Infoteca's E-Journal

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UK butterflies 'need good summer'

Butterflies need a warm summer in order to help numbers recover from last year's washout, say conservationists.

Data from the UK Butterfly Monitoring Scheme showed that eight species were at an all-time low as a result of an unsuccessful summer in 2007.

The main reason behind the decline was an above average rainfall, which meant the insects, such as the common blue, had fewer chances to feed or breed.

Early forecasts suggest this summer could be wetter than average.

Figures compiled by the monitoring scheme, operated by the charity Butterfly Conservation and the Centre for Ecology and Hydrology, suggested that the creatures experienced their worst year for more than a quarter of a century.

The data, which was collected by thousands of volunteers, also revealed that species that were already declining, including the high brown fritillary and the Duke of Burgundy, suffered another bad year.

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British butterflies enjoy the sunshine

"Butterflies face mounting threats," warned Sir David Attenborough, president of Butterfly Conservation. "Some face possible extinction."

Conservationists are hoping the affected species will be able to recover this year but they fear that the consequences of last year will have a knock-on effect, resulting in further declines.

They say the worst-case scenario is that local populations of certain butterflies may be too small to recover, and these species will simply disappear from some parts of the UK.

Biodiversity Minister Joan Ruddock said that the government would support recovery projects.

"Butterflies are a vital element of the British summer," she said. "Their numbers indicate whether or not there are problems in the countryside.

"Butterfly populations also indicate the speed and extent of climate change. We will provide every encouragement for those working to conserve them."

Earlier this month, the UK Met Office issued its long-range seasonal forecast for the summer. It suggested that the UK faced a summer with temperatures and rainfall slightly above the long-term average.

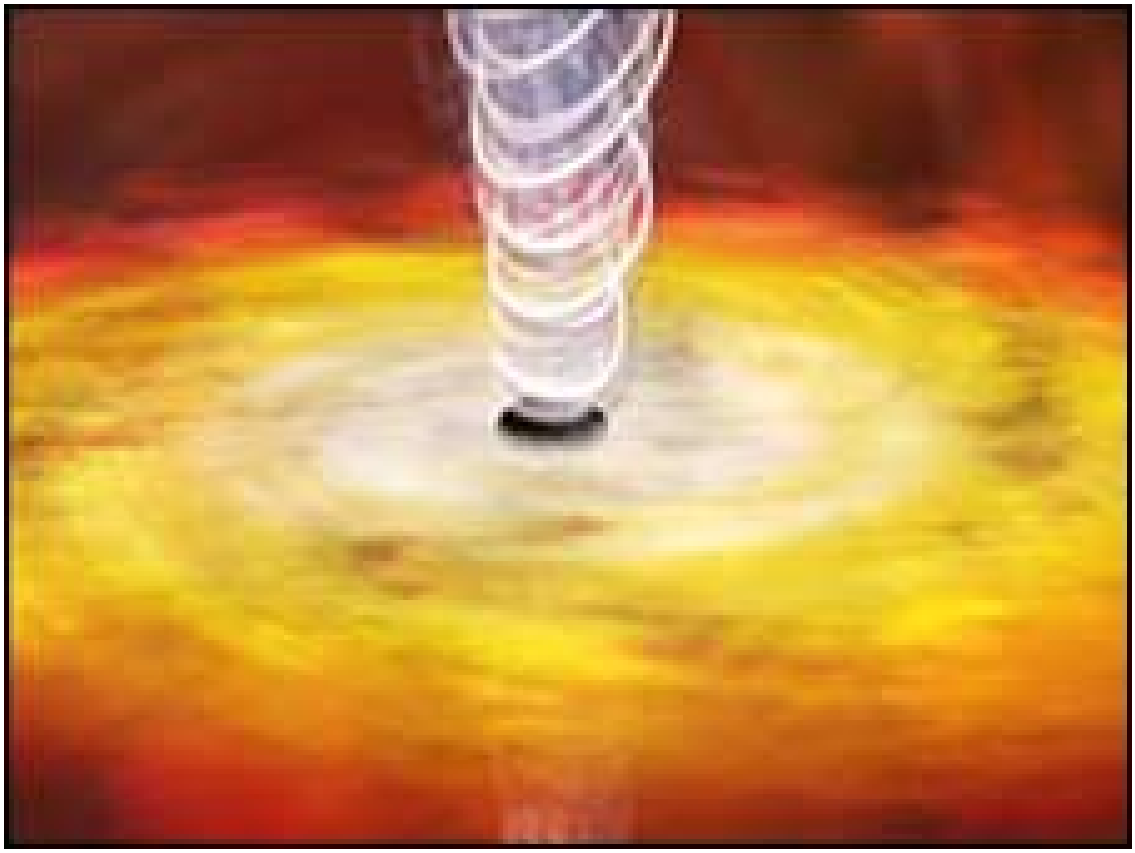
But forecasters said the risk of exceptional downpours on the same scale as last year was very low.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/science/nature/7363411.stm

Published: 2008/04/24 00:21:58 GMT

Black holes reveal more secrets

Scientists say they have unlocked some of the secrets behind black holes, the gravitational fields known for sucking up light and stars from the Universe.



In a report in the journal Nature, US researchers say they have worked out how black holes emit jet streams of particles at close to light speed.

The University of Boston team say the streams originate in the magnetic field near the edge of the black hole.

They say it is within this region that the jets are accelerated and focused.

Despite the fact that it is probable that a black hole lurks at the centre of our Milky Way galaxy, astronomers still know very little about these celestial monsters which vacuum up almost everything in their path, even light.

Professor Alan Marscher of the University of Boston and his colleagues claim they have delved deeper than ever into their heart.

Using almost every type of telescope known to humankind, Prof Marscher believes he has worked out where and how the jets - or blazars - are formed.

Using an array of 10 powerful radio telescopes, aimed at the galaxy BL Lacertae, the researchers studied a black hole just as it was sending forth a blazar jet.

The astronomers had suspected that the supermassive black hole was spewing out plasma jets in a winding corkscrew, and they say that their observations have now confirmed just that.

"We have gotten the clearest look yet at the innermost portion of the jet, where the particles actually are accelerated," Prof Marscher said in a statement.

University of Michigan astronomy professor Hugh Aller, who worked on the project, told Reuters news agency that the process of accelerating the material to nearly the speed of light was similar to what happened in a jet engine.

"We think it is focused by a nozzle of sorts and it comes out at us," he was quoted by Reuters as saying.

However, the BBC's science correspondent Neil Bowdler says despite this breakthrough, scientists are no closer to finding what lies within the black hole - beyond what is called the event horizon

In fact, if the theoretical physicists are right, our correspondent says, then we will never be able to see inside these strange phenomena.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/science/nature/7364206.stm

Published: 2008/04/24 05:38:29 GMT

Heart cells cultured in the lab

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See the heart cells in action

Scientists have moved a step closer to creating functioning heart tissue for transplants in the lab.

They have grown three types of human heart cells from cultures derived from embryonic stem cells.

When a mix of the cells was transplanted into mice with simulated heart disease, the animals' heart function was significantly improved.

The study, by a team of Canadian, US and UK scientists, features in the journal Nature.

> **In the future, these cells may be very effective in developing new strategies for repairing damaged hearts**
> Dr Gordon Keller
> McEwen Centre for Regenerative Medicine

The researchers created the cells by supplying embryonic stem cell cultures with a cocktail of growth factors and other molecules involved in development.

By supplying the right growth factors at the right time, they encouraged the cells to grow into immature versions of three different types of cardiac cell.

The three cell types they created - cardiomyocytes, endothelial cells and vascular smooth muscle cells - are each important constituents of heart muscle.

Researcher Dr Gordon Keller, from the McEwen Centre for Regenerative Medicine in Toronto, said: "This development means that we can efficiently and accurately make different types of human heart cells for use in both basic and clinical research.

"The immediate impact of this is significant as we now have an unlimited supply of these cells to study how they develop, how they function and how they respond to different drugs.

"In the future, these cells may also be very effective in developing new strategies for repairing damaged hearts, following a heart attack."

Jeremy Pearson, associate medical director at the British Heart Foundation, said: "This research provides another promising indication that we are steadily getting closer to the day when stem cells will be used successfully to repair damaged hearts in patients."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/7361250.stm

Published: 2008/04/24 00:46:10 GMT

Action urged to keep net neutral

Tough action is required by US regulators to protect the principles that have made the net so successful, a leading digital rights lawyer has said.

Professor Lawrence Lessig was speaking at a public meeting to debate the tactics some net firms use to manage data traffic at busy times.

He said the Federal Communications Committee (FCC) should act to keep all net traffic flowing equally.

The FCC said net firms had a duty to tell customers about data management.

No more rules

The seven-hour public meeting was held at Stanford University and featured presentations from Prof Lessing, songwriters, network administrators and net engineers.

Prof Lessig said one of the principles that guided the foundation of the net was that all traffic should flow equally across it.

This principle of net neutrality, he said, was being eroded as net firms manage traffic and place restrictions on what their domestic broadband customers can do.

> **Consumers must be fully informed of the exact nature of the service they are purchasing**
> Kevin Martin, FCC

The meeting was called by the FCC in reaction to the news that US net firm Comcast had been exposed as managing traffic by stopping some of its 13m customers uploading files to BitTorrent and other peer-to-peer networks.

The FCC has started a formal investigation to see if Comcast merits a fine for its actions.

In response to the publicity surrounding its actions, Comcast has said it would change its policy.

In the UK many net firms manage traffic at peak times in a bid to ensure that everyone gets the highest broadband speed possible.

Prof Lessig said there had to be clear rules, perhaps involving financial incentives, to force net firms to respect net neutrality. Current rules, he warned, meant that many firms were tempted to manage traffic to protect profits.

At the meeting the two Democrats who sit on the five-strong FCC board said it needed new powers to make sure net firms complied with net neutrality principles.

But the two Republican commissioners on the board warned against over-burdening net firms with more rules.

Summing up, FCC chairman Kevin Martin said its net policies were powerful enough but just needed to be properly enforced.

He said there was nothing wrong with net firms managing traffic as long as they kept customers fully informed.

"There must be adequate disclosures of the particular traffic management tools," said Mr Martin. "Consumers must be fully informed of the exact nature of the service they are purchasing."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/technology/7354133.stm

Published: 2008/04/18 11:11:37 GMT

The oldest Americans are also the happiest, research finds

By LINDSEY TANNER
AP Medical Writer

AP Photo/Nam Y. Huh

CHICAGO (AP) -- It turns out the golden years really are golden. Eye-opening new research finds the happiest Americans are the oldest, and older adults are more socially active than the stereotype of the lonely senior suggests. The two go hand-in-hand: Being social can help keep away the blues.

"The good news is that with age comes happiness," said study author Yang Yang, a University of Chicago sociologist. "Life gets better in one's perception as one ages."

A certain amount of distress in old age is inevitable, including aches and pains and the deaths of loved ones and friends. But older people generally have learned to be more content with what they have than younger adults, Yang said.

This is partly because older people have learned to lower their expectations and accept their achievements, said Duke University aging expert Linda George. An older person may realize "it's fine that I was a schoolteacher and not a Nobel prize winner."

George, who was not involved in the new study, believes the research is important because people tend to think that "late life is far from the best stage of life, and they don't look forward to it."

Yang's findings are based on periodic face-to-face interviews with a nationally representative sample of Americans from 1972 to 2004. About 28,000 people ages 18 to 88 took part.

There were ups and downs in overall happiness levels during the study, generally corresponding with good and bad economic times. But at every stage, older Americans were the happiest.

While younger blacks and poor people tended to be less happy than whites and wealthier people, those differences faded as people aged.

In general, the odds of being happy increased 5 percent with every 10 years of age.

Overall, about 33 percent of Americans reported being very happy at age 88, versus about 24 percent of those age 18 to their early 20s. And throughout the study years, most Americans reported being very happy or pretty happy. Less than 20 percent said they were not too happy.

A separate University of Chicago study found that about 75 percent of people aged 57 to 85 engage in one or more social activities at least every week. Those include socializing with neighbors, attending religious services, volunteering or going to group meetings.

Those in their 80s were twice as likely as those in their 50s to do at least one of these activities.

Both studies appear in April's American Sociological Review."People's social circles do tend to shrink a little as they age - that is mainly where that stereotype comes from, but that image of the isolated elderly really falls apart when we broaden our definition of what social connection is," said study co-author Benjamin Cornwell, also a University of Chicago researcher.

The research rings true for 81-year-old George O'Hare, a retired Sears manager in Willowbrook, Ill. He's active with church and AARP and does motivational speaking, too. His wife is still living, and he's close to his three sons and four grandchildren.I'm very happy because I've made friends that are still living," O'Hare said. "I like to go out and speak in schools about motivation."

"Happiness is getting out and being with people, and that's why I recommend it," he said.

Ilse Siegler, an 84-year-old retired nurse manager in Chicago, has a slightly different perspective. Her husband died 35 years ago, and she says she still misses him every day.

She has vision problems and has slowed down with age. Yet she still swims, runs a social group in her condo building, volunteers in a retirement home and is active with her temple. These all help "make life more enjoyable," she said.

While Siegler said these aren't the happiest years of her life, she's content.

"Contentment as far as I'm concerned comes with old age ... because you accept things the way they are," she said. "You know that nothing is perfect."Cornwell's nationally representative study was based on in-home interviews with 3,005 people in 2005 and 2006. While it didn't include nursing home residents, only about 4 percent of Americans aged 75 to 84 are in nursing homes, Cornwell said.

It's all good news for the aging population. However, Yang's study also found that baby boomers were the least happy. They could end up living the unfortunate old-age stereotype if they can't let go of their achievement-driven mind-set, said George, the Duke aging expert.So far, baby boomers aren't lowering their aspirations at the same rate earlier generations did. "They still seem to believe that they should have it all," George said. "They're still thinking about having a retirement that's going to let them do everything they haven't done yet."

Previous research also has shown that mid-life tends to be the most stressful time, said Cornell University sociologist Elaine Wethington. "Everyone's asking you to do things and you have a lot to do. You're less happy because you feel hassled."

The new studies show "if you can make it through that," there's light at the end of the tunnel, Wethington said.

http://news.wired.com:80/dynamic/stories/O/OLDER_AND_HAPPIER?SITE=WIRE&SECTION=HOME&TEMPLATE=DEFAULT&CTIME=2008-04-19-07-05-57

Discovery Of Link In Mosquito Mating Mechanism Could Lead To New Attack On Dengue And Yellow Fever

A female Aedes aegypti mosquito obtains a "blood meal." The A. aegypti mosquito is the primary vector for dengue and yellow fevers. (Credit: Image courtesy of Cornell University)

ScienceDaily (Apr. 14, 2008) — Cornell researchers have identified a mating mechanism that possibly could be adapted to prevent female mosquitoes from spreading the viruses that cause dengue fever, second only to malaria as the most virulent mosquito-borne disease in the tropical world. Specifically, they have discovered 63 proteins that male mosquitoes transfer to Aedes aegypti females during mating and are thought briefly to change the females' physiology and behavior, in particular suppressing the female's appetite for mammalian blood.

In a study published in the journal Insect Biochemistry and Molecular Biology, the Cornell researchers report that the proteins in the seminal fluid of the males also trigger a loss of sexual appetite in the females, stimulate egg production and influence clotting of the blood she has ingested. The findings could lead to novel strategies to prevent the spread of dengue as well as mosquito-borne yellow fever viruses. "This is a new angle in our fight against vector-borne disease," said Laura Harrington, Cornell associate professor of entomology and the paper's senior author.

Dengue affects 50 million people annually, and two-thirds of the world's population is at risk. In the past year, it has reached epidemic levels in Asia, South and Central America and Mexico, where the number of dengue cases has increased by more than 300 percent from a year earlier. No dengue vaccine is available, and no treatment exists beyond supportive care. Laura Sirot, a postdoctoral researcher in molecular biology and genetics, is the paper's lead author, and Mariana Wolfner, Cornell professor of molecular biology and genetics, also is a co-author. The work builds on Wolfner's work on the reproductive biology of fruit flies. The next step, said Harrington, is to isolate, identify and verify the targets of the mosquito proteins that regulate such key post-mating behaviors as reduced sexual drive or lack of appetite for blood; also, to manipulate such physiological responses as increased egg production. Eventually, the researchers hope that this knowledge will lead to new ways to control mosquitoes that spread disease. This could involve the identification of highly specific chemicals that affect these newly discovered reproductive proteins, or potentially could inform experiments on the use of genetically modified mosquitoes with knocked out (or turned off) genes or modified reproductive behaviors. The study was funded primarily through U.S. Department of Agriculture Hatch Funds awarded to Harrington and Wolfner. It complements and enhances Harrington's work as a member of a global team of scientists that received a $19.7 million grant from the Foundation for the National Institutes of Health to cure dengue fever and control the mosquitoes that transmit the viruses that causes it.

Adapted from materials provided by Cornell University.

http://www.sciencedaily.com /releases/2008/04/080410124650.htm

Sea Salt Worsens Coastal Air Pollution

Port of Houston, Texas. Researchers recently found unexpectedly high levels of nitryl chloride, a chemical long suspected to be involved in ground-level ozone production, in busy shipping areas along the southeastern coast of the United States. (Credit: iStockphoto)

ScienceDaily (Apr. 14, 2008) — Air pollution in the world's busiest ports and shipping regions may be markedly worse than previously suspected, according to a new study showing that industrial and shipping pollution is exacerbated when it combines with sunshine and salty sea air.

In a paper published in the journal Nature Geoscience, a team of researchers that included University of Calgary chemistry professor Hans Osthoff report that the disturbing phenomenon substantially raises the levels of ground-level ozone and other pollutants in coastal areas.

"We found unexpectedly high levels of certain air pollutants where pollution from cities and ships meets salt in the ocean air along the southeast coast of the United States," said Osthoff, who joined the U of C's Department of Chemistry last August. "It only makes sense that this is a problem everywhere industrial pollution meets the ocean, as is the case in many of the largest cities around the world. It also changes our view of the chemical transformations that occur in ship engine exhaust plumes, and tells us that emissions from marine vessels may be polluting the globe to a greater extent than currently estimated."

Dr. Osthoff was part of a National Oceanic and Atmospheric Administration (NOAA) team that spent six weeks monitoring air quality in busy shipping areas off the southeastern coast of the United States between Charleston, South Carolina and Houston, Texas, in the summer of 2006. The researchers found unexpectedly high levels of nitryl chloride (ClNO2), a chemical long suspected to be involved in ground-level ozone production along the coast.

They then determined that the compound is efficiently produced at night by the reaction of the nitrogen oxide N2O5 in polluted air with chloride from sea salt. With the help of sunlight, the chemical then splits into radicals that accelerate production of ozone and, potentially, fine particulate matter, which are the main components of air pollution. Their findings also show that up to 30 per cent of the ground-level ozone present in seaside cities such as Houston may be the result of pollution mixing with salt from ocean mist.

Dr. Osthoff intends to continue to work on halogen compounds at the University of Calgary.

"The Texas study covered only a very limited geographic area. We would like to find out to what extent this chemistry affects air quality in other regions, for example, the the Greater Vancouver area, or the Arctic," he said. "Our study indicates that halide salts such as chloride or bromide, which have been thought of as being relatively inert, may be playing a much greater role overall in the lower atmosphere."

The paper "High levels of nitryl chloride in the polluted subtropical marine boundary layer" is available in the April 6, 2008 advance online edition of the journal Nature Geoscience. The print version is scheduled to appear on May 1st, 2008.

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

http://www.sciencedaily.com /releases/2008/04/080408163231.htm

Walking Through Virtual Environments: One Virtual Step For Man, One Real Leap For Mankind

Imagine being able to take a step back in time and walk through the streets of ancient Pompeii hours before the eruption of Vesuvius. In April 2008, European researchers will demonstrate that walking through virtual environments is set to be a reality. (Credit: Image courtesy of ICT Results)

ScienceDaily (Apr. 14, 2008) — Imagine being able to take a step back in time and walk through the streets of ancient Pompeii hours before the eruption of Vesuvius.

In April 2008, European researchers will demonstrate that walking through virtual environments is set to be a reality.

“In the virtual environment you have flight simulators, car simulators, but the most natural way of locomotion for humans is walking and this was practically impossible,” says Marc Ernst, the coordinator of the CyberWalk project at the Max Planck Institute for Biological Cybernetics.

To make virtual walking a reality, the CyberWalk researchers had to address five key issues: providing a surface to walk on, controlling the surface in a way that minimised forces on the user, developing a non-intrusive tracking system, displaying a high-quality visualisation, and ensuring a natural human perception of the virtual environment.

This month, at a special workshop in Tuebingen, Germany, the EU-funded researchers will demonstrate their treadmill allowing unconstrained walking in all directions (omni-directional) through large-scale virtual environments.

“Walking through a virtual city was impossible before,” Ernst says. “We are the first to demonstrate that you can walk through a virtual city or any type of extended environment.”

Be natural

Several attempts have been made to develop omni-directional treadmills, with Japanese researchers producing prototypes, and a group in the USA developing a smaller treadmill for military use. Neither allow for truly natural walking and immersion in a virtual environment.

“A key feature is that you need a relatively large treadmill to simulate natural walking,” explains Ernst. “The one that will be demonstrated is 6m by 6m, with an active walking area of 4.5m by 4.5m.”

According to Ernst, this is the minimum size necessary for 'natural walking'.

The treadmill, or CyberCarpet, incorporates several new mechanical solutions, which ensure smooth and safe operation. The key to the CyberCarpet is a platform with a big chain drive. The chain elements are made of conventional treadmills.

The chain moves in one direction whereas the movement direction of the belts is orthogonal to that. Summing the two directions of the chain and the belts provides the omni-directional actuation principle and so the treadmill motion opposing the motion of the walker can be in any direction.

“Theoretically there is no limit to the size of treadmill. In fact, the bigger the better,” says Ernst. “But practicalities dictate that the size of the CyberCarpet is limited to the size of the room, the mechanical constraints of the construction and the money you have to spend.”

To track the walker, CyberCarpet wanted to dispense with the Hollywood-style suits covered in reflective marker balls. Its unique system uses cameras to track the position and posture of the individual. This helps control the velocity of the treadmill and interactions with the virtual environment. Visualising the virtual environment is achieved courtesy of a commercial head-mounted display, which does have markers on it, says Ernst, because you “simply need a fast and accurate system”.

Real-life applications for virtual reality

The possibility of walking through large virtual environments has already received a lot of attention and captured the public’s attention. One project partner, the Swiss Federal Institute of Technology (ETHZ) developed the CityEngine, developed a software package for quickly creating large-scale virtual environments in particular cities, in various degrees of detail.

Combining the CityEngine with CyberWalk will allow people to go beyond strolling through the streets of ancient Pompeii and Rome. Architects, for example, could transport customers into the future, and allow them to walk through buildings even before they have been built.

ETHZ is considering exploiting CityEngine as a tool for the gaming industry. Talks with some game production houses are already underway.

Beyond the obvious use in entertainment, the achievements of the CyberWalk project could extend to training for firemen in dangerous scenarios, while keeping them well out of harm’s way. It could also help with medical rehabilitation for people after a stroke, people with Parkinson’s disease, or to help them overcome phobias.

The developments have also created exciting new academic possibilities for research into behavioural science and the biomechanics of human locomotion.

But the showcase demonstration is pure escapism, bringing Pompeii to life again after nearly two millennia.

Adapted from materials provided by ICT Results.

http://www.sciencedaily.com /releases/2008/04/080412174455.htm

Plan Brokered By Archaeologists Would Remove Roadblock To Mideast Peace

Map shows the expanded boundaries of Jerusalem that would receive special archaeological protection under the new agreement. (Credit: Image courtesy of University of California, Los Angeles)

ScienceDaily (Apr. 14, 2008) — Israelis and Palestinians may not be able to agree right now on their present or future, but, if a pair of Los Angeles archaeologists have their way, they soon will see eye to eye on their past.

Working tirelessly for the past five years, Ran Boytner, a University of California, Los Angeles archaeologist and Lynn Swartz Dodd, an archaeologist at the University of Southern California, have guided a team of prominent Israeli and Palestinian archaeologists to arrive at the first-ever agreement on the disposition of the region's archaeological treasures following the establishment of a future Palestinian state.

"Israelis and Palestinians never previously had sat down to achieve a structured, balanced agreement to govern the region's archaeological heritage," said Dodd, a lecturer in religion and curator of USC's Archaeological Research Collection. "Our group got together with the vision of a future when people wouldn't be at each other's throats and archaeology would need to be protected, irrespective of which side of the border it falls on."

With dozens of high-ranking Israeli, Palestinian, U.S. and international statesmen and Palestinian archaeologists already aware of the Israeli-Palestinian Archaeology Working Group Agreement, the 39-

point document now faces its toughest audience: Israeli archaeologists whose country would cede control over tens of thousands of artifacts and hundreds of sites.

"We're talking about putting your precious archaeological heritage — things you believe your ancestors created — in the hands of what you now consider to be your enemy," Dodd said. "We're asking enemies to become partners."

"According to international law, if there is a future Palestinian state, the Israelis will have to return all archaeological artifacts to the Palestinian state," said Boytner, director for international research at the Cotsen Institute of Archaeology at UCLA. "That, for the [Israeli] right wing, would be a major rallying point to oppose the peace process. Therefore, archaeology could be a deal-breaker in future peace negotiations. But if we can deal with archaeology, we can help create a stable peace process that will be respected by both sides for years to come."

While the agreement does not spell out the disposition of specific sites or artifacts, it has implications — depending on how borders eventually are drawn by statesmen — for a wide range of cultural lightning rods located in or excavated from Israeli-occupied territories, including a religious compound thought to be involved in the production of the Dead Sea Scrolls (Qumran), the capital of the ancient Kingdom of Israel (Samaria) and an important archaeological site (Mount Ebal) celebrated by Israeli settlers as the spot where the Old Testament leader Joshua built an altar to the Jewish God in thanks for allowing the Israelites to cross the Jordan River and reach the Promised Land.

In addition to international law on the repatriation of artifacts from occupied territories, the document is based on such democratic principles as equal protection for archaeological treasures of all cultures and unfettered access to sites and artifacts for the public and scholars, without regard to their ethnicity or religion. The agreement also borrows from concepts floated in previous peace processes, including general concepts from the Israeli-Egyptian Peace Treaty of 1979 and the Tentative Taba Agreement of 2001.

The negotiating team presented their case to 200 Israeli archaeologists on April 8 at a four-hour conference at the Van Leer Institute, a Jerusalem nonprofit dedicated to enhancing and deepening Israeli democracy.

Among the document's specific recommendations:

- Repatriation of artifacts excavated since 1967 in the Occupied Territories to the state in which they were originally found. Currently, the Israeli Archaeological Authority and the archaeology staff officer of the Israeli military's Civil Administration maintain control of all archaeological material excavated in Israel and some from the West Bank.
- More than tripling of the footprint of that part of Jerusalem that would qualify for special protections as a UNESCO World Heritage Site to include the city's boundaries during the 10th century, or roughly the era of the Crusades. Currently, such status extends to a one-third-square-mile area that includes the Temple Mount, the Western Wall and the walls of Jerusalem's more than 2,000-year-old Old City.
- Ceding control over archaeological sites and artifacts to the state in which they reside and prohibiting the destruction of archaeological sites because of their cultural or religions affiliations. Currently, archaeological authorities on both sides of the conflict have been accused of being less careful about protecting and excavating archaeological sites and artifacts from cultures that are not their own.
- Consideration of archaeological sites that will straddle future international borders proposed under a peace plan to ensure that these borders do not divide or harm archaeological remains.
- Support for the establishment of museums, labs and storehouses for the protection, study and care of archaeological heritage where they currently do not exist, so that repatriation of materials to territories occupied by Israel in 1967 does not stall for the lack of such facilities.

"These are the principles that we need to govern how we address and preserve archaeological heritage that's of interest to both sides, irrespective of what border it falls within," Dodd said.

In a parallel effort, the team spent three years tracking down and itemizing more than 1,500 sites and tens of thousands of artifacts that would fall into a legal limbo if a two-state system were adopted, as previous peace plans have suggested. Assembled through investigation of scholarly reports about the excavations, the use of Freedom of Information Act requests and, finally, legal action, the resulting electronic database also includes the current location of artifacts removed from the West Bank and East Jerusalem, including those removed from the Rockefeller Museum, an East Jerusalem archaeological museum that houses a large collection of artifacts unearthed in excavations conducted in Palestine beginning in the late 19th century. The information now is available on request to researchers, policymakers and politicians, but the team hopes to make it available soon over the Internet.

"When negotiators come in, they will know what to talk about specifically," Boytner said.

At issue is control of all archaeological material recovered inside the borders of a future Palestinian state. Palestinians have expressed the desire to control such resources within their boundaries. But since the 1967 War, Israelis have excavated extensively in the West Bank, deciding where to excavate and then removing the artifacts to storage facilities controlled by the Israeli Civil Administration.

Yet, as much as Palestinians have expressed the desire to control such cultural heritage, they can also view preservation efforts with suspicion.

"Archaeology sometimes has been used as a reason to curtail the natural expansion and refurbishing of Palestinian villages and towns," Dodd said. "The combination of military, economic and archaeological barriers to prosperity in Palestinian villages caused great resistance to archaeological-heritage preservation among segments of the Palestinian population. Prominent Palestinian archaeologists report that for some Palestinians, looting of artifacts becomes a means of resistance to the Israeli occupation."

Participants credit Israel-born Boytner, whose expertise is actually Andean archaeology, with getting the ball rolling. Long fascinated with "the role politics plays in archaeology in one of the greatest conflicts on earth right now," he decided to pursue an agreement following a chance meeting with an assistant to a leading negotiator for the Israeli government. Boytner was surprised to learn about the lack of progress on cultural heritage in past peace negotiations.

"Nobody was doing anything about it," Boytner said. "This was off the radar for everyone."

With the help of Dodd, who also studies the role of politics in interpreting the past, Boytner enlisted six of the region's most prominent working archaeologists and ultimately involved 10 institutions from around the world. To bankroll their activities, the team raised more than $150,000 in funds from a range of public and private donors, including USC, UCLA and the U.S. Institute of Peace, an independent, nonpartisan institution established and funded by the U.S. Congress with the goal of helping to prevent and resolve violent international conflicts.

Palestinian archaeologists have already expressed support for the document's provisions, which are now on file with the Israeli and Palestinian governments, the U.S. Department of State and former British Prime Minister Tony Blair, who is now the official envoy of the Middle East diplomatic "quartet" — the four outside entities (the United Nations, European Union, United States and Russia) involved in mediating the peace process for the Israeli-Palestinian conflict.

Of the five years so far devoted to the project, three have been spent in sometimes tense negotiations. On three occasions, in fact, professional facilitators were employed to keep discussions moving. But the team continued to meet — a total of four times over three years, in three different countries — often making the most headway over meals shared between the sessions. Stakes were high for the three Palestinian and three Israeli archaeologists who lent their expertise to the project.

"People who participated did so at great risk, professional and personal, to themselves," Boytner said. "It's not unheard of for Palestinians who are caught negotiating with Israelis to be treated as traitors, some being dragged to the street and shot dead. For the Israelis, it's not unheard of to be branded as traitors and therefore being denied positions or being fired or basically being blackballed."

"The collaboration and investment in future peace made by our Israeli and Palestinian colleagues should be highlighted," Dodd said. "They are the ones who made the radical choice to envision a shared future by joining this process and working together. Their role as peacemakers deserves emphasis."

To this day, only two participants — Rafi Greenberg, a lecturer in archaeology at Tel Aviv University, and David Ilan, director of the Nelson Glueck School of Biblical Archeology at Hebrew Union College in Jerusalem — have agreed to be publicly identified. The other four have remained anonymous, fearing reprisals. Yet they all see themselves as private citizens trying with the only tool they have at hand to contribute to a process that so far has stumped professional statesmen.

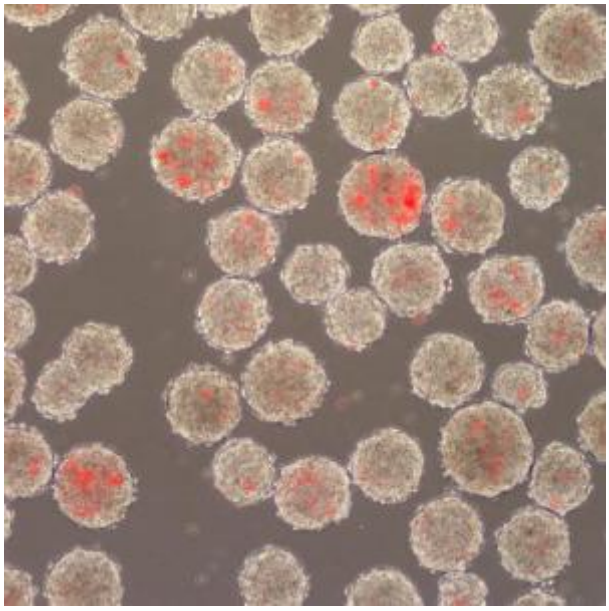
"Even though we are archaeologists, we are peacemakers first," Boytner said.

To view a video on the archaeology plan, visit http://www.youtube.com/watch?v=wkRATNj8WDo.

Adapted from materials provided by University of California, Los Angeles.

http://www.sciencedaily.com /releases/2008/04/080411123057.htm

Method To Deliver Molecules Within Embryonic Stem Cells Improves Differentiation



Fluorescence microscopy image overlaid with phase image to display incorporation of microspheres (red stain) in embryoid bodies (gray circles). New research shows that delivering molecules via biodegradable microspheres enhances the efficiency and purity of stem cell differentiation. (Credit: Image courtesy of Todd McDevitt)

ScienceDaily (Apr. 14, 2008) — Embryonic stem cell therapies have been proposed for regenerative medicine and tissue replacement after injury or disease. However, the inability of stem cells to efficiently develop into the desired specific cell type -- such as muscle, skin, blood vessels, bone or neurons -- now limits the potential clinical utility of this therapy.

New research shows that delivering molecules within aggregates of embryonic stem cells via biodegradable microspheres enhances the efficiency and purity of differentiation, which is the process the cells undergo to become more specialized. Details of the microsphere-mediated delivery method were presented on April 9 at the 235th American Chemical Society national meeting.

"Directing embryonic stem cells to efficiently differentiate into a specific cell type has been challenging to this point," said Todd McDevitt, an assistant professor in the Wallace H. Coulter Department of Biomedical Engineering at Georgia Tech and Emory University. "In my lab, we're trying to better define and then control the environmental cues that regulate the fate and function of the stem cells."

Because physical interactions between stem cells is critical during normal embryonic development, most laboratory growth methods allow the cells to aggregate in three-dimensional clumps called "embryoid bodies" in order to differentiate. After individual cells aggregate together, hollow internal structures begin to develop and the aggregate becomes larger and more complex over time.

"Many researchers add soluble factors to the culture dish medium to direct differentiation, but this does not accurately mimic the time and location of signaling events present in normal development, and may contribute to heterogeneous differentiation," said McDevitt. "Our method focuses on incorporating the differentiation factors directly into the cell aggregates in order to have a more controlled mechanism of presentation."

The research team -- which also includes graduate students Richard Carpenedo and Andrés Bratt-Leal and undergraduate students Ross Marklein and Scott Seaman -- fabricated biodegradable polymer microspheres that could contain growth factors, proteins or other small molecules.

McDevitt's team tested the impact of the poly(lactic-co-glycolic acid) (PLGA) microspheres on embryonic stem cell differentiation under different conditions by varying the microsphere-to-cell ratio and speed at which the aggregate cells were mixed with the microspheres. They also included a fluorescent dye in the microspheres so the degree of incorporation of the microspheres within the embryoid bodies could be assessed using fluorescent microscopy and spectroscopy.

The results revealed that the microspheres were incorporated into embryoid bodies under a variety of mixing conditions, but that slower rotary speeds and higher microsphere-to-cell ratios resulted in a greater degree of incorporation.

Next, the researchers compared differentiation of untreated cells, cells mixed with empty microspheres, cells mixed with retinoic acid-loaded microspheres, and cells treated with soluble retinoic acid. Retinoic acid was chosen initially because it is a potent inducer of embryonic stem cell differentiation.

After ten days, approximately 90 percent of the embryoid bodies mixed with retinoic acid-loaded microspheres began to display the hollow structure signifying differentiation, compared to 6 percent of the untreated bodies, 10 percent of the bodies coated with soluble retinoic acid, and 30 percent of the bodies mixed with empty microspheres. In addition, thirty percent of the embryoid bodies mixed with retinoic acid-loaded microspheres were completely hollow in the center, compared to nearly zero percent for the other groups.

"These results suggest that if you can control the signaling by presenting molecules locally on the inside of the embryoid body from biodegradable microspheres, you can effectively change the course and synchrony of differentiation," said McDevitt.

To examine the cells in more detail, McDevitt teamed with Georgia Tech School of Biology chair John McDonald and research scientist Nathan Bowen to conduct microarray gene expression studies to determine cell phenotype.

The results revealed enhanced expression of fibroblast growth factor 5 (FGF-5) -- a marker for primitive ectoderm -- in the embryoid bodies mixed with retinoic acid-loaded microspheres compared to the other treatment groups after 10 days. The researchers also confirmed increased or inhibited expression of many additional markers.

"The importance of these findings is that we've shown that biomaterial-based approaches to regulate stem cell microenvironments can significantly improve differentiation methods," said McDevitt. "Our ultimate goal is to improve the efficiency of this differentiation process into specific cell types for cell replacement therapies."

This research was funded by the National Science Foundation.

Adapted from materials provided by Georgia Institute of Technology.

http://www.sciencedaily.com /releases/2008/04/080409150104.htm

Artificial Lightning: Laser Triggers Electrical Activity In Thunderstorm For The First Time

Lightning strikes have been the subject of scientific investigation dating back to the time of Benjamin Franklin, but they are still not fully understood. (Credit: iStockphoto/Martin Fischer)

ScienceDaily (Apr. 14, 2008) — A team of European scientists has deliberately triggered electrical activity in thunderclouds for the first time, according to a new paper in the latest issue of Optics Express, the Optical Society's (OSA) open-access journal. They did this by aiming high-power pulses of laser light into a thunderstorm.

At the top of South Baldy Peak in New Mexico during two passing thunderstorms, the researchers used laser pulses to create plasma filaments that could conduct electricity akin to Benjamin Franklin's silk kite string. No air-to-ground lightning was triggered because the filaments were too short-lived, but the laser pulses generated discharges in the thunderclouds themselves.

"This was an important first step toward triggering lightning strikes with laser beams," says Jérôme Kasparian of the University of Lyon in France. "It was the first time we generated lighting precursors in a thundercloud." The next step of generating full-blown lightning strikes may come, he adds, after the team reprograms their lasers to use more sophisticated pulse sequences that will make longer-lived filaments to further conduct the lightning during storms.

Triggering lightning strikes is an important tool for basic and applied research because it enables researchers to study the mechanisms underlying lightning strikes. Moreover, triggered lightning strikes will allow engineers to evaluate and test the lightning-sensitivity of airplanes and critical infrastructure such as power lines.

Pulsed lasers represent a potentially very powerful technology for triggering lightning because they can form a large number of plasma filaments -- ionized channels of molecules in the air that act like conducting wires extending into the thundercloud. This is such a simple concept that the idea of using

lasers to trigger lightning strikes was first suggested more than 30 years ago. But scientists have not been able to accomplish this to date because previous lasers have not been powerful enough to generate long plasma channels. The current generation of more powerful lasers, like the one developed by Kasparian's team, may change that.

Kasparian and his colleagues involved in the Teramobile project, an international program initiated by National Center for Scientific Research (CNRS) in France and the German Research Foundation (DFG), built a powerful mobile laser capable of generating long plasma channels by firing ultrashort laser pulses. They chose to test their laser at the Langmuir Laboratory in New Mexico, which is equipped to measure atmospheric electrical discharges. Sitting at the top of 10,500-foot South Baldy Peak, this laboratory is in an ideal location because its altitude places it close to the high thunderclouds.

During the tests, the research team quantified the electrical activity in the clouds after discharging laser pulses. Statistical analysis showed that their laser pulses indeed enhanced the electrical activity in the thundercloud where it was aimed--in effect they generated small local discharges located at the position of the plasma channels.

The limitation of the experiment, though, was that they could not generate plasma channels that lived long enough to conduct lightning all the way to the ground. The plasma channels dissipated before the lightning could travel more than a few meters along them. The team is currently looking to increase the power of the laser pulses by a factor of 10 and use bursts of pulses to generate the plasmas much more efficiently.

Lightning strikes have been the subject of scientific investigation dating back to the time of Benjamin Franklin, but despite this, remain not fully understood. Although scientists have been able to trigger lightning strikes since the 1970s by shooting small rockets into thunderclouds that spool long wires connected to the ground, typically only 50 percent of rocket launches actually trigger a lightning strike. The use of laser technology would make the process quicker, more efficient and cost-effective and would be expected to open a number of new applications.

Kasparian conducted the research with his colleagues at CNRS, the University of Lyon, the University of Geneva, École Polytechnique and ENSTA in Palaiseau, France, the Free University of Berlin and the Dresden-Rossendorf Research Center as part of the Teramobile project. This work was funded jointly by the CNRS, DFG, the French and German ministries of foreign affairs, Agence Nationale de la Recherche, Fonds national suisse de la recherche scientifique, and the Swiss Secrétariat d'État à l'Éducation et à la Recherche.

Paper: "Electric events synchronized with laser filaments in thunderclouds," Jérôme Kasparian et al, Optics Express, Vol. 16, Issue 8, April 14, 2008, pp. 5757-63; abstract at http://www.opticsexpress.org/abstract.cfm?id=157189.

Adapted from materials provided by Optical Society of America, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com /releases/2008/04/080414082517.htm

Ancient Method, 'Black Gold Agriculture' May Revolutionize Farming, Curb Global Warming

The raw materials involved in the production of biochar. (Credit: Courtesy of Mingxin Guo)

ScienceDaily (Apr. 15, 2008) — Fifteen hundred years ago, tribes people from the central Amazon basin mixed their soil with charcoal derived from animal bone and tree bark. Today, at the site of this charcoal deposit, scientists have found some of the richest, most fertile soil in the world. Now this ancient, remarkably simple farming technique seems far ahead of the curve, holding promise as a carbon-negative strategy to rein in world hunger as well as greenhouse gases.

At the 235th national meeting of the American Chemical Society, scientists report that charcoal derived from heated biomass has an unprecedented ability to improve the fertility of soil -- one that surpasses compost, animal manure, and other well-known soil conditioners.

They also suggest that this so-called "biochar" profoundly enhances the natural carbon seizing ability of soil. Dubbed "black gold agriculture," scientists say this "revolutionary" farming technique can provide a cheap, straight-forward strategy to reduce greenhouse gases by trapping them in charcoal-laced soil.

"Charcoal fertilization can permanently increase soil organic matter content and improve soil quality, persisting in soil for hundreds to thousands of years," Mingxin Guo, Ph.D., and colleagues report. In what they describe as a "new and pioneering" ACS report -- the first systematic investigation of soil improvement by charcoal fertilization -- Guo found that soils receiving charcoal produced from organic wastes were much looser, absorbed significantly more water and nutrients and produced higher crop biomass. The authors, with Delaware State University, say "the results demonstrate that charcoal amendment is a revolutionary approach for long-term soil quality improvement."

Soil deterioration from depletion of organic matter is an increasingly serious global problem that contributes to hunger and malnutrition. Often a result of unsustainable farming, overuse of chemical

fertilizers and drought, the main weapons to combat the problem --compost, animal manure and crop debris -- decompose rapidly.

"Earth's soil is the largest terrestrial pool of carbon," Guo said. "In other words, most of the earth's carbon is fixed in soil." But if this soil is intensively cultivated by tillage and chemical fertilization, organic matter in soil will be quickly decomposed into carbon dioxide by soil microbes and released into the atmosphere, leaving the soil compacted and nutrient-poor.

Applying raw organic materials to soil only provides a temporary solution, since the applied organic matter decomposes quickly. Converting this unutilized raw material into biochar, a non-toxic and stable fertilizer, could keep carbon in the soil and out of the atmosphere, says Guo."Speaking in terms of fertility and productivity, the soil quality will be improved. It is a long-term effect. After you apply it once, it will be there for hundreds of years," according to Guo. With its porous structure and high nutrient- and water-holding capabilities, biochar could become an extremely attractive option for commercial farmers and home gardeners looking for long-term soil improvement.

The researchers planted winter wheat in pots of soil in a greenhouse. Some pots were amended with two percent biochar, generated from readily available ingredients like tree leaves, corn stalk and wood chips. The other pots contained ordinary soil.

The biochar-infused soil showed vastly improved germination and growing rates compared to regular soil. Guo says that even a one-percent charcoal treatment would lead to improved crop yield.

Guo is "positive" that this ground-breaking farming technique can help feed countries with poor soil quality. "We hope this technology will be extended worldwide," says Guo.

"The production of current arable land could be significantly improved to provide more food and fiber for the growing populations. We want to call it the second agricultural revolution, or black gold revolution!"

He suggests that charcoal production has been practiced for at least 3000 years. But until now, nobody realized that this charcoal could improve soil fertility until archaeologists stumbled on the aforementioned Amazonian soil several years ago.Biochar production is straightforward, involving a heating process known as pyrolysis. First, organic residue such as tree leaves and wood chips is packed into a metal container and sealed. Then, through a small hole on top, the container is heated and the material burns. The raw organic matter is transformed into black charcoal. Smokes generated during pyrolysis can also be collected and cooled down to form bio-oil, a renewable energy source, says Guo.

In lieu of patenting biochar, Guo says he is most interested in extending the technology into practice as soon as possible. To that end, his colleagues at Delaware State University are investigating a standardized production procedure for biochar. They also foresee long-term field studies are needed to validate and demonstrate the technology. Guo noted that downsides of biochar include transportation costs resulting from its bulk mass and a need to develop new tools to spread the granular fertilizer over large tracts of farmland.

The researchers are about to embark on a five-year study on the effect of "black gold" on spinach, green peppers, tomatoes and other crops. They seek the long-term effects of biochar fertilization on soil carbon changes, crop productivity and its effect of the soil microorganism community.

"Through this long-term work, we will show to people that biochar fertilization will significantly change our current conventional farming concepts," says Guo.

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

http://www.sciencedaily.com /releases/2008/04/080410153658.htm

You Bet Your Tintype, Buckaroo

By RANDY KENNEDY

ONE fairly reliable way to tell if you are in a part of the country where people still herd cattle for a living is the frequent and unself-conscious use of the word cowboy as a verb.

As in: “Buck got a good scholarship to go to college, but he turned it down. All he wanted to do was cowboy.”

For more than 20 years the photographer Robb Kendrick, a longtime contributor to National Geographic, has traveled around the United States, Canada and northern Mexico visiting just such places, increasingly rare ones where development has been kept at bay and discouraging words seldom are heard, at least on cellphones, which stop working a hundred miles from the nearest tower.

Mr. Kendrick fits in well not only because he is a sixth-generation Texan, raised in ranch country in the state’s panhandle, but also because of the unusual method of photography he favors, one patented and popularized at a time when the idea of the American cowboy was itself just being created.

He doesn’t need batteries or memory cards or even film for his pictures. Mostly he just needs time, patience and lots of elbow grease. And as he labors, moving methodically from beneath the hood of his wooden box camera to a portable field darkroom, bearing wet iron plates that he has painstakingly prepared, he thinks of himself not as simply making pictures but also as taking part in the world of the cowboys who are the subjects of his otherworldly tintype portraits.

“The tendency of cowboys is to think of photographers as very demanding, high-maintenance people,” Mr. Kendrick said. “And in the end I think they really respect the fact that I have to work for these pictures. They respect any kind of honest hard work.”

Mr. Kendrick belongs to a growing group of commercial and art photographers — including gallery stars like Sally Mann and Chuck Close — who have retreated in recent years from the ease and exactitude of the digital age and taken up the difficult, ethereal techniques of early photography, including the ambrotype (in which a unique image is created on a glass plate), daguerreotype (on polished silver) and tintype (usually on tin-plated iron).

The latest result of Mr. Kendrick's twin obsessions — with tintypes and the bow-legged anachronisms who continue to make their living on horseback — is "Still: Cowboys at the Start of the Twenty-First Century," a new collection of 148 tintype portraits published by the University of Texas Press.

The pictures — made by exposing and developing the metal plates after they have been coated with a light-sensitive solution of silver nitrate — are a kind of ideal meeting of subject and style. Many of the cowboys pine to have been born in the 19th century. And the tintypes, with their sepia tones, blurred peripheries and ghostly aura, take the cowboys back to the era when such photographs were taken by traveling commercial photographers. Mr. Kendrick's impulses may be more nostalgic and sociological than artistic, but the best of the pictures have a timeless power that evokes — oddly, given that Mr. Kendrick's pictures are of cowboys — the portraits of North American Indians taken by Edward S. Curtis in the early 1900s.

For the new book, and an earlier one, "Revealing Character," published in 2005, Mr. Kendrick estimates conservatively that he has covered more than 40,000 miles of often lonesome road in his pickup and visited more than 60 ranches, towing a trailer that he uses as a darkroom. (The most recent version of this mobile darkroom, specially made for him by a Mennonite company in Indiana, is as high-tech as his wooden cameras are primitive; it has an iPod docking station, climate control and stainless steel countertops.)

Robb Kendrick

"When I'm doing tintypes, everything has to be driving, not flying — all the stuff for the developing is fairly flammable," said Mr. Kendrick, who began to learn tintype techniques in 1999, after years of photographing cowboys with more conventional cameras and no toxic vats of potassium cyanide. "Fortunately for me I love driving," he said, pausing before adding, "Thank God for satellite radio."

Mr. Kendrick has long been drawn to cowboys as subjects, in part because he grew up around so many in Hereford, Tex., but also because he finds the endurance of their culture and mythology — more than a hundred years after the last great cattle drives — to be as fascinating as that of other groups he has photographed, like Sherpas in the Himalayas or the Tarahumara Indians of northern Mexico.

"Many cultures threatened by so-called progress can lose much in a matter of one or two generations," he writes in the new book. "But cowboys — actual working cowboys, in all their manifestations — proudly and determinedly endure."

As the era in which their livelihood was created recedes ever further and fascination with their stubborn embrace of it seems only to grow, cowboys also have to endure a lot of curiosity, from writers and filmmakers and photographers. And so Mr. Kendrick has had to work hard to overcome the impression that he is just another dilettante spectator.

"Some of us like the publicity, and some of us just get tired of it," said Merlin Rupp, a 71-year-old lifelong range worker from Burns, Ore., who retired several years ago after a horse fell under him, badly breaking Mr. Rupp's neck and, as he describes it with great understatement, "putting me to sleep for three weeks."

But Mr. Rupp said he was proud of the stoical portrait Mr. Kendrick took of him, standing next to his wife, Faithe, the twirled ends of his long white mustache seeming to reach out toward her like tendrils. And Mr. Rupp said he believes that such portraits were an important record of modern-day cowboys at a time when cattle ranches are shrinking along with the number of working cowboys — or at least those he considers worthy of the name.

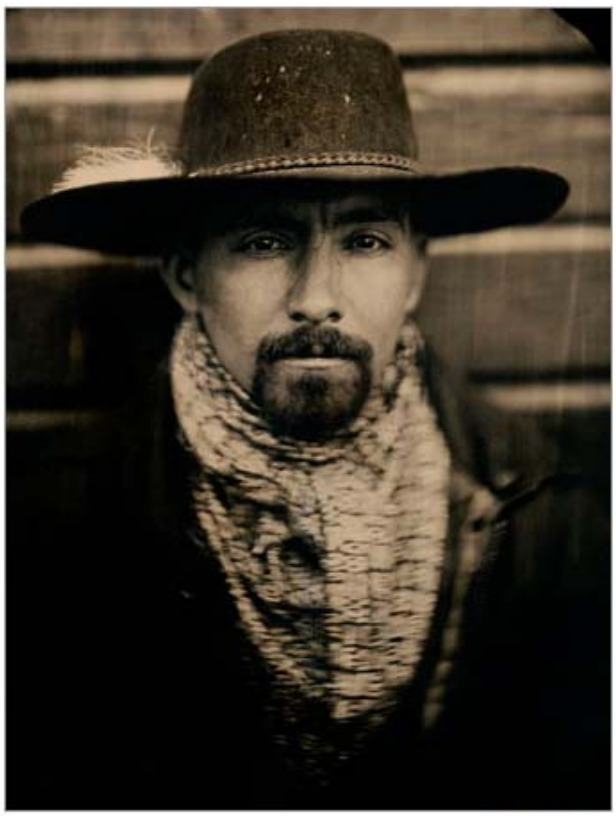
“There are fewer places to do this kind of work, but there are also fewer people who have the heart for it,” he said. “It’s a way of life that don’t pay a lot of money, and it’s hard on you. But it’s also stress free. You don’t have to drive 50 miles to work. You just get up out of your teepee and go to the cookhouse and then you go to work.”

Another cowboy, whom Mr. Kendrick has known for 20 years, David Ross of the Pitchfork Ranch in northwest Texas, spends winters alone in a range teepee on a wheat field, speaking to someone about once a month when his supplies are dropped off. “It’s good for a man to be alone,” Mr. Ross told Mr. Kendrick, whose photographs of him could be mistaken for those of a Rough-Rider-era Teddy Roosevelt. “It clears your mind.”

Over the years of riding, eating, bunking, branding and chewing tobacco with cowboys, Mr. Kendrick, 45, has become a fairly well-informed student of their regional idiosyncrasies and the ways in which they allow the modern world to seep into the 19th-century version that they try very hard to preserve around them.

Cowboys in northern and northwestern states like Oregon and Idaho and parts of Nevada and California tend to think of themselves not as cowboys but as buckaroos, a term that might sound as if it originated on the television show “Hee Haw” but is probably an Anglicization of the Spanish vaquero. Buckaroos are known, sometimes with a little derision, as the Beau Brummels of the saddle-office set, wearing antique-looking flat hats, leather brush cuffs, silver spurs, huge neckerchiefs they call wild rags and short chaps with long fringe, called chinks.

“These guys are very concerned with how their shadows look, whether they cut a good figure,” Mr. Kendrick said. “They don’t earn very much, but what they do earn they spend on their gear and they way they look.” (A starting cowboy salary can be less than a $1,000 a month.)



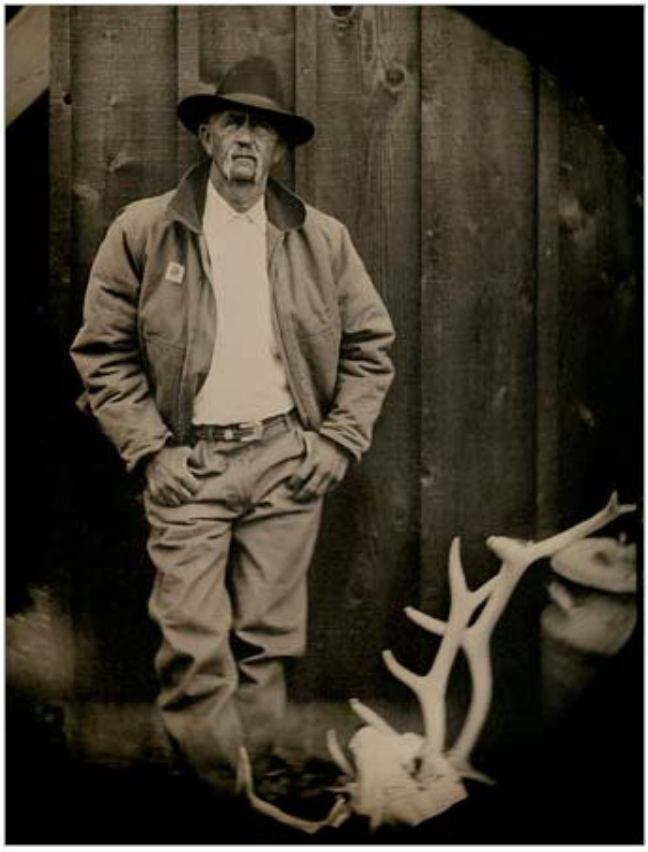
Robb Kendrick

Moving further south on the cowboy map the term cowpuncher takes over, mostly in Texas, New Mexico and Oklahoma, where the work clothes are much more utilitarian and the brims of the hats arch skyward on the sides, a style that flat-hatted buckaroos call “taco hats.” (A good example can be seen in the well-known publicity picture of James Dean from “Giant,” sitting in profile with his boots up.)

Mr. Kendrick remembers a conversation with a Texas cowpuncher whose brim edges threatened to meet somewhere over the crown of his hat. “I said: ‘Tom, doesn’t that hat defeat the purpose of keeping the sun off of you? Doesn’t it shine right on your ears?’ ” The rancher told him that whatever the hat’s failings, its aerodynamics kept it from leaving his head in a high wind and it

also sluiced the rain like a clean storm gutter.

The third major category of cowboy — those who call themselves just plain cowboys — tends to be found east of the Rockies, in Kansas, Nebraska, the Dakotas and Colorado and Wyoming, and its members usually find a middle ground between the fancy and the plain range looks. But Mr. Kendrick points out that it is much more common these days to see, for example, chink chaps in Texas or a taco hat far north, as cowboys migrate more and have better access to online shopping. As the new book shows, though cowboying in the United States is still done mostly by white men, it is also more common to find cowgirls at work on ranches, not simply minding the books or cooking but on horseback, repairing fences and tracking lost calves. Jodi Miner, who runs the Snowline Ranch in Montana with her husband, Wes, told Mr. Kendrick in a series of interviews he has recorded and transcribed that she tries to live according to the dictum of working like a man but knowing when to be a lady.



"I'm proud to be a cowboy," she said. "Or a cowgirl, however you want to word it." Mr. Kendrick said that though there are few creature comforts when he is making his portraits, food is sometimes one of them. Among his chuck-wagon highlights, he counts a mincemeat pie made by a cook on the ORO Ranch in Arizona with a filling of cow's tongue mixed with wild apples and berries. "You could have been in San Francisco or New York eating that in a really expensive restaurant," he said. He also notes that there are many modern-day cowboys who like to live a little; one in British Columbia confessed to spending his recent winters windsurfing in Mexico.

But you get the impression that Mr. Kendrick, like most cowboys, is much happier when doing things the hard way. "Making these kinds of pictures, you don't need the mental skills that you have to have a Ph.D. for," he said. "It's more like learning to be a carpenter. It's work and it's satisfying. What you get is unique, not mass-produced. You can't repeat the process. So it's the antithesis of digital."

The feeling is one that Mr. Rupp knew well. He tells a story of herding a couple hundred cows on a ranch in Nevada and taking them to the crest of a trail, below which lay a seemingly endless prairie. "I just sat on my horse and I looked down," he told Mr. Kendrick. "Gosh, I was right in the middle of God's flower garden. The wildflowers were just everywhere. The smell was so great. And I couldn't help but say: 'Thank you, Lord. Thank you, Lord, for just lettin' me be out there.' "

http://www.nytimes.com/2008/04/20/arts/design/20kenn.html?ref=design

Now You See It, Now You Don't

By NICOLAI OUROUSSOFF

BIG-TIME development has always been a rough-and-tumble world in New York. But in recent years, as government has ceded more and more power to private interests, developers have become magicians at negotiating their way through the byzantine public review process. Nowhere is this sleight of hand more visible than in the way they tailor architectural renderings for public consumption.

As the battles over mammoth-scale development grow more heated, developers and their marketing teams have become extremely cautious about the information they release before a project passes review, for fear of inciting a public outcry.

Architects are now regularly asked to sign confidentiality agreements that forbid them to talk to the press, a tactic that was virtually unheard of a few years ago. The images released to the public are often restricted to a few renderings that are carefully scrutinized in advance by marketing experts. As a result the public is often left without the visual tools it needs to make thoughtful judgments about a development's impact.

The design for a 12-million-square-foot development proposal by Tishman Speyer Properties at the site of the West Side railyards is a case in point. When reporters showed up for its unveiling last month, they were handed a packet with a fact sheet and a few cursory renderings.

Basic details like the surrounding context were left incomplete; there were no elevations to show what the project would look like from the street. The largest of the models on display was cut off at mid-elevation, making it virtually impossible to understand the towers' colossal scale.

I don't mean to single out Tishman Speyer for criticism here. On the contrary, the company represents the norm. Like most developers it probably sees architectural renderings as just one element of an elaborate marketing campaign. I'm sure it's even proud of its designs. But the end result is a distorted picture of reality, one that stifles what is supposed to be an open, democratic process. NICOLAI OUROUSSOFF

http://www.nytimes.com/2008/04/20/arts/design/20ouro.html?ref=design

Radiant Line of Russian Style Energized in a Triplet of Balanchines

By ALASTAIR MACAULAY

A colleague of Serge Diaghilev (1872-1929) shrewdly wrapped up that great impresario's work into three categories: "To reveal Russia to itself; to reveal Russia to the world; to reveal the world — the new world — to itself." We can now see that a fourth project remained: to reveal that new world to Russia. Only after the Iron Curtain had lifted, decades after his death, could that be possible. The Kirov Ballet closed its three-week season at New York City Center on Sunday with a triple bill of ballets by George Balanchine, the last of the five choreographers Diaghilev introduced to the West. These three — "Serenade" (Tchaikovsky), "Rubies" (Stravinsky) and "Ballet Imperial" (Tchaikovsky) — demonstrated just how this process is still going on.

What experience could be more historically and aesthetically complex than watching companies that are still waking from the deep freeze of the Communist era coming to terms with works made in the West by radical St. Petersburg modernists who got out of Russia before that freeze began? Even some of the early Diaghilev ballets by Michel Fokine, a few of which the Kirov danced earlier in this City Center season, have joined the St. Petersburg company's repertory relatively recently.

There have been horrors: no account of Bronislava Nijinska's "Noces" can ever have been worse (more misdirected in body language and accentuation) than the Kirov's a few years ago. There have been triumphs: the Kirov's illustrious 1989 accounts of Balanchine's "Scotch Symphony" and "Theme and Variations"; its galvanized, glowing 2000-2 accounts of his "Rubies"; and to a lesser extent, the rest of "Jewels."

Generally any Kirov season in the West will now contain a Balanchine program or at least one Balanchine ballet, and it's always a completely compelling spectacle. If St. Petersburg is the Russian city known as the "window on the West," then Balanchine in New York is always, in part, a window on St. Petersburg. When you watch the Kirov dancing any Balanchine ballet, you see how strong a stylistic connection still runs between the two. And any Balanchine ballet wakes up these dancers and turns their spectacular and competitive technique into sheer dancing.

To watch a corps of 16 Kirov women hopping in arabesque in "Serenade" or "Ballet Imperial" is a joy. The radiant line of Russian style, so juicy, here becomes not statuesque but energized. To watch the same corps, in either ballet, facing into the wings with the same annunciatory arms they use in "La Bayadère" is to see one of a hundred moments in which the Kirov refracts ballet history like a hall of mirrors. They

then move those arms, and the rest of the body, turning dance past into busy present. This is especially true at City Center, where the audience is so close to the stage and where, in these performances, "Serenade" has never been more brightly lighted. Innumerable choreographic masterstrokes that on larger stages pass casually fell into the sharpest focus here.

But it's also true that the Kirov dancing almost any Balanchine ballet will show how deep the chasm is between these two ballet cultures. Kirov dancers tend to be grandly theatrical; like the British Royal Ballet, they need almost always to act Balanchine, to present Balanchine. It's not enough for one dancer to look another in the eyes; she has to give that moment dramatic weight and let us know just what that weight is.

In the first three City Center performances of these ballets, I enjoyed and admired no dancer more than the bewitchingly elegant Ekaterina Kondaurova: beautiful in "Serenade" as the heroine (Saturday evening) and the Dark Angel (Friday evening, Saturday matinee), and marvelous as the "Rubies" second girl (Friday evening). But she seemed to need to show us (even at curtain calls) how the "Serenade" heroine was an innocent girl struck down by transformative experience, how the Dark Angel is a reluctant agent of tragic fate and how the "Rubies" soloist is a twinkling source of dark mischief. Apparently, she can't just be these things and let the rest take us by surprise.

As a result, layers of the ballets — much of their true and thrilling mystery — go missing. So much of "Serenade" is just about dancers doing, and returning to, basic ballet class work. But the Kirov responds to the real drama in "Serenade" by "playing" even the class work theatrically. (Though in "Études" and its William Forsythe quadruple bill, the Kirov drops its airs and shows unaffected, cool manners.)

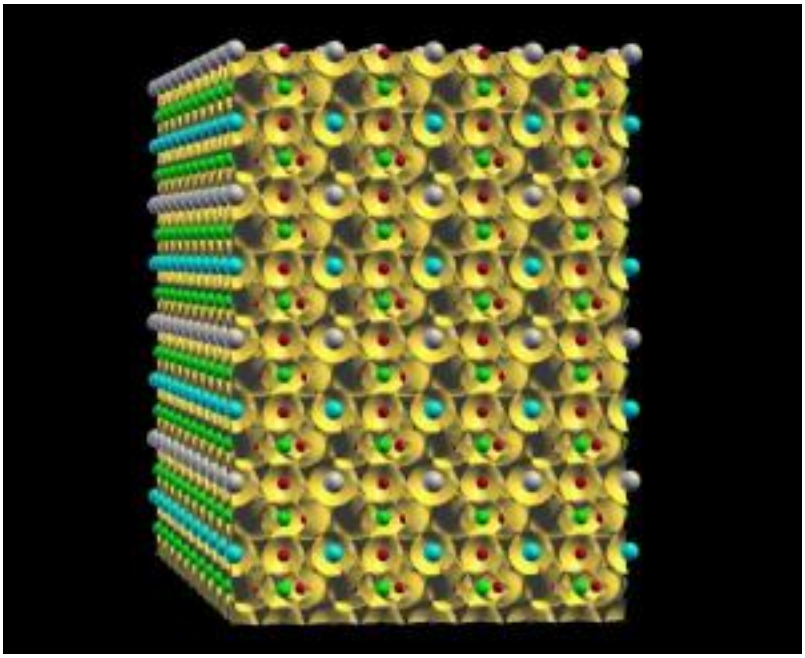
The Kirov "Rubies" is no longer the ultrapercussive knockout it was a few years ago. All three ballerinas officially cast for it at these performances dropped out at short notice. Replacing them, Olesia Novikova danced the role with a soft and demure loveliness that was all wrong until, on Saturday night, she began to find the sharpness and nonstop impetus it needed. Of three successive men in the male principal role, Anton Korsakov (Saturday matinee) showed the right basic Balanchine style, the whole body shiningly engaged, but without any of the role's particular technical flair; Leonid Sarafanov (Saturday evening) had technical flair of a far too weightless kind.

In the central role of "Ballet Imperial," Victoria Tereshkina had something of a triumph on Friday night. Deservedly so. She not only manages all its complex turns and jump steps with real skill, she also finds moments of pliancy and luxuriance in between. On Saturday night Uliana Lopatkina showed even more understanding of its many interpretative nuances, but in a role that calls for juice galore she is the least juicy of all Kirov ballerinas, and she simply can't manage all the technical challenges with sufficient ease.

At these performances I heard some people say, "The Kirov shouldn't be dancing Balanchine," and others say, "Nobody dances Balanchine better." I disagree with both; the Kirov dancing Balanchine is revelatory. Yet even now, 19 years after the first Balanchines it showed us, there is still much left for it to reveal to itself. The Kirov has become the temple of ballet academicism. Balanchine was the genius of ballet classicism. The connections and the differences between the two were rivetingly evident at these performances.

http://www.nytimes.com/2008/04/21/arts/dance/21bala.html?ref=dance

New Artificial Material Paves Way To Improved Electronics



The atomic scale structure of a 1/1 PbTiO3/SrTiO3 superlattice (as obtained from first-principles calculations), (Pb atoms in grey, Sr atoms in blue, Ti atoms in green and O atoms in red). The associated electron cloud is in yellow. The distinct rotations of oxygen atoms (in red) in consecutive layers are generated by the artificially produced layering in the structure and are a specific feature of the improper ferroelectric behavior discovered. (Credit: Copyright University of Liège)

ScienceDaily (Apr. 16, 2008) — In the 10 April issue of Nature, a new artificial material is revealed that marks the beginning of a revolution in the development of materials for electronic applications. The discovery results from a collaboration between the theory group of Professor Philippe Ghosez (University of Liège, Belgium) and the experimental group of Professor Jean-Marc Triscone (University of Geneva, Switzerland). One of the lead researchers on this project, Matthew Dawber, who recently joined the Department of Physics and Astronomy at Stony Brook University, will be at the forefront of the continued effort to make and understand these revolutionary artificial materials in his new lab.

The new material, a superlattice, which has a multilayer structure composed of alternating atomically thin layers of two different oxides (PbTiO3 and SrTiO3), possesses properties radically different to either of the two materials by themselves. These new properties are a direct consequence of the artificially layered structure and are driven by interactions at the atomic scale at the interfaces between the layers.

“Besides the immediate applications that could be generated by this nanomaterial, this discovery opens a completely new field of investigation and the possibility of new functional materials based on a new concept: interface engineering on the atomic scale,” said Dr. Dawber.

Transition metal oxides are a class of materials that provoke great interest because of the great diversity of properties which they can present (they can be dielectrics, ferroelectrics, piezoelectrics, magnets or superconductors) and their ability to be integrated into numerous devices. The majority of these oxides possess a similar structure (referred to as ‘perovskite’) and, recently, researchers have developed the ability to build these kinds of materials up, atomic layer by atomic layer, much as a child plays with Lego bricks, hoping to produce new materials with exceptional properties.

Ferroelectrics are some of the most useful functional materials, with applications ranging from advanced non-volatile computer memories, to micro-electromechanical machines or infrared detectors. ‘Improper ferroelectricity’, is a kind of ferroelectricity that occurs only rarely in natural materials and usually the

effects are far too small to be useful. The properties of improper ferroelectrics depend on temperature in a totally different way to normal ferroelectrics, meaning they would have significant advantages for many applications where the operation temperature might vary, if only the ferroelectric properties were larger in magnitude.

This new superlattice material shows improper ferroelectricity (a property that neither of the parent materials possesses) with a magnitude around 100 times greater than any naturally occurring improper ferroelectric, opening the door for a host of real world applications.

PbTiO3 and SrTiO3 are two well-known and well characterized oxide materials, presenting, in one case, a ferroelectric structural instability, and, in the other, a non-polar structural instability. A theoretical study carried out in Liège (using sophisticated first principles quantum mechanical simulation techniques, referred to as ab initio) predicted that when these materials are combined in a superlattice, an unusual and completely unexpected coupling between the two types of instabilities occur which is what causes the improper ferroelectricity.

A parallel experimental study in Geneva, confirmed the improper ferroelectric character in this type of superlattice, and also provided evidence of an exceptionally useful new property: a dielectric constant (a value which describes the response of the material to an electric field) which is, at the same time, very high and independent of temperature, two characteristics that tend to be exclusive of one another but are here combined in the same material.

But indeed the ideas generated by this discovery are much more significant than the immediate applications; this study demonstrates the possibility of creating radically different materials by engineering on the atomic scale and the PbTiO3/SrTiO3 superlattice system is only a first example. The concept of coupling of instabilities at the interfaces in artificially layered structures is a concept transferable to other types of oxides, and could be a particularly interesting strategy in the emerging domain of multiferroic oxides. These results follow hot on the heels of the discovery last year that the interface between a different pair of oxide materials was in fact superconducting , where neither of the natural materials from which it was made had this property.

This and other recent progress lead the journal Science to class the recent discoveries in oxide multilayers as one of the ten most significant scientific breakthroughs of 2007. In the same way that the mastery of the interface properties of semiconductors was crucial for the development of the modern electronics we depend on today, it seems that engineering of new properties at interfaces between oxides could result in an equally significant technological revolution in the years to come.

Journal reference and funding: This research results from a collaboration, which has been funded by the Volkswagen Foundation (Nanosized Ferroelectric Hybrids), the Swiss National Science Foundation (through the National Centre of Competence in Research-MaNEP) and the European Community (FAME-EMMI and MaCoMuFi). Eric Bousquet (ULg), Matthew Dawber (SBU/UniGe), Nicolas Stucki (UniGe), Céline Lichtensteiger (UniGe), Patrick Hermet (ULg), Stefano Gariglio (UniGe), Jean-Marc Triscone (UniGe) & Philippe Ghosez (ULg). Nature 10 April 2008 ; 452 (7188) 732-736.

Earlier Science article: N. Reyren et al., Science 317, 1196 (2007).

Adapted from materials provided by Stony Brook University.

http://www.sciencedaily.com:80 /releases/2008/04/080415193420.htm

'OBJECT OBJECT'

Here's Looking at You and You, Babe: Taking a Whack at Female Stereotypes

By CLAUDIA LA ROCCO

The open-mouthed sexpot, the hot and bothered housewife, the mysterious siren with luxurious locks: all are familiar images of women, slickly packaged and easily digestible.

Whether behind the canvas or the camera, male artists have been objectifying women for centuries. Female artists began responding in organized fashion when the feminist art movement got rolling in the late 1960s, playing with the very same archetypes as a means of deconstructing them, as documented by "WACK!: Art and the Feminist Revolution," at P.S. 1 in Queens. But much (though certainly not all) has changed since that movement's first urgently felt wave, and responses from younger female artists today often feel more like jaunty anthropological expeditions than activism.

So it was on Thursday as Dance New Amsterdam presented the latest installment of "Object Object," a series dedicated to female choreographers. In "Julia Julia Julia Child," Shannon Gillen and Elisabeth Motley of the Doorknob Company flew through various domestic clichés involving the good wife come unhinged. Both are fluid movers, and the fearsome Ms. Gillen has an electrifying theatrical presence. From feather-dusting each other's derrières to threatening abuse over badly cooked meals, they are a compelling team, and the prop-strewn stage formed a rich environment for their antics. Cake was smeared over skin, Child's looped Yoda-like voice formed an absurdist score, and a good time was had by all. But at no point did it seem that either of these Juilliard graduates was responding to any sort of firsthand oppression or degradation.

Nicole Wolcott opened "Dramarama!" with a nightmarish phalanx of crazed women, mouths gaping in lipsticked smiles, hands snaking provocatively around their jutting hips. The facade cracked as one woman convulsed, miming labor pains, and then fractured altogether as Ms. Wolcott sped through a series of shifting choreographic formations.

Ms. Wolcott has a gift for organizing space, but her sophisticated comedic abilities are probably her strongest suit, and "Dramarama!" was never better than in those first deranged — fun with stereotypes! — moments.

Vanessa Justice's "Noise'sNoise" provided the glossy-haired sirens — sort of. She and five women swaddled themselves in winter garments and long wigs, appearing almost like drag versions of women.

But Ms. Justice didn't push this evocative construct very far, instead setting unremarkable phrases against a sound installation. The connection to those tantalizingly strange wigs remained obscure.

"Object Object" runs through Sunday at Dance New Amsterdam, 280 Broadway, at Chambers Street, TriBeCa; (212) 279-4200, dnadance.org.

http://www.nytimes.com/2008/04/19/arts/dance/19obje.html

In Lean Times, Biotech Grains Are Less Taboo

By ANDREW POLLACK

Soaring food prices and global grain shortages are bringing new pressures on governments, food companies and consumers to relax their longstanding resistance to genetically engineered crops.

In Japan and South Korea, some manufacturers for the first time have begun buying genetically engineered corn for use in soft drinks, snacks and other foods. Until now, to avoid consumer backlash, the companies have paid extra to buy conventionally grown corn. But with prices having tripled in two years, it has become too expensive to be so finicky.

"We cannot afford it," said a corn buyer at Kato Kagaku, a Japanese maker of corn starch and corn syrup.

In the United States, wheat growers and marketers, once hesitant about adopting biotechnology because they feared losing export sales, are now warming to it as a way to bolster supplies. Genetically modified crops contain genes from other organisms to make the plants resistance to insects, herbicides or disease. Opponents continue to worry that such crops have not been studied enough and that they might pose risks to health and the environment.

"I think it's pretty clear that price and supply concerns have people thinking a little bit differently today," said Steve Mercer, a spokesman for U.S. Wheat Associates, a federally supported cooperative that promotes American wheat abroad.

The group, which once cautioned farmers about growing biotech wheat, is working to get seed companies to restart development of genetically modified wheat and to get foreign buyers to accept it.

Even in Europe, where opposition to what the Europeans call Frankenfoods has been fiercest, some prominent government officials and business executives are calling for faster approvals of imports of genetically modified crops. They are responding in part to complaints from livestock producers, who say they might suffer a critical shortage of feed if imports are not accelerated.

In Britain, the National Beef Association, which represents cattle farmers, issued a statement this month demanding that "all resistance" to such crops "be abandoned immediately in response to shifts in world demand for food, the growing danger of global food shortages and the prospect of declining domestic animal production."

The chairman of the European Parliament's agriculture committee, Neil Parish, said that as prices rise, Europeans "may be more realistic" about genetically modified crops: "Their hearts may be on the left, but their pockets are on the right."

With food riots in some countries focusing attention on how the world will feed itself, biotechnology proponents see their chance. They argue that while genetic engineering might have been deemed unnecessary when food was abundant, it will be essential for helping the world cope with the demand for food and biofuels in the decades ahead.

Through gene splicing, the modified crops now grown — mainly canola, corn, cotton and soybeans — typically contain bacterial genes that help the plants resist insects or tolerate a herbicide that can be sprayed to kill weeds while leaving the crop unscathed. Biotechnology companies are also working on crops that might need less water or fertilizer, which could have a bigger impact on improving yield.

Certainly any new receptivity to genetically modified crops would be a boon to American exporters. The United States accounted for half the world's acreage of biotech crops last year.

But substantial amounts of corn, soy or canola are grown in Argentina, Brazil and Canada. China has developed insect-resistant rice that is awaiting regulatory approval in that country.

The pressure to re-evaluate biotech comes as prices of some staples like rice and wheat have doubled in the last few months, provoking violent protests in several countries including Cameroon, Egypt, Haiti and Thailand. Factors behind the price spikes include the diversion of crops to make biofuel, rising energy prices, growing prosperity in India and China, and droughts in some regions — including Australia, a major grain producer.

Biotechnology still certainly faces obstacles. Polls in Europe do not yet show a decisive shift in consumer sentiment, and the industry has had some recent setbacks. Since the beginning of the year France has banned the planting of genetically modified corn while Germany has enacted a law allowing for foods to be labeled as "G.M. free."

And a new international assessment of the future of agriculture, released last Tuesday, gave such tepid support to the role genetic engineering could play in easing hunger that biotechnology industry representatives withdrew from the project in protest. The report was a collaboration of more than 60 governments, with participation from companies and nonprofit groups, under the auspices of the World Bank and the United Nations.

Hans R. Herren, co-chairman of the project, said providing more fertilizer to Africa would improve output much more than genetic engineering could. "What farmers really are struggling with are water issues, soil fertility issues and market access for their products," he said.

Opponents of biotechnology say they see not so much an opportunity as opportunism by its proponents to exploit the food crisis. "Where politicians and technocrats have always wanted to push G.M.O.'s, they are jumping on this bandwagon and using this as an excuse," said Helen Holder, who coordinates the campaign against biotech foods for Friends of the Earth Europe. G.M.O. refers to genetically modified organism.

Even Michael Mack, the chief executive of the Swiss company Syngenta, an agricultural chemical and biotechnology giant, cautioned that the industry should not use the current crisis to push its agenda.

Whatever importance biotechnology can play in the long run, food shortages are making it harder for some buyers to avoid engineered crops.

The main reason some Japanese and South Korean makers of corn starch and corn sweeteners are buying biotech corn is that they have dwindling alternatives. Their main supplier is the United States, where 75 percent of corn grown last year was genetically modified, up from 40 percent in 2003.

"We cannot get hold of non-G.M. corn nowadays," said Yoon Chang-gyu, director of the Korean Corn Processing Industry Association.

But the tightening global supply has made it harder to get nonengineered corn from elsewhere. And as corn prices soar, millers and food companies are less able to pay the surcharge to keep nonengineered corn separate from biotech varieties. The surcharge itself has been rising.

Mr. Yoon said non-engineered corn cost Korean millers about $450 a metric ton, up from $143 in 2006. Genetically engineered corn costs about $350 a ton.

In Europe, livestock producers say that regulations on genetically modified crops could choke feed supplies at a time when they are already reeling from higher prices. Even after a new genetically engineered variety is approved for growing in the United States, it might take several years for Europe to approve it for import.

Moreover, European rules require an entire shipment of grain to be turned back if it contains even a trace of an unapproved variety. Such a problem last year disrupted exports of corn gluten, a feed product, from the United States to Europe.

Feed makers and livestock producers want faster approvals and a relaxation of the rules to allow for trace amounts of unapproved varieties in shipments.

Even in the United States, where genetically engineered food has been generally accepted, the wheat industry has had to rethink its reluctance to accept biotech varieties.

Because about half of America's wheat crop is exported, farmers and processors feared foreign buyers would reject their products. Facing resistance from American farmers, Monsanto in 2004 suspended development of what would have been the first genetically modified wheat.

But some farmers and millers now say that the lack of genetically engineered wheat has made growing the grain less attractive than growing corn or soybeans. That has, in turn, contributed to shrinking supplies and rising prices for wheat.

Milling & Baking News, an influential trade newspaper in Kansas City, Mo., said in an editorial that companies that used wheat were now paying the price for their own "hesitancy, if not outright opposition" to biotechnology.

Su-hyun Lee in Seoul, South Korea, and Yasuko Kamiizumi in Tokyo contributed reporting.

http://www.nytimes.com/2008/04/21/business/21crop.html?ref=science

Leafonomics

By SCOTT L. MALCOMSON

In poor countries around the world, there's money being made by cutting down forests. Should these countries be paid *not* to cut down their forests? Such a curious transfer of wealth may represent the next twist in the politics of climate change.

The beneficent capacity of trees to act as "carbon sinks" — storing carbon that would otherwise be released into the atmosphere — is well known, and when most major industrial nations agreed in the 1997 Kyoto Protocol to limit carbon emissions, they added a special provision: polluters could "offset" some carbon production by planting forests. This raised the possibility of corporations in one country compensating for their carbon emissions by planting forests in another.

And if creating new forests is a boon, isn't preserving old forests just as worthwhile? Even before Kyoto, policy experts were considering an enticing concept: "avoided deforestation." After all, existing rain forests, in particular, are crucial carbon sinks, and from Indonesia to Brazil, they are being cut down — mainly for grazing land and timber. This doesn't just lead to the loss of a carbon sink; in many cases the forests are cleared by burning, which itself pours carbon into the atmosphere. It's widely reckoned that global carbon emissions would be 20 percent lower were it not for the destruction of forests and the resulting loss of their carbon-storage capacity.

If carbon pollution must be paid for, then perhaps an acre of forest should have a market value proportional to its capacity to store carbon. Suppose a steel mill in China wanted to emit 10 tons of carbon. It could do so by paying a certain price per ton of emissions for the corresponding quantity of forest needed to store that much carbon.

In the past year, avoided deforestation has acquired a number of new friends. At the U.N. global climate conference held in Bali, Indonesia, last December, the idea entered the mainstream of intergovernmental negotiations on combating climate change. The United States endorsed the Bali road map, and there are a

number of bills being considered in Congress with avoided-deforestation provisions. A major Senate bill, sponsored by Senators Joe Lieberman and John Warner, would create a national "account" of tradable carbon-emission credits. The hope is that the limited supply of such credits will lead companies to reduce their emissions rather than have to pay for credits. But if they do pay for credits, some of those credits could involve avoided deforestation.

That's because the Lieberman-Warner proposal would allocate 2.5 percent of the U.S. emissions account to the State Department, which can then distribute its credits to foreign countries. Those countries would then be able to sell the credits, which will represent commitments to avoid deforestation, to companies who need them to offset their carbon production. According to David McIntosh, a Lieberman staff member who helped with the bill, this 2.5 percent would amount to $28 billion in the period from 2012 (when the Kyoto accords expire) to 2020. But beyond this simple transfer payment to forested countries, the connection of U.S. carbon credits to avoided deforestation would, it is hoped, stimulate the development of a global market in avoided-deforestation credits. "Our bill," McIntosh says, "is essentially calling upon the U.S. to be an early mover in developing this market."

Developing countries tend to be wary of avoided-deforestation programs. But that is changing. Indonesia has been a leader in such programs, and Congo and Brazil have been coming around. For such heavily forested countries, the choice seems to be between entering an infant market in avoided-deforestation carbon offsets — or accepting that their forests will steadily be cut down. The trade-offs are rarely simple: some rain forests are being cleared to make way for palm-oil plantations because of the increased demand for palm oil as a biofuel alternative to petroleum.

An avoided-deforestation market relies on stable governments for its functioning — like carbon markets generally, only more so. A government cannot promise to preserve a forest unless it controls that forest. That, to some, is the idea's great weakness. "I'm bearish toward that particular section of the market," says Cindy Dawes, who trades carbon credits in the European market. "The main obstacle is governance, because most of these activities are in markets that are politically difficult." Indeed, the biggest recent news in avoided deforestation is the certification by conservation groups of a plan to preserve, and generate carbon credits for, Indonesia's vast Ulu Masen forest, an extreme example of "politically difficult" — it is in Aceh province, which has seen decades of insurgency. But it is in just such places that the battle against climate change may be won or lost.

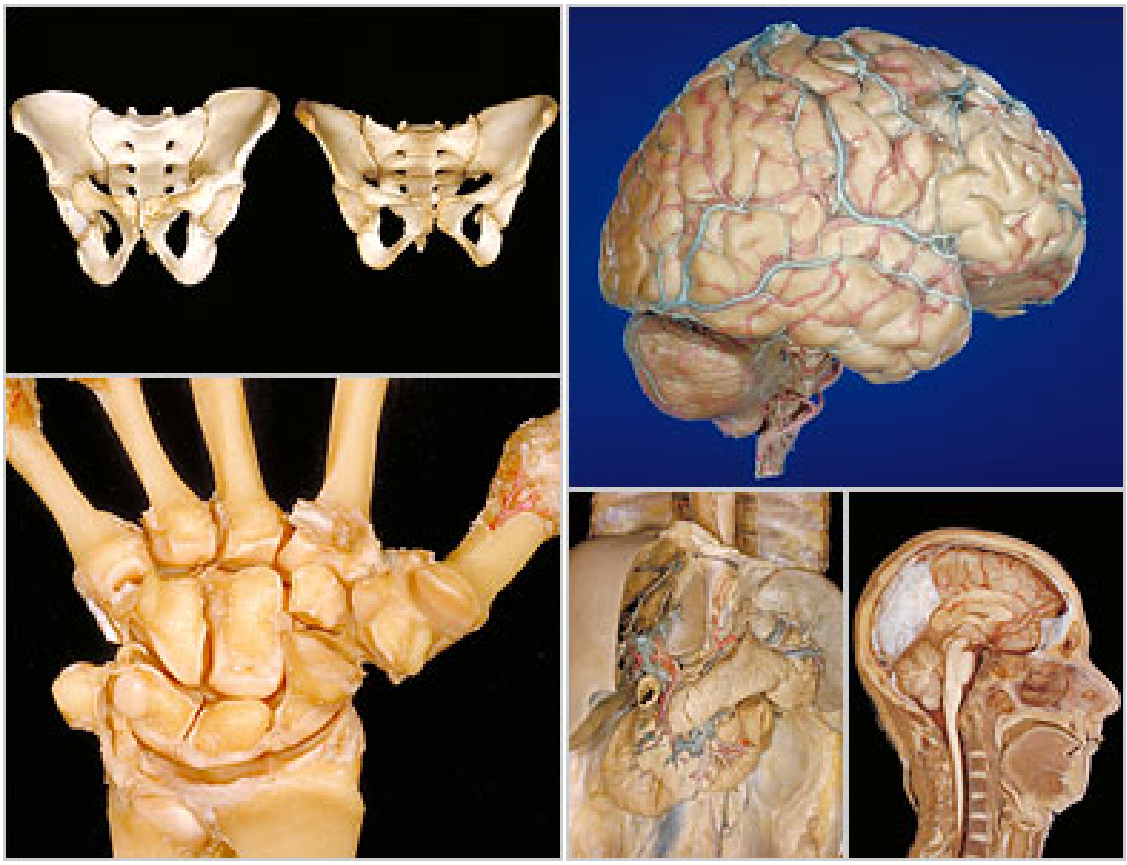
Scott L. Malcomson is an editor of the magazine.

http://www.nytimes.com/2008/04/20/magazine/20wwln-essay-t.html?ref=science

The Body in Depth

By JOHN SCHWARTZ

Roberta Corson recalled her father's dissection lab as a happy place.

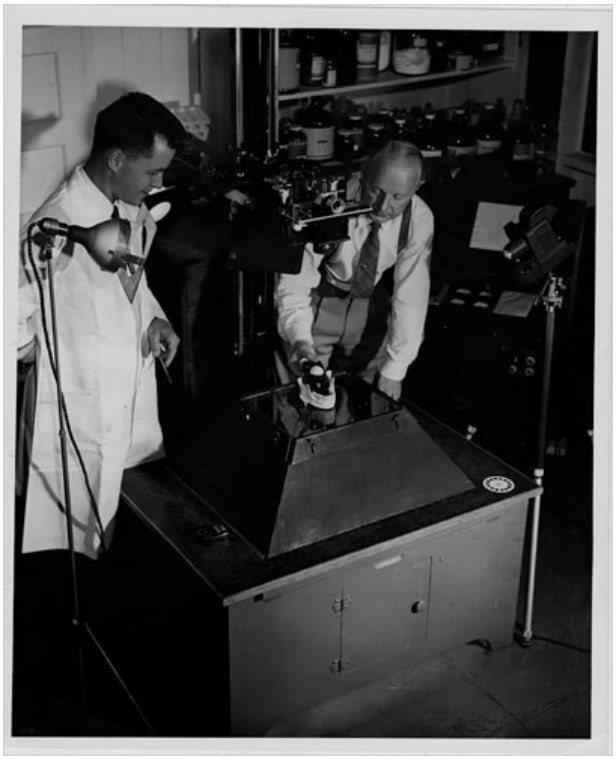


Her father, David L. Bassett, was an expert in anatomy and dissection at the University of Washington. For more than 17 years, he was engaged in creating what has been called the most painstaking and detailed set of images of the human body, inside and out, ever produced. In 3-D.

Working closely with William Gruber, the inventor of the View-Master, the three-dimensional viewing system that GAF Corporation popularized as a toy in the 1960s, Dr. Bassett created the 25-volume "Stereoscopic Atlas of Human Anatomy" in 1962. It included some 1,500 pairs of slides, along with line drawings that made the details more discernible. The paired slides could be examined with a View-Master, making the chest cavity look cavernous, and making details of structure and tissue stand out unforgettably.

The atlas was an immediate success and the images became an important resource for medical students, even more so as schools have de-emphasized gross anatomy and cadaver work. But the atlas eventually went out of publication in the 1960s.

Thanks to Stanford University's school of medicine, however, the work will soon be available to the world. The school is bringing the images online, (See a sampling.). The school has also worked with eHuman, a company in Silicon Valley that hopes to charge students and the curious for access to the trove. Rolling a computer mouse over an image at the eHuman site will highlight anatomical details, and bring up the line drawings from the atlas. So far access to the head and neck collection is $8 a month. Nothing else is online yet.



Even without the stereoscopic boost, the images are stunning, though perhaps not best examined over breakfast. Blood vessels cluster in a cobwebby tangle along a spinal column, and pelvic bones stand out like butterflies against a stark black field. The back of a man's head, its layers of flesh and bone sliced away, shows the excavation from the scalp down to the brain as if looking at a stratified canyon wall. The original Kodachrome slides, carefully preserved, still provide images of tremendous clarity.

Looking at the images today is a little like viewing the "Body Worlds" exhibition but without unsettling concerns about the exact provenance of the bodies. Critics and the exhibitors give different accounts of where the bodies came from. It is quite clear that Dr. Bassett's cadavