen users, they may have actually been comparing the health of the sort of women who conscientiously take pills with that of the sort of women who don't or who do so less rigorously.

The advantage of randomized clinical trials is that you have to worry a lot less about whether your groups are alike. You assign them treatments by the statistical equivalent of a toss of the coin, the idea being that differences among individuals will be randomly allocated in the groups. Faithful pill takers will be as likely to show up in the beta carotene group, for example, as in the placebo group.

The second basic principle is that the bigger the group studied, the more reliable the conclusions. That's because the real result of a study is not a single number, like a 20 percent reduction in risk. Instead, it's a range of numbers that represent a so-called margin of error, like a 5 to 35 percent reduction in risk. The larger the sample size, the smaller the margin of error. Small studies have large uncertainties in results, making it difficult to know where the truth lies. Also, in a small study, randomization may not balance things well.

The third principle, Dr. Goodman says, "is often off the radar of even many scientists." But it can be a deciding factor in whether a result can be believed. It's a principle that comes from statistics, called Bayes' theorem. As Dr. Goodman explains it,

"What is the strength of all the supporting evidence separate from the study at hand?"

A clinical trial that randomly assigns groups to an intervention, like beta carotene or a placebo, Dr. Goodman notes, "is typically at the top of a pyramid of research." Large and definitive clinical trials can be hugely expensive and take years, so they usually are undertaken only after a large body of evidence indicates that a claim is plausible enough to be worth the investment. Supporting evidence can include laboratory studies indicating a biological reason for the effect, animal studies, observational studies of human populations and even other clinical trials.

But if one clinical trial tests something that is plausible, with a lot of supporting evidence to back it up, and another tests something implausible, the trial testing a plausible hypothesis is more credible even if the two studies are similar in size, design and results. The guiding principle, Dr. Goodman says, is that "things that have a good reason to be true and that have good supporting evidence are likely to be true."

To teach students the power of that reasoning, Dr. Goodman shows them a paper on outcomes of patients in an intensive care unit, with every mention of the intervention blacked out. The study showed that the intervention helped, but that the result was barely statistically significant, just beyond the threshold of chance.

He asks the students to raise their hands if they believe the result. Most indicate that they do. Then Dr. Goodman reveals that the intervention was prayer for the patient by others. Most of the hands go down.

The reason for the skepticism, Dr. Goodman says, is not that the students are enemies of religion. It is that there is no plausible scientific explanation of why prayer should have that effect. When no such

explanation or evidence exists, the bar is higher. It takes more clinical trial evidence to make a result credible.

With the beta carotene studies, it was the discordance between all the evidence that came before the clinical trials and what the clinical trials found that shocked the scientists. They had a proposed mechanism and a mass of evidence from observational studies. But the randomized studies found no protection.

The clinical trials, though, were methodologically sound and large enough to leave little uncertainty about their conclusions. The scientific consensus was that these large and rigorous clinical trials trumped everything that came before them.

When the news was released in 1996, Dr. Richard Klausner, then the director of the National Cancer Institute, summed up the conclusion.

"The major message," Dr. Klausner said, "is that no matter how compelling and exciting a hypothesis is, we don't know whether it works without clinical trials."

http://www.nytimes.com/2008/09/30/health/30stud.html?nl=8hlth&emc=hltha2

Study Finds Association Between Hepatitis B and Pancreatic Cancer

By DENISE GRADY

People with pancreatic cancer are more likely than those without the disease to have been infected with the hepatitis B virus, a study has shown for the first time.

The finding suggests that hepatitis B — already known to cause liver cancer in some patients — may also increase the risk of pancreatic cancer, one of the deadliest types of tumor. But while the study showed an association, it did not prove cause and effect, the researchers said. More work is needed to determine whether the virus really can cause pancreatic cancer.

"We don't want to be alarmist," said Dr. James L. Abbruzzese, the lead author of the study and the chairman of gastrointestinal medical oncology at the M.D. Anderson Cancer Center in Houston.

Pancreatic cancer is not common, and most people have less than a 1 percent risk of ever developing it. There are about 38,000 new cases a year in this country, but the death rate is high, and most patients die within months or a few years.

By contrast, there are 1.25 million people in the United States who have chronic hepatitis B, and hundreds of millions around the world. Globally, it is a major cause of liver cancer. A vaccine can prevent the infection and the cancer. But when an unvaccinated person develops a chronic infection, it cannot be cured, though antiviral drugs may help control it in some cases.

Dr. Abbruzzese said it might be a good idea for people who have had hepatitis B to take extra measures to try to reduce their risk of pancreatic cancer, like not smoking and trying to watch their weight. Smoking is a major risk factor factor for pancreatic cancer, and obesity and diabetes have also been linked to the disease.

The study, being published today in the Journal of Clinical Oncology, compared 476 people who had pancreatic cancer with 879 healthy control subjects. All were tested to see if they had ever been infected with the viruses that cause hepatitis B or hepatitis C. There was no connection to hepatitis C, but the cancer patients were twice as likely as the healthy ones to have had hepatitis B. Among those with cancer, 7.6 percent had had hepatitis B, as opposed to only 3.2 percent of the controls. So the virus may contribute somehow to the cancer, the researchers suggest.

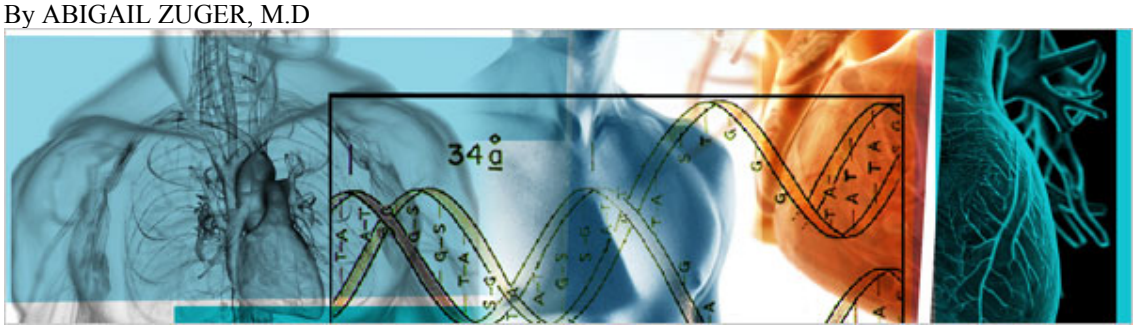
Dr. Eileen O'Reilly, an expert on pancreatic cancer at Memorial Sloan Kettering Cancer Center in Manhattan, said the study was well done and the interpretation reasonable, though she emphasized that more research was needed to verify it. She said there had been previous suggestions in the medical literature of a connection between hepatitis B and pancreatic cancer.

"This gives a clearer sense that it's a real finding," Dr. O'Reilly said.

http://www.nytimes.com/2008/09/30/health/research/30cancer.html?nl=8hlth&emc=hltha2

Healthy Right Up to the Day You're Not

By ABIGAIL ZUGER, M.D



It is as fragile and elusive as a soap bubble, as protean as a Lava lamp. It is as hard to define as love or happiness, and even harder to trap and keep.

This is your health we're talking about, the intangible that you probably think people like me can help you achieve and maintain. Why do we all persist in treating health like a bankable asset? Is it the solidity of our flesh and bone? The lab reports that look like bank statements? Either way, the operant fiction is that with diligent adherence to expert advice, pretty much anyone can sock away a nice little stash of health for the future.

In fact, though, health is the opposite of a commodity. It flits around like Tinkerbell, defying all the best intentions and predictions. No one can really articulate what the word means; no two people understand the concept in exactly the same way. And that includes you and your doctor.

Consider all the things that can be wrong with you even while you say you are healthy. You may have eyes that no longer focus on the printed page. You may be nursing a bum hip or a broken arm or leg; you may be missing an arm or a leg. You may have acne or a mouth full of cavities. Your toenails may be crumbling with fungus. You may have wrinkles and a tremor. Still, you rightfully call yourself healthy.

But then one day a few little viral particles crawl up your nose. A sniffle ensues, then congestion, fever, cough. Immediately, you are on the phone with your employer. "Not coming in today," you mumble. "Too sick."

Of course, you know you are not really sick, not sick in a way that negates your actual health. You are healthy in the midst of sickness, sick in the midst of health. Your bankable assets are secure.

It is a complicated journey, then, to get to the core of what makes health and what destroys it. The body ticks on through a lot of chaos. Even deep in our internal organs, where health is most often threatened, things can go badly wrong before we cross the river between healthy and sick.

Women who get a diagnosis of breast cancer, for example, are usually quite healthy. It is the appendage that is sick. After they lose the appendage, they must take treatment that makes them very sick, so they can stay healthy. But, of course, some never quite make it back to that shore, for the terror of recurrent illness can itself negate health.

When epidemic infection came to town in the old days, it was usually clear who was sick and who was well. Yet in the midst of New York's typhoid outbreaks of the early 20th century, one of the healthy was Mary Mallon, "Typhoid Mary," the cook who carried the germ, infected dozens of others, yet never got sick. She died in quarantine, typhoid-free: the community's health will trump your own personal stash every time.

Kidney and liver failure clearly spell the end of health. At least, they used to; now the borders are not quite so clear. You have your newly transplanted organ, and it is working beautifully, as long as you take handfuls of pills to crush your immune system into submission. Are you sick? Are you well? You are on a small island in the middle of the river, with lovely views of a rock and a hard place. And yet, you wake up in the morning, and you feel pretty good.

Some like to call high blood pressure "the invisible killer." You feel just fine with it; almost everyone does. As your health care provider will patiently explain, it is simply a matter of risk. Your risk for a heart attack and a stroke is higher than it need be.

Blood pressure medication will lower your risk. It will not do a thing for your health per se, but, increasingly, health and risk are becoming conflated.

As we become healthier, the concept of health has ballooned to acquire a fourth dimension of time. It is not only enough to feel good today; we are not really healthy unless we feel good tomorrow, and the day after, until one morning we just don't wake up at all.

From health directly to death: that is now our goal, with no stops in between.

A patient and I have been conducting an increasingly existential dialogue on these subjects for years now — not easy to sustain in 15-minute segments, even less as we both realize we are getting exactly nowhere.

She has untreated H.I.V. infection with an immune system now so dysfunctional that it is quite extraordinary for her to be still in the pink of health.

Which she is, no doubt about it. She feels fine. At some point in the past a health care professional hazarded that she had a year to live, and after 10 years she lost all faith in expert predictions.

From my own long experience with patients just like her, I know the very unpleasant future that surely awaits her. She has no interest in letting my memories drag her across the river. She only knows she feels fine. Furthermore, she has tried all the drugs that will change her risk, and every one of them makes her feel sick.

We have tossed this all around many times, and each time she enunciates the same paradox: I, with my gloomy warnings and my new ideas for medication, am trying to make her sick. She is determined to stay healthy.

Healthy to infect others, I point out. Healthy to leave her son an orphan. Healthy until she gets sicker than anyone needs to be.

Healthy in the here and now, she insists. Healthy not to throw up every morning, healthy to go to work, pay her bills and buy the kid a set of drums. Healthy to feel like herself.

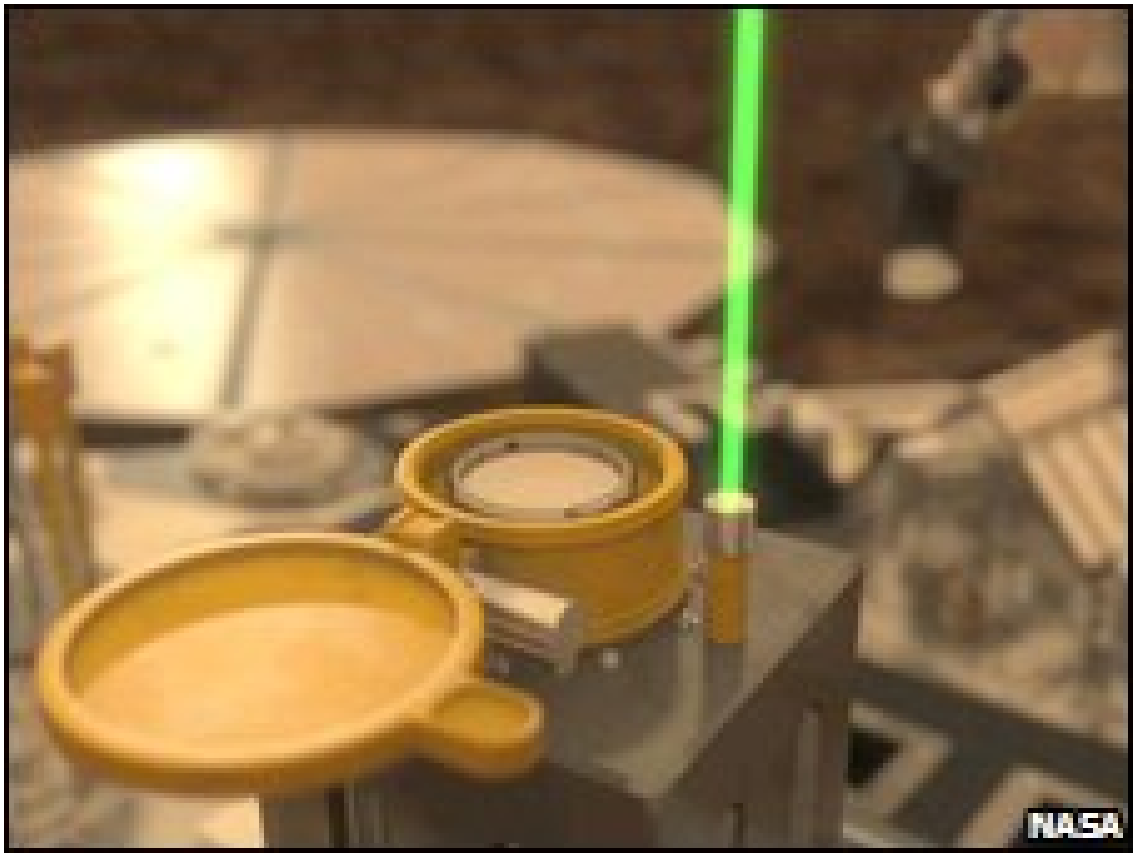
Clearly, there is health, and there is health, and sometimes the twain just will not meet. Meanwhile, every time I look at her lab reports I feel a little sick.

Abigail Zuger, who writes the Books column in Science Times, is a physician in Manhattan.

http://www.nytimes.com/2008/09/30/health/views/30essa.html?nl=8hlth&emc=hltha8

Phoenix detects Red Planet snow

The Phoenix spacecraft on Mars has detected snow above its landing site.



The US robot used its lidar instrument to probe the structure of clouds and saw large water ice-crystals falling through the Martian "air".

The instrument, which works by scattering pulses of laser light off particles in the sky, did not follow the snow to the ground.

The data suggests the snow vaporised before it reached the surface - but Phoenix is monitoring the situation.

"We're going to be watching very closely over the next month for evidence that the snow is actually landing on the surface," said Jim Whiteway, of York University, Toronto, lead scientist for the Canadian-supplied Meteorological Station on Phoenix.

"This is a very important factor in the hydrological cycle on Mars with the exchange of water between the surface and the atmosphere."

Changing seasons

Phoenix touched down successfully on Mars' northern plains on 25 May this year.

The static lander carries a number of instruments to study the geochemistry and environment of the Martian "Arctic".

Its weather station continuously monitors the temperature, pressure and wind around the robot.

The station has detailed the rise in temperatures as the summer season has taken hold; and seen the temperatures begin to fall again as the Sun dips below the horizon for increasing periods of time with the onset of winter.

"Over the first two months of the mission, the humidity of the atmosphere was increasing as water [ice] sublimated from the ground and the polar ice cap; and over the second half of the mission we've started to see frost, ground fog and clouds. And this is now occurring every night," explained Dr Whiteway.

Standing water?

Other key results released this week by the US space agency (Nasa) include the identification in the soil around Phoenix of calcium carbonate, which on Earth is a chief component of limestone rock.

Phoenix has also detected sheet-like particles which are probably clays of some kind.

The significance of both minerals is that they form only in the presence of liquid water.

Orbiters have identified such minerals in other parts of Mars, but only in areas where there is clear evidence of flowing water. The difference with the Phoenix landing site is that it is an open plain with no obvious geological features that have been cut by running water.

"Assuming we really do need liquid water to form these carbonates - which appears to be the case - then what this says is that we might have had standing water at some point in the past," speculated Bill Boynton of the University of Arizona and the lead scientist on the Tega instrument.

"It's possible that the ice that is there [just below the surface] has melted in-situ and stayed right in that spot and the reaction happened there."

Cold death

Phoenix's original mission was set to last just 90 Martian days, but this has now been extended indefinitely - not that engineers expect the spacecraft to live for much longer.

The Arctic Sun now spends four hours a day below the horizon, and the lander is getting less power into its batteries and is having to expend more energy on heating its systems.

The nights will gradually get longer until, in April next year, the Sun will stay below the horizon for three months.

The ability of Phoenix to gather sunlight is also expected to be severely compromised by the settling of carbon dioxide frost on its solar panels.

On current projections, the robot will probably go silent at the end of November or in early December.

"We're trying to... make hay as the Sun shines and get the most out of the instruments in these last few days before the end of the mission," said Barry Goldstein, the Phoenix project manager at Nasa's Jet Propulsion Laboratory.

"As the ice builds up on the solar arrays, we may see the solar arrays crack, if not fall off. We're going to go through a glassification temperature where the material around the circuit boards gets so brittle that it turns into a glass-like material and actually cracks."

The temperature at winter solstice will be at most -120C (-184F) and perhaps even colder.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/science/nature/7644125.stm

Published: 2008/09/30 15:16:21 GMT

Venezuela splashes out on laptops

Venezuela is ordering one million low cost laptops for its school children.

The machines will be based on the Intel Classmate laptop that has been designed for school children.

Many see the deal as a blow for the One Laptop Per Child organisation that has also been touting its child-friendly machine to developing nations.

Venezuela is buying the portable computers as part of a $3bn (£1.66bn) bilateral trade deal with Portugal that also covers housing and utilities.

Computer clash

Portugal is manufacturing the blue and white laptops under licence from Intel and are broadly based on the chip maker's design of its Classmate computer.

Dubbed Magalhaes (Magellan), the laptops will have on board low-power Intel Atom chips designed for laptops. They will also sport digital cameras and a broadband net connection.

As an operating system, the machines will run a version of Linux developed in Venezuela.

The deal with Venezuela follows an agreement between Intel and Portugal, signed in August for Classmate machines. Under that deal Portugal agreed to buy 500,000 machines to enable every six-to-10-year-old in the country to get one.

The deal to buy the machines is the largest yet for laptops created for school children.

Intel's big rival in this market is the One Laptop Per Child (OLPC) organisation, which has developed the XO laptop. That machine has wi-fi onboard and its battery can be re-charged using a built-in wind-up generator.

The original aim of the OLPC was to make a laptop that cost less then $100. The finished design ended up costing about $188.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/technology/7642985.stm

Published: 2008/09/30 11:52:38 GMT

Vitamin 'may blunt cancer drugs'

Vitamin C supplements may substantially reduce the benefit from a wide range of anti-cancer drugs, research suggests.

Thirty to 70% less cancer cells in a lab were killed by a range of drugs, after pretreatment with vitamin C.

Follow-up chemotherapy tests found tumours grew more rapidly in mice given cancer pretreated with vitamin C.

Cancer Research reports the Memorial Sloan-Kettering Cancer Center findings. The US researchers say the same mechanism may affect patient outcomes.

Some studies have suggested that because vitamin C is an antioxidant it could be beneficial to cancer patients.

> **The use of vitamin C supplements could have the potential to reduce the ability of patients to respond to therapy**
> Dr Mark Heaney
> Memorial Sloan-Kettering Cancer Center

The US team tested the impact of a form of vitamin C on the effectiveness of a range of anti-cancer drugs in tests on cancer cells in the lab.

They found that every drug they tested did not work as well if cells were pretreated with vitamin C as they did on untreated cancer cells.

Between 30% and 70% less cancer cells treated with vitamin C were killed, depending on the drug tested.

Follow-up tests on mice showed that while chemotherapy kept untreated cancer in check, tumours grew more rapidly in mice that were given cancer pretreated with vitamin C.

Some classes of cancer drugs produce molecules known as oxygen free radicals which can react with other molecules in the cancer cell, forcing its death.

In theory, vitamin C could mop up the free radicals, keeping the cancer cell alive despite chemotherapy treatment.

Boiler room

However, the researchers found the key was not that the nutrient was neutralising free radicals.

Instead, vitamin C appeared to protect tiny structures inside the cancer cells called mitochondria from damage.

Mitochondria effectively form the energy-creating boiler room of a cell, and if damaged can lead to its death.

Lead researcher Dr Mark Heaney said: "Vitamin C appears to protect the mitochondria from extensive damage, thus saving the cell. "And whether directly or not, all anti-cancer drugs work to disrupt the mitochondria to push cell death."

Previous research by the same team has shown that vitamin C seems to accumulate within cancer cells more than in normal cells.

The amount of vitamin C used in the current study were equivalent to that found in high dose supplements.

Dr Heaney said vitamin C was probably good for cells in normal tissue - but its protective effect was completely counter-productive in relation to cancer cells.

He added: "The use of vitamin C supplements could have the potential to reduce the ability of patients to respond to therapy."

Early stage

Dr Joanna Owens, of the charity Cancer Research UK, said the study was interesting, but at an early stage.

"As yet, there is not enough evidence to know whether antioxidants such as vitamin C are helpful or harmful during cancer treatment.

"It is possible that high doses of antioxidants can make treatment less effective, but until we know for sure our advice is to try and get the vitamins you need through a balanced and varied diet rather than through vitamin supplements."

Pamela Mason, scientific advisor to the Health Supplements Information Service, said no conclusions could be drawn until research was carried out on humans.

She stressed that cancer patients should seek expert advice before taking any product not prescribed by their doctor.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/7643533.stm

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Antisocial behaviour hormone link

Low levels of the stress hormone cortisol have been linked to antisocial behaviour in adolescent boys.

Cortisol levels in the body usually surge in stressful situations, thought to help people regulate emotions.

But a Cambridge university study found this did not happen in boys with a history of severe antisocial behaviour.

The Biological Pyschiatry study suggests some bad behaviour may be a form of mental illness linked to a chemical imbalance in the brain.

> **If we can figure out precisely what underlies the inability to show a normal stress response, we may be able to design new treatments for severe behaviour problems.**
> Dr Graeme Fairchild
> University of Cambridge

An increase in cortisol levels is thought to make people behave more cautiously, and help them to regulate their emotions, particularly their temper and violent impulses.

The Cambridge team recruited participants for the study from schools, pupil referral units and the Youth Offending Service.

Samples of saliva were collected over several days from the subjects in a non-stressful environment to measure levels of the hormone under resting conditions.

The young men then took part in a stressful experiment that was designed to induce frustration.

Samples of saliva were taken immediately before, during and after the experiment to track how cortisol changed during stress.

While the average adolescents showed large increases in the amount of cortisol during the frustrating situation, cortisol levels actually went down in those with histories of severe antisocial behaviour.

The researchers said the results suggest that antisocial behaviour may be more biologically-based than previously considered, just as some individuals are more vulnerable to depression or anxiety due to their biological make-up.

Possible treatments

Lead researcher Dr Graeme Fairchild said: "If we can figure out precisely what underlies the inability to show a normal stress response, we may be able to design new treatments for severe behaviour problems.

"We may also be able to create targeted interventions for those at higher risk.

"A possible treatment for this disorder offers the chance to improve the lives of both the adolescents who are afflicted and the communities in which they live."

According to a Home Office study, almost three-quarters of antisocial behaviour orders are given to offenders under the age of 21.

Responding to reports of antisocial behaviour costs the government approximately £3.4bn per year.

Professor Sheilagh Hodgins, of the Institute of Psychiatry at King's College London, said there was a wealth of studies linking physiological markers to problem behaviour.

For instance, a low pulse rate in children had been linked to a raised risk of later criminal behaviour.

But there was no proof that hormone levels - or any other physiological marker - actually caused the bad behaviour.

However, she said the study might help experts to maximise the effectiveness of therapy, such as parenting classes.

Such therapy has a good track record in improving behaviour, but Professor Hodgins said therapists might have to work harder with young people with low cortisol levels, who may find it harder to become engaged.

"The low cortisol suggests they are just too cool, too laid back, so you want to make even more of an effort to get them involved in positive situations that can help them change," she said.

Marjorie Wallace, of the mental health charity SANE, said the study may help antisocial behaviour to be viewed as a health issue, rather than a purely criminal one.

She said: "More work needs to be done, but we welcome the possibility of developing better treatments and approaches that can help troubled young men to lead less destructive and more productive lives."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/7642020.stm

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Autonomy 'key to school success'

Independent schools get better results than state schools because they have the freedom to tailor teaching to the needs of their pupils, researchers say.

A University of Buckingham report found social background and ability were not the only factors behind higher grades in private schools.

The study said autonomy meant decisions were made close to the classroom.

The findings showed how the quality of education could be improved in the state school sector, the report added.

The study was commissioned by the Headmasters' and Headmistresses' Conference (HMC), which represents 250 independent schools across the UK.

> **The autonomy of the school is very effective in delivering high quality education**
> Professor Alan Smithers, report author

It found the academic record of HMC schools outstripped that of state schools, including grammar schools, but suggests this cannot be attributed to social advantage or to their selection process.

Grammar schools were more selective, the report argued and yet HMC schools outperformed them in exams.

It found that HMC schools achieve better A-level results in 24 out of 30 subjects than grammar schools and in 29 out of 30 subjects than comprehensive schools and academies.

Freedom to innovate

Report author Professor Alan Smithers said the autonomy enjoyed by the independent sector meant decisions were made "closer to the teaching".

"The autonomy of the school is very effective in delivering high quality education," said Prof Smithers.

"What we really need to do is make the shape of the system right, put in the money, then have the courage to step back and let teachers take the decisions.

"It gives an indication to the government as to how they can improve the quality of education in the state sector."

Schools Minister Andrew Adonis said freedom for schools to manage their affairs was a "key principle" of government policy.

"That is why we have established 130 academies - which are independent state schools - and given all schools greater control of their budgets, staffing and management."

Best teachers

The research also found that independent schools were likely to recruit and retain the best teachers.

Three times as many teachers moved from the state sector to work in independent schools, attracted by the greater freedoms to teach how and what they wanted.

"We found that teachers in independent schools were more likely to have a degree in the subject they were teaching and to hold a good degree from a leading university," the report said.

"Not being bound by national pay scales gives them [independent schools] the freedom to do what is necessary to recruit teachers of the quality required from whatever sources are available.

"Bearing in mind the importance of teacher expertise to student outcomes, it is reasonable to infer that a key factor in the quality of education provided by independent schools is the teachers they are able to attract."

The report likened private schools to businesses, with parents being customers.

"It is not a matter of running up a deficit and having knuckles rapped by the government or local authority.

"If they do not turn a profit then that's it."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/uk_news/education/7644655.stm

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'The Odyssey' and 'The Iliad' are giving up new secrets about the ancient world

By Jonathan Gottschall | September 28, 2008

NEARLY 3,000 YEARS after the death of the Greek poet Homer, his epic tales of the war for Troy and its aftermath remain deeply woven into the fabric of our culture. These stories of pride and rage, massacre and homecoming have been translated and republished over millennia. Even people who have never read a word of "The Iliad" or "The Odyssey" know the phrases they have bequeathed to us - the Trojan horse, the Achilles heel, the face that launched a thousand ships.Today we still turn to Homer's epics not only as sources of ancient wisdom and wrenchingly powerful poetry, but also as genuinely popular entertainments. Recent translations of "The Iliad" and "Odyssey" have shared the best-seller lists with Grisham and King. "The Odyssey" has inspired works from James Joyce's "Ulysses" to a George Clooney movie, and an adaptation of "The Iliad" recently earned more than $100 million in the form of Wolfgang Petersen's "Troy" - a summer blockbuster starring Brad Pitt as an improbable Achilles.

The ancient Greeks, however, believed that Homer's epics were something more than fiction: They thought the poems chronicled a real war, and reflected the authentic struggles of their ancestors. But modern scholars have generally been more skeptical. The poems describe a culture that thrived hundreds of years before Homer was born, and which would have seemed legendary even to him. Scholars have allowed that a kernel of historical truth might be tucked beneath the layers of heroic hyperbole and poetic embroidery, but only a small kernel. In the last 50 years, most scholars have sided with the great classicist Moses Finley, who argued that the epics were "a collection of fictions from beginning to end" and that - for all their majesty and drama - they were "no guide at all" to the civilization that

may have fought the Trojan War.

But thanks to evidence from a range of disciplines, we are in the middle of a massive reappraisal of these foundational works of Western literature. Recent advances in archeology and linguistics offer the strongest support yet that the Trojan War did take place, with evidence coming from the large excavation at the likely site of Troy, as well as new analysis of cuneiform tablets from the dominant empire of the region. Insights from comparative anthropology have transformed studies of the society that created the poems and allowed us to analyze the epics in a new way, suggesting that their particular patterns of violence contain a hidden key to ancient Greek history - though not necessarily the key that Homer's readers once thought they were being given."The Iliad" and "The Odyssey" are our most precious artifacts of early Greek culture. Aside from the dry and voiceless remains of archeological sites, the poems are the last surviving impressions of the society that created them - what the people hoped for, what they despaired of, and how they managed their social and political lives. The poems are time machines - imperfect, surely - that show us people who were so like us, and so different, too. And they are still revealing new truths about the prehistoric civilization that has exerted such a strong formative influence over the art, the history, and even the psychology of the West.

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The desire to find truth in Homer has a long and checkered history, and no figure looms larger than the German businessman and self-taught archeologist Heinrich Schliemann. In 1870 he landed on the western coast of Asia Minor (modern day Turkey) with a copy of "The Iliad" in his hand. On the plain before him, an unimpressive mound of grass and stone and bushes swelled 100 feet into the air. Tradition had long identified this mound, called Hisarlik, as a possible site of the historical Troy.

Schliemann soon reported to the world, breathlessly, that he and his diggers had found the charred remains of a grand citadel destroyed in prehistory by hostile men - that he had found Troy just where Homer said it would be. The news was a worldwide sensation, and Schliemann's view that the Homeric epics were fairly accurate chronicles of Late Bronze Age history - that is, the Greek world of around 1200 BC - dominated scholarship for more than 50 years.

But, in fact, Schliemann hadn't found Homer's Troy. Hisarlik was occupied from 3000 BC until 500 AD, and subsequent archeological excavations showed that the civilization Schliemann chipped from the mound actually ended more than 1,000 years before the Trojan War could realistically have been fought. When the German archeologist Carl Blegen examined the proper layer of the Hisarlik mound, the settlement he found seemed like a wretched and insignificant place. Schliemann's amateurism, wishful thinking, and instinct for self-glorification had led him into serious error, and ended up discrediting his claim that Homer's poems were historically based.But the newest digging at Troy is tipping the consensus again, perhaps this time for good. Schliemann and Blegen, it now appears, had only discovered the tip of the iceberg. The mound at Hisarlik thrusts up from the plain, but most of its ruins are concealed beneath the surface. In a project that has now been underway for 20 years, the German archeologist Manfred Korfmann and hundreds of collaborators have discovered a large lower city that surrounded the citadel. Using new tools, such as computer modeling and imaging technology that allows them to "see" into the earth before digging, Korfmann and his colleagues determined that this city's borders were 10 to 15 times larger than previously thought, and that it supported a population of 5,000 to 10,000 - a big city for its time and place, with impressive defenses and an underground water system for surviving sieges. And, critically, the city bore signs of being pillaged and burned around 1200 BC, precisely the time when the Trojan War would have been fought.

In his influential book, "Troy and Homer," German classicist Joachim Latacz argues that the identification of Hisarlik as the site of Homer's Troy is all but proven. Latacz's case is based not only on archeology, but also on fascinating reassessments of cuneiform tablets from the Hittite imperial archives. The tablets, which are dated to the period when the Late Bronze Age city at Hisarlik was destroyed, tell a story of a western people harassing a Hittite client state on the coast of Asia Minor. The Hittite name for the invading foreigners is very close to Homer's name for his Greeks - Achaians - and the Hittite names for their harassed ally are very close to "Troy" and "Ilios," Homer's names for the city.

"At the very core of the tale," Latacz argues, "Homer's 'Iliad' has shed the mantle of fiction commonly attributed to it."

But if the Trojan War is looking more and more like a historical reality, there is still the question of whether the poems tell us anything about the motives and thinking of the people who actually fought it. Do the epic time machines actually take us back to the Greek culture of the Late Bronze Age?

It is almost certain that they do not. Homer's epics are a culmination of a centuries-long tradition of oral storytelling, and extensive cross-cultural studies of oral literature have established that such tales are unreliable as history. Homeric scholars believe that the epics were finally written down sometime in the 8th century BC, which means that the stories of Achilles and Odysseus would have been passed by word of mouth for half a millennium before they were finally recorded in what was, by then, a vastly changed Greek culture. Facts about the war and the people who fought it would have been lost or grossly distorted, as in a centuries-long game of "telephone." Scholars agree that the relatively simple and poor culture Homer describes in his epics is quite sharply at odds with the complex and comparatively rich Greek kingdoms of the Late Bronze Age, when the war would have taken place.

But even if the epics make a bad history of Greece in 1200 BC - in the sense of transmitting names, dates, and accurate political details - scholars increasingly agree that they provide a precious window on Greek culture at about the time the poems were finally written down. Moses Finley, who believed that the epics were "no guide at all" to the history of the Trojan War, did believe they were guides to Homer's own culture. And by turning an anthropological eye to the conflicts Homer writes about, we are now learning far more about what that culture was really like.

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Reconstructing a prehistoric world from literary sources is rife with complications. But there are aspects of life in the Homeric era upon which most scholars agree. Homer paints a coherent picture of Greek

attitudes, ideology, customs, manners, and mores that is consistent with the 8th century archeological record, and holds together based on anthropological knowledge about societies at similar levels of cultural development. For instance, we can trust that the Greeks' political organization was loose but not chaotic - probably organized at the level of chiefdoms, not kingdoms or city-states. In the epics we can see the workings of an agrarian economy; we can see what animals they raised and what crops, how they mixed their wine, worshipped their gods, and treated their slaves and women. We can tell that theirs was a warlike world, with high rates of conflict within and between communities.

This violence, in fact, opens an important window onto that world. Patterns of violence in Homer are intriguingly consistent with societies on the anthropological record known to have suffered from acute shortages of women. While Homeric men did not take multiple wives, they hoarded and guarded slave women who they treated as their sexual property. These women were mainly captured in raids of neighboring towns, and they appear frequently in Homer. In the poems, Odysseus is mentioned as having 50 slave women, and it is slave women who bear most of King Priam's 62 children. For every slave woman working a rich man's loom and sharing his bed, some less fortunate or formidable man lacks a wife.

In pre-state societies around the world - from the Yanomamo of the Amazon basin to the tribes of highland New Guinea to the Inuit of the Arctic - a scarcity of women almost invariably triggers pitched competition among men, not only directly over women, but also over the wealth and social status needed to win them. This is exactly what we find in Homer. Homeric men fight over many different things, but virtually all of the major disputes center on rights to women - not only the famous conflict over Helen, but also over the slave girls Briseis and Chryseis, Odysseus's wife Penelope, and all the nameless women of common Trojan men. As the old counselor Nestor shouts to the Greek hosts, "Don't anyone hurry to return homeward until after he has lain down alongside a wife of some Trojan!"

The war between Greeks and Trojans ends in the Rape of Troy: the massacre of men, and the rape and abduction of women. These events are not the rare savageries of a particularly long and bitter war - they are one of the major points of the war. Homeric raiders always hoped to return home with new slave-concubines. Achilles conveys this in his soul-searching assessment of his life as warrior: "I have spent many sleepless nights and bloody days in battle, fighting men for their women."

Historical studies of literature are sometimes criticized for ignoring, or even diminishing, the artistic qualities that draw people to literature in the first place. But understanding how real history underlies the epics makes us appreciate Homer's art more, not less. We can see Homer pioneering the artistic technique of taking a backbone of historical fact and fleshing it over with contemporary values and concerns - the same technique used later by Virgil in "The Aeneid," by Shakespeare in his history plays, and by Renaissance painters depicting the Bible and classical antiquity.

And understanding Homer's own society gives us a new perspective on the oppressive miasma of fatalism and pessimism that pervades "The Iliad" and, to a lesser but still palpable extent, "The Odyssey." While even the fiercest fighters understand that peace is desirable, they feel doomed to endless conflict. As Odysseus says, "Zeus has given us [the Greeks] the fate of winding down our lives in hateful war, from youth until we perish, each of us." A shortage of women helps to explain more about Homeric society than its relentless violence. It may also shed light on the origins of a tragic and pessimistic worldview, a pantheon of gods deranged by petty vanities, and a people's resignation to the inevitability of "hateful war."

Jonathan Gottschall teaches English at Washington & Jefferson College. He is the author of "The Rape of Troy: Evolution, Violence, and the World of Homer," and he is currently at work on a novel of the Homeric age called "Odysseus, A True Story." ■

http://www.boston.com/bostonglobe/ideas/articles/2008/09/28/hidden_histories/

Against Intuition

Experimental philosophers emerge from the shadows, but skeptics still ask: Is this philosophy?

By CHRISTOPER SHEA

"If anything can be pursued in an armchair, philosophy can," the esteemed Oxford philosopher Timothy Williamson told the Aristotelian Society, of London, a few years ago. That may sound like an innocuous truism: No one pictures Bertrand Russell doing his philosophical cogitation anywhere but in a club chair, or perhaps in bed, postcoitally (given his adventurousness in that arena). But, in fact, Williamson's remarks are fighting words these days, thanks to the rise of a cohort of philosophers who believe that the armchair arguments of philosophers need to be probed and tested through surveys of ordinary people and laboratory experiments using human subjects. If philosophers want to demonstrate that their arguments comport with how the mind really works, say the proponents of experimental philosophy, they need to get off their duffs.

Does that sound like an incendiary charge? Indeed, an armchair in flames has become the informal symbol of the experimental-philosophy movement, also known as "x-phi." Online you can buy a burning-armchair T-shirt or watch a burning-armchair YouTube video, accompanied by the x-phi alt-rock anthem. The aggressive symbol is only partly tongue-in-cheek: Some experimental philosophers believe they are simply augmenting and supplementing traditional philosophical work, but others view themselves as overturning a significant number of philosophical projects. They think they are calling into question methodologies that philosophers have made use of "for 2,400 years," as the Rutgers philosopher Stephen Stich, a pioneer of x-phi, puts it.

Experimental philosophy has percolated on the edge of the discipline for several years, yet remains dogged by this question: Will it mature into a central, respected strand of philosophy or remain a semi-fringe endeavor, viewed from the mainstream as the kind of work that should be done (if at all) in psychology departments — with the results perhaps pondered later by "real" philosophers?

At the heart of experimental philosophy lies a suspicion of so-called "intuitions." An intuition in philosophy is something far more potent than it is in ordinary discourse. Intuitions rear their heads when philosophers write such things as, "In this case, we would surely say …," or, "It would be natural to say …" (for example, that killing a man to harvest his organs is wrong). It is a deeply rooted sense, tested from multiple angles and honed through thought experiments and dialogue. The trustworthiness of intuitions (whose roots can be traced back to Plato and Socrates, who thought they represented glimpses of the true, ideal world usually hidden from us) hardly goes undebated by traditional philosophers — quite the opposite — but the experimental philosophers apply a new kind of pressure. They think that by studying human minds, using empirical techniques, and drawing on the insights of modern psychological science, they can get a better sense of where intuitions come from, and whether or when they should be granted credence.

Experimental philosophy has suggested, for example, that people from East Asian cultures may have different intuitions on very basic philosophical questions — reference (what nouns refer to in certain situations), morality, epistemology (what it means "to know" something) — than members of Western societies do. Experimental philosophers also draw on work by contemporary psychologists demonstrating just how malleable human cognition is, how easily redirected and reshaped it is by external cues, even as the conscious mind remains blissfully unaware. Opinions on crime and punishment, for instance, can be altered by placing people in a dirty room designed to trigger feelings of disgust: Subjects in such experiments respond more punitively when asked what should be done to certain hypothetical criminals.

"If we keep getting the same kind of results with the right kinds of controls and right kind of experiments," says Stich, "then there is a problem with the central method that philosophers have used throughout the 20th century, and for a long time before that": the reliance on armchair intuitions.

Understandably, such claims have met with resistance. "A philosophical problem is not an empirical problem," writes Judith Jarvis Thomson, the noted MIT moral philosopher, in an e-mail message to *The Chronicle*, "so I don't see how their empirical investigations can be thought to have any bearing on any philosophical problem — much less help anyone to solve a philosophical problem."

When several philosophers, including Stich and Joshua Knobe, an assistant professor at the University of North Carolina at Chapel Hill, along with a few psychologists, including the University of Virginia's Jonathan Haidt, proposed to Oxford University Press a new journal focusing on empirical studies of moral philosophy, they got back one particularly scathing anonymous review: "This group," it said, "is overly impressed by dubious functional MRI studies purporting to demonstrate the neurophysiological underpinnings of moral thinking, and by small sample, 'rinky-dink experiments' conducted by philosophers who are not trained experimentalists."

While much of the proposal authors' work was "perfectly philosophically respectable," the reviewer said, "a great deal of their interest lies in what I can only describe as the desire to eliminate morality (or at least the study of morality) from the discipline of philosophy itself." Other reviews were more favorable, although Oxford has not made a decision about the journal.

There are signs, however, that experimental philosophy is coming into its own. One was the publication in June of *Experimental Philosophy* (Oxford), a greatest-hits anthology edited by Knobe and Shaun Nichols, of the University of Arizona. What's more, the National Endowment for the Humanities recently awarded Nichols and Ron Mallon, of the University of Utah, $180,000 to invite some top experimental philosophers to Utah next summer to present the basics to professors unacquainted with the subject. The University of St. Andrews, in Scotland, held a conference in September at which Stich and Williamson were to argue for and against the armchair, while the University of Cologne, in Germany, sponsored a gathering last month titled "The Armchair in Flames?" And the chair of the American Philosophical Association, Kwame Anthony Appiah, of Princeton, has written about x-phi as a positive development.

X-phi'ers were especially pleased that Caltech mentioned experimental philosophy as a subfield of interest — an apparent first — when it recently posted an ad for a tenure-track job in philosophy. "I just came out of grad school in 2005," says Thomas Nadelhoffer, who teaches at Dickinson College and runs the influential x-phi blog Experimental Philosophy, which has some 70 contributors. "We were universally told back then to do the best we could to hide that we do this stuff. Now people wear it on their sleeve."

In "An Experimental Philosophy Manifesto," the opening chapter of *Experimental Philosophy,* Knobe and Nichols say their critics would be right to reject the approach if the parody version of it reflected reality: But no one, they say, believes that philosophical questions — What acts count as "intentional"? Is it permissible to kill one innocent person to save five? — can be resolved by studying the answers ordinary people give. Rather, Knobe and Nichols argue, "The suggestion is just that, whatever else we do, we should also be looking at people's intuitions … as a way of coming to a deeper understanding of how the human mind works."

If Stich is the provocateur of the movement, upending 2,400 years of philosophizing with a single blow, Knobe is the diplomatic young star, emphasizing in a gentle voice that he merely wants philosophers to embrace "new tools" and that, for the most part, the reception of x-phi has been "a testament to the community of philosophy, and how open they are to different methodologies." A precocious 2006 Ph.D. from Princeton, he'd done some postgraduate work in a psychology lab at the University of Oregon under Bertram Malle, before enrolling in grad school. He finds himself drawn, he says, to the sorts of questions

philosophers debated until the 19th century, as opposed to those of the 20th century, when the discipline got diverted into narrower, logic-chopping channels.

"From the beginning," he says, "Nietzsche was inspirational to me. I was interested in working on the kinds of questions he was interested in: how people make moral judgments, how moral judgments affect the way we understand our world." But while most Nietzsche scholars wrote essays on the philosopher's work, Knobe continues, "I was interested in doing experiments to answer the questions that he asked." Indeed, Knobe has argued, in a paper written with the University of Chicago's Brian Leiter, that Nietzsche deserves a spot alongside Aristotle and Kant in the pantheon of moral philosophers — in fact, above them. That's because Nietzsche argued that morality is the product of neither a virtuous upbringing, focused on creating firm character, nor the pure application of reason, but comes from individual, innate, sometimes unalterable attributes of humans — the sort of traits experimental philosophers like Knobe now pursue.

Knobe's best-known papers demonstrate how ordinary people's understanding of such things as intention, which philosophers have traditionally treated as value-neutral (one either tries to do something or doesn't, independent of the moral content of the act), is in fact shot through with moral considerations. Consider this scenario, used in numerous scholarly articles: A corporate chairman is presented by a vice president with a proposal for a new project. The VP explains that the project will increase profits but hurt the environment. The chairman replies, "I don't care at all about helping the environment. I just want to make as much profit as I can. Let's start the new program." They do, and predictably the environment is harmed.

Did the CEO intentionally damage the environment? In one of Knobe's most cited studies, some 82 percent of students said yes.

Then take this scenario: Same chairman, same VP, but this time the VP says the program will help the environment. The CEO, again, replies that he doesn't care; his only concern is money. He gives a thumbs-up and, again, as predicted, the environment is helped. This time only 23 percent of students say the CEO intentionally helped the earth, although the scenarios are logically identical.

That people's judgment about intentionality is shaped by the degree of harm done by the act being evaluated, also known as the Knobe effect, has been demonstrated in subjects from India, among 4-year-olds, even among people who suffer from deficits in their emotional processing. Some traditional philosophers had suggested in passing — using their intuition — that moral judgments might be shaping judgments about intention, but Knobe offered the striking data.

The study of intentionality is not purely ivory-tower stuff. Every time a U.S. bomber kills civilians in the course of combating the Taliban, the laws of war demand that the military investigate whether the pilots and their commanders intentionally caused the deaths and should be punished.

Knobe has found this intertwining of moral judgment with analytic assessment across a range of human thought: when we try to ascertain what people truly "value," for example, and when we judge people who have acted in situations in which they had little choice but to do what they did. (Presented with a hypothetical deterministic universe, in which every action can be predicted in advance, test subjects still say, oddly, that they would hold wrongdoers responsible.)

One could argue that the asymmetry in judgments about intentionality amounts to simple error, just as clearly as when people flip heads nine times in a row and then say they are "due" for a tails. But Knobe says it makes more sense to say that "intention" and "moral blame" cannot be neatly disaggregated without doing violence to the way the mind functions (as opposed to how philosophers think it should function). "From the beginning, your whole process of figuring out what is going on in the world is saturated with moral judgment," he says.

Other philosophers, even those of an experimental bent, are quicker to say that the test subjects are mistaken. Nadelhoffer, for example, in an essay in *Experimental Philosophy,* argues that courts may want to make jurors aware of this psychological puzzle, lest defendants who cause harm unintentionally (under the traditional understanding) receive punishments better suited to purposeful, coldblooded criminals.

One way that researchers have followed up Knobe's work is to parse even more finely the answers people provide in these surveys. Adam Feltz, a philosopher at Florida State University, and Edward T. Cokely, of the Max Planck Institute for Human Development, in Berlin, recently found that subjects' answers to the chairman question correlated with personality traits: Extroverts were more likely to say that the CEO who harmed the environment did so intentionally than introverts were. Extroverts, being more socially minded, may be more primed to punish those who violate societal norms.

In fact, while Knobe speaks of pinning down "folk philosophy," or how ordinary people make sense of the world, the latest developments seem to underscore just how many folk philosophies there are. Alfred Mele, of Florida State, has investigated the Knobe effect and identified a multitude of subgroups, each of which responds to the scenarios in a distinct way, worthy of analysis. Although he's a sometime participant in x-phi, and hardly an enemy, he's still not sure where this work is headed. "I think the project of finding and understanding folk concepts of this and that is interesting," he says. "But it won't settle a lot of deeper philosophical questions."

That was precisely the point that New York University's J. David Velleman made in one of the most-famous takedowns of experimental philosophy. After Slate published a brief article about the trend in 2006, Velleman said (on the now-defunct Web site Right2Left.com) that many of the so-called x-phi discoveries "are not exactly news to traditional philosophers."

"Of course," he went on to say, "it's useful to know what most people think about intentional action and moral responsibility. In philosophizing on these topics, we can't stray too far from what people think. … Even Aristotle relied on *endoxa* — received opinions — as a starting point of his inquiries.

"Maybe Aristotle was the first 'experimental philosopher,' then? No. Aristotle knew that the real philosophizing starts after the *endoxa* have been surveyed. His view remains true today."

Today Velleman says he does not want to be painted as an enemy of experimental philosophy, or to be interviewed on the subject. But via e-mail, he affirms that he is dubious about whether philosophy departments ought to be training students in experimental methodology (none currently does so systematically), given limited resources. Still, he says, he is willing to let the marketplace of ideas settle the question.

X-phi'ers now tend to pick up their experimental chops by wandering over to psychology or cognitive-science departments, collaborating with psychologists, or working with someone already part of the movement. Sean Kelly, the first philosopher with a laboratory at Harvard since William James (Kelly studies visual cognition), suggests that they're working in a Jamesian spirit. When James wanted to learn about mammalian neuroanatomy, he went out, bought a sheep's head, and started sawing and slicing. Similarly, Kelly says, young experimental philosophers are picking up whatever statistical and other tools they need, any way they can. "You shouldn't be afraid to do something because you haven't got a professional degree in it," he says.

Thanks in part to its experimental wing, philosophy is becoming a less-insular discipline. Granted, its insularity can be overstated; bioethicists regularly interact with physicians. Yet many scientists and social scientists find philosophy to be a hermetic field, and experimental philosophy opens a door. One meeting place is the Moral Psychology Research Group, founded in 2003, which includes academic psychologists like UVa's Jonathan Haidt, Richard Nisbett (of the University of Michigan), and Josh Greene (Harvard), as well as empirically minded philosophers.

"Something that has always frustrated me with reading philosophy is that it's a mixture of logical inference and just description of intuitions," says Haidt. "And often my intuition would differ from that of the philosophers. It would seem like a step from tight link to tight link. but one-quarter of the links were up for grabs." Now that the x-phi'ers have embraced experimental techniques, however, they "are producing work of interest to our side of the fence as well."

Haidt, who studies the balance between intuitive or emotional responses and reasoning in moral decisions, has come up with the following x-phi-like results: Low-income Americans are more likely to think there is something seriously wrong with cooking and eating the family dog, should it be hit by a car, than are high-income Americans (who may be overriding their revulsion with the reasoned argument that no one is hurt by the dinner). More recently he has explored the differences in moral reasoning between liberals and conservatives, finding (unshockingly) that conservatives are more interested in principles of loyalty and purity than liberals are. Significantly more conservatives than liberals, for example, say they would never accept a transfusion of blood from a child molester, no matter how much money they were offered.

And John Doris, a philosopher at Washington University in St. Louis and another member of the moral-philosophy working group, has drawn on findings from social psychology to question the very underpinnings of Aristotelian "virtue ethics." Perhaps no theory that relies on stable, stout character can survive once psychologists have shown that even seminary students who have just heard a sermon on the Good Samaritan will step over a man in need if they are in a hurry.

A key question for experimental psychology is how it proposes to get from descriptive findings to philosophically sound conclusions about what we ought to do, or what ought to count as sound knowledge.

So far, it appears, the discipline tends to be better at tearing down such conclusions, or trying to. Mallon, Nichols, Stich, and Edouard Machery, of the University of Pittsburgh, for example, have taken aim at one of the most-famous philosophical theories regarding "reference," which comes into play every time people open their mouths to speak. Only a few decades ago, most philosophers adhered to the theory that a term refers to a person or thing when it offers the best fit with the qualities or properties of that person or thing.

The philosopher Saul Kripke, of the Graduate Center of the City University of New York, upended that theory, arguing that for a reference to be successful, it merely needed to be part of a chain of comprehensible usages of the term, passed from person to person. No one in the chain need know any of the descriptive details about the figure in question — which is why people who could not relate a single detail about Cicero's life can still use his name and be referring to the same historical figure a classical scholar knows intimately.

In one thought experiment, Kripke asked readers to think of Kurt Gödel, the logician who devised the numerical "incompleteness theory." What if an unknown figure named Schmidt had, in fact, created that theory, and Gödel had stolen it? Once we knew that, if we said "Gödel," would we then be referring to Schmidt, who, after all, now fit the description of Gödel better than Gödel himself? No, Kripke argued, we would still be referring to Gödel. Case closed, most philosophers have agreed.

In surveys, however, Machery, Mallon, Nichols, and Stich found that while American college students tended to respond to the thought experiment as Kripke predicted, English-speaking students in Hong Kong answered quite differently. A majority said "Gödel" would actually refer to Schmidt. A substantial minority of American students also agreed with that intuition.

Why, Stich and his collaborators conclude, should we privilege the intuitions of Western philosophers, or even Westerners in general, over those of Hong Kong students — and perhaps over those of most Asians? (His thinking has been influenced by the work of the psychologist Richard E. Nisbett, who has argued

that Asians and Westerners categorize their observations of the world quite differently.) "I'm not going to hold my breath," says Stich, "while you come up with a theory why a third of the world's population is wrong on this question."

Commentary on this paper and related ones by the same authors has been flourishing. In one draft paper, CUNY's Michael Devitt offers several objections. One is that the Gödel example is a minor one among many that Kripke offered to defend his theory. Devitt also argues that, in the end, the question remains: Which theory of reference best explains the way humans use language — a question that, he suggests, may yet require some philosophical training and argumentation to resolve. As Kirk Ludwig, a professor of philosophy at the University of Florida, put it last year, commenting on the same papers, "[We] must ultimately return to the first-person approach to achieve the goals we set ourselves in philosophy." In other words: Back to the armchair.

At a recent gathering of the Society for Philosophy and Psychology, Brian Scholl, a Yale psychologist who studies visual perception, raised an even more fundamental objection to the kind of work typified by many x-phi papers: They are overreliant on surveys, which are unreliable precisely for the reasons experimental philosophers notice in other contexts: The people who take them can be swayed by all sorts of un-pin-downable factors. Although he thinks much work in x-phi is "fantastic," he wrote in comments posted on the Experimental Philosophy blog this month, "I worry that these sorts of methods end up telling you less about the psychological processes that underlie the philosophically relevant intuitions — and more about the psychology of how people cope with being asked strange questions."

Expect the experimental philosophers to argue back, adjust some of their approaches in response, and soldier on. They say they are well past the point where an objection or two can cause the movement to implode. "This is one of the best parts of experimental philosophy," says John Mikhail, who teaches at the Georgetown University Law Center, and whose work translates people's complex responses to moral thought experiments into algorithms. "Younger people are not taking 'no' for an answer."

Christopher Shea, a journalist in Washington, writes The Boston Globe's *"Brainiac" column.*

http://chronicle.com
Section: The Chronicle Review
Volume 55, Issue 6, Page B9

http://chronicle.com/free/v55/i06/06b00901.htm

Reading shouldn't be a numbers game

Applying numerical ratings to books does nothing to help kids read better.
By Regina Powers
September 30, 2008

School has started. I can tell because frazzled parents drag their embarrassed children up to the reference desk at my library to ask, "Where are the fifth-grade books? We need a 5.6 level that's worth at least 7 points."I avoid frustrating both parties with an explanation of how the Dewey decimal system works, and ask the child, "What do you *like* to read?" The response from both adult and child is all too often a blank expression.
Although I am elated that many families are visiting my public library more frequently because schools send them, I am disturbed at how infrequently parents and teachers are allowing young readers to *choose* what to read.During the summer, children were excited about reading because, freed from school requirements, they decided what to read. Being able to choose their favorite author, genre or topic seemed to empower them to read more. Now with school back in session, finding a book again involves navigating through a labyrinth of point values and reading levels.

How did it come to this?

More than 50 years ago, educators nationwide created complicated mathematical formulas to identify a text's reading level. Some of these formulas were originally used to develop science textbooks that could be more easily understood by young students. Today, there are more than 200 readability formulas. Computers make using these formulas convenient for schools to apply them to literature. But mathematical readability formulas are still limited to merely counting the number of words and syllables. They are not advanced enough to measure language complexity or content.In 2001, California started assigning reading levels to every public school student, grades 2 to 11. The state matches results from the annual Stanford 9 test to the Lexile Reading Framework and assigns each child a California Reading List number. Some schools also purchase optional programs such as Accelerated Reader and Reading Counts. The idea is to assist parents and students in selecting books tailored to match the level of each student.

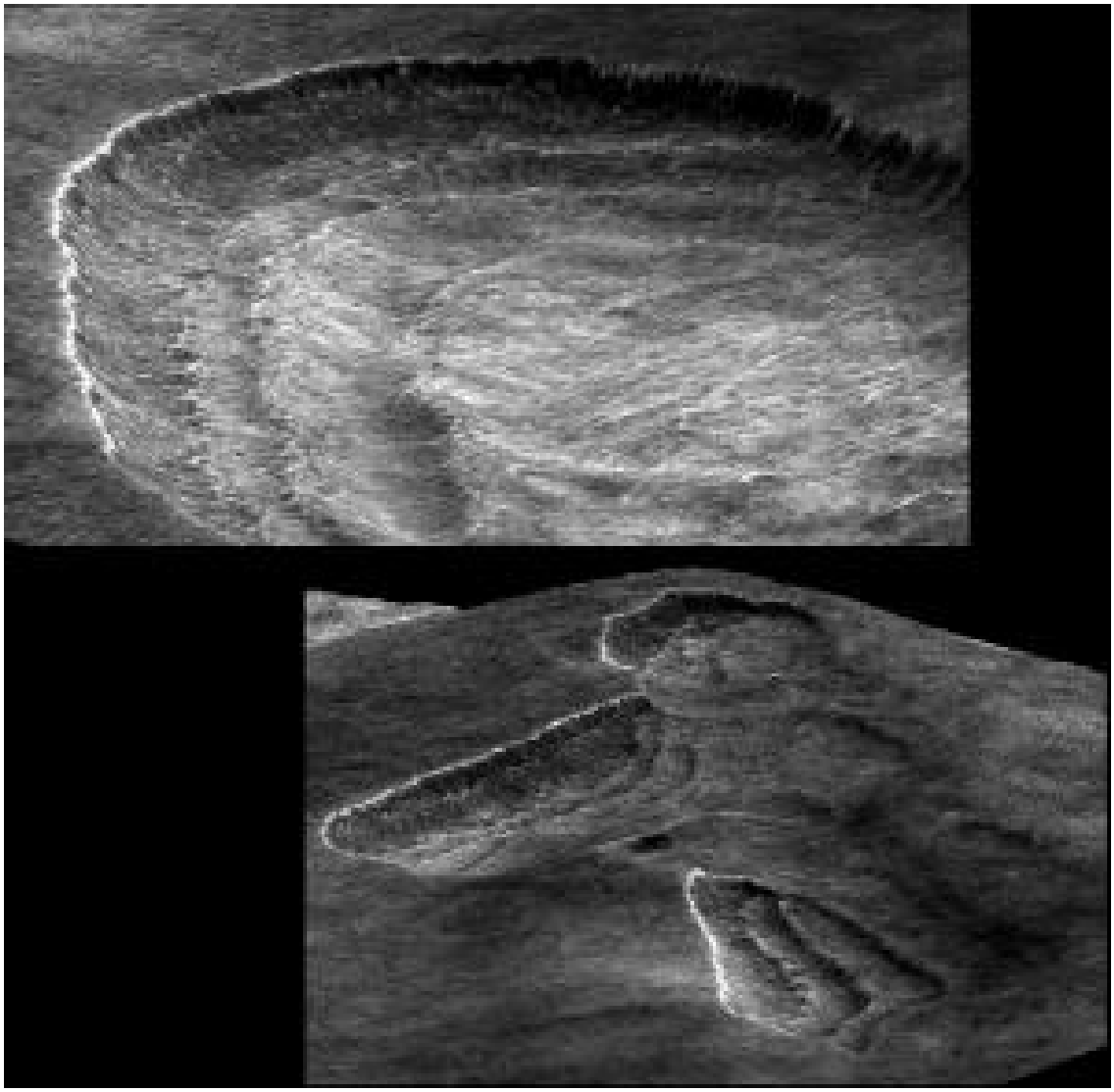
However, these programs and their measurements are restrictive and confusing. For example, the California Reading List book selections, each given a Lexile number, are mostly older titles that are no longer in print. Another problem is that the programs assign different numbers to the same book. "The Magician's Nephew" from the Narnia series by C.S. Lewis, for example, is a 790 Lexile level, a 5.6 Reading Counts level and a 5.4 Accelerated Reader level. "The Lion, the Witch and the Wardrobe," the next book in the series, is listed as 940 Lexile, 6.1 Reading Counts and 5.7 AR. The guidelines could prohibit a child who enjoyed the first novel from reading its sequel because of the conflicting reading levels. If this weren't complicated enough, the optional reading programs award incentive points for reading and successfully completing a book's corresponding electronic quiz. And because schools have spent a lot of money on these programs, teachers often push students to participate. The most damaging consequence of this practice is when teachers require all students to earn a certain number of points as part of their reading grade. This increasingly ubiquitous approach results in students reading a book based solely on the number of points its quiz is worth.

Reading is supposed to be a pleasurable habit. California's reading scores have remained flat since 1971. Research verifies that comprehension and reading test scores improve when students simply read more. So let's encourage reading by allowing kids to choose what to read, unimpeded by the pressure of points, levels and quizzes.

Regina Powers is a teacher and children's librarian in Orange County.

http://www.latimes.com/news/opinion/la-oe-powers30-2008sep30,0,4605947.story

Mars: Ancient And Ongoing Processes That Shape Planet Surface



3D view of a few scallops. The ridges are asymmetrical with a steeper, shorter, scarp-facing-slope and form steps on the scallop floor (HiRISE image PSP_001938_2265 overlaid on a HiRISE DEM). (Credit: NASA/JPL/University of Arizona)

ScienceDaily (Oct. 1, 2008) — The unprecedented image quality of the High Resolution Imaging Science Experiment (HiRISE) carried by NASA's Mars Reconnaissance Orbiter is helping scientists make leaps forward in understanding both the ongoing and ancient processes that shaped the surface of Mars.

Professor Alfred McEwen, HiRISE's Principal Investigator, highlighted some of the most recent results at the European Planetary Science Congress in Münster on September 24th.

A study of the nature and distribution of ancient megabreccia, led by McEwen at the University of Arizona, suggests that this bedrock was formed during the late heavy bombardment period. Megabreccia consists of angular, randomly-orientated blocks that formed suddenly in energetic events such as

meteorite impacts. It is thought to contain fragments of the oldest and deepest bedrock exposed on the surface of Mars.

"We think that the megabreccia was formed during a period of heightened meteorite activity about 3.9 billion years ago. This is around the time life appears to have begun on Earth, but we have very little record of that era in our terrestrial geology because ancient rocks are heavily metamorphosed. Mars preserves a much better record of the heavy bombardment and, unlike the dry lunar surface, it shows the environmental effects in a water-rich crust," said McEwen.

The HiRISE team has identified megabreccia in more than 50 locations consistent with the most ancient terrains on Mars. These include the central uplifts of large craters and deep exposures such as the floor of parts of Valles Marineris. Well-exposed rock outcrops are needed to identify megabreccia, in particular from the diversity of colours and textures indicating diverse rock types.

Megabreccia contains rock fragments from the earliest geological period on Mars, the Noachian era, which is more than 3.8 billion years ago.

The megabreccia blocks vary in size from relatively small (1-5 metres) to larger than 10 metres in diameter. The blocks are cemented in a matrix of finer material. The small blocks were probably formed by post Noachian cratering, particularly when found in material filling crater floors. The large blocks are only found in locations consistent with hard, deep bedrock, such as the central uplifts. McEwen suggests that the blocks are largely cemented by melt from impacts and hydrothermal alteration.

"We are in the midst of a paradigm shift in understanding the Noachian crust of Mars, thanks to the high-resolution data from the Mars Express and MRO missions. The spectrometers on these missions found evidence of alteration due to water in the bedrock in many, if not most Noachian aged places. However, the younger Noachian era may have been relatively dry, so we may need to study the oldest outcrops of megabreccia to understand this era."

McEwen will also be presenting results of processes that may be shaping the surface of Mars today. A study led by Dr Alexandra Lefort, a researcher in the team of Professor Nicolas Thomas of the University of Bern, has shown that scallop-shaped features found in mid-latitudes on Mars are likely to be formed by the sublimation of shallow ice.

HiRISE imagery shows the scallops have steep polar-facing scaps and gentle equatorial-facing rises. Groups of scallops appear to be separated by areas of knobbly ground. Lefort and colleagues studied scallops in the western part of a region called Utopia Planitia, between 40-55 degrees north.

Lefort said, "We have developed a model where a small hummock on the landscape becomes warmer on the equatorial-facing side. As the fraction of ice in the subsurface sublimates, the ground slumps leaving an asymmetric scallop-shaped hollow. The equatorial-facing slope continues to erode, lengthening out the shape. Near the polar-facing scarp, the depression is deepest and coldest and the underlying ice is most stable. Higher ice concentrations near the scarp leads to the development of a fine network of polygonal-shaped cracks across the floor and this may make the scarp more fragile and prone to landslides. Eventually, neighbouring scallops can coalesce"

Large parts of the mid and high-latitudes of Mars are covered by an erosion-resistant mantle deposit perhaps metres thick in places. This layer consists of ice and dust, with concentrations equivalent to around 4 percent water at 40 degree latitudes, ranging to 20 percent water at 60 degree latitudes. It is unclear as yet whether the scallops form in the ice-rich mantle or in ground that is rich in ice due to some other process

Unlike Earth, Mars has a significant variation in the angle at which its rotational axis is tilted relative to the plane of its orbital axis, known as its obliquity. Over periods of tens of millions of years, this angle can vary from nearly vertical to almost 60 degrees. Models have shown that ice is most stable at lower latitudes during periods of high obliquity. The axis of Mars is currently tilted at an angle of 25.2 degrees, an intermediate obliquity, which means that it is possible that these scallop-forming erosion processes are continuing today.

Dr Kathryn Fishbaugh presented results suggesting that the presence of thick, erosion resistant layers called marker beds, which are found at regular intervals through the north polar layered deposits, are linked to changes caused by periodic fluctuations in the planet's orbital orientation.

The marker beds are separated by 20-30 metres and are 5-10 metres thick, without any evidence of finer-scale layering within them. This suggests that they have either been deposited quickly or that a coating layer is shrouding evidence of fine layering. Between the marker beds are thinner layers with a thickness of a metre or less.

Fishbaugh and colleagues have found an intriguing resonance between the ratio of marker beds to fine layers (20,30:1) and the ratio of the orbital inclination to the precessional period of Mars's axis (23:1).

"From our observations, it looks like marker beds are formed on Mars when its orbit is relatively flat with respect to the equatorial plane and its axis is relatively upright. But this makes it hard to explain why these layers are so tough. It's easier to explain the resistance to erosion of they were formed during periods of high obliquity. With more observations, we hope to answer this question."

Adapted from materials provided by Europlanet.

http://www.sciencedaily.com:80/releases/2008/09/080924085547.htm

Continuous Glucose Monitoring In Diabetic Pregnant Women Lowers Risk Of Complications

ScienceDaily (Oct. 1, 2008) — Continuous glucose monitoring as part of antenatal care for women with diabetes improves maternal blood glucose control and lowers birth weight and risk of macrosomia* (excessive birth weight in babies), according to a study published on the British Medical Journal website.

During pregnancy it is important that women with diabetes keep their blood glucose under control. If not, there may be an increase in the amount of glucose reaching the baby, which makes the baby grow faster than normal, and may cause difficulties at birth as well as an increased longer term risk of insulin resistance, obesity and type 2 diabetes.

Evidence suggests that measuring glucose more often improves outcomes, but the optimum frequency of blood glucose testing is not known.

Dr Helen Murphy and colleagues examined whether continuous glucose monitoring during pregnancy can improve maternal glucose control and reduce birth weight and risk of macrosomia in babies of mothers with diabetes.

They recruited 71 pregnant women with type 1 and type 2 diabetes from antenatal clinics in the UK.

The women were randomly assigned to standard antenatal care (intermittent self monitoring of glucose levels using the finger prick technique) or intermittent monitoring plus continuous glucose monitoring (using glucose values from subcutaneous tissues measured electronically every 10 seconds, giving up to 288 measurements a day).

Continuous glucose monitoring was used as a tool to aid patient education and optimise lifestyle and therapeutic management of blood glucose levels.

The researchers found that women in the continuous glucose monitoring group had lower mean levels of HbA1c (a measure of the amount of glucose attached to red blood cells) from 32 to 36 weeks' gestation, and improved blood glucose control during the third trimester, compared to women receiving standard antenatal care.

Babies of mothers who had continuous monitoring also had lower birth weight and reduced risk of macrosomia.

But because macrosomia rates were still 3.5 times higher in women using continuous glucose monitoring than in the general maternity population it shows that standard interventions including diet and insulin have failed to reduce rates of macrosomia enough, say the authors. This emphasises the need for novel educational and technological interventions especially in women with long duration type 1 diabetes, they add.

This trial provides evidence of the lasting benefits of continuous monitoring for the babies of mothers with diabetes and is a potentially important target for public health strategies that aim to reduce the burden of obesity in childhood, say the authors.

In an accompanying editorial, Professor Mario Festin says that continuous glucose monitoring increases the consistency and accuracy of glucose measurement which is vital for the nutritional and drug management of diabetes in pregnancy.

Continuous glucose monitoring is relatively cheap compared with a clinic based monitoring system and more widespread use may make it more affordable even in developing countries, he concludes.

*Macrosomia or big baby syndrome refers to babies with a birth weight above the 90th percentile (the weight above which you expect only 10% of babies to be born) and it is the commonest complication of pregnancy in women with diabetes.

Adapted from materials provided by BMJ-British Medical Journal, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com/releases/2008/09/080925214825.htm

Experiment Demonstrates 110 Years Of Sustainable Agriculture

ScienceDaily (Oct. 1, 2008) — A plot of land on the campus of Auburn University shows that 110 years of sustainable farming practices can produce similar cotton crops to those using other methods.

In 1896, Professor J.F. Duggar at the Agricultural and Mechanical College of Alabama (now Auburn University) started an experiment to test his theories that sustainable cotton production was possible on Alabama soils if growers would use crop rotation and include winter legumes (clovers and/or vetch) to protect the soil from winter erosion.

Today, his experiment on the campus of Auburn University is the oldest, continuous cotton experiment in the world and the third oldest field crop experiment in the United States on the same site. The experiment, known as "the Old Rotation," has continued with only slight modifications in treatments and was placed on the National Register of Historical Places in 1988.

Researchers at Auburn University and at USDA-Soil Dynamics Laboratory in Auburn, AL, have prepared the first ever comprehensive research publication covering the entire 110-yr history of this experiment. It was published in the September-October issue of Agronomy Journal, and provides insight into issues both past and present that effect sustainable crop production in the South.

The thirteen plots in the Old Rotation include (i) continuous cotton, (ii) a 2-yr rotation of cotton with corn, and (iii) a 3-year rotation of cotton-corn-wheat-soybean. These crop rotations include treatments with and without winter legumes (usually crimson clover and/or vetch) and with and without fertilizer nitrogen.

After more than 110 years, the Old Rotation continues to document the long-term effects of crop rotation and winter legumes on cotton production in the Deep South. It provides growers, students, and faculty with a living demonstration of fundamental agronomic practices that result in sustainable crop production. Long-term yields indicate that winter legumes are as effective as nitrogen fertilizer in producing non-irrigated, 10-yr average cotton yields of 1,100 pounds lint per acre. Winter legumes and crop rotations contribute to increased soil organic matter. Higher soil organic matter results in higher crop yields.

In 1997, the Old Rotation entered a new era of agricultural production where boll weevil eradication, genetically modified crops, and conservation tillage almost eliminated the need for the plow and pesticides. In 2003, irrigation was added to half of each plot. Yields of cotton, corn, wheat and soybean continue to increase far beyond the yields of Professor Duggar's generation. Since initiating conservation tillage practices in 1997, all-time, non-irrigated record yields have been made on all the crops grown on the Old Rotation: 1,710 pounds cotton lint per acre in 2006, 95 bushels wheat per acre in 2001, 236 bushels corn per acre in 1999, and 67 bushels of double-cropped soybean per acre in 1997 after wheat.

Journal reference:

1. Mitchell, Charles C., Delaney, Dennis P., Balkcom, Kipling S. **A Historical Summary of Alabama's Old Rotation (circa 1896): The World's Oldest, Continuous Cotton Experiment**. *Agronomy Journal*, 2008; 100 (5): 1493 DOI: 10.2134/agronj2007.0395

Adapted from materials provided by American Society of Agronomy.

http://www.sciencedaily.com/releases/2008/09/080929123945.htm

Alternative To Burning: Environmentally Sound Disposal For Wood Chips

Mature pecan trees. (Credit: Howard F. Schwartz, Colorado State University, Bugwood.org)

ScienceDaily (Oct. 1, 2008) — Pecan and other hickory woods are the third most popular hardwood group in the United States, behind only black walnut and black cherry. Used in production of beautiful hardwood flooring and furniture, pecan is highly valued for its durability and strength.

The pruned wood of pecan, a byproduct of forested trees, is usually burned as an economical means of disposal. Increasingly though, pruned pecan is being chipped and incorporated into the soil as an environmentally viable method of handling the waste. Although more expensive than burning, chipping and soil incorporation avoid burning controls recently imposed by many states and the Environmental Protection Agency. To adhere to current EPA regulations, more producers are looking to chipping and incorporation of pruned wood as an alternative to burning. The practice has gained acceptance in many areas of the United States, including the San Joaquin Valley California, where strict environmental regulations have forced growers to adopt alternative ways to deal with waste.

Mohammed B. Tahboub, Department of Soil and Crop Sciences at Texas A&M University, William C. Lindemann, Department of Plant and Environmental Sciences, New Mexico State University, and Leigh Murray, Department of Statistics, Kansas State University, recently published a research study they designed to determine how pecan wood incorporation into the soil would affect soil organic matter content, chemical and physical properties, and whether this practice might present an alternative to burning.

The research study involved incorporating pecan chips into silty clay soil at differing rates. Results indicated that incorporating pecan chips had little effect on soil moisture content, but the soil had an inherently high capacity to hold water. Pecan wood chip incorporation significantly increased soil organic matter content and aggregate stability, particularly at the higher application rates and with repeated

amendment. The incorporation of pecan pruning wood into the soil appeared to improve soil tilth and aggregation while providing growers with an environmentally acceptable means of disposal.

The practice may be an environmentally sound solution, but there is a downside. Lindemann observed; "chipping and incorporation (of wood waste) is an alternative to burning, but the practice is expensive. Depending on the size and quantity of wood and the type of self-propelled chipper, the estimated cost for chipping and incorporation in New Mexico is $120-200 per acre, whereas dragging the pruned wood to the end of the field for burning costs $30-50 per acre."

A previous article published in HortScience addressed the nutritional aspects of burning wood chips. Concerns that incorporation of wood chips would tie up nutrients proved not to be the case. According to Lindemann, further research may help refine the practices outlined in the study. He summarized; "the influence of pecan wood chip incorporation must be viewed over several years and with repeated applications for a clear picture of the beneficial and detrimental effects of this disposal method."

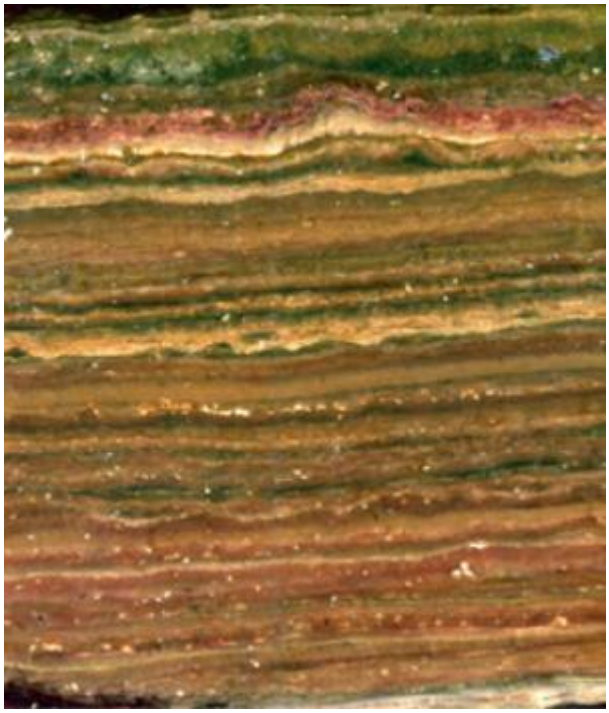
Journal reference:

1. Trout, Thomas J., Johnson, Lee F., Gartung, Jim. **Remote Sensing of Canopy Cover in Horticultural Crops**. *HortScience*, 2008; 43: 333-337 [link]

Adapted from materials provided by American Society for Horticultural Science, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com/releases/2008/09/080929104615.htm

Microbes 'Run The World': Metagenomics Increasingly Used To Characterize Them



A cross-section of a hypersaline Guerrero Negro microbial mat. (Credit: Image courtesy of DOE/Joint Genome Institute)

ScienceDaily (Sep. 30, 2008) — Mostly hidden from the scrutiny of the naked eye, microbes have been said to run the world. The challenge is how best to characterize them given that less than one percent of the estimated hundreds of millions of microbial species can be cultured in the laboratory.

The answer is metagenomics—an increasingly popular approach for extracting the genomes of uncultured microorganisms and discerning their specific metabolic capabilities directly from environmental samples. Now, some ten years after the term was coined, metagenomics is going mainstream and already paying provocative dividends according to the U.S. Department of Energy Joint Genome Institute (DOE JGI) microbial ecology program head Philip Hugenholtz and MIT researcher Gene Tyson, published in the September 25 edition of the journal Nature.

"By employing the techniques of metagenomics we can go beyond the identification of specific players to creating an inventory of the genes in that environment," said Hugenholtz. "We find that genes occurring more frequently in a particular community seem to confer attributes beneficial for maintenance of the function of that particular ecological niche."

Hugenholtz and Tyson were part of the team assembled by University of California, Berkeley geochemist Jillian Banfield to investigate microbial communities associated with the acid mine drainage of Iron Mountain in far Northern California in 2004. In the dank recesses of the mine, protected by moon suits from the highly acidic effluent, the researchers scooped up pink biofilm growing on the surface of acid mine drainage streams.

Extracting the nucleic acid from the sample and directing DOE JGI's powerful DNA sequencing resource on them, the Banfield team was able to reconstruct the metabolic profiles of the organisms living under such inhospitable conditions—like putting many Humpty-Dumpties back together again. Their findings,

published in Nature 428, 37 - 43 (01 Feb 2004), showed that reconstructing the genomes of dominant populations from the environment was feasible and that the imprints of evolutionary selection could be discerned in these genomes.

Since this pioneering work, DOE JGI has gone on to characterize many other metagenomes with other newly selected targets in the sequencing queue at the Walnut Creek, Calif. Production Genomics Facility. These range from the hindguts of termites, to plumb for microbes producing cellulose-degrading enzymes, likewise to microbial communities in the cow rumen, foregut of the Tammar Wallaby, and the crop of the Hoatzin, the Amazon stinkbird. Beyond guts, the DOE JGI, through its Community Sequencing Program is enabling metagenomic explorations of Lake Washington near Seattle, Antarctica's Lake Vostok, and the Great Salt Lake, in addition to the hypersaline mats at Guerrero Negro, Baja California. A video podcast of the Lake Vostok CSP project is featured on the DOE JGI site.

Responding to the steadily increasing need to manage and interpret the terabases and terabytes of metagenomic data now bubbling up into the public domain, DOE JGI launched the Integrated Microbial Genomes with Microbiome Samples data management and analysis system. IMG/M provides tools for analyzing the functional capability of microbial communities based on the DNA sequence of the metagenome in question.

"Metagenomic tools are becoming more widely available and improving at a steady pace," said Hugenholtz. "But, there are still computational and other bottlenecks to be addressed, such as the high percentage of uncharacterized genes emerging from metagenomic studies."

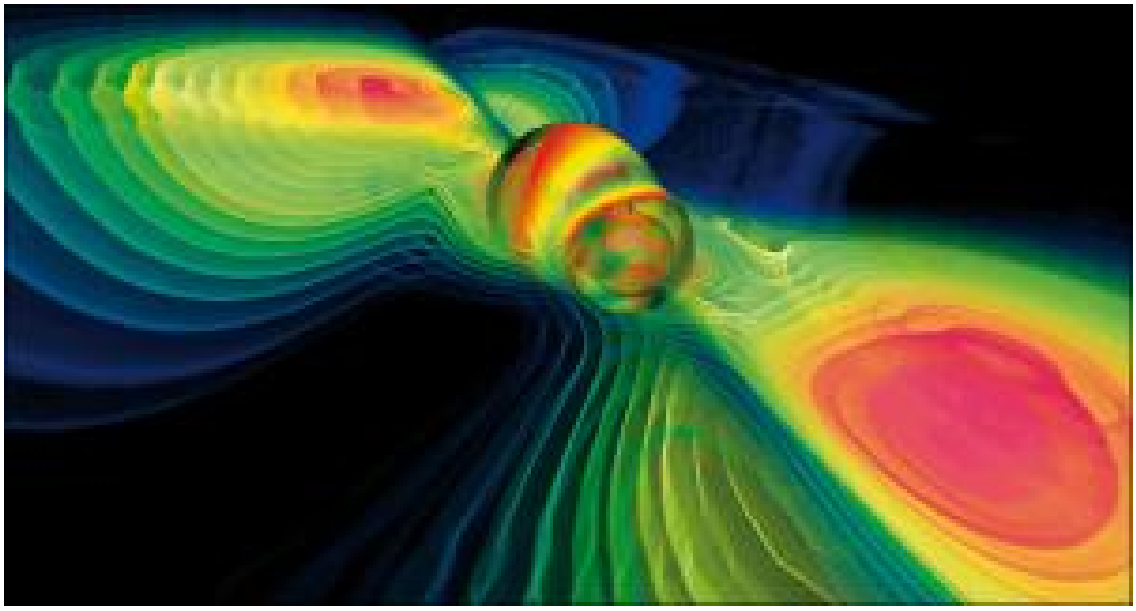
In the Nature piece, Hugenholtz and Tyson go on to cite the emergence of next generation sequencing technologies that are already creating a deluge of data that has outstripped the computational power available to cope with it.

"Nevertheless, it's not necessary to compare all the data to glean useful biological insights," Hugenholtz said. "What we can capture will help steer the direction toward a relevant data subset to investigate. At least with metagenomics, we have the environmental genetic blueprints awaiting our interpretation. We are still far from capturing and characterizing the dazzling diversity of the microbial life on earth—but at least we have hit upon the gold standard for scratching the surface."

Adapted from materials provided by DOE/Joint Genome Institute.

http://www.sciencedaily.com/releases/2008/09/080925104313.htm

The 'Magnificent Seven' Of European Astroparticle Physics Unveiled To The World



Modelling of gravitational waves. Will we be able to detect gravitational waves? (Credit: MPI for Gravitational Physics/W.Benger-ZIB)

ScienceDaily (Sep. 30, 2008) — Today Europeans presented to the world their strategy for the future of astroparticle physics. What is dark matter? What is the origin of cosmic rays? What is the role of violent cosmic processes? Can we detect gravitational waves?

With seven types of major large-scale projects physicists want to find the answers to some of the most exciting questions about the Universe:

- CTA, a large array of Cherenkov Telescopes for detection of cosmic high-energy gamma rays
- KM3NeT, a cubic kilometre-scale neutrino telescope in the Mediterranean Sea
- Ton-scale detectors for dark matter searches
- A ton-scale detector for the determination of the fundamental nature and mass of neutrinos
- A Megaton-scale detector for proton decay's search, neutrino astrophysics & investigation of neutrino properties
- A large array for the detection of charged cosmic rays
- A third-generation underground gravitational antenna

"New exciting discoveries lie ahead; it is up to us to take the lead on them in the next decade." says Christian Spiering from DESY – Germany, Chairman of the Roadmap Committee. After two years of roadmap process, the publication of The European Strategy for Astroparticle Physics is an important step for the field outlining a leading role for Europe in this increasingly globalised endeavour.

From undersea and underground laboratories to the most isolated deserts and outer space, astroparticle physics experiments accept very exciting challenges. It is a promising and rapidly growing field of research at the intersection of particle physics, cosmology and astrophysics, aiming to detect the most elusive particles, and to penetrate the most intimate secrets of the Universe.

To insure the coordination of astroparticle physics at the European level, research agencies from 13 countries joined their efforts within the ASPERA* European network, an ERA-Net funded by the

European Commission. Thanks to the work achieved through ASPERA*, European countries for the first time have a common tool to programme jointly and share their efforts in astroparticle physics.

This ambitious programme will gather European countries to open new exciting windows to the Universe, and the most advanced projects such as CTA (high-energy gamma rays) and KM3NeT (high-energy neutrinos) could start construction by 2012. The complete funding of this billion-scale programme would need a smooth yearly increase of current investments for astroparticle physics, amounting to an integrated increase of about 50% in a ten-year period.

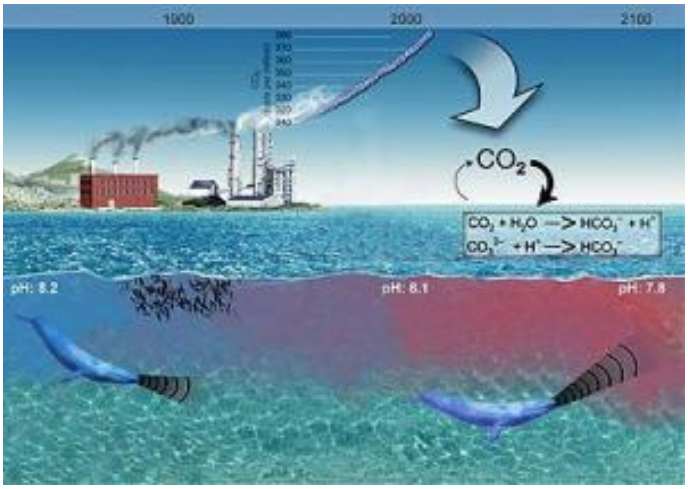
"The timely realization of the Magnificent Seven is a big challenge" says the coordinator of ASPERA Prof. Stavros Katsanevas (IN2P3/CNRS) - France, "But we are confident that none will be killed contrary to what happens in the film, as the European agencies and ApPEC* support these priorities and the same also emerge in other continents. It is important that we coordinate and share costs not only inside Europe but on a global scale."

European astroparticle physicists also affirmed their support to Earth- and space-based missions to explore the phenomenon of "dark energy", to the concept of a cooperative network of deep underground laboratories, and to a common call for innovative technologies in the field of astroparticle physics. In addition, they declared their wish to see the formation of a European Centre for Astroparticle Physics Theory.

Adapted from materials provided by CERN.

http://www.sciencedaily.com/releases/2008/09/080929095916.htm

Sounds Travel Farther Underwater As World's Oceans Become More Acidic



This illustration shows how increasing carbon dioxide in the atmosphere leads to an increase in the acidity of seawater, which in turn allows sounds (such as whale calls) to travel farther underwater. Image: (Credit: Copyright 2008 MBARI; Base image courtesy of David Fierstein)

ScienceDaily (Sep. 30, 2008) — It is common knowledge that the world's oceans and atmosphere are warming as humans release more and more carbon dioxide into the Earth's atmosphere. However, fewer people realize that the chemistry of the oceans is also changing—seawater is becoming more acidic as carbon dioxide from the atmosphere dissolves in the oceans.

According to a paper to be published this week by marine chemists at the Monterey Bay Aquarium Research Institute, these changes in ocean temperature and chemistry will have an unexpected side effect—sounds will travel farther underwater.

Conservative projections by the Intergovernmental Panel on Climate Change (IPCC) suggest that the chemistry of seawater could change by 0.3 pH units by 2050 (see below for background information on pH and ocean acidification). In the October 1, 2008 issue of Geophysical Research Letters, Keith Hester and his coauthors calculate that this change in ocean acidity would allow sounds to travel up to 70 percent farther underwater. This will increase the amount of background noise in the oceans and could affect the behavior of marine mammals.

Ocean chemists have known for decades that the absorption of sound in seawater changes with the chemistry of the water itself. As sound moves through seawater, it causes groups of atoms to vibrate, absorbing sounds at specific frequencies. This involves a variety of chemical interactions that are not completely understood. However the overall effect is strongly controlled by the acidity of the seawater. The bottom line is the more acidic the seawater, the less low- and mid-frequency sound it absorbs.

Thus, as the oceans become more acidic, sounds will travel farther underwater. According to Hester's calculations, such a change in chemistry will have the greatest effect on sounds below about 3,000 cycles per second (two and one half octaves above "middle C" on a piano).

This range of sounds includes most of the "low frequency" sounds used by marine mammals in finding food and mates. It also includes many of the underwater sounds generated by industrial and military activity, as well as by boats and ships. Such human-generated underwater noise has increased dramatically over the last 50 years, as human activities in the ocean have increased.

The MBARI researchers say that sound already may be traveling 10 percent farther in the oceans than it did a few hundred years ago. However, they predict that by 2050, under conservative projections of ocean acidification, sounds could travel as much as 70 percent farther in some ocean areas (particularly in the Atlantic Ocean). This could dramatically improve the ability of marine mammals to communicate over long distances. It could also increase the amount of background noise that they have to live with.

There are no long-term records of sound absorption over large ocean areas. However, the researchers cite a study off the coast of California that showed an increase in ocean noise between 1960 and 2000 that was not directly attributable to known factors such as ocean winds or ships.

Hester's research shows once again how human activities are affecting the Earth in far-reaching and unexpected ways. As the researchers put it in their paper, "The waters in the upper ocean are now undergoing an extraordinary transition in their fundamental chemical state at a rate not seen on Earth for millions of years, and the effects are being felt not only in biological impacts but also on basic geophysical properties, including ocean acoustics."

This research was supported by grants from the David and Lucile Packard Foundation.

Ocean acidification: background information

Over the last century, cars, power plants, and a variety of human activities have released hundreds of billions of tons of carbon dioxide (CO2) into the Earth's atmosphere. In analyzing the effects of this planet-wide chemistry experiment, scientists discovered that about half of this CO2 has been absorbed by the world's oceans. In the last five or ten years, chemical oceanographers have come to the conclusion that adding carbon dioxide to the oceans has caused them to be more acidic, just as adding carbon dioxide to water causes the resulting soda water to become more acidic.

Chemists measure acidity using pH units, with a scale that runs from 0 (the most acidic) to 14 (the least acidic, or most basic). Neutral tap water, for example, has a pH of about 7. For comparison, lemon juice has a pH of about 2 and the acid in your car battery might have a pH of 0.8. Seawater, on the other hand, is usually slightly basic, with a pH of about 8.1.

Marine chemists (including MBARI's Peter Brewer) estimate that the pH of the world's oceans has already dropped by about 0.1 pH units since the beginning of the industrial revolution, about 250 years ago. They further estimate that the pH of the ocean may drop by another 0.2 pH units (to 7.9) by the year 2050. This may not seem like much of a change, but it could have significant impacts on corals and other marine organisms whose body chemistry is adapted to millions of years of relatively constant chemical conditions.

Journal reference:

1. K. C. Hester, E. T. Peltzer, W. J. Kirkwood, and P. G. Brewer. **Unanticipated consequences of ocean acidification: A noisier ocean at lower pH**. *Geophysical Research Letters*, Vol. 35, No. 31 (October 1, 2008)

Adapted from materials provided by Monterey Bay Aquarium Research Institute.

http://www.sciencedaily.com/releases/2008/09/080929144116.htm

Pain Is Not A Symptom Of Arthritis, Pain Causes Arthritis, Study Shows

Pain is more than a symptom of osteoarthritis, it is an inherent and damaging part of the disease itself, according to a new study. (Credit: iStockphoto/Sebastian Meckelmann)

ScienceDaily (Sep. 30, 2008) — Pain is more than a symptom of osteoarthritis, it is an inherent and damaging part of the disease itself, according to a study just published in journal Arthritis and Rheumatism. More specifically, the study revealed that pain signals originating in arthritic joints, and the biochemical processing of those signals as they reach the spinal cord, worsen and expand arthritis.

In addition, researchers found that nerve pathways carrying pain signals transfer inflammation from arthritic joints to the spine and back again, causing disease at both ends.

Technically, pain is a patient's conscious realization of discomfort. Before that can happen, however, information must be carried along nerve cell pathways from say an injured knee to the pain processing centers in dorsal horns of the spinal cord, a process called nociception. The current study provides strong evidence that two-way, nociceptive "crosstalk" may first enable joint arthritis to transmit inflammation into the spinal cord and brain, and then to spread through the central nervous system (CNS) from one joint to another.

Furthermore, if joint arthritis can cause neuro-inflammation, it could have a role in conditions like Alzheimer's disease, dementia and multiple sclerosis. Armed with the results, researchers have identified

likely drug targets that could interfere with key inflammatory receptors on sensory nerve cells as a new way to treat osteoarthritis (OA), which destroys joint cartilage in 21 million Americans. The most common form of arthritis, OA eventually brings deformity and severe pain as patients loose the protective cushion between bones in weight-bearing joints like knees and hips.

"Until relatively recently, osteoarthritis was believed to be due solely to wear and tear, and inevitable part of aging," said Stephanos Kyrkanides, D.D.S., Ph.D., associate professor of Dentistry at the University of Rochester Medical Center. "Recent studies have revealed, however, that specific biochemical changes contribute to the disease, changes that might be reversed by precision-designed drugs. Our study provides the first solid proof that some of those changes are related to pain processing, and suggests the mechanisms behind the effect," said Kyrkanides, whose work on genetics in dentistry led to broader applications. The common ground between arthritis and dentistry: the jaw joint is a common site of arthritic pain.

Study Details

Past studies have shown that specific nerve pathways along which pain signals travel repeatedly become more sensitive to pain signals with each use. This may be a part of ancient survival skill (if that hurt once, don't do it again). Secondly, pain has long been associated with inflammation (swelling and fever).

In fact, past research has shown that the same chemicals that cause inflammation also cause the sensation of pain and hyper-sensitivity to pain if injected. Kyrkanides' work centers around one such pro-inflammatory, signaling chemical called Interleukin 1-beta (IL-1β), which helps to ramp up the bodies attack on an infection.

Specifically, Kyrkanides' team genetically engineered a mouse where they could turn up on command the production of IL-1β in the jaw joint, a common site of arthritis. Experiments showed for the first time that turning up IL-1β in a peripheral joint caused higher levels of IL-1β to be produced in the dorsal horns of the spinal cord as well.

Using a second, even more elaborately engineered mouse model, the team also demonstrated for the first time that creating higher levels of IL-1β in cells called astrocytes in the spinal cord caused more osteoarthritic symptoms in joints. Past studies had shown astrocytes, non-nerve cells (glia) in the central nervous system that provide support for the spinal cord and brain, also serve as the immune cells of CNS organs. Among other things, they release cytokines like IL-1β to fight disease when triggered. The same cytokines released from CNS glia may also be released from neurons in joints, possibly explaining how crosstalk carries pain, inflammation and hyper-sensitivity back and forth.

In both mouse models, experimental techniques that shut down IL-1β signaling reversed the crosstalk effects. Specifically, researchers used a molecule, IL-1RA, known to inhibit the ability of IL-1β to link up with its receptors on nerve cells. Existing drugs (e.g. Kineret® (anakinra), made by Amgen and indicated for rheumatoid arthritis) act like IL-1RA to block the ability IL-1β to send a pain signal through its specific nerve cell receptor, and Kyrkanides' group is exploring a new use for them as osteoarthritis treatment.

The implications of this process go further, however, because the cells surrounding sensory nerve cell pathways too can be affected by crosstalk. If 10 astrocytes secrete IL-1β in response to a pain impulse, Kyrkanides said, perhaps 1,000 adjacent cells will be affected, greatly expanding the field of inflammation. Spinal cord astrocytes are surrounded by sensory nerve cells that connect to other areas of the periphery, further expanding the effect. According to Kyrkanides' model, increased inflammation by in the central nervous system can then send signals back down the nerve pathways to the joints, causing the release of inflammatory factors there.

Among the proposed, inflammatory factors is calcitonin gene related peptide (CGRP). The team observed higher levels calcitonin-gene related peptide (CGRP) production in primary sensory fibers in the same regions where IL-1β levels rose, and the release of IL-1β by sensory neurons may cause the release of CGRP in joints. Past studies in Kyrkanides reveal that CGRP can also cause cartilage-producing cells (chondrocytes) to mature too quickly and die, a hallmark of osteoarthritis.

Joining Kyrkanides in the publication from the University of Rochester School of Medicine and Dentistry were co-authors M. Kerry O'Banion, M.D., Ph.D., Ross Tallents, D.D.S., J. Edward Puzas, Ph.D. and Sabine M. Brouxhon, M.D. Paolo Fiorentino was a student contributor and Jennie Miller was involved as Kyrkanides' technical associate. Maria Piancino, led a collaborative effort at the University of Torino, Italy. This work was supported in part by grants from the National Institutes of Health.

"Our study results confirm that joints can export inflammation in the form of higher IL-1β along sensory nerve pathways to the spinal cord, and that higher IL-1β inflammation in the spinal cord is sufficient in itself to create osteoarthritis in peripheral joints," Kyrkanides said. "We believe this to be a vitally important process contributing to orthopaedic and neurological diseases in which inflammation is a factor."

Adapted from materials provided by University of Rochester Medical Center, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com/releases/2008/09/080929123935.htm

Ethnic Conflict Stoked By Government Economic Intervention, Not Globalization, Study Finds

ScienceDaily (Sep. 30, 2008) — Economic globalization and liberalization have been blamed for numerous social ills over the last two decades, including a sharp rise in interethnic violence in countries all over the world. Not so, say the results of a study conducted by researchers from McGill University and published in the current issue of the journal International Studies Quarterly.

In fact, according to Dr. Stephen Saideman and his former McGill Master's student David Steinberg – now pursuing his doctorate at Northwestern University – the more government intervention there is in the local economy, the more likely interethnic violence and rebellion becomes. Conversely, the more economically open a society is, the less likely such violence becomes.

"Our study counters the idea that a liberalized economy is worse for ethnic groups. Minorities are more likely to be on the outside of the political system," explained Saideman, associate professor and associate director of graduate studies in the Department of Political Science, and Canada Research Chair in International Security and Ethnic Conflict. "So, if the government is involved in the economy, minorities are more likely to be affected by the whims of the state than by the whims of the market."

Utilizing their own original research, along with the Minorities at Risk dataset compiled by their colleagues at the University of Maryland, Steinberg and Saideman's results show that government intervention in the economy leads to a spiral of political competition among groups to gain control of the state and the economic spoils it distributes.

"Thus groups on the outs feel threatened because they have no control, which can lead to open rebellion," Saideman said, "while those who are in power become terrified of losing control, as occurred in Serbia. Before the war the Serbs controlled a large hunk of the Yugoslav political system and it was their fear of losing it that led to war."

Moreover, the researchers said, their results were reasonably consistent in virtually every society they studied, regardless of political system.

"We're not just talking about command economies like the old Soviet Union or Yugoslavia," he said. "We control for regime type, so whether a country is a democracy or not, statistically and probabilistically, the more government involvement there is in the economy, the more likely ethnic conflict is."

Though interethnic violence is somewhat more likely to occur in less-developed economies, Saideman said, similar interventions even in the industrialized world have the potential to sow serious intergroup tensions.

"Ironically, look at how the government of the United States is now in the process of buying up a large hunk of the economy to bail out Wall Street," he said. "In the future this will give people who are denied loans or who have other economic grievances an incentive to blame the government. They won't consider factors like oil shocks and housing bubbles, it will all be laid on the government's doorstep."

Adapted from materials provided by McGill University.

http://www.sciencedaily.com/releases/2008/09/080929144118.htm

Mass Extinctions And The Evolution Of Dinosaurs

Illustration of a Tarbosaurus, a cousin of Tyrannosaurus Rex, chasing two Parasaurolophuses. (Credit: iStockphoto/Allan Tooley)

ScienceDaily (Sep. 30, 2008) — Dinosaurs survived two mass extinctions and 50 million years before taking over the world and dominating ecosystems, according to new research published this week.

Reporting in Biology Letters, Steve Brusatte, Professor Michael Benton, and colleagues at the University of Bristol show that dinosaurs did not proliferate immediately after they originated, but that their rise was a slow and complicated event, and driven by two mass extinctions.

"The sheer size of dinosaurs like Tyrannosaurus makes us think there was something special about these animals that preordained them for success right from the beginning," Brusatte said. "However, our research shows that the rise of dinosaurs was a prolonged and complicated process. It isn't clear from the data that they would go on to dominate the world until at least 30 million years after they originated."

Importantly, the new research also shows that dinosaurs evolved into all their classic lifestyles – big predators, long-necked herbivores, etc. – long before they became abundant or diversified into the many different species we know today.

Brusatte added: "It just wasn't a case of dinosaurs exploding onto the scene because of a special adaptation. Rather, they had to wait their turn and evolved in fits and starts before finally dominating their world."

Dinosaurs originated about 230 million years ago and survived the Late Triassic mass extinction (228 million years ago), when some 35 per cent of all living families died out. It was their predecessors dying out during this extinction that allowed herbivorous dinosaurs to expand into the niches they left behind.

The rapid expansion of carnivorous and armoured dinosaur groups did not happen until after the much bigger mass extinction some 200 million year ago, at the Triassic-Jurassic boundary. At least half of the species now known to have been living on Earth at that time became extinct, which profoundly affected life on land and in the oceans.

Historically the rise of the dinosaurs has been treated as a classic case in which a group evolves key features that allow it to rapidly expand, fill many niches, and out-compete other groups. But Professor Benton said the story isn't so simplistic: "We argue that the expansion of the dinosaurs took up to 50 million years and was not a simple process that can be explained with broad generalizations."

Adapted from materials provided by University of Bristol.

http://www.sciencedaily.com/releases/2008/09/080930102631.htm

Radiation Device May Customize Therapy, Enable Some To Avoid More Lengthy Treatment

Radiation device may customize therapy. (Credit: UCSD)

ScienceDaily (Sep. 30, 2008) — A study of the first approximately 100 patients who have received partial breast irradiation with a small, whisk-like, expandable device inserted inside the breast has shown that after one year, the device is effective at sparing nearby healthy tissue from the effects of radiation.

The device, called SAVI™, is aimed at providing customized radiation therapy while minimizing exposure to healthy tissue around the breast after a woman has received a lumpectomy for early stage cancer.

The findings, reported recently at the American Society of Clinical Oncology's 2008 Breast Cancer Symposium held in Washington, D.C., showed that nearly half of the women, because of their anatomy or the location of the tumor, would not have qualified for other such similar internal radiation therapy techniques and would have likely needed a much longer course of therapy.

The device is another option for women with early breast cancer who have received a lumpectomy to remove a cancer. Radiation specialists sometimes opt to give women internal radiation – a process called brachytherapy – with the goal of giving concentrated doses of radiation to areas of concern while avoiding healthy tissue such as the heart, lungs, ribs and skin.

In the study, the researchers found that the Food and Drug Administration-approved SAVI, which consists of flexible catheters through which radiation is given, is easy to use and enabled them to change the dosages according to the woman's needs. They saw very little radiation burning of the skin and a low infection rate. In addition, it allows women to have treatment twice daily for five days rather than daily for six weeks.

"The problem with other internal radiation methods is that women with small breasts, or with a tumor bed near the breast surface, would get skin burns with the standard device," said Catheryn Yashar, M.D., assistant professor of radiation oncology and chief of breast and gynecological radiation services at the Moores Cancer Center at the University of California, San Diego, who led the work. "The SAVI device

was created to overcome those downsides. It enables specialists to shape the radiation to the shape and size of the woman's tumor and still miss healthy tissue.

"These findings emphasize the fact that we could expand the patient population eligible for partial breast irradiation because of the SAVI," Yashar said.

In recent years, a balloon-like device called the MammoSite has been increasingly used to deliver radiation therapy internally after lumpectomy. Another technique, called interstitial irradiation, involves the use of needles in the breast and has gained some popularity as well. But according to Dr. Yashar, neither device has been proven superior to whole breast irradiation for local and regional control of early breast cancer. "Partial breast irradiation is in its infancy," she said.

"Of the patients we've treated here, 30 to 40 percent would not have been eligible for a MammoSite (a balloon device) and wouldn't have otherwise been treated by partial breast irradiation this way," noted Daniel Scanderbeg, Ph.D., a resident in medical physics in the department of radiation oncology. The reported results involve the first 102 patients seen at the Moores Cancer Center, Arizona Oncology Services and the Breast Care Center of the Southwest, both in Phoenix, AZ.

The SAVI breast brachytherapy applicator is made by Cianna Medical, Inc. The Moores UCSD Cancer Center was one of the first medical facilities in the nation to offer SAVI.

Yashar thinks that SAVI or devices like it could become the standard eventually for radiation therapy for early breast cancer, though it is still early on in its testing. Radiation oncologists at the Moores UCSD Cancer Center have begun teaching others about device placement and radiation treatments.

Other authors include Anne Wallace, M.D., professor of clinical surgery, Sarah Blair, M.D., associate professor of surgery, UC San Diego; Coral Quiet, M.D., Salih Gurdalli, Ph.D., and Robert Kuske, M.D., Arizona Oncology Services; and Victor Zannis, M.D., Breast Care Center of the Southwest.

Adapted from materials provided by University of California - San Diego.

http://www.sciencedaily.com/releases/2008/09/080925094721.htm

Naturally Occurring 'Protective RNA' Used To Develop New Antiviral Against Influenza

ScienceDaily (Sep. 30, 2008) — Researchers from the University of Warwick, Coventry, United Kingdom have developed a new antiviral using naturally occurring influenza virus "protecting virus" that may defend against any influenza A virus in any animal host.

Human influenza virus A is not only responsible for seasonal disease in humans, it is also the cause of worldwide pandemics of which the last three resulted in millions of deaths all over the globe. Currently, live and killed vaccines countering specific strains of the flu are available, however a vaccine for a new pandemic strain would take months to develop. Also, increased resistance to antivirals currently on the market has emphasized the need for a new effective prophylactic and therapeutic treatment method.

The "protecting virus" contains an altered gene that makes it harmless and prevents it from reproducing in a cell. If another influenza virus invades the cell it still remains harmless, but rapidly reproduces and prevents infection by literally crowding out the new influenza strain.

In the study researchers used a "protecting virus" (known as 244) as an influenza A antiviral therapy and tested it in mice. A 120-ng intranasal dose completely protected mice simultaneously challenged with 10 50% lethal doses of influenza A/WSN (H1N1) virus. The 244 protecting virus also protected mice against strong doses of H2N2, H3N2, and H3N8.

Prophylactic activity was maintained in mice at least 1 week prior to challenge and a clear therapeutic benefit was observed when administered 24 to 48 hours following a lethal challenge. Finally, the 244 protecting virus was noted to be 10- to 100-fold more active than previous defective influenza A viruses.

Journal reference:

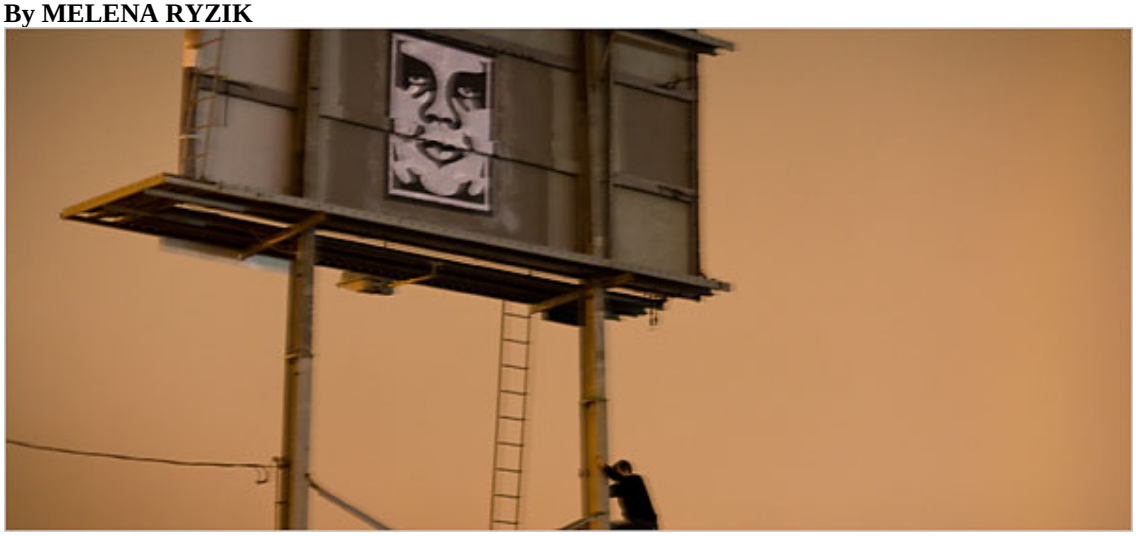
1. Dimmock et al. **Influenza Virus Protecting RNA: an Effective Prophylactic and Therapeutic Antiviral**. *Journal of Virology*, 2008; 82 (17): 8570 DOI: 10.1128/JVI.00743-08

Adapted from materials provided by American Society for Microbiology.

http://www.sciencedaily.com/releases/2008/09/080926143749.htm

Closer to Mainstream, Still a Bit Rebellious

By MELENA RYZIK



SAN FRANCISCO — The code word was "chill." That's what the crew with Shepard Fairey, the cult graphic artist known for his screen prints and stickers of the wrestler Andre the Giant, had been instructed to say if a police car rolled by as Mr. Fairey was wheat-pasting one recent night here, illegally tagging warehouse walls and empty billboards with his black-and-white images. Then Mr. Fairey and his helpers would know to make a run for it, to avoid yet another arrest.

But the law is not much of a deterrent for a self-styled populist culture jammer. Mr. Fairey had already spent nearly a week bombing the city's streets. By midnight he and his crew of a half-dozen 20-something guys, most employees at Obey Giant, his company in Los Angeles, had finished prepping for another all-night run at the White Walls Gallery here, where Mr. Fairey's solo show, "The Duality of Humanity," runs through Saturday.

Dressed in torn jeans (Mr. Fairey) and hoodies (everybody), they packed up supplies — buckets of paste, scissors, rope, video camera — and gathered the art: 10-foot-long photocopies of Mr. Fairey's work, neatly snipped in half. Then they piled into a rented minivan — "No one suspects a minivan," said Derek Millner, the videographer — and went looking for real estate. They drove by one of Mr. Fairey's Barack Obama posters, put up two nights before in a parking lot. It was already defaced — the "pe" in the slogan "Hope" had been torn off.

"Everything gets messed with," Mr. Fairey said, using language more appropriate for a guerrilla graffitist. "It's just the nature of street art. You can't be too precious about it."

Mr. Fairey, a boyish 38, occupies a rare position for an artist. A star in the world of street art for nearly two decades (the Andre stickers earned him an A on an assignment at the Rhode Island School of Design), he has parlayed his stark imagery and indie cred into a successful design and marketing company with corporate clients like Pepsi. His "Obey" images and slogans appear on T-shirts sold at Urban Outfitters, and he has created logos for the likes of Kobe Bryant.

This year Mr. Fairey has earned a new level of mainstream attention thanks to the much distributed and copied Obama poster, highly visible at the Democratic National Convention in Denver and, as a T-shirt or accessory, on a liberal body near you. The White Walls show, his third and largest there, sold out before it opened, with some pieces going for as much as $85,000. (On obeygiant.com, his prints go for $75; studio

pieces are normally around $20,000.) He also has a new book, "E Pluribus Venom," of work from his 2007 exhibition in New York, and in February the Institute of Contemporary Art in Boston will host his first solo museum show, "Supply and Demand."

Through it all he has continued scaling fences and clambering atop buildings to put up his purposefully simplistic, propagandistic images (his crew members serve as spotters and second hands). This despite changes in his health (he is diabetic, and wears an insulin drip under his shirt), family status — he is married with two young daughters — and the continued arrests. His 14th (or 15th, "if you count a brief detention in Japan," he said, where he was asked to write a note of apology) came when he was wheat-pasting in an alley near the Denver convention center. Because the charge usually amounts to a misdemeanor, which is expunged after six months, Mr. Fairey typically pleads guilty and pays a fine.

"My time's too valuable to go back to court and fight," he said.

Still, Mr. Fairey draws scorn from underground artists who think he's too marketable and critics who say he's too watered-down. Reviewing "E Pluribus Venom" at the Jonathan LeVine Gallery, Benjamin Genocchio wrote in The New York Times that "the imagery comes off as generic." He added, "It's Norman Rockwell crossed with the Dead Kennedys crossed with Communist-era propaganda."

Andrew Michael Ford, the director of Ad Hoc Art, a Brooklyn gallery that specializes in pieces by street artists, said, "People will say he's doing something that seems very commercial." He noted that though he was a fan, Mr. Fairey seemed particularly ripe for criticism because he makes money from socially and politically charged work. "It doesn't seem to match up in people's minds," Mr. Ford said.

Last year Mr. Fairey's street art in New York was defaced by the Splasher, a paint-slinging detractor, and a pamphlet deploring the commercialization of the art world was distributed by an unknown group at a reception for "E Pluribus Venom."

Mr. Fairey had printed his own money for that show — "Indiscriminate Capitalism," it reads on one side, and "Never Bow to the System/Change the System/Or Create Your Own" on the other — and says that like many pop artists he has always toyed with ideas of commercialism, advertising and appropriation.

A child of the punk skateboard scene, Mr. Fairey said he considers the Sex Pistols role models. He's also quick to give props to his contemporaries and predecessors, like the British artist Banksy, who wrote the foreword to an earlier book, and the Los Angeles artist Robbie Conal, who made his name with his own guerilla political posters in the 1980s.

Being called a sellout can hurt. Still, he's not bitter. "I hated being under anyone's thumb when I was younger and now I'm not, through my art," he said in an earlier interview at the Obey headquarters in the Echo Park section of Los Angeles. As he signed 450 of his Billy Idol posters, he added, "This ability to make things creatively on my own terms that then found an audience and sold — I've sort of made my dream come true."

And that means Mr. Fairey will continue to put his work where anyone can see it. "I don't need to do street art anymore," he said in San Francisco. "But I enjoy it. It's not insidery. It's an opportunity to ire or inspire. And it's free."

The first place he and his crew stopped that night was the South of Market neighborhood, an area well known to old-school graffiti artists. Mr. Fairey grabbed an armful of rope and slipped the folded-up halves of an Andre poster in his hoodie pocket. Within 30 seconds, without help, he had shimmied up the foot-wide metal frame of a billboard. A minute later he popped up on a roof, where he dropped down the rope so it could be attached to a paste bucket. He hoisted it up and another minute later popped up on an

even higher roof, where he pasted the unsmiling Andre together with a long brush, stepping back to survey his handiwork occasionally. The whole thing took about 15 minutes.

Next they moved to an industrial area. Though a spotter noticed a potential risk nearby — was that a security guard? — a blank wall above a garage that was clearly visible from the freeway was too good to pass up. “Turn the lights off and keep the car running,” Mr. Fairey’s assistant, Dan Flores, instructed. A retractable ladder was raised on top of the minivan; Mr. Fairey climbed up and pasted “Fiend Rocker,” a menacing image of a Misfits-like skeleton in a leather jacket. It loomed as if it was meant to be there.

Just as he was finishing, a police cruiser slunk by. “Chill chill chill!” someone shouted, and the whole gang jumped in the car, which peeled off with its doors still open, on to the next spot.

http://www.nytimes.com/2008/10/02/arts/design/02fair.html?_r=1&th&emc=th&oref=slogin

Explaining That Most Remarkable Structure

By PATRICIA COHEN

As David Macaulay takes a bite of salad, you can follow along in his new book as the lettuce and tomato make their journey between his enamel-coated teeth, onto his knobby tongue, into a wash of saliva, past the flapping uvula and epiglottis, down the tubular esophagus and into the churning, burning stomach. (You can pick up with the rest of the travelogue later.)

"I'm a big fan of the digestive system," Mr. Macaulay said during a recent trip to New York. Of the body's vast array of architecture, chemical reactions and moving parts, the illustrations of the digestive tract that he drew for "The Way We Work," are his favorite.

Paging through this 336-page book, which is being released by Houghton Mifflin Company on Tuesday, he said, "I'm constantly changing the scale, so that the reader can move around these things and get inside them."

The view of the mouth, for instance, is from the back of the throat, looking out at a "sea of saliva," a pinkish-red cataract in which broken stalks of broccoli swirl like fallen trees caught in a maelstrom. A semicircular row of teeth shaped like arches from the Roman Colosseum serve as the backdrop.

Throughout the book tiny tourists can often be spied rafting down the duodenum or wearing yellow slickers to see the nasal cavity like Maid of the Mist passengers at Niagara Falls. Fans of Mr. Macaulay — and there are millions of them — are probably most familiar with his extraordinarily detailed, erudite and witty visual explanations of architecture and engineering, which include "Cathedral," "City," "Pyramid," "Underground," "Mosque," and the most popular, "The Way Things Work."

Now they can see his interpretation of the most complicated system of all, the human body.

The book "is responding to my ignorance of my own body," Mr. Macaulay, 62, said, standing next to a skinless cadaver, its bones, muscles and ligaments preserved in polymer at "Bodies: The Exhibition" at

the South Street Seaport in Manhattan. Nearby a skeleton hangs from a hook as in a science lab. "I have one of these," he said as he walked toward it. "They're beautifully formed. The closer you look, the more you see."

In another room he moved around a glass case that contains the human nervous system laid out like a long deep-sea jellyfish. "I started with anatomy books," he said, explaining how he conducted the research. He spent the first four years of the six he took to finish the book just reading, he said. The stacks of books were supplemented by a six-DVD set of a dissection used mostly by medical schools that he watched over and over and over. He also took a dissection course at the University of Massachusetts in Worcester, not far from his home in Norwich, Vt., where he lives with his wife and two children.

The faculty was extremely helpful. "I'd call up and say I'm coming to Worcester, and ask, 'Can I have a couple of hands and elbows?' and they'd be on the table for me when I arrived," he recalled. After he asked the chief of surgery there at the time if he could observe an operation, the doctor replied, "Why don't we just make you a faculty member?" — so he could go as often as he wanted.

Mr. Macaulay knew he didn't want to try to write the text as well as draw the pictures, so he collaborated with Richard Walker, a medical writer.

Unlike a building project, which has an obvious beginning, middle and end, the human body does not offer a clearly marked starting point. Mr. Macaulay made the decision to begin with an organism's most basic building block, the cell.

Walking through a darkened room with glass cases of bright, almost iridescent red arteries at the exhibition, Mr. Macaulay said he was constantly amazed by how logical the system is. At some point the benefits of forming a community of cells that specialized in different tasks outweighed those of going it alone.

It is hard not to imagine the cells having a clear motivation, he said, as if they knew when they first developed from the primeval protoplasmic soup just where they wanted to go.

After the cell, the order of the chapters naturally flowed, he explained. Cells need food and have to get rid of waste, which they can't do without a circulatory system (drawn as a roller coaster that picks up and drops off passengers in the form of oxygen and carbon dioxide molecules).

Pretty soon you need more energy for the building blocks, which leads to the digestive system, which is controlled by the brain and the nervous system. He found the brain the hardest structure to draw; there just wasn't a lot of room for creativity and variety, he said.

From there, he continued, illustrating how the body protects itself and how this now large lump of cells moves around, with its complex configuration of bones and muscles. He ends with reproduction and the zygote, which turns into a dividing mass of cells.

"I started with cells, and I ended with cells," he said.

His speech retains no trace of a British accent, surprising since he didn't leave Burton-on-Trent, the city in Northern England where he was born, until he was 11. His family moved to the United States and settled in Bloomfield, N.J. His parents were always making things — woodworking, sewing and drawing — and from an early age, Mr. Macaulay said, he was always fascinated by how things worked.

He met his wife, his third, Ruthie Murray, at the Rhode Island School of Design in Providence where he earned a degree in architecture and then taught for 25 years.

Mr. Macaulay got the idea of doing illustrations from hanging out in bookstores, he said. Finally, "I got the courage to write my own." He began writing children's stories because, he said, "it looked like the people doing that were having the most fun."

His editor, Walter Lorraine, suggested doing a book about building, which turned into "Cathedral," published in 1973. "That was the beginning and I never looked back," he said.

Mr. Macaulay admits he was a workaholic, which contributed to the failure of his first two marriages. "If you are lucky enough to be successful, you get drawn further in and you stop paying attention to the stuff that matters," he said.

Now he says, he is no longer building a career. "I'm just looking for projects I enjoy." The $500,000 MacArthur Fellowship he won in 2006 certainly makes that easier.

Mr. Macaulay's work is generally found in the children's section, but his vast array of fans defies any categorization. His explanations are geared at someone like himself. "I've never thought about the ages of my readers," he said. "I always think about how I would understand it."

http://www.nytimes.com/2008/10/02/books/02macaulay.html?th&emc=th

Archaeologists Unveil Majestic Roman Ruins That Rival Riches of Pompeii

By ELISABETTA POVOLEDO

OSTIA ANTICA, Italy —The ruins of Ostia, an ancient Roman port, have never captured the public imagination in the same way as those of Pompeii, perhaps because Ostia met with a less cataclysmic fate.

Yet past archaeological digs here have yielded evidence of majestic public halls and even multistory apartment buildings that challenge Pompeii's primacy. Now officials hope that the decade-long restoration of four dwellings lavishly decorated with frescoes will focus new attention on this once-bustling port about 15 miles west of Rome.

Last week the second-century insulae, or housing complexes, were presented to the public through the European Heritage Days program, in which each member country of the Council of Europe promotes new cultural assets and sites that have mainly been closed to the public.

"Over all, this is the most important ensemble of second- and third-century frescoes in the world," Angelo Pellegrino, the director of excavations at the site, now called Ostia Antica, said in an interview.

At its peak in the second century, Ostia sat at the mouth of the Tiber and served as the main shipping point for goods traveling to and from Rome. (Over the centuries deposited sediment has caused the ancient town to recede several miles inland.) Prosperous Ostians liked to embellish their homes, and traces of art have emerged on crumbling walls around the site. But the frescoes in the insulae are among the best preserved, officials say.

Ethereal floating figures dance against a red backdrop in the House of Lucceia Primitiva. (A graffito with that woman's name was recently uncovered in the dwelling.) The nine Muses hold court in a house that bears their names; a small, erotic panel decorates what experts say was probably a bedroom in the House of the Painted Vaults.

"They're exceptional indicators of the emerging merchant class and the economic and political well-being of the city in the second century," said Flora Panariti, an archaeologist who participated in the restoration.

Stella Falzone, an expert in mural painting at Sapienza University in Rome, described the dwellings and their decorations as "a reliable mirror of Rome" during that period, especially precious for archaeologists and art historians because so little from that era survives in Rome.

Popular colors of the time, red and yellow, dominate the House of the Yellow Walls, for example. "It's no coincidence that these are the colors of the Roma soccer team," Ms. Panariti said.

Unlike Rome, which cannibalized much of its heritage over the centuries, or Pompeii, which was buried in volcanic ash in A.D. 79 and was not systematically excavated until the 18th century, Ostia remained mostly untouched until the early 20th century.

The multistory dwellings were first excavated in the 1960s, but work stopped when the archaeologist leading the dig left for another job. They remained largely unknown to the public and to many scholars until archaeological administrators at Ostia Antica resolved to recover them.

The buildings, in the western part of the ancient city, were built around A.D. 128 in a housing boom during Emperor Hadrian's reign. With demand for accommodations growing, new multilevel homes resolved issues of space and expansion. Although only the ground floors remain, evidence that buildings stood taller than one story has emerged from the rubble.

If it weren't for Ostia Antica and its multistory houses and apartments, "it would be difficult for people to imagine how people lived in that era," said Norbert Zimmermann, president of an international association for ancient mural painting.

Like Pompeii, Ostia Antica faces problems common to many of the sprawling archaeological sites in Italy. Money is scarce, the site is understaffed, and surveillance is spotty. But the biggest challenge here is high humidity resulting from the high groundwater level.

"We try to dig as little as possible nowadays, because we can barely deal with caring for what's emerged," said Mr. Pellegrino, the excavations director. It took nine years to restore the four buildings, he noted, in an effort that was possible only because of a private donation of about $150,000.

In the House of the Painted Vaults Ms. Panariti pointed to a delicately painted human form high on a wall. "These figures are disappearing again even though they were only restored two years ago," she said sadly.

Humidity has forced conservators to detach many frescoes from walls and transfer them onto panels before returning them to their original locations. "It's necessary, but it causes immense sorrow whenever we have to do that," Mr. Pellegrino said.

Only a limited number of visitors will be allowed to tour the four dwellings, and reservations are required. (Officials have not worked out the details.)

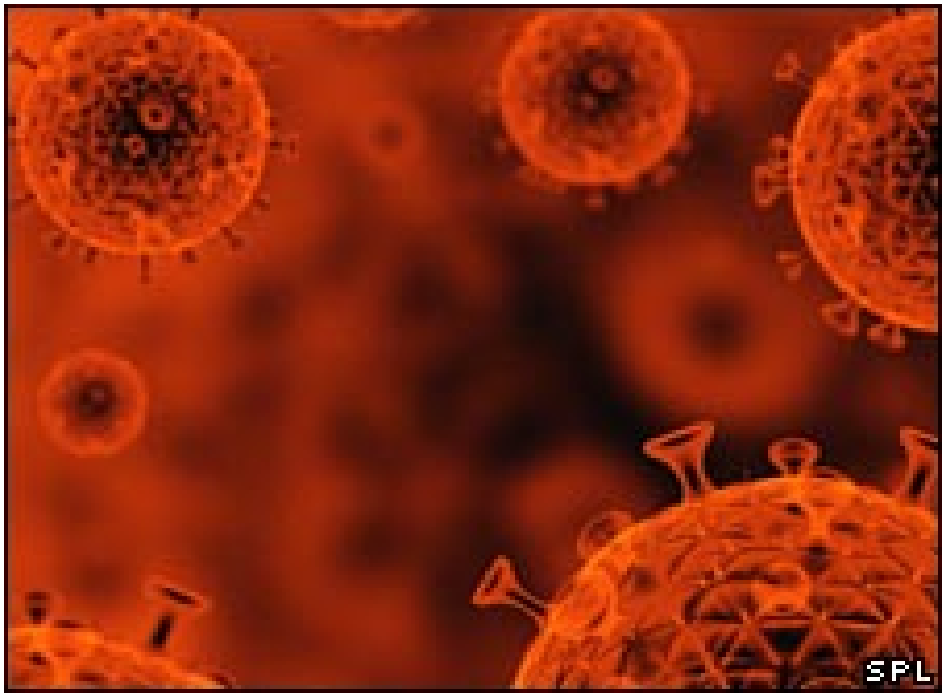
Ostia Antica has not given up all its secrets. On Friday, in a different section of the ancient city, students were cleaning colorful frescoes in the House of Jupiter and Ganymede, named for the chief Roman god and the Trojan prince he anointed as cup bearer.

"We're constantly restoring the site," Mr. Pellegrino said, "as long as we can afford to."

http://www.nytimes.com/2008/10/01/arts/design/01fres.html?ref=design

Colonial clue to the rise of HIV

The arrival of colonial cities in sub-Saharan Africa at the dawn of the 20th Century may have sparked the spread of HIV.



US experts analysed one of the earliest samples of the virus ever found, in the Democratic Republic of Congo in 1959.

The study, published in the journal Nature, suggests the virus may have crossed from apes to humans between 1884 and 1924.

They believe newly-built cities may have allowed the virus to thrive.

> **I think the picture that has emerged here, is that changes the human population experienced may have opened to the door to the spread of HIV**
> Dr Michael Worobey
> University of Arizona, Tucson

Aids, the illness caused by HIV, was first reported by doctors in 1981, but the virus had been around for many decades before that.

HIV is not a single virus - there are a number of different strains and subtypes of strains, some sharing the same "founder event" in history, in which a single human was infected.

Scientists believe that these "founder events" may have involved eating monkeys infected with a similar virus.

Research published last year found the viral ancestor of a subtype of HIV responsible for most modern cases in the US and Europe in a blood sample taken in Leopoldville, the capital of Belgian Congo - now Kinshasa, the capital of the Democratic Republic of Congo.

Now the same team, from the University of Arizona at Tucson, has found another sample containing a different subtype in a 1960 sample from a different patient in the same city.

HIV ancestor

By analysing the genetic differences between the two viruses, and calculating the amount of time these differences would take to evolve, they now say that the two probably have a common ancestor dating from at least 50 years earlier.

Dr Michael Worobey, who led the research, said: "Now, for the first time, we have been able to compare two relatively ancient HIV strains.

"That helped us to calibrate how quickly the virus evolved and make some really robust inferences about when it crossed into humans, how the epidemic grew from that time, and what factors allowed the virus to enter and become a successful human pathogen."

HIV was and remains a "relatively poorly transmitted" virus, he said, so the key to the success of the virus was possibly the development of cities such as Leopoldville in the early 1900s.

The large numbers of people living in close proximity would have allowed more opportunity for new infections.

"I think the picture that has emerged here, is that changes the human population experienced may have opened to the door to the spread of HIV," he said.

Professor Paul Clark, a researcher into evolutionary history at the University of Edinburgh, said that while the finding was mainly of "historical interest", it might provide more clues about how the virus changed over time.

He suggested that it was likely that all of the early cases of "group M" HIV-1 - the strain causing 19 out of 20 modern infections - happened in the Leopoldville area.

He said: "We can now paint a remarkably detailed picture of the time and place of origin of HIV-1 group M viruses and their early diversification, and thus of the prehistory of the AIDS pandemic."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/7646255.stm

Published: 2008/10/01 17:00:37 GMT

Hi-tech windows into a whale's world

By Richard Black
Environment correspondent, BBC News website, the Canary Islands

Just as the humble torch broke humankind's inability to see through night, new technology based on acoustics and video imaging is giving scientists unprecedented glimpses of a whale's life.

Even elusive, reclusive creatures such as beaked whales are giving up data in previously unthinkable detail.

El Hierro, the southernmost point of the Canary Islands, is one of the best places ever found for studying the animals. But even so, they come to the surface apparently randomly and for only brief periods of time.

It is a far cry from the acrobatics of the humpback whale or the ebullient eruptions of dolphins.

But these brief appearances have been enough to allow scientists to fix tags to beaked whales and register what they do beneath the waves.

Please turn on JavaScript. Media requires JavaScript to play.

See how land-based teams help Song of the Whale in its work

Researchers from the University of La Laguna in Tenerife first identified beaked whales here in 2003.

Already, a team from Woods Hole Oceanographic Institute near Boston, US, had developed devices called D-tags that could be stuck to the backs of other whales and taken down in the animals' deepest dives, registering sounds, depths and movements.

Collaboration clearly made sense; and it has worked.

"The importance of D-tags is that we have acoustic information, and information in three dimensions on the pitch, roll and heading of the animals," says Patricia Arranz, a member of the La Laguna team.

"It was the first time that vocalisations of Blainville's beaked whales had been described, and the first time you could receive echoes from prey."

The tags are a canny mix of space-age materials and low-tech improvisation.

Sticking one onto a whale entails sidling up in an inflatable dinghy, hoping the animal does not take flight, and then deploying the tag on the end of a five metre pole.

It sticks to the whale's back with suction cups, a system that chimes well with the overall intention of causing the animals as little stress as possible.

"We have to minimise the effect of these devices on the whales," says Mark Johnson, who developed the tags in the Marine Mammal Behavior Laboratory at Woods Hole.

"They are exquisitely streamlined animals, and so the tag has to be small. Luckily, they work pretty well on beaked whales."

1. Visual reflectors, to aid in retrieval
2. Instrumentation, including pressure sensors, hydrophones, accelerometers, compasses, battery and 13Gb flash memory
3. Syntactic foam; consists of air-filled glass beads set in epoxy resin, to provide buoyancy whilst resisting implosion at great depths
4. Antenna
5. Suction cups allow device to attach to whales, self-detaching when necessary; the casing is filled with oil to prevent implosion at great depths

Inside the tags are hydrophones to record sound, accelerometers and magnetometers to measure movement in three dimensions; a battery, and 13Gb of flash memory

"The whales dive down to about 2,000m; and when they do, the tags are under about 200 atmospheres of pressure, which will crush pretty much anything with air in it," says Dr Johnson.

"There are two ways to get round that - you either make a strong housing, which would be made of metal and really thick and heavy - or you find electronic components that can stand the pressure, and most of them, it turns out, can.

"Then you put the electronics in a plastic bag full of vegetable oil."

Some tags slide off the animals' backs within a few hours. Those that stay on are automatically released with an ingeniously low-tech system.

The suction cups all have a piece of plastic tubing, as used in medical wards worldwide, leading into them. The tube is bent over and secured with a twist of nickel-chromium wire.

The wire will last for years in seawater. But put three volts across it, and it dissolves away within minutes, allowing water into the suction cup and releasing the tag.

A buoyant foam brings it to the surface, where a VHF antenna signals "I am here".

Deep impressions

So far, tagging projects conducted here suggest beaked whales typically dive in an approximate pattern of one long and deep, then three short and shallow - and other scientists have shown how this may leave them prone, for reasons not completely understood, to a decompression-like sickness that can be triggered by military sonar.

D-tags have registered dives by Cuvier's beaked whales that are longer and deeper than any other cetacean documented.

"Tags have given us new insights into the acoustic behaviour of beaked whales," says Ollie Boisseau, a research scientist with the International Fund for Animal Welfare (Ifaw) which is now also engaged in beaked whale research around El Hierro.

"They can certainly help answer certain questions, and they pose several more - it's a very promising area of research."

Distant shore

The tagging projects were made much easier by the establishment of a land station, a work area perched on El Hierro's hills.

Observers there scan the seas with binoculars and report possible whale sightings to the waiting dinghies.

Now, the land station is also being used by researchers from the Sea Mammal Research Unit (SMRU) at St Andrews University in Scotland, to field test a range-finding system that uses video and computing.

The system starts with a high-tech pair of binoculars with video camera attached, connected umbilically to a laptop computer.

With Jeppe Dalgaard, a St Andrews researcher spending the summer months here, I peer against the sparkling morning sun at the laptop screen.

He shows me the coastline, the blob marking our location, and another indicating the Ifaw boat Song of the Whale, a few kilometres out to sea.

"When we have a [whale] sighting, we use the bearing and the range program to get the distance; and when we have the bearing and the distance, that automatically plots the position of the sighting for us," he explains.

Jeppe's equipment knows where Song of the Whale is because it picks up the yacht's periodic Automatic Identification System (AIS) broadcasts.

The bearing to a whale sighting is simple, because the binocular's tripod has an old-fashioned gauge showing which way they are pointing.

What is new is the way the system measures the range to the whales.

Video time

Images of each sighting are sent from the video camera into the laptop.

Using a variation on traditional trigonometry, the program measures the vertical distance on the image between the sighting and the horizon, and converts that into the horizontal distance from land station to whale. This quickly becomes a pair of co-ordinates for the sighting.

Radioed down to Song of the Whale, it raises the odds that the yacht can get close to the cetaceans by using GPS to hit the right co-ordinates.

"This is a simple but effective way of measuring range at sea," says SMRU's Jonathan Gordon, one of the system's principal developers.

"There is an alternative from shore stations which is to use a theodolite; but the problem with marine mammals is they're only there for a short period of time, whereas using video allows us to capture a frame and analyse it."

Dr Gordon says his system is accurate to within about 1%, and can be used on board ships as well.

"I've been really pushing it because I have very little faith in my own ability to estimate distance at sea, but it's been a strangely uphill battle to persuade people they should be using it rather than just estimating distance by eye or crude instruments."

Off the slab

From my own brief time on board Song of the Whale, and from peering through binoculars from the land station, I have seen at first hand how hard it can be to see and track beaked whales.

They spend perhaps 8% of their time at the surface; and although they can be fairly vocal, they only seem to make sounds at depth.

But D-tags have generated a lot of new data about them. Recording the locations of sightings accurately using the St Andrews system could in time help establish whether they pursue typical foraging paths, and perhaps identify key habitat.

Meanwhile close range photography, which the University of La Laguna team also pursues, is getting to the stage where individuals can be distinguished from each other. The team is able to suggest that El Hierro may be home to a resident population of Blainville's beaked whale *(Mesoplodon densirostris)* numbering about 100.

The Woods Hole, St Andrews and Ifaw groups are all using acoustics to identify and track the animals when they vocalise at depth.

Not so long ago, the only information we had on beaked whales came from examination of dead animals.

For some species, hydrophones and D-tags and video positioning and photo identification mean that era is most definitely over.

The observation window is open.

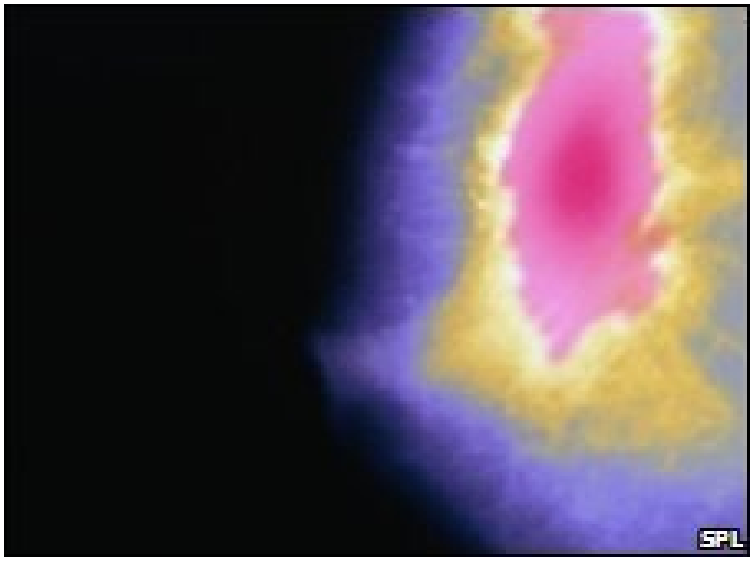
Richard.Black-INTERNET@bbc.co.uk

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/science/nature/7647325.stm

Published: 2008/10/01 21:50:06 GMT

Computers could read mammograms

A computer plus one expert are as effective at spotting breast cancer as the two experts usually used to read a mammogram in the UK, research suggests.



Computer-aided detection found 198 out of 227 cancers, compared with 199 from double-reading, in the Cancer Research UK study involving 28,000 women.

NHS breast screening could be made more efficient, say the scientists in the New England Journal of Medicine. Some women are not offered screenings by the NHS as regularly as they should.

Women aged 50 to 70 should be offered screenings every three years, but in some areas a lack of experts means they do not get screening invitations regularly enough.

> **This is good news for women - particularly for those who live in areas where invitations for screening have been late in arriving**
> Dr Lesley Walker, Cancer Research UK's director of information

The national programme screens over 1.7 million each year.

The NHS would like to see even more women offered screening by extending eligibility to include the ages 47 to 73. Scanning these extra 200,000 women would increase workload by 30%.

More scans read

Computer-aided detection would mean the same number of experts could read more mammograms in a given period of time, say the researchers.

Professor Fiona Gilbert of the University of Aberdeen and lead author of the study published in the New England Journal of Medicine said: "We want to offer screening to a wider age group. This computer technology will help us achieve this."

She said the financial cost of the software to the NHS would not be astronomical. The researchers are now waiting to see if the NHS cancer screening programme will agree that it can be used in hospitals.

We can now say for certain that this system is as good at detecting breast cancer as the one used as standard practice
Professor Stephen Duffy, Cancer Research UK's professor of cancer screening

The study invited around 28,000 women to have their NHS mammograms read both in the conventional way by two radiologists and also by a single radiologist using the computer. The proportion of cancers detected was 199 out of 227 (87.7%) for double reading and 198 out of 227 (87.2%) for single reading with computer-aided detection.

Conflicting results

Professor Stephen Duffy, Cancer Research UK's professor of cancer screening, said earlier studies had conflicting results about the success of the computer-aided readings. He said: "We can now say for certain that this system is as good at detecting breast cancer as the one used as standard practice."

Dr Lesley Walker, Cancer Research UK's director of information, said: "This is good news for women - particularly for those who live in areas where invitations for screening have been late in arriving."

He said there would always be a need for the human eye of an expert to read mammograms.

"In the rare instance when the computer is at odds with the radiologist the human interpretation takes precedence. "But now we know that a computer can help give more accurate readings there is bound to be an improvement in the national screening programme which already saves 1,400 lives a year through early detection of breast cancer."

Dr Alexis Willett of Breakthrough Breast Cancer said further investigations were required to determine why the technique led to more women needing repeat screening and also to assess practical implications for the NHS. "To support technology like this, it will also be vital that digital mammography, which captures mammograms electronically rather than on film, is in place.

"Breakthrough Breast Cancer wants to see the Government's existing commitment to the roll-out of digital mammography in England by 2010 is made a reality."

Maria Leadbeater, of Breast Cancer Care, said the system would have to be closely monitored if introduced into clinical practice. "We know from supporting women with breast cancer or breast health concerns that delays in access to routine screening can cause great anxiety.

"Any measures which could reduce these delays would be very welcome." In the US and some other European countries only a single expert reads mammograms. The researchers say computers could aid detection in these countries.

The results will be presented at the National Cancer Research Institute's annual conference in Birmingham.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/7644635.stm

Published: 2008/10/01 23:23:06 GMT

Specific Gene Found In Adolescent Men With Delinquent Peers

Teenage boys tipping over headstones in a pioneer cemetery. Adolescent males who possess a certain type of variation in a specific gene are more likely to flock to delinquent peers. (Credit: iStockphoto/Jerry Koch)

ScienceDaily (Oct. 2, 2008) — Birds of a feather flock together, according to the old adage, and adolescent males who possess a certain type of variation in a specific gene are more likely to flock to delinquent peers, according to a landmark study led by Florida State University criminologist Kevin M. Beaver.

"This research is groundbreaking because it shows that the propensity in some adolescents to affiliate with delinquent peers is tied up in the genome," said Beaver, an assistant professor in the FSU College of Criminology and Criminal Justice.

Criminological research has long linked antisocial, drug-using and criminal behavior to delinquent peers -- in fact, belonging to such a peer group is one of the strongest correlates to both youthful and adult crime. But the study led by Beaver is the first to establish a statistically significant association between an affinity for antisocial peer groups and a particular variation (called the 10-repeat allele) of the dopamine transporter gene (DAT1).

However, the study's analysis of family, peer and DNA data from 1,816 boys in middle and high school found that the association between DAT1 and delinquent peer affiliation applied primarily for those who had both the 10-repeat allele and a high-risk family environment (one marked by a disengaged mother and an absence of maternal affection).

In contrast, adolescent males with the very same gene variation who lived in low-risk families (those with high levels of maternal engagement and warmth) showed no statistically relevant affinity for antisocial friends.

"Our research has confirmed the importance of not only the genome but also the environment," Beaver said. "With a sample comprised of 1,816 individuals, more than usual for a genetic study, we were able to

document a clear link between DAT1 and delinquent peers for adolescents raised in high-risk families while finding little or no such link in those from low-risk families. As a result, we now have genuine empirical evidence that the social and family environment in an adolescent's life can either exacerbate or blunt genetic effects."

Beaver worked with research colleagues John Paul Wright, an associate professor and senior research fellow at the University of Cincinnati, and Matt DeLisi, an associate professor of sociology at Iowa State University.

The biosocial data analyzed by Beaver and his two co-authors derived from "Add Health," an ongoing project focused on adolescent health that is administered by the University of North Carolina-Chapel Hill and funded largely by the National Institute of Child Health and Human Development. Since the program began in 1994, a total of nearly 2,800 nationally representative male and female adolescents have been genotyped and interviewed.

"We can only hypothesize why we saw the effect of DAT1 only in male adolescents from high-risk families," said Beaver, who will continue his research into the close relationship between genotype and environmental factors -- a phenomenon known in the field of behavioral genetics as the "gene X environment correlation."

"Perhaps the 10-repeat allele is triggered by constant stress or the general lack of support, whereas in low-risk households, the variation might remain inactive," he said. "Or it's possible that the 10-repeat allele increases an adolescent boy's attraction to delinquent peers regardless of family type, but parents from low-risk families are simply better able to monitor and control such genetic tendencies."

Among female adolescents who carry the 10-repeat allele, Beaver and his colleagues found no statistically significant affinity for antisocial peers, regardless of whether the girls lived in a high-risk or low-risk family environment.

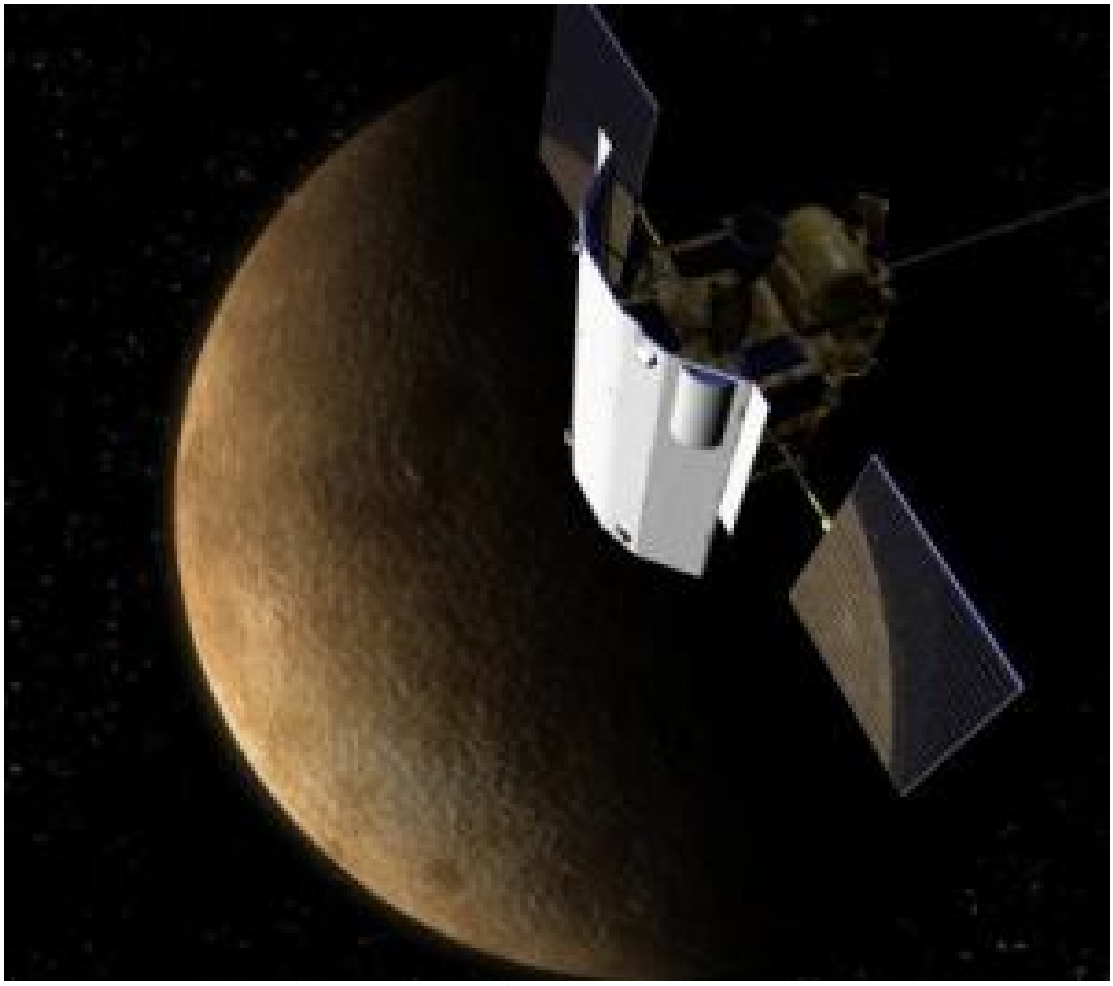
Journal reference:

1. Beaver et al. **Delinquent Peer Group Formation: Evidence of a Gene X Environment Correlation**. *The Journal of Genetic Psychology*, 2008; 169 (3): 227 DOI: 10.3200/GNTP.169.3.227-244

Adapted from materials provided by Florida State University.

http://www.sciencedaily.com:80/releases/2008/10/081001130004.htm

Space Scientists Set For Second Spacecraft Flyby Of Mercury



NASA's MESSENGER spacecraft carrying an $8.7 million University of Colorado at Boulder instrument will make its second flyby of Mercury Oct. 6. The desk-sized spacecraft will settle into Mercury orbit in 2011 after having made 15 loops around the sun since its 2004 launch. (Credit: NASA)

ScienceDaily (Oct. 2, 2008) — NASA's MESSENGER spacecraft, which is toting an $8.7 million University of Colorado at Boulder instrument to measure Mercury's wispy atmosphere and blistering surface, will make its second flyby of the mysterious, rocky planet Oct. 6.

Traveling at a mind-blowing 4.2 miles per second, the spacecraft will dip within 124 miles of Mercury and image much of the surface never before seen by spacecraft. As MESSENGER pulls away from the planet it will view a region seen at high resolution only once before -- when NASA's Mariner 10 spacecraft made three flybys in 1974 and 1975, said Senior Research Associate William McClintock, a mission co-investigator from CU-Boulder's Laboratory for Atmospheric and Space Physics.

Launched in August 2004, MESSENGER will make the last of three passes by Mercury -- the closest planet to the sun -- in October 2009 before finally settling into orbit around it in 2011. The circuitous, 4.9 billion-mile-journey to Mercury requires more than six years and 15 loops around the sun to guide it closer to Mercury's orbit. McClintock led the development of CU-Boulder's Mercury Atmospheric and

Surface Composition Spectrometer, or MASCS, miniaturized to weigh less than seven pounds for the arduous journey.

The craft is equipped with a large sunshade and heat-resistant ceramic fabric to protect it from the sun, and more than half of the weight of the 1.2-ton spacecraft at launch consisted of propellant and helium. "We are almost two-thirds of the way there, but we still have a lot of work to do," said McClintock. "We are continually refining our game plan, including developing contingencies for the unexpected."

The desk-sized MESSENGER spacecraft is carrying seven instruments -- a camera, a magnetometer, an altimeter and four spectrometers. Data from MASCS earlier this year during the first flyby Jan. 14 provided LASP researchers with evidence that about 10 percent of the sodium atoms ejected from Mercury's hot surface during the daytime were accelerated into a 25,000-mile-long sodium tail trailing the planet, McClintock said.

MESSENGER will take data and images from Mercury for about 90 minutes on Oct. 6, when LASP will turn on a detector in MASCS for its first look at Mercury's surface in the far ultraviolet portion of the light spectrum, said McClintock. The scanner will look at reflected light from Mercury's surface to better determine the mineral composition of the planet.

"We got some surprising results with our UV detector in January, and we hope to see additional surprises as we extend our observations further into the ultraviolet," he said.

The second Mercury flyby is slated for 2:40 a.m. MDT on Oct. 6. LASP Director Daniel Baker, also a co-investigator on the MESSENGER mission, is using data from the mission to study Mercury's magnetic field and its interaction with the solar wind. Mark Lankton is the LASP program manager for the MASCS instrument.

Dozens of undergraduates and graduate students will be involved in analyzing data over the next several years as information and images pour back to Earth from MESSENGER. Sean Solomon from the Carnegie Institution of Washington in Washington, D.C., is the MESSENGER principal investigator.

Adapted from materials provided by University of Colorado at Boulder.

http://www.sciencedaily.com/releases/2008/09/080930144216.htm

Canada's Shores Saved Animals From Devastating Climate Change 252 Million Years Ago

Present-day shores of British Columbia. The shorelines of ancient Alberta, British Columbia and the Canadian Arctic were an important refuge for some of the world's earliest animals, most of which were wiped out by a mysterious global extinction event some 252 million years ago. (Credit: iStockphoto/Jason Van Der Valk)

ScienceDaily (Oct. 2, 2008) — The shorelines of ancient Alberta, British Columbia and the Canadian Arctic were an important refuge for some of the world's earliest animals, most of which were wiped out by a mysterious global extinction event some 252 million years ago.

U of C scientists have solved part of the mystery of where marine organisms that recovered from the biggest extinction on earth were housed. A team of researchers, including Charles Henderson, a geoscience professor at the U of C, Tyler Beatty, a PhD candidate at the U of C and J-P Zonneveld, an associate professor at the U of A, discovered that the shorelines of ancient Canada provided a refuge for marine organisms that escaped annihilation during the Permian-Triassic extinction event.

"The boundary between the end of the Permian and beginning of the Triassic period saw unparalleled species loss in the marine realm, and biotic recovery was delayed relative to other mass extinctions," says Henderson, in a paper published in the October edition of Geology. "A major unresolved question has been discovering where the marine organisms that recovered from the extinction were housed."

Henderson adds that this may not be the only refuge where life survived after the mass extinction, but it is the only area discovered to date.

During the Permian, all the world's land masses joined together into a single supercontinent called Pangea. Near the end of the Permian, during the mass extinction, about 95 per cent of all marine species and 70 per cent of land species died and the recovery of life on Earth took longer than other extinction events because so much biodiversity was lost. There are several theories as to why this mass extinction event took place ranging from the heating of the Earth to a catastrophic event. The authors favour major

climate change since increased temperatures and elevated CO_2 levels are linked to oxygen stress that is key to the results of their research.

On land, the Permian period marked the expansion of reptiles and mammal-like reptiles. Perhaps the most famous is Dimetrodon, a pre-dinosaur reptile, which grew to about 11 feet (3.5 metres) and had what looked like a sail on its back.

Researchers have been studying the Permian-Triassic extinction event for years, but mostly in Greenland and south China where formations represent areas of deep water and have very low levels of oxygen. The inter-university research team studied trace fossils along the ancient shorelines found in rock located in western Alberta, northeast British Columbia, and the barren landscapes of the Canadian Arctic. Trace fossils preserve the activity of organisms and can be burrows or other actions created by the ancestors of modern worms and marine arthropods. The dating of these shorelines is confirmed by the presence of distinct conodonts – a microfossil in which the passing of time is recorded by rapid evolutionary changes.

"These trace fossils present a record of ocean-bottom dwelling organisms and indicate locally well-oxygenated conditions in an ocean otherwise characterized by widespread anoxia," says Beatty - the lead author. "Within this habitable zone, the latest Permian extinction levels are reduced and the recovery time is minimized. The findings support the idea that reduced oxygen levels is a major cause of why the recovery from Earth's greatest extinction was delayed."

Journal reference:

1. Tyler W. Beatty, J-P Zonneveld and Charles Henderson. **Anomalously diverse Early Triassic ichnofossil assemblages in northwest Pangea: A case for a shallow-marine habitable zone**. *Geology*, 2008; 36 (10): 771 DOI: 10.1130/G24952A.1

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

http://www.sciencedaily.com/releases/2008/10/081001093616.htm

Hormone Replacement Therapy And Heart Attack Risk: Danish Study Provides New Information

ScienceDaily (Oct. 2, 2008) — It's not what you take but the way that you take it that can produce different results in women who take hormone replacement therapy (HRT), according to new research on the association between HRT and heart attacks, published online in Europe's leading cardiology journal, the European Heart Journal.

The study is the largest to look at the effects of HRT since the Women's Health Initiative trial was stopped early after finding that HRT increased the risk of women developing a range of conditions including breast cancer and thromboembolism.

The research is an observational study of 698,098 healthy Danish women, aged 51-69, who were followed between 1995-2001. It has found that overall there was no increased risk of heart attacks in current users of HRT compared to women who had never taken it.

However, it did find that in younger women (aged 51-54) who were taking HRT during the period of the study, their risk of heart attacks was about a quarter (24%) more than in women who had never taken HRT. In addition, in younger women there was an increasing risk with longer duration of HRT, which was not seen in the older age groups.

The study also found that the type of HRT and the way that the women took it made a difference to the risk of heart attacks. Continuous HRT (a continuous combination of oestrogen and progesterone) carried a 35% increased risk of heart attacks compared with women who had never used HRT. But if HRT was taken on a cyclical basis (oestrogen, followed by a combination of oestrogen and progesterone) there was a tendency for these women to have a reduced risk of heart attacks compared to women who had never used HRT, and this was also seen if a synthetic hormone, tibolone, was used. If the method of taking the oestrogen was via a patch or gel on the skin or in the vagina, the risk of heart attack reduced by more than a third (38% and 44% respectively).

Dr Ellen Løkkegaard, a gynaecologist at the Rigshospitalet in Copenhagen, Denmark, who led the study, said: "Our finding of lower risk with a cyclic combined regimen, which gives monthly bleeding, than with continuous combined oestrogen/progesterone therapy, which does not cause bleeding, is potentially of great clinical importance. Also, the decreased risk of myocardial infarction with vaginal treatment is a very interesting finding that has not been tested before in large scale observational studies."

She said that the study produced similar results to the WHI study (a randomised controlled trial) for comparable HRT treatments, and that this suggested that the results from her study for the other, non-comparable treatments were valid.

"Our study does not change indications and duration recommendations for HRT. But the main message is that when hormone therapy is indicated for a woman, then a cyclic combined regimen should be preferred, and that application via the skin or the vagina is associated with a decreased risk of myocardial infarction.

"From the previous studies on HRT we have no reason to believe that these recommendations increase the risk of other diseases influenced by hormone therapy, such as breast cancer, venous thromboembolism and stroke. Actually, we believe they could reduce the risk."

Since the WHI trial was stopped, no further randomised controlled trials of HRT have been started.

"This study is the first, big observational study that addresses the influence of various regimens, doses and routes of administration," said Dr Løkkegaard. "In this 'post randomised era' where randomised studies on HRT are not easily performed, it provides important new information."

Journal reference:

1. Ellen Løkkegaard, Anne Helms Andreasen, Rikke Kart Jacobsen, Lars Hougaard Nielsen, Carsten Agger, and Øjvind Lidegaard. **Hormone therapy and risk of myocardial infarction: a national register study**. *European Heart Journal*, 2008; DOI: 10.1093/eurheartj/ehn408

Adapted from materials provided by European Society of Cardiology.

http://www.sciencedaily.com/releases/2008/10/081001093504.htm

Vegetation Hardly Affected By Extreme Flood Events: Impacts On Flora And Fauna Of The Elbe Flood Of 2002

Summer 2002 flood of the Middle Elbe (Germany). (Credit: André Künzelmann/UFZ)

ScienceDaily (Oct. 2, 2008) — Extreme flood events in floodplain grasslands affect carabid beetles and molluscs more than plants. This is the finding of a study by biologists from the Helmholtz Centre for Environmental Research (UFZ), TU Berlin, the German Federal Institute of Hydrology (BfG), ÖKON Kallmünz and the ILN Bühl, following several years of observations before and after the Elbe floods of August 2002.

Flow variations are known to be most important drivers in structuring riverine communities. However, until now, the effects of extreme flood events on the flora and fauna of floodplains have been largely unknown, despite the fact that such events are likely to become more frequent as a result of climate change, say the researchers, writing in the latest issue of the US journal Ecology.

They surveyed plants, carabid beetles and molluscs in spring and autumn at 36 plots on an Elbe floodplain grassland that was flooded in 2002. Data from 1998 and 1999 were compared with data from 2003 and 2004.

The samples were taken from marked plots in riverine grassland near Dessau (UNESCO-Biosphere Reserve Riverine Landscape Elbe – Saxony-Anhalt) measuring almost one square kilometre which is flooded seasonally by the Elbe. During the 2002 flood these plots were submerged for at least two weeks, with the water height ranging from 2.4 to 5.4 metres above soil level.

"Our findings show that the mollusc and carabid beetle communities were the most severely affected by the floods," explains Christiane Ilg of the UFZ. "This disproves the hypothesis that groups with lower mobility are more severely affected by floods being less able to escape, and that they recolonise the flooded habitat only after some delay."

The number of carabid beetles fell from 117 species before the flood to 88 immediately after the flood, but had recovered by 2004, quickly returning to their pre-flood level. Surprisingly, populations that are adapted to moist conditions and partly are good swimmers were the most severely affected and lost over 40 per cent of their species richness. Carabid beetles may have adapted well to floods over the course of their evolution, but these adaptations aim the survival through the typical winter and spring floods.

This is why a summertime flood can have such a drastic effect on the number of carabid beetles. Because of their high mobility, however, these species also recovered the fastest. Land snails were not seriously affected by the 2002 summer flood, their abundance and species richness remaining similar to the ones observed in the pre-flood years. Merely, water mollusc species and individuals increased following the flood.

The vegetation was the least affected by the flood. The decline from 113 plant species to 107 is of hardly any significance in statistical terms. However, further analyses show that the frequency of several species drastically decreased whereas other species, on the contrary, benefited from the flood. The vegetation evidently is well adapted to flooding.

Although this research is the first to provide data about the impacts of such extreme events on flora and fauna, the researchers stress that it is difficult to infer long-term consequences from one flood: "We believe that long-term monitoring of floodplain ecosystems with standardised methods is essential to assess the consequences of an increased frequency of extreme events on floodplain biodiversity."

Journal reference:

1. Ilg et al. **Long-term reactions of plants and macroinvertebrates to extreme floods in floodplain grasslands**. *Ecology*, 2008; 89 (9): 2392 DOI: 10.1890/08-0528.1

Adapted from materials provided by Helmholtz Centre For Environmental Research - UFZ.

http://www.sciencedaily.com/releases/2008/09/080924085543.htm

Using Molecules To Measure Rate Of Flow

ScienceDaily (Oct. 2, 2008) — Dutch researcher Jeroen Bominaar has developed a new measurement technique based on following molecules in a (turbulent) airflow. Its main advantage is that no measuring instruments or small particles, such as glass beads, need to be inserted into the flow.

These techniques fail if, for example, the particle density is too low or the measurement techniques influence the flow. Bominaar's research was part of a project funded by Technology Foundation STW.

Jeroen Bominaar set out to improve the new measurement technique, apply it and study its effect. The method involves directing a focused laser beam in a single line in an airflow, which results in some of the nitrogen and oxygen molecules in the line being converted into nitric oxide molecules. Shortly afterwards the line of new molecules is irradiated with a second laser and this causes the molecules to fluoresce. As these molecules move with the airflow, the speed of the airflow can be accurately measured.

The technique can be used in situations where current particle techniques fall short of the mark, for sample, in accurate speed measurements in wind tunnels, on satellite engines or in the wake of moving objects. ILA GmbH, NMi, Philips Research and NLR were industrial partners in the research project.

Adapted from materials provided by Netherlands Organization for Scientific Research.

http://www.sciencedaily.com/releases/2008/09/080929093752.htm

During Exercise, Human Brain Shifts Into High Gear On 'Alternative Energy'

ScienceDaily (Oct. 1, 2008) — Alternative energy is all the rage in major media headlines, but for the human brain, this is old news. According to a study by researchers from Denmark and The Netherlands, the brain, just like muscles, works harder during strenuous exercise and is fueled by lactate, rather than glucose.

Not only does this finding help explain why the brain is able to work properly when the body's demands for fuel and oxygen are highest, but it goes a step further to show that the brain actually shifts into a higher gear in terms of activity. This opens doors to entirely new areas of brain research related to understanding lactate's specific neurological effects.

"Now that we know the brain can run on lactate, so to speak, future studies should show us when to use lactate as part of a treatment," said Gerald Weissmann, MD, Editor-in-Chief of The FASEB Journal. "From an evolutionary perspective, the result of this study is a no-brainer. Imagine what could have or did happen to all of the organisms that lost their wits along with their glucose when running from predators. They were obviously a light snack for the animals able to use lactate."

To reach their conclusion, the researchers looked at research that compared the blood running to and from the heads of volunteers undergoing strenuous exercise. They found that the blood on its way to the brain contained considerably more lactate than blood flowing from the brain. Further investigation showed that the brain was not storing the lactate which had come from the muscles during exercise, but rather using it as fuel. In fact, the brain helped to clear lactate from the circulation, thereby leaving glucose to the muscles that need it for the hard work they were performing.

Journal reference:

1. Quistorff et al. **Lactate fuels the human brain during exercise**. *The FASEB Journal*, 2008; 22 (10): 3443 DOI: 10.1096/fj.08-106104

Adapted from materials provided by Federation of American Societies for Experimental Biology, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com/releases/2008/09/080930135305.htm

Occupational Therapy Gets People With Osteoarthritis Moving

ScienceDaily (Oct. 1, 2008) — Physical activity is the cornerstone of any healthy lifestyle – and especially for people with osteoarthritis as exercise helps maintain good joint health, manage their symptoms, and prevent functional decline. Osteoarthritis, however, often makes physical activity, such as exercise, and even performing daily activities, a challenge.

But an occupational therapist-led approach – called activity strategy training – could provide patients with knee and hip osteoarthritis the opportunity to lead more active lives and even improve their overall health, according to a new study led by researchers at the University of Michigan Health System.

In the pilot study, the researchers found that patients who engaged in activity strategy training along with regular exercise increased their physical activity, more so than those patients who only took part in exercise and health education sessions. Study results are now online and are set to appear in the October issue of Arthritis & Rheumatism.

"Occupational therapy is really the missing link in promoting wellness of people with hip and knee osteoarthritis," says study lead author Susan L. Murphy, Sc.D., OTR, assistant professor in the Department of Physical Medicine and Rehabilitation at the U-M Medical School and Research Health Science Specialist at the VA Ann Arbor Healthcare System.

"Most people with osteoarthritis want to be active, but often find that there are personal or physical barriers in the way. For instance, people with osteoarthritis often deal with pain and fatigue, which makes engaging in regular physical activity more difficult. In addition, there are often barriers in people's homes and communities that make physical activity difficult," she continues.

For that reason, Murphy says the pilot study used activity strategy training in groups and in places – such as senior housing facilities – where barriers could be addressed and potential solutions discovered.

Taught by occupational therapists, this structured rehabilitation program is designed to educate patients about joint protection, proper body mechanics, activity pacing, and environmental barriers. For example, patients with joint pain caused by osteoarthritis learn techniques for walking around the house or outdoors, or even getting in and out of a car. For the pilot study, the activity strategy training included education, group discussion, a home visit, and demonstration and practice of techniques to facilitate activity.

Activity strategy training, however, is not commonly prescribed to patients with hip or knee osteoarthritis, a degenerative disease that causes the breakdown of the cartilage in joints. Most physical activity programs for these patients only offer structured exercise, which has been shown to have short-term positive effects on arthritis pain and physical disability. But these effects usually fade soon after participation in the program ends.

In this study, both groups participated in the same structured exercise program. However, only participants who received the activity strategy training were found to have increased the intensity of their physical activity at the end of the study compared to those who received health education.

While the results are promising, Murphy says more research needs to be conducted to replicate with larger groups and to examine long-term effects before this technique can be applied to patient care.

Regardless, Murphy encourages patients with hip or knee osteoarthritis to seek out opportunities now to enhance and expand their daily physical activity, and improve overall health behaviors.

"People with osteoarthritis tend to know more about surgical options, and less about how they can take an active role in promoting their own health and well-being," Murphy explains. "People with osteoarthritis need to be their own agents of change. They can do so much to manage symptoms and stave off functional decline caused by osteoarthritis just by being physically active. The bottom line is to find ways to help people create and maintain these healthy habits."

Methodology: The pilot trial was conducted at three senior housing facilities and one senior center. Fifty-four older adults with hip or knee osteoarthritis participated, and were randomly assigned to take part in one of two programs: exercise with activity strategy training, or exercise with health education, which was based on education materials from the Arthritis Foundation. The groups participated in eight sessions during a four-week period, and then two follow-up sessions during a six-month period. During the trial, researchers measured patients' pain, total physical activity, and physical activity intensity. Objective physical activity was measured by a wrist-worn accelerometer.

Authors: Along with Murphy, study authors from the U-M Health System were Debra M. Strasburg, MS, PT; Angela K. Lyden, MS; Dylan M. Smith, Ph.D.; Jessica F. Koliba, BA; Dina P. Dadabhoy, M.D.; and Susan Wallis, M.D.

Funding: This research was supported by a grant from the National Center for Medical Rehabilitation Research, and the U-M Office of the Vice President for Research.

Reference: Arthritis & Rheumatism, Vol. 58, No.10.

Adapted from materials provided by University of Michigan Health System.

http://www.sciencedaily.com/releases/2008/09/080929084301.htm

Disease Diagnosis In Just 15 Minutes? Biosensor Technology Uses Antibodies To Detect Biomarkers Much Faster

Scientists have developed a biosensor technology that uses antibodies to detect biomarkers much faster than current testing methods, paving the way for testing for diseases such as cancer and multiple sclerosis that could be as simple as using a pregnancy testing kit. (Credit: iStockphoto/Achim Prill)

ScienceDaily (Oct. 1, 2008) — Testing for diseases such as cancer and multiple sclerosis could soon be as simple as using a pregnancy testing kit.

A team led by scientists at the University of Leeds has developed a biosensor technology that uses antibodies to detect biomarkers – molecules in the human body which are often a marker for disease – much faster than current testing methods.

The technology could be used in doctors' surgeries for more accurate referral to consultants, and in hospitals for rapid diagnosis. Tests have shown that the biosensors can detect a wide range of analytes (substances being measured), including biomarkers present in prostate and ovarian cancer, stroke, multiple sclerosis, heart disease and fungal infections. The team also believes that the biosensors are versatile enough to test for diseases such as tuberculosis and HIV.

The technology was developed through a European collaboration of researchers and commercial partners in a 2.7 million Euro project called ELISHA. It features new techniques for attaching antibodies to innovative surfaces, and novel electronic measurement methods that need no reagents or labels.

ELISHA was co-ordinated by Dr Paul Millner from the Faculty of Biological Sciences at the University of Leeds, and managed by colleague Dr Tim Gibson. Says Dr Millner: "We believe this to be the next generation diagnostic testing. We can now detect almost any analyte faster, cheaper and more easily than the current accepted testing methodology."

Currently blood and urine are tested for disease markers using a method called ELISA (Enzyme Linked Immunosorbant Assay). Developed in the 1970s, the process takes an average of two hours to complete, is costly and can only be performed by highly trained staff.

The Leeds team are confident their new technology – which provides results in 15 minutes or less - could be developed into a small device the size of a mobile phone into which different sensor chips could be inserted, depending on the disease being tested for.

"We've designed simple instrumentation to make the biosensors easy to use and understand," says Dr Millner. "They'll work in a format similar to the glucose biosensor testing kits that diabetics currently use."

Professor Séamus Higson, Dean of the Faculty of Medicine and Biosciences, Cranfield Health, and one of the partners within the ELISHA programme, says: "The speed of response this technology offers will be of great benefit to early diagnosis and treatment of many diseases, and will permit testing in de-localised environments such as GP's surgeries."

A spinout company – ELISHA Systems Ltd – has been set up by Dr Gibson, commercial partners Uniscan Instruments Ltd and Technology Translators Ltd to bring the technology to market.

Says Dr Gibson: "The analytes used in our research only scratch the surface of the potential applications. We've also shown that it can be used in environmental applications, for example to test for herbicides or pesticides in water and antibiotics in milk."

Adapted from materials provided by University of Leeds.

http://www.sciencedaily.com/releases/2008/10/081001093231.htm

Reversible 3D Cell Culture Gel Invented

ScienceDaily (Oct. 1, 2008) — Singapore's Institute of Bioengineering and Nanotechnology (IBN), which celebrates its fifth anniversary this year, has invented a unique user-friendly gel that can liquefy on demand, with the potential to revolutionize three-dimensional (3D) cell culture for medical research.As reported in Nature Nanotechnology, IBN's novel gel media has the unique ability to liquefy when it is subjected to a moderate shear force and rapidly resolidifies into a gel within one minute upon removal of the force. This phenomenon of reverting between a gel and a liquid state is known as thixotropy.

IBN's thixotropic gel is synthesized from a nanocomposite of silica and polyethylene glycol (PEG) under room temperature, without special storage conditions. This novel material facilitates the safe and convenient culture of cells in 3D since cells can be easily added to the gel matrix without any chemical processes.According to IBN Executive Director Jackie Y. Ying, Ph.D., "Cell culture is conventionally performed on a flat surface such as glass slides. It is an essential process in biological and medical research, and is widely used to process cells, synthesize biologics and develop treatments for a large variety of diseases.

"Cell culture within a 3D matrix would better mimic the actual conditions in the body as compared to the conventional 2D cell culture on flat surfaces. 3D cell culture also promises the development of better cell assays for drug screening," Dr. Ying added.Another key feature of IBN's gel is the ease with which researchers can transfer the cultured cells from the matrix by pipetting the required amount from the liquefied gel.Unlike conventional cell culture, trypsin is not required to detach the cultured cells from the solid media. As trypsin is an enzyme that is known to damage cells, especially in stem cell cultures, the long-term quality and viability of cells cultured using IBN's thixotropic gel would improve substantially without the exposure to this enzyme.

Researchers are also able to control the gel's stiffness, thus facilitating the differentiation of stem cells into specific cell types."Ways to control stem cell differentiation are important as stem cells can be differentiated into various cell types. Our gel can provide a novel method of studying stem cell differentiation, as well as an effective new means of introducing biological signals to cells to investigate their effect in 3D cultures," said Shona Pek, IBN Research Officer.

Andrew Wan, Ph.D., IBN Team Leader and Principal Research Scientist, added, "Another interesting property of the gel is its ability to support the extracellular matrix (ECM) secretions of cells. Gel stiffness is modulated by ECM secretions, and can be used to study ECM production by cells responding to drug treatments or disease conditions.

"The thixotropic gel may then provide new insights for basic research and drug development," Dr. Wan added.

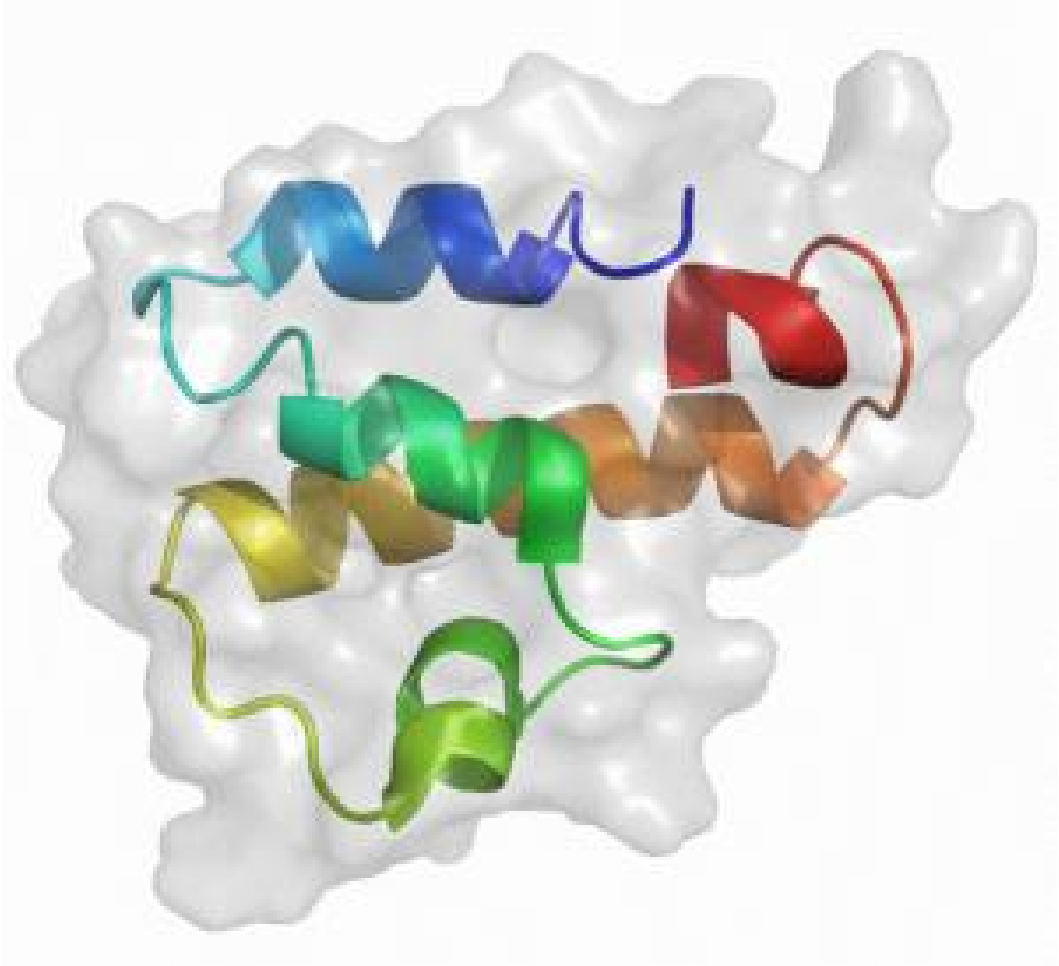
Journal reference:

1. Y.S. Pek, A. C. A. Wan, A. Shekaran, L. Zhuo and J. Y. Ying. **A Thixotropic Nanocomposite Gel for Three-Dimensional Cell Culture**. *Nature Nanotechnology*, (in press)

*Adapted from materials provided by Agency for Science, Technology and Research (A*STAR), Singapore.*

http://www.sciencedaily.com/releases/2008/09/080928145610.htm

Immune System Can Hurt As Well As Help Fight Cancer, Study Shows



Model of the C5a molecule, part of the immune complement system. (Credit: John D. Lambris, PhD, University of Pennsylvania School of Medicine)

ScienceDaily (Oct. 1, 2008) — Researchers at the University of Pennsylvania School of Medicine have found that some proteins of the immune system can promote tumor growth. Investigators found that instead of fighting tumors, the protein C5a, which is produced during an immune response to a developing tumor, helps tumors build molecular shields against T-cell attack. These findings appeared online this week in Nature Immunology.

C5a is part of the complement system, one of the body's immune defenses against pathogens. When activated, the system's proteins rid the body of microbes and foreign cells. Many cancer treatments are aimed at boosting the immune system to kill tumors.

"Until now, everyone thought that the complement system was there to eliminate tumor cells. We found that in some conditions, the complement system can promote tumor growth, depending on the specific tumor and the specific environment in which the tumors are developing," says John Lambris, PhD, the Dr. Ralph and Sallie Weaver Professor of Research Medicine.

However, Penn researchers found that in a mouse model, activation of the complement system in tumor tissue leads to the generation of C5a, which recruits myeloid-derived suppressor cells (MDSC) to tumors. These MDSCs block the function of CD8+ T cells, which would normally dismantle a tumor.

Researchers also found that blocking the C5a receptor on cell surfaces impairs tumor growth at the same rate of Paclitaxel, a chemotherapy drug. This discovery could lead to new cancer treatments with far fewer side effects than chemotherapy, surmise the investigators.

"Researchers are trying to introduce immune therapies and anti-tumor vaccines, but most of these vaccines fail," says Lambris. "We show in this study a possible mechanism how to overcome this problem." Lambris and his team are conducting studies that apply the approaches outlined in this paper to five models of cancer.

In addition to Lambris, Penn co-authors are Maciej M. Markiewski, Robert A. DeAngelis, Salome K Ricklin-Lichtsteiner, Anna Koutoulaki, Fabian Benencia (now at the University of Ohio), and George Coukos, as well as Craig Gerard, Children's Hospital, Boston. The National Institutes of Health provided funding for this research.

Adapted from materials provided by University of Pennsylvania School of Medicine.

http://www.sciencedaily.com/releases/2008/09/080929153458.htm

Honey Effective In Killing Bacteria That Cause Chronic Sinusitis

Honey is very effective in killing bacteria in all its forms, especially the drug-resistant biofilms that make treating chronic rhinosinusitis difficult. (Credit: iStockphoto/Ivan Mateev)

ScienceDaily (Oct. 1, 2008) — Honey is very effective in killing bacteria in all its forms, especially the drug-resistant biofilms that make treating chronic rhinosinusitis difficult, according to research presented during the 2008 American Academy of Otolaryngology-Head and Neck Surgery Foundation (AAO-HNSF) Annual Meeting & OTO EXPO, in Chicago, IL.*

The study, authored by Canadian researchers at the University of Ottawa, found that in eleven isolates of three separate biofilms (Pseudomonas aeruginosa, and methicicillin-resistant and -suseptible Staphylococcus aureus), honey was significantly more effective in killing both planktonic and biofilm-grown forms of the bacteria, compared with the rate of bactericide by antibiotics commonly used against the bacteria.

Given the historical uses of honey in some cultures as a homeopathic treatment for bad wound infections, the authors conclude that their findings may hold important clinical implications in the treatment of refractory chronic rhinosinusitis, with topical treatment a possibility.

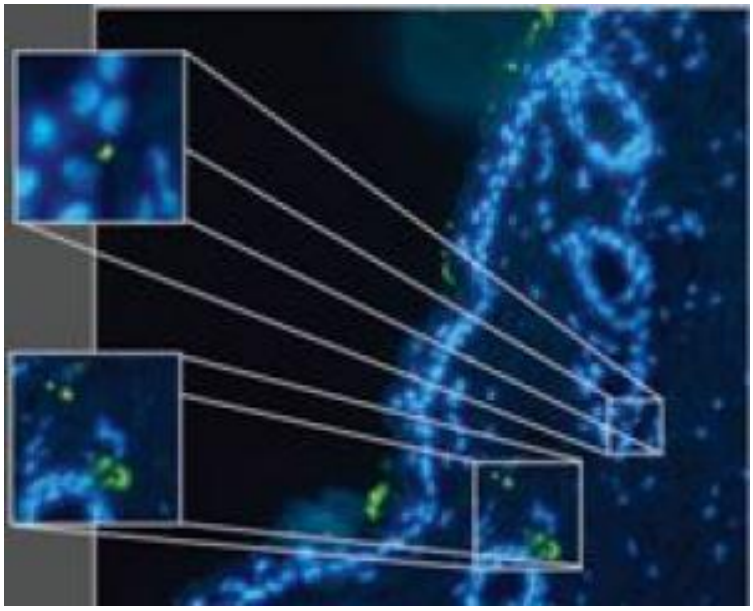
Chronic rhinosinusitis affects approximately 31 million people each year in the United States alone, costing over $4 billion in direct health expenditures and lost workplace productivity. It is among the three most common chronic diseases in all of North America.

*Title: Effectiveness of Honey on S. aureus and P. aeruginosa Biofilms. Authors: Talal Alandejani, MD (presenter); Joseph G. Marsan, MD; Wendy Ferris, BSc, MLT, MSc; Robert Slinger; Frank Chan, PhD. Date: September 23, 2008.

Adapted from materials provided by American Academy of Otolaryngology -- Head and Neck Surgery, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com/releases/2008/09/080923091335.htm

Nano Breach: When Particles Are So Small That They Seep Right Through Skin



Quantum dot nanoparticles are visible as fluorescing green dots in the skin. (Credit: Image courtesy of University of Rochester Medical Center)

ScienceDaily (Oct. 1, 2008) — Scientists are finding that particles that are barely there – tiny objects known as nanoparticles that have found a home in electronics, food containers, sunscreens, and a variety of applications – can breach our most personal protective barrier: The skin.

The particles under scrutiny by Lisa DeLouise, Ph.D., are almost unfathomably tiny. The particles are less than one five-thousandth the width of a human hair. If the width of that strand of hair were equivalent to the length of a football field, a typical nanoparticle wouldn't even belly up to the one-inch line.

In the September issue of the journal Nano Letters, a team led by DeLouise at the University of Rochester Medical Center published a paper showing that nanoparticles pass through the skin of a living organism, a type of mouse commonly used as a model to study the damaging effects of sunlight.

It's the strongest evidence yet indicating that some nanoparticles are so small that they can actually seep through skin, especially when the skin has been damaged.

The health implications of nanoparticles in the body are uncertain, said DeLouise, an assistant professor of Dermatology and Biomedical Engineering and an expert on the properties of nanoparticles. Other scientists have found that the particles can accumulate in the lymph system, the liver, the nervous system, and in other areas of the body. In her study, she found that the particles accumulate around the hair follicles and in tiny skin folds.

DeLouise, a chemist, points out that her study did not directly address the safety of nanoparticles in any way. "We simply wanted to see if nanoparticles could pass through the skin, and we found that they can under certain conditions," she said.

DeLouise's work is part of a broad field known as nanomedicine that is a strategic area at the University of Rochester Medical Center. The area includes research, like hers, looking at the properties of

nanoparticles, as well as possibilities like new forms of drug delivery and nano-sensors that can immediately identify microbes and other threats to our health.

While nanoparticles are becoming widely used in the manufacture of consumer products, they are also under a great deal of study in research labs, and there are some processes – including ordinary candle flames – that produce them naturally. Some of the particles are so small, less than 10 nanometers wide (a nanometer is one-millionth of a millimeter), that they are nearly as small as the natural gaps between some skin cells.

In its paper in Nano Letters, the team studied the penetration of nanoparticles known as quantum dots that fluoresce under some conditions, making them easier to see and track compared to other nanoparticles. The scientists looked at the distribution of quantum dots in mice whose skin had been exposed to about the same amount of ultraviolet light as might cause a slight sunburn on a person. The team showed that while the nanoparticles were able to breach the skin of all the mice, the particles passed more quickly through skin that had been damaged by ultraviolet light.

Part of the explanation likely lies with the complex reaction of skin when it's assaulted by the Sun's rays. In response to ultraviolet light, cells proliferate, and molecules in the skin known as tight-junction proteins loosen so that new cells can migrate to where they're needed. Those proteins normally act as gatekeepers that determine which molecules to allow through the skin and into the body, and which molecules to block. When the proteins loosen up, they become less selective than usual, possibly giving nanoparticles an opportunity to pass through the barrier.In the future, DeLouise plans to study titanium dioxide and zinc oxide, two materials that are widely used in sunscreens and other cosmetic products to help block the damaging effects of ultraviolet light. In recent years the size of the metal oxide particles used in many consumer products has become smaller and smaller, so that many now are nanoparticles. The effects of the smaller particle size are visible to anyone who takes a walk on the beach or stops by the cosmetics counter at a department store: The materials are often completely transparent when applied to skin. A transparent lip gloss that protects against UV light, for example, or a see-through sunscreen may contain nanoparticles, DeLouise says.

"A few years ago, a lifeguard at the swimming pool wearing sunscreen might have had his nose completely covered in white. Older sunscreens have larger particles that reflect visible light. But many newer sunscreens contain nanoparticles that are one thousand times smaller, that do not reflect visible light," said DeLouise, who noted that many people apply sunscreens after their skin has been damaged by sunlight.

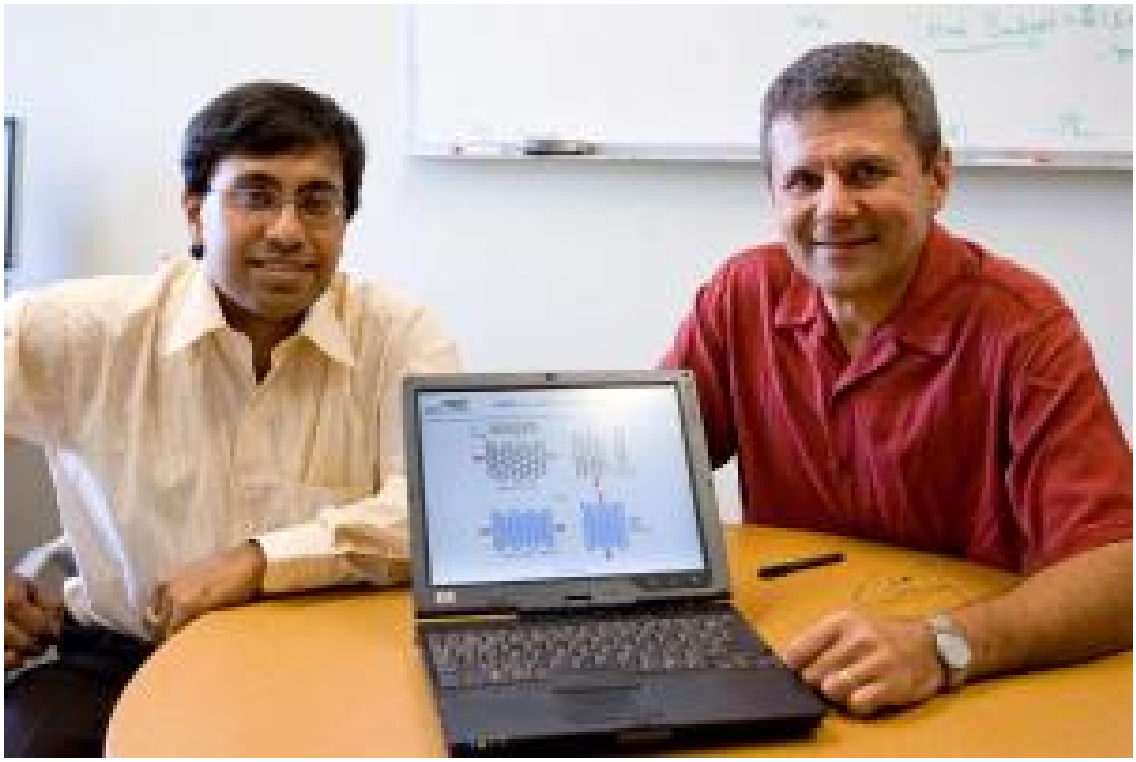
Initial funding from two sources allowed the team to gather the evidence necessary to expand the project dramatically. DeLouise's project was first funded by the University's Environmental Health Sciences Center, which supported graduate student Luke Mortensen during his research. The University's Clinical and Translational Science Institute has also awarded $100,000 to the team, and DeLouise has just received $394,000 from the National Science Foundation to expand the project for the next three years. She will be working with dermatologist Lisa Beck, M.D., who is an expert in allergic skin disorders.

In addition to DeLouise and Mortensen, authors of the paper include Günter Oberdörster, Ph.D., professor of Environmental Medicine and a widely recognized authority on the bio-effects of nanoparticles. Oberdörster is director of the Particulate Matter Center, funded by the Environmental Protection Agency, where scientists study the link between tiny air particles we breathe every day and our cardiovascular health. Dermatologist Alice Pentland, M.D., professor and chair of the Department of Dermatology and an expert on how sunlight brings about skin cancer, was also an author.

Adapted from materials provided by University of Rochester Medical Center.

http://www.sciencedaily.com/releases/2008/09/080930102635.htm

Hot Laptops: Engineers Aim To Solve 'Burning' Computer Problem



Avik Ghosh and Mircea Stan. (Credit: Photo by Jane Haley)

ScienceDaily (Oct. 1, 2008) — If you've balanced a laptop computer on your lap lately, you probably noticed a burning sensation. That's because ever-increasing processing speeds are creating more and more heat, which has to go somewhere — in this case, into your lap.

Two researchers at the University of Virginia's School of Engineering and Applied Science aim to lay the scientific groundwork that will solve the problem using nanoelectronics, considered the essential science for powering the next generation of computers.

"Laptops are very hot now, so hot that they are not 'lap' tops anymore," said Avik Ghosh, an assistant professor in the Charles L. Brown Department of Electrical and Computer Engineering. “The prediction is that if we continue at our current pace of miniaturization, these devices will be as hot as the sun in 10 to 20 years."

To head off this problem, Ghosh and Mircea Stan, also a professor in the department, are re-examining nothing less than the Second Law of Thermodynamics. The law states that, left to itself, heat will transfer from a hotter unit to a cooler one — in this case between electrical computer components — until both have roughly the same temperature, a state called "thermal equilibrium."

The possibility of breaking the law will require Ghosh and Stan to solve a scientifically controversial — and theoretical — conundrum known as "Maxwell's Demon."

Introduced by Scottish physicist James Clerk Maxwell in 1871, the concept theorizes that the energy flow from hot to cold could be disrupted if there were a way to control the transfer of energy between two

units. Maxwell's Demon would allow one component to take the heat while the other worked at a lower temperature.

This could be accomplished only if the degree of natural disorder, or entropy, were reduced. And that's the "demon" in Maxwell's Demon. "Device engineering is typically based on operating near thermal equilibrium," Ghosh said.

But, he added, nature has examples of biological cells that operate outside thermal equilibrium.

"Chlorophyll, for example, can convert photons into energy in highly efficient ways that seem to violate traditional thermodynamic expectations," he said.

A closely related concept, Brownian "ratchets," will also be explored. This concept proposes that devices could be engineered to convert non-equilibrium electrical activity into directed motion, allowing energy to be harvested from a heat source.

If computers could be made with components that operate outside thermal equilibrium, it could mean better computer performance. Basically, your laptop wouldn't burst into flames as it processes larger amounts of information at faster speeds. Also, because it would operate at extremely low power levels and would have the ability to harness, or scavenge, power dissipated by other functions, battery life would increase.

Combining Ghosh's command of physics with Stan's expertise in electrical engineering, the two hope to bridge the concept of tackling Maxwell's Demon and Brownian ratchets from theoretical physics to engineered technologies.

"These theories have been looked at from a physics perspective for years, but not from the perspective of electrical engineering," Stan said. "So that's where we are trying to break some ground."

Adapted from materials provided by University of Virginia. Original article written by Zak Richards.

http://www.sciencedaily.com/releases/2008/09/080929144120.htm

Young Children Can Develop Full-blown Obsessive Compulsive Disorder (OCD)

ScienceDaily (Oct. 1, 2008) — A new study by researchers at the Bradley Hasbro Children's Research Center has found that children as young as four can develop full-blown obsessive compulsive disorder (OCD) and often exhibit many of the same OCD characteristics typically seen in older kids.

The study, published online by the Journal of Psychopathology and Behavioral Assessment, is the largest sample of young children with OCD published to date.

"There have been very few studies focusing on early childhood OCD, even though we know that OCD, if left untreated, can significantly disrupt a child's growth and development and can worsen as the child gets older," says lead author Abbe Garcia, PhD, director of the Bradley Hasbro Children's Research Center (BHCRC) Pediatric Anxiety Research Clinic. "That's why we need to understand more about OCD in very young children, since early diagnosis and intervention are critical to reducing the severity of symptoms and improving quality of life."

OCD is an anxiety disorder characterized by recurrent, unwanted thoughts (obsessions) and/or repetitive behaviors (compulsions). Repetitive behaviors such as handwashing, counting, checking, or cleaning are often performed with the hope of preventing obsessive thoughts or making them go away. Performing these so-called "rituals," however, provides only temporary relief, and not performing them markedly increases anxiety. According to the American Academy of Child and Adolescent Psychiatry, as many as 1 in 200 children and adolescents struggle with OCD.

Garcia and colleagues studied 58 children with OCD between the ages of four and eight, including 23 boys and 35 girls. All children underwent a series of clinical psychological assessments. Approximately 19 percent had been previously treated with medication and 24 percent had received some form of previous psychotherapy for OCD. Twenty percent reported a first-degree family history of OCD. Nearly 22 percent of children had an additional diagnosis of attention deficit hyperactivity disorder (ADHD) and about 20 percent were also diagnosed with generalized anxiety disorder (GAD).

Common obsessions among children in the study included fear of contamination and aggressive/catastrophic fears (involving death or harm to themselves or loved ones), and three-quarters reported having multiple obsessions. Nearly all of the children suffered from multiple compulsive behaviors, with an average of four compulsions per child. Washing, checking and repeating were the most commonly reported compulsions.

A data analysis revealed a number of parallels between young children with OCD and reported samples of their older peers in terms of symptoms and severity. For example, both groups appear to have similar types of obsessions and compulsions, multiple psychiatric diagnoses, and high rates of OCD family history.

"These similarities suggest this is a study sample involving full-blown OCD, as opposed to children who are either in the beginning phases of the illness or only have a partial OCD diagnosis," says Garcia, who is also an assistant professor of psychiatry (research) at The Warren Alpert Medical School of Brown University.

However, Garcia says they also discovered some important differences between younger and older children with OCD. Although anxiety disorders seem to be a common comorbid diagnosis in both groups, younger children were less likely to have depression, compared to older children. Also, while many experts believe boys are more likely to present with juvenile OCD, the findings from the current study actually indicate a lower boy to girl ratio.

"Our findings offer the first glimpse at the features and variables that emerge during early childhood onset OCD and will hopefully lead to further studies focusing on assessment and treatment of this age group," Garcia says.

The study was supported in part by a grant from the National Institutes of Mental Health. Co-authors were Jennifer Freeman and Henrietta Leonard from the BHCRC and Alpert Medical School; Noah Berman, Alexandra Ogata and Molly Choate-Summers from the BHCRC; Michael Himle from the University of North Dakota; and Janet Ng from the University of Oregon.

Adapted from materials provided by Lifespan, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com/releases/2008/09/080930102633.htm

Cloud Radar: Predicting The Weather More Accurately

Cloud radar deployed at Field Station. (Credit: Image courtesy of Science and Technology Facilities Council)

ScienceDaily (Oct. 1, 2008) — The weather. It's the one topic of conversation that unites Britain – umbrella or sun cream? Now scientists at the Science and Technology Facilities Council have developed a system that measures the individual layers of cloud above us which will make answering the all-important weather questions much easier in future.

The Cloud Radar will not only allow forecasters to predict the weather more precisely, the information gathered will also enable aircraft pilots to judge more accurately whether it is safe to take off and land in diverse weather conditions, offering a powerful safety capability for civil airports and military air bases.

Developed over 10 years by researchers and engineers at the STFC Rutherford Appleton Laboratory, in collaboration with the Met Office, the Cloud Radar can take a complete and accurate profile of cloud or fog up to 5 miles overhead. Operating at 94 GHz, 50 times higher in frequency than most mobile phones, the radar measures the cloud base height, its thickness, density and internal structure as well as providing similar information on cloud layers at higher altitudes.

The earliest version of the cloud radar was built to demonstrate that a low power system operating at high frequency could compete with more common radar types. It was built from the spare components of a radar altimeter designed to operate on a satellite, so that it used small, low-power components in contrast to previous cloud radars that use expensive pulsed sources which consume many times more power and have limited lifetimes.

Brian Moyna, Senior Systems Engineer at STFC said: "In a nutshell, our Cloud Radar takes a slice of cloud and provides a complete and accurate vertical profile. Compared to conventional pulsed radar

instruments, this radar is a low power, high sensitivity, portable instrument that uses all solid state components for lower cost and increased reliability."

The Met Office has just purchased a Cloud Radar which is being trialled at sites around Britain. Additionally, a Cloud Radar has also been acquired by the University of Marburg in Germany.

The radar consists of a millimetre-wave frequency source that continuously emits a low power signal in the vertical direction that is frequency modulated. A signal is returned, mainly due to what is known as 'back-scattering' from water droplets and ice crystals in the atmosphere. This signal is picked up by a receiver and converted to a microwave signal, which is then digitised, analysed and a real-time image of the returned signal intensity versus altitude is displayed for the user.

The new Cloud Radar is the result of several hundred thousands of pounds of investment into the Space Science & Technology Department at STFC with proof of concept funding from CLIK, STFC's wholly-owned technology exploitation company, along with the Met Office.

Adapted from materials provided by Science and Technology Facilities Council.

http://www.sciencedaily.com/releases/2008/09/080924085200.htm

New Formula Predicts How People Will Migrate In Coming Decades

ScienceDaily (Oct. 1, 2008) — Nearly 200 million people now live outside their country of birth. But the patterns of migration that got them there have proven difficult to project. Now scientists at Rockefeller University, with assistance from the United Nations, have developed a predictive model of worldwide population shifts that they say will provide better estimates of migration across international boundaries.

Because countries use population projections to estimate local needs for jobs, schools, housing and health care, a more precise formula to describe how people move could lead to better use of resources and improved economic conditions.

The model, recently published in Proceedings of the National Academy of Sciences, improves existing ways to estimate population movement between individual countries and is being considered by the United Nations as an approach all nations can utilize, says the study's lead investigator, Joel E. Cohen, Abby Rockefeller Mauzé Professor and head of the Laboratory of Populations.

"From year to year, it has been difficult to calculate how the world's population ebbs and flows between countries other than guessing that this year will resemble last year. But that is critical information in so many ways, and this model offers a new and unified approach that, we hope, will be of global benefit," Cohen says.

Formulas used until now were so flawed that they sometimes estimated that net emigration away from a particular country was greater than the country's original population, Cohen says, with a result that a nation was left with a predicted population of fewer than zero. "This has been a very inexact science," Cohen says.

To minimize such problems, Cohen and his colleagues used 43,653 reports from 11 countries of migration, which included 228 origins and 195 destinations reported from 1960 to 2004. The data on population and migration were provided by coauthor Marta Roig of the United Nations' Population Division. Cohen then added other geographical data. He and the other coauthors, Daniel Reuman, a former postdoctoral researcher at Rockefeller who is now at Imperial College London, and Cai GoGwilt, a Massachusetts Institute of Technology undergraduate who was a summer intern at Rockefeller, determined how to weight each variable.

The variables they selected were the populations and areas of countries receiving and sending people, the trend over time and the distance between locations. They then added "indicator" variables to account for differences in how nations report their data and used off-the-shelf computer software to estimate coefficients of a mathematical model of migration patterns.

"Our model accounts for roughly 60 percent of the variation in annual numbers of migrants from any country or region to any other, based on historical data, and nothing has come close to this," says Cohen. "This is only a first step, but it is a step that had not been made before. I hope this stimulates countries to come together and improve the standards by which they collect migration data. The data available to us are incomplete, inconsistent and in some cases contradictory. Better data in the future will help to improve models like this."

Understanding international migration has become more important in recent years because fertility worldwide has dropped, Cohen says. "That means the relative importance of migration as a factor in population change is accentuated, particularly for the countries that are the big receivers." For example, significant numbers of workers leave Southeast Asia for work in the Middle East, and migration continues from Turkey to Germany, Pakistan to England and Mexico to the United States.

The study was funded by a National Science Foundation award that supports Cohen's laboratory.

Journal reference:

1. Joel E. Cohen, Daniel C. Reuman, and Cai GoGwilt. **International migration beyond gravity: A statistical model for use in population projections**. *PNAS*, August 18, 2008 [link]

Adapted from materials provided by Rockefeller University.

http://www.sciencedaily.com/releases/2008/09/080929212933.htm

Tiny Organisms Feast On Oil Thousands Of Feet Below Bottom Of Sea

Bubble of oil oozing from the ocean floor. (Credit: David Valentine)

ScienceDaily (Oct. 1, 2008) — Thousands of feet below the bottom of the sea, off the shores of Santa Barbara, single-celled organisms are busy feasting on oil.

Until now, nobody knew how many oily compounds were being devoured by the microscopic creatures, but new research led by David Valentine of UC Santa Barbara and Chris Reddy of Woods Hole Oceanographic Institution in Massachusetts has shed new light on just how extensive their diet can be.

In a report to be published in the Oct. 1 edition of the journal Environmental Science & Technology, Valentine, Reddy, lead author George Wardlaw of UCSB, and three other co-authors detail how the microbes are dining on thousands of compounds that make up the oil seeping from the sea floor.

"It takes a special organism to live half a mile deep in the Earth and eat oil for a living," said Valentine, an associate professor of earth science at UCSB. "There's this incredibly complex diet for organisms down there eating the oil. It's like a buffet."

And, the researchers found, there may be one other byproduct being produced by all of this munching on oil - natural gas. "They're eating the oil, and probably making natural gas out of it," Valentine said. "It's actually a whole consortium of organisms - some that are eating the oil and producing intermediate products, and then those intermediate products are converted by another group to natural gas."

Reddy, a marine chemist at Woods Hole, said the research provides important new clues in the study of petroleum. "The biggest surprise was that microbes living without oxygen could eat so many compounds that compose crude oil," Reddy said. "Prior to this study, only a handful of compounds were shown, mostly in laboratory studies, to be degraded anaerobically. This is a major leap forward in understanding petroleum geochemistry and microbiology."

The diet of the single-cell microbes is far more diverse than previously thought, Valentine said. "They ate around 1,000 of the 1,500 compounds we could trace, and presumably are eating many more," he said.

Research for this project began seven years ago and much of the testing was done at one of the planet's best natural labs. "We have the world's most prolific hydrocarbon seep field sitting right offshore of Santa Barbara, about two miles out," Valentine said. "We have something on the order of 100 barrels of oil a day coming up from the sea floor."

The source of this oil seepage is near Platform Holly, but it's not being caused by the drilling. "It's just oil that is naturally oozing out, probably has been for thousands of years," Valentine explained. "Holly just happens to be near some of these seepage areas, which is fortuitous because we were able to get samples from about a mile deep."

By studying samples from the subsurface, the ocean floor, the mid-water, and then from the surface, the researchers could determine how much of the oil was being degraded and digested by the microbes.

Using a new technique devised by Reddy, the scientists were able to pick apart the differences in the makeup of the oil, which is migrating to the surface through faults from deep below the sea floor. The microbes prefer the lighter compounds of oil, the gasoline part of the black goo. They tend to leave behind the heavily weathered residue, which is what makes its way to the surface and, sometimes, to the beaches in the form of tar.

"There always seems to be a residue," Valentine said. "They (bacteria) hit a wall. There seems to be stages in which they eat. There's the easy stuff - the steak. And then they work their way to the vegetables, and then garnish, and then they stop eating after awhile. Just depends on how hungry they are and what's fed to them."

Reddy's new diagnostic technology is called a comprehensive two-dimensional gas chromatography (GCxGC). Typically, chromatography involves heating up a sample and putting it into a column around 60 meters long. Compounds are then separated based on their boiling points, which works well with light crude oil, Valentine said. But, with the two-dimensional test, the compounds are put into a cooled trap, for about 10 seconds, and a flash pulse of hot air releases them into the second column. This two-dimensional separation allows the researchers to pick out the many thousands of compounds.

"This new technology was actually too good at its job," Reddy said. "It was able to separate and help identify significantly more compounds in the oil samples than traditional analytical techniques. The end result was that we were handcuffed with too much data afforded by the GCxGC. However, we overcame this hurdle by using new algorithms to help us interpret the data, which in turn led us to these milestone discoveries."

The next steps in their research are already under way, according to Valentine. They are following the oil diet in controlled laboratory conditions, and tracking the fate of the oil once it forms a slick at the sea surface.

"When you fly out of the Santa Barbara Airport, you can look down and see these massive slicks," Valentine said. "You can follow them for about 20 miles. A lot of the oil comes up on the beaches, but then what happens to it after that? Certainly the microorganisms continue to act on it. Evaporation occurs,

but most of it can't evaporate. Some of it breaks down from sunlight. So where does the rest of it end up? We want to know how far the organisms will go in eating the oil and what happens to the residual tar. It doesn't all stick to our feet and there must be a lot of it out there somewhere."

Wardlaw, the lead author of this paper, is a graduate student in the Marine Science program at UCSB. The other co-authors were J. Samuel Arey of the Swiss Federal Institute of Technology, and G. Todd Ventura and Robert K. Nelson, both of Woods Hole Oceanographic Institution.

Funding for this research was provided by the National Science Foundation, the Department of Energy, and the U.S. Minerals Management Service.

Adapted from materials provided by University of California - Santa Barbara.

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Water Table Depth Tied To Droughts

Will there be another "dust bowl" in the Great Plains similar to the one that swept the region in the 1930s? It depends on water storage underground. (Credit: iStockphoto/Clint Spencer)

ScienceDaily (Oct. 1, 2008) — Will there be another "dust bowl" in the Great Plains similar to the one that swept the region in the 1930s?

It depends on water storage underground. Groundwater depth has a significant effect on whether the Great Plains will have a drought or bountiful year.

Recent modeling results show that the depth of the water table, which results from lateral water flow at the surface and subsurface, determines the relative susceptibility of regions to changes in temperature and precipitation.

"Groundwater is critical to understand the processes of recharge and drought in a changing climate," said Reed Maxwell, an atmospheric scientist at Lawrence Livermore National Laboratory, who along with a colleague at Bonn University analyzed the models that appear in the Sept. 28 edition of the journal Nature Geoscience.

Maxwell and Stefan Kollet studied the response of a watershed in the southern Great Plains in Oklahoma using a groundwater/surface-water/land-surface model.

The southern Great Plains are an important agricultural region that has experienced severe droughts during the past century including the "dust bowl" of the 1930s. This area is characterized by little winter snowpack, rolling terrain and seasonal precipitation.

While the onset of droughts in the region may depend on sea surface temperature, the length and depth of major droughts appear to depend on soil moisture conditions and land-atmosphere interactions.

That's what the recent study takes into account. Maxwell and Kollet created three future climate simulations based on the observed meteorological conditions from 1999. All included an increase in air temperature of 2.5 degrees Celsius. One had no change in precipitation; one had an increase in precipitation by 20 percent; and one had a decrease in precipitation by 20 percent.

"These disturbances were meant to represent the variability and uncertainty in regional changes to central North America under global model simulations of future climate," Maxwell said.

The models showed that groundwater storage acts as a moderator of watershed response and climate feedbacks. In areas with a shallow water table, changes in land conditions, such as how wet or dry the soil is and how much water is available for plant function, are related to an increase in atmospheric temperatures. In areas with deep water tables, changes at the land surface are directly related to amount of precipitation and plant type.

But in the critical zone, identified here between two and five meter's depth, there is a very strong correlation between the water table depth and the land surface.

"These findings also have strong implications for drought and show a strong dependence on areas of convergent flow and water table depth," Maxwell said. "The role of lateral subsurface flow should not be ignored in climate-change simulations and drought analysis."

The simulations were performed on LLNL's Thunder supercomputer and the work was supported by the LLNL climate change initiative.

Adapted from materials provided by DOE/Lawrence Livermore National Laboratory, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com/releases/2008/09/080929133725.htm

Your Robotic Friend, The Humanoid Robot

ARMAR, one of the humanoid robots in the the European Network of Robotic Research (EURON), works in the kitchen at tasks like opening the dishwasher door, filling it with dirty dishes and then closing the door before turning the machine on. (Credit: ARMAR Project / Courtesy of ICT Results)

ScienceDaily (Oct. 1, 2008) — Robots can take any shape or form and with the explosion in European research and development for every imaginable robot application, there are dozens of completely different designs. Why, then, do we remain fascinated by humanoid robots?

In Europe, as the rest of the world, there is s surge in robotics research, reflected in part by the European Network of Robotic Research (EURON), an EU-funded network of excellence that completed its work in 2008.

It was an important network. Observers like Bill Gates believe that there will be a robot in every home by 2025, and they compare the current state of play to the early days of the personal computer in the 1970s. The dozens of research programmes united by EURON represent the state-of-the-art in robotics, and a glimpse of the future.

At first blush, the humanoid robots in the EURON network do not necessarily make a lot of sense. They are seriously difficult to design and implement. For robots with legs, for example, there are enormous problems with balance, movement and safety.

And some would argue they are even an extravagance, given that a robot can be any shape that will allow it to best perform its function. Yet researchers and designers remain fascinated by the allure of the mechanical friend, the humanoid robot.

It is also surprising for cultural reasons. “Generally speaking, Europeans and Americans prefer their robots to look like machines, they do not like the ambiguity of a robot that looks like a person,” explains Bruno Siciliano, a robotics researcher.

"The Japanese, on the other hand, are very comfortable with humanoid robots, and I think it is something to do with the Shinto religion that believes machines can have a soul," he says.

But for all the cultural resistance, humanoid robotics do play an important role in European research, and not just because they look cute.

"Humanoid designs, especially ones that walk, pose enormous design and engineering challenges, and that in itself is a good reason do develop them, because they advance the field as a whole," suggests Siciliano who is dissemination officer of EURON.

Even better, a robust and reliable humanoid design would find it much easier to operate in a world designed for humans, where steps, gradients, variable terrain and corners abound.

Some robot friends

Reem-A, a life-size humanoid robot can recognise casual questions and commands, hold simple objects and stop for obstacles in its path during a leisurely stroll. It has sturdy legs, designed for stability, and it won a race at RoboCup 2006, a sort of robot Olympics. It can even play chess.

ARMAR is more of a geeky housemate, working in the kitchen at tasks like opening the dishwasher door, filling it with dirty dishes and then closing the door before turning the machine on. Granted, this is something humans can do much easier, but it is a significant step on the road to complete automation of daily and in many cases disagreeable chores.

Maggie was designed by the University Carlos III in Madrid to be a sociable robot. It has a friendly, almost cartoon frog-like appearance and can talk and recognise speech. It tries to understand gestures and touch through a touch screen on its chest. With a little prompting, it will even dance.

The same research team is also responsible for RH1, a rather chubby precursor to C3PO, the robot made famous by Star Wars. RH1 can change its gait to adapt to walking indoors or outside, and it can co-operate with people and other robots in real collaborative environments.

Learning hard lessons

Casimiro is another robot, though not mobile, designed for social interactions. Here, the researchers have focused on the face, teaching the robot to respond to people with a range of expressions. It is a fascinating area of research because engineers at the University of Las Palmas in Gran Canaria have found that they can get realistic interactions in the testing and teaching phase. But reliability over time is a challenge.

Because what is easy for people, like social intelligence, is hard for robots. Researchers at Las Palmas believe it is because we acquire social intelligence unconsciously, as children, that we find it very hard to create a series of protocols or algorithms that can be easily applied to a robot.

Physical manipulation is something we do consciously, however, so that is easy to translate into robotic terms. It is just one of the fascinating insights into both human and robotic intelligence that this research reveals.

The obvious, immediate applications for friendly robots are still evolving, but it is already clear that they have enormous implications for the future acceptance of humanoid machines in the home. "There is a huge amount of research on social robots currently underway in Japan and even in the USA," notes Siciliano.

Ultimately, with enough sophistication, social robots will be able to act as a comforting, animated presence for children or the elderly, combining the roles of companion with that of assistant.

Another robot, Justin, may be an early precursor of that type of robot. It is an incredibly sophisticated platform with enormous dexterity and it is even capable of making coffee.

"Japanese researchers familiar with Justin believe it is the most sophisticated European platform to date," notes Siciliano. "It shows what Europe is capable of in this domain."

Many of these robots have been funded through a variety of EU programmes. All of them benefited from networking.

This is part two of a special series of features exploring European robotics research, from humanoids friends, to functional home help, to just plain odd-bots.

Adapted from materials provided by ICT Results.

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Immigrant Children From Poor Countries Academically Outperform Those From Developed Countries

ScienceDaily (Oct. 1, 2008) — Children from small immigrant communities and children of politically motivated immigrants are at educational disadvantage, new research suggests.

Immigrants who seek a better life in Western countries may not be able to escape the influence of their home country when it comes to their children's academic performance, according to the new findings.

Sociologists Mark Levels, Jaap Dronkers and Gerbert Kraaykamp find that large-scale influences such as country of origin, destination country and immigrant community play a role in educational outcomes for immigrant children in their host country.

The research, which looked at the mathematical literacy scores of thousands of 15-year-old immigrants to 13 Western nations from 35 different native countries, indicates that economic development and political conditions in an immigrant's home country impact the child's academic success in his or her destination country. Counter-intuitively, immigrant children from countries with lower levels of economic development have better scholastic performance than comparable children who emigrate from countries with higher levels of economic development.

Children of immigrants from politically unstable countries have poorer scholastic performance compared to other immigrant children. "Adult political immigrants are known to face serious negative consequences that can be related to the political situations in their origin countries," said sociologist Mark Levels, junior researcher in the Department of Sociology at Radboud University, Nijmegen, in the Netherlands. "We found that these consequences carry across generations to affect their children's educational chances as well. Our findings therefore have urgent implications in countries that receive a large number of these immigrants."

"Specific educational programs designed to counter the negative effects of political migration may be essential to ensure that the children of politically motivated immigrants achieve their full potential," Levels said.

The study authors also analyzed the impact of policies and political conditions in destination countries. In traditional immigrant-receiving countries such as Australia and New Zealand, they found that immigrant children academically outperformed their counterparts in other Western nations. The authors theorize that this finding is likely the result of restrictive immigration policies that ensure that better qualified adults emigrate (e.g., those with employment and high levels of education), rather than a receptive climate toward immigrants or education policies designed to meet their needs.

The size and socioeconomic characteristics of immigrant communities also played a role in the academic performance of their children. Children from immigrant communities with higher socioeconomic status relative to the native population had higher scholastic performance than those from other immigrant communities. Likewise, children from large immigrant communities were more likely to perform better academically than children from smaller immigrant communities.

Data for this study came from the 2003 wave of the Project for International Student Assessment (PISA) from the Organization for Economic Co-operation and Development (OECD), the first large cross-national OECD dataset to contain information on the origin of first- and second-generation migrants. The sample was comprised of 7,403 15-year-old immigrant children from 35 different native countries living in 13 destination/host countries. Scholastic performance was based on PISA measurement of mathematical literacy scores.

Jaap Dronkers, professor of social inequality and stratification at the European University Institute in San Domenico di Fiesole, Italy, and Gerbert Kraaykamp, professor of empirical sociology at Radboud University, Nijmegen, co-authored the report with Mark Levels.

Journal reference:

1. . **Immigrant Children's Educational Achievement in Western Countries: Origin, Destination, and Community Effects on Mathematical Performance**. *American Sociological Review*, October 2008

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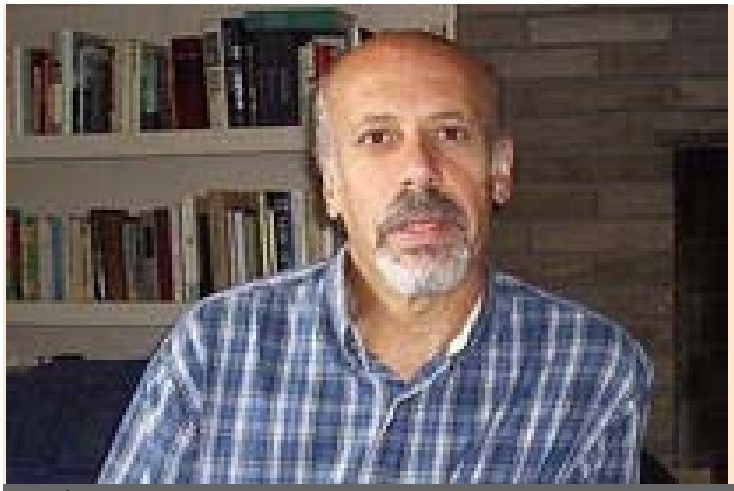
Shifting Winds in Arabic Teaching



Munther Younes

Teaching conversation skills in an Arabic classroom may seem like an uncontroversial thing. It would be standard, after all, in many introductory courses for other languages. But when Munther Younes started integrating instruction of the formal written language with a spoken dialect in Cornell University classrooms 18 years ago, he was a pioneer.

"What we're doing that's different … is that other programs either teach the classical language by itself – they're a small program and they don't have the manpower or support. Other programs that are bigger introduce a spoken dialect, but they do the two in separate tracks. What we do at Cornell is integrate the two into one track, with two sides, so students learn to read what Arabs read and write, and they learn to speak what Arabs speak," says Younes, a senior lecturer and director of Cornell's Arabic program.

"So it's an honest reflection of what really happens in the Arab world."

Arabic is characterized by a so-called "diglossic" situation, in which the formal, uniform written language (Modern Standard Arabic) differs considerably from the various spoken dialects. Traditionally, and still, the former has been privileged in foreign language classrooms — in some cases to the total exclusion of the latter.

The reasons are complicated. Some are pedagogical — fear of confusing students by constantly switching between varieties. Some are practical — native Arabic speakers pick up the dialect at home and study Modern Standard Arabic in school, and carry that tradition to the North American classroom. And some are ideological or political. Modern Standard Arabic is the language of literature and Arab culture, while the dialects lack respect. Arab students, Younes says, "would be condemning the dialect in the strongest terms [while speaking] in the dialect."

Younes has authored two textbooks on his approach (in elementary and intermediate Arabic, and published by Yale University Press). He clearly stands out in the field for the degree to which he practices (and writes materials on) integration of the written and spoken varieties. Many, however, describe varying degrees of integration or synthesis occurring with increasing frequency, and as the future direction of Arabic instruction.

Asked of his own reception by the field, since 1990, Younes paraphrases Gandhi: "First they ignore you and then they laugh at you and they fight you and then you win."

So, he's won?

Younes laughs, seeming embarrassed by his own suggestion, and qualifies it. "I'm not there yet. I think it will happen, but it's probably going to be a long time."

On the Cutting Edge

Arabic study has been booming since September 11. The Modern Language Association reported last year that the number of students enrolled in Arabic at U.S. colleges increased 126.5 percent from 2002 to 2006, the raw number growing from 10,584 to 23,974.

"These people would like to be able to speak with Arabs, converse with them, understand them," says Younes. "If you want to converse with Arabs, you have to converse in a language they communicate with" — a spoken dialect.

In outlining his approach to teaching Arabic, Younes says that he "capitalizes" on the many shared aspects of the written and spoken forms – in his case he teaches the Levantine dialect, spoken by Israelis, Lebanese, Jordanians, Palestinians, and Syrians. ("It is mutually intelligible," he explains, "with Egyptian and other major Arabic dialects.")

"So students listen to things and read things, and what they listen to is going to be mostly the spoken, conversational language, and what they read will be the written language. It is done so naturally. This is exactly what Arabs do in daily life and they don't think much about it."

"For example, in a classroom in the Arab world, a professor would be reading a text in the literary language but discussing it in spoken Arabic, the dialect."

Among the common criticisms is that a free mixing between the two confuses students learning the language. "We deal with it, in that we teach students how to navigate through the system," Younes says.

"In the first semester, they start using them appropriately, because whenever we speak, we use one. Whenever we read, we use another," says Younes. "We don't want to simplify the situation in a way that will deceive the students... If we have to give the students two different forms, we try to help them distinguish them, which is a sociolinguistic skill that they need to develop anyway."

"There's no doubt about it, that it adds an element of potential confusion," says Kirk Belnap, director of the National Middle East Language Resource Center and a professor of Arabic at Brigham Young University, which — independently of Cornell — has also used an integrated approach since around 1990. "Your students, ideally you want them to keep them separate, not mix them and not be confused about what belongs to one variety and what belongs to another variety, but the fact is Arabs mix them all the time."

"Our experience has been that the output is a happier product – we have students who are able to use the language for speaking earlier," says Belnap.

"It's spreading," Belnap continues, of integration in Arabic instruction. "It's kind of a gradual thing."

Of Younes, Belnap says, "He's pretty much been cutting-edge for some time."

"He's probably been the one who's gone furthest in terms of publishing his materials."

Degrees of Integration

By his own account, however, Younes' textbooks haven't been adopted by many colleges, and are used primarily as a supplementary resource. "It's not competing in any way with the main textbook," says Younes.

Even some professors who avidly support Younes' approach have made the conscious choice to stick with the most popular book in Arabic classrooms — *Al-Kitaab* — as a main text. "That's the textbook that I knew the best," says Uri Horesh, the new director of the Arabic language program at Franklin & Marshall College, in Pennsylvania. Horesh paid Younes two visits this summer, first to observe his Cornell classes and then to attend a workshop on Younes' methods.

"On the one hand, I came with a very open mind. But I did know a priori that I would probably – how would I put it? – probably view his approach favorably. Because I too believe that the Arabic language in particular has to be taught as a whole."

"It's a sad situation that in some cases the only qualification you need to teach Arabic is that you speak Arabic. And it's true of other languages as well. But in those institutions where teaching Arabic is more professionalized, and more than just having a bunch of people who happen to speak Arabic, I think more and more people, probably silently – and it might even be a silent majority that we don't even know of – are trying to do what we are trying to make more public," Horesh says.

Younes says he generally agrees with the assessment that integration is becoming more common in Arabic classrooms. But he also says he doesn't know of anyone else that's doing it like Cornell does. Among faculty interested in the approach, many, he says, "feel that they really cannot go all the way yet."

Maher Awad, a lecturer of Arabic at Rice University's Center for the Study of Languages who also participated in Younes' summer workshop, characterizes it as a matter of degree.

"His is really an extreme version of integration, which I think it should be done that way," says Awad. "He combines and integrates colloquial and standard [Arabic] to a higher degree than *Al-Kitaab* does."

"I think it's going to become mainstream. I am sure of it. I can see the movement towards it, but right now we are in the middle of it."

Karin Ryding, president of the American Association of Teachers of Arabic and professor emerita at Georgetown University, puts it in a different way.

"In the past five years, about, it is now possible to raise the issue, and not be shouted down."

Speaking Arabic at Home and Abroad

Heralding another shift in this direction, at Western Michigan University last year, Mustafa Mughazy attracted attention when he started teaching solely colloquial Arabic in the first semester of study, with an integration between Modern Standard and the colloquial thereafter. So far, continuation in Arabic from year one to year two has climbed from 50 to 75 percent.

"Well, because it's fun," says Mughazy, an associate professor of Arabic. He explains the impetus for the change was observing students' frustration. In studying abroad, "Even if they studied Standard Arabic for five years, once they deal with native speakers of Arabic they realize that they cannot communicate. Native speakers of Arabic are very uncomfortable speaking in Standard Arabic."

Again, though, changes are happening in pockets. Arguably, the professors with the most influence on Arabic instruction as a whole are the authors of the field's most popular textbook. So what's their vision?

"Our vision of integrating colloquial into the Arabic classroom began with the first edition, and every edition has gone further with the introduction of the colloquial," says Kristen Brustad, an associate professor of Arabic studies at the University of Texas at Austin and one of three authors of *Al-Kitaab*. The series is billed as developing skills in Modern Standard Arabic while "gradually" introducing colloquial content. Rice's Awad describes the book as 90-10 in its Modern Standard versus colloquial mix, a description Brustad agrees is generally fair.

"The second edition was really focused on exposure, exposure, exposure," says Brustad, who adds that the third edition, forthcoming next year, will feature a heavier colloquial language component, in both the Egyptian and Levantine dialects (the current edition only includes Egyptian).

"We definitely see this as the direction. I think more and more programs are realizing that not doing colloquial in the classroom, whatever the excuse or reason, is sort of tantamount to putting your head in the sand," Brustad says.

She points out that more students are studying abroad in Arab countries (the Institute of International Education last year reported that American study abroad in the Middle East was up 31 percent).

"The students are the ones who really see the need and want more colloquial," Brustad says. "They don't want to hit the ground and say, 'Oh, now, what was that language that I studied in that classroom back there? I don't understand a thing that's going on around me.'"

— Elizabeth Redden

The original story and user comments can be viewed online at http://insidehighered.com/news/2008/10/01/arabic.

A 'Penalty' for Starting at a Community College?

Almost half of students enrolled in public colleges attend two-year institutions, whose role in expanding access to higher education continues to increase even as financial support for the institutions fails to keep up with student demand. Not all community college students start out with the goal of earning a bachelor's degree, but even for those who do, the path is laden with obstacles.

Experts have debated whether it's in these students' best interests to beef up advising and outreach to help them at the community college level or if, rather, encouraging them to enroll at two-year institutions can lead them to get sidetracked. Studies in the past have shown that students who successfully transfer from two-year to four-year colleges do as well as their peers who started at baccalaureate institutions to begin with — but the problem is getting to that point.

A working paper circulated in September by the National Bureau of Economic Research takes a look at the entire pathway, from community college to bachelor's degree, and compares students' success over a nine-year period with their peers who began at four-year colleges. Like previous studies, it found a significant "penalty," or decreased likelihood of completing a degree, for students who started out in community colleges compared to those who started at four-year institutions.

Although it conflicts with some efforts to expand access to higher education, the implication is that students with the desire to earn a four-year degree would be better off if they started out at four-year colleges rather than trying to transfer out of a community college.

The paper offers a closer look at more recent, more comprehensive data than previous studies have used. Taking as its focus the entire entering class of 1998 in Ohio's public higher education system, the research tracks every student over a nine-year period and uses several statistical techniques to control for differences between groups. For example, the student who enters a community college is more likely to be from a disadvantaged background, and the student who successfully transfers to a four-year college may have been more driven than average to navigate the system.

The study, by Bridget Terry Long of Harvard University's Graduate School of Education and Michal Kurlaender, an education professor at the University of California at Davis, quantifies the penalty at 14.5 percent, which they say is a conservative estimate. In other words, a student who enrolls at a community college with the intention of earning a bachelor's degree in Ohio is 14.5 percent less likely to do so within nine years than is a student who starts out at a four-year public college in the state.

The difficulty with comparing degree completion rates between two-year and four-year colleges is that the profile of students attending each isn't necessarily comparable. On average, community college students are older, more likely to be minorities and to come from more disadvantaged backgrounds. In addition, not all students who enroll in a community college intend to earn a bachelor's degree, and even those who do can change their minds. For example, Long said in an interview, about 60 percent of students in the sample from ages 17 to 20 who enrolled in two-year colleges began with that intent.

To overcome that and related procedural hurdles, the study's authors looked at two sources: an item in the application for Ohio community colleges that asks students about their ultimate goals (such as earning a degree or job certification), and whether or not students took the ACT. The latter variable, Long said, was crucial in distinguishing students who "we think are pretty serious about wanting to get a bachelor's degree."

Without taking such considerations into account, she said, "things look bad for community colleges." But separating the students with a "demonstrated intent" of graduating with a four-year degree solves the apples-and-oranges problem of comparing students from different types of institutions. While the results still show a penalty for community college students, it's smaller than it otherwise would be and suggests possible solutions.

"I think what we're trying to say ... in the paper [is that] a lot of policy is putting a lot of pressure on the community colleges, and they already are not really supported financially. In comparison to their four-

year counterparts, they receive a lot less money," Long said. So, rather than arguing that students who would otherwise have started at community colleges should be siphoned off to four-year colleges instead, she said it was important to improve support and make it easier for students to transfer.

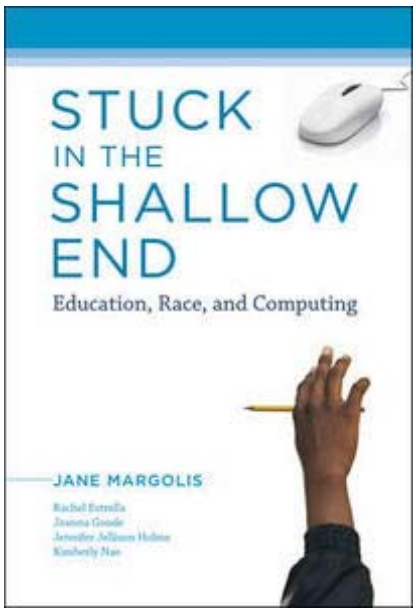
David S. Baime, vice president for government relations at the American Association of Community Colleges, emphasized the differences between the typical community college student and those at four-year colleges, and said the penalty identified in the study was "not very great" considering the circumstances. He also added that it was difficult to pinpoint students' goals, since even those change over time.

"The whole question or issue of student intentions is a very difficult one — what students say they plan to do, what they want to do, what they really want to do, often changes ... in the course of their college education," Baime said. "It's a sort of a behavioral reality that many more students [say they want a B.A.] than actually seem to based on their attendance patterns."

— Andy Guess

The original story and user comments can be viewed online at http://insidehighered.com/news/2008/10/01/pathway.

'Stuck in the Shallow End'



Jane Margolis is a scholar of equity issues raised by technology whose previous book was *Unlocking the Clubhouse: Women and Computing.* Her new book, which (like the previous one) is published by MIT Press, focuses on how issues of class and race affect access to technology and training. *Stuck in the Shallow End: Education, Race, and Computing* is based on research by Margolis in Los Angeles high schools serving students of varying socioeconomic backgrounds. Margolis, a senior researcher at the University of California at Los Angeles Institute for Democracy, Education and Access, responded via e-mail to questions about the book.

Q: What are some examples or statistics that show the "virtual segregation" between low-income urban and more affluent high schools?

A: Advanced Placement Computer Science (AP CS) is the most advanced high school CS course and the only high school CS course that qualifies for college admission credit. Comparing AP CS course offerings in California high-poverty schools and low-poverty schools, we found in 2006 that 16.2 percent of low poverty schools offer AP CS (not a large number for sure), while only 5.2 percent of high poverty schools offer this course. In Los Angeles, Latino/as represent 69 percent of the high school population, but only 24 percent of the students enrolled in AP CS.

Q: Your study also found problems within affluent high schools with plenty of instruction and services available. What did you find there in terms of differing experiences of minority and other students?

A: Advanced Placement Computer Science was offered only in one of the schools we studied — the school with the higher number of white students, the school located in a white and wealthy part of LA. In this school, AP CS was insular, populated primarily by students with "preparatory privilege" — plenty of home resources, including equipment and parents who can be relied on for support or knowledge of the field; further, these students had networks of friends who know much about computing and have plentiful resources at home as well.

One of the biggest differences we found between the white students in this AP CS class and the few minority students that were enrolled was that of social networks. Networks can include counselors or teachers, parents and family who can demystify a subject. And friends. Peer networks. These social

networks are ubiquitous for middle class students, and do not exist or function well for students of color. Many of the students of color report that when counselors come to speak with them about college, they feature the local community college, whereas when the counselors speak with the white students they talk about four-year universities such as UCLA.

Further, we found that when a student of color does break the color line and does enroll in the higher level courses (usually alone), the experience in these classes can be isolating, and even a psychological assault — i.e. the students are made to feel not up to the standard. It is understandable why students tend to want to be in classes where they feel more comfortable and surrounded by friends.

Q: Some of the problems you describe seem to be economic (lack of resources), but others relate to attitudes. Can you describe the problem there?

A: Attitudes play a big role here. We witnessed an educational system that was riddled with low expectations for the students of color. Then what occurs is that low curriculum is designed to match the low expectations.

Teachers and administrators commonly justify the lack of offerings based on students' lack of interest and/or motivation. But, we witnessed students having lots of interest for technology and computing in the schools, but few opportunities to learn more. Without opportunities, interest will not ignite. Interest is not innate. It is fostered by opportunity and teaching that is engaging.

Q: Colleges have embraced the Web in terms of admissions recruiting and the application process. Does your work raise questions about whether this is wise?

A: I really can't answer this question. I know very little about admissions recruiting and the application process. I do know that the schools we studied have very high ratios of students per counselor. Sometimes over 500 students for one counselor. The result is that students, especially students of color in low-resourced schools, are often misguided and misinformed about the requirements they need for college.

Q: What advice would you offer colleges on how as institutions they should respond to the issues raised in your book?

A: University computer science departments should be familiar with the computer science curriculum in their local K-12 districts. Interdisciplinary (for instance education and computer science) university/K-12 partnerships could then be formed to figure out how to help strengthen the high school computer science curriculum, how to build the capacity of the local school district so that engaging, rigorous, college preparatory courses in computer science are offered. This needs to be a real partnership as high school educators have much to teach the college partners about the challenges they are facing. Teachers need more professional development so they can teach the classes in an engaging way, and teachers need assistance in being proactive to broaden the participation in computing. Programs that support students also must be put in place.

Also, all educators at every level need to understand more about the details of how fields become segregated. The technical aspects of schooling must be addressed (number of courses, qualifications of teachers), but so must the belief systems (different and often lower expectations for students of color) and the political pressures that narrow down curriculum and end up reducing high end learning opportunities, leaving students of color "stuck in the shallow end," unprepared for 21st century jobs and opportunities.

— Scott Jaschik

The original story and user comments can be viewed online at
http://insidehighered.com/news/2008/10/01/shallowend.

NASA's Dirty Secret: Moon Dust

The surface of the Moon is covered in powdery gray dust that caused unforeseen problems for NASA astronauts. Apollo 17 astronaut Harrison "Jack" Schmitt took this picture of Eugene Cernan during their third and last walk on the lunar surface in December of 1972. (Credit: Courtesy of NASA)

ScienceDaily (Sep. 29, 2008) — The Apollo Moon missions of 1969-1972 all share a dirty secret. "The major issue the Apollo astronauts pointed out was dust, dust, dust," says Professor Larry Taylor, Director of the Planetary Geosciences Institute at the University of Tennessee. Fine as flour and rough as sandpaper, Moon dust caused 'lunar hay fever,' problems with space suits, and dust storms in the crew cabin upon returning to space.

Taylor and other scientists will present their research on lunar dust at the "Living on a Dusty Moon" session on Thursday, 9 October 2008, at the Joint Meeting of the Geological Society of America (GSA), Soil Science Society of America (SSSA), American Society of Agronomy (ASA), Crop Science Society of America (CSSA), and Gulf Coast Association of Geological Societies (GCAGS) in Houston, Texas, USA.* NASA will use these findings to plan a safer manned mission to the Moon in 2018. Taylor will also deliver a Pardee Keynote Session talk on Sunday, 5 October 2008 entitled "Formation and Evolution of Lunar Soil from An Apollo Perspective."

The trouble with moon dust stems from the strange properties of lunar soil. The powdery grey dirt is formed by micrometeorite impacts which pulverize local rocks into fine particles. The energy from these collisions melts the dirt into vapor that cools and condenses on soil particles, coating them in a glassy shell.

These particles can wreak havoc on space suits and other equipment. During the Apollo 17 mission, for example, crewmembers Harrison "Jack" Schmitt and Gene Cernan had trouble moving their arms during moonwalks because dust had gummed up the joints. "The dust was so abrasive that it actually wore through three layers of Kevlar-like material on Jack's boot," Taylor says.

To make matters worse, lunar dust suffers from a terrible case of static cling. UV rays drive electrons out of lunar dust by day, while the solar wind bombards it with electrons by night. Cleaning the resulting charged particles with wet-wipes only makes them cling harder to camera lenses and helmet visors. Mian

Abbas of the National Space Science and Technology Center in Huntsville, Alabama, will discuss electrostatic charging on the moon and how dust circulates in lunar skies.

Luckily, lunar dust is also susceptible to magnets. Tiny specks of metallic iron (Fe0) are embedded in each dust particle's glassy shell. Taylor has designed a magnetic filter to pull dust from the air, as well as a "dust sucker" that uses magnets in place of a vacuum. He has also discovered that microwaves melt lunar soil in less time than it takes to boil a cup of tea. He envisions a vehicle that could microwave lunar surfaces into roads and landing pads as it drives, and a device to melt soil over lunar modules to provide insulation against space radiation. The heating process can also produce oxygen for breathing.

But the same specks of iron that could make moon dust manageable also pose a potential threat to human health, according to Bonnie Cooper at NASA's Johnson Space Center. "Those tiny blebs of pure iron we see on the surface of lunar grains are likely to be released from the outside edges of the particle in the lungs and enter the bloodstream," she says. Preliminary studies suggest that the inhalation of lunar dust may pose a health hazard, possibly including iron toxicity. Members of NASA's Lunar Airborne Dust Toxicity Advisory Group, Cooper, Taylor, and colleagues are studying how moon dust affects the respiratory system. They plan to set a lunar dust exposure standard by 2010, in time for NASA engineers to design a safer and cleaner trip to the Moon.

*On 9 October, the following abstracts will be presented in the George R. Brown Convention Center, Room 310AD at the Joint Meeting:

1. Abstracts, Session 345: "Living on a Dusty Moon"
2. Abstract 345-1 (Taylor): "Formation of Lunar Dust: Unique Properties for a Human Outpost"
3. Abstract 345-9 (Cooper): "Physical and Biological Hazards of Lunar Dust and Their Impact on Habitat and Space Suit Design"

Adapted from materials provided by Soil Science Society of America, via Newswise.

http://www.sciencedaily.com/releases/2008/09/080924191552.htm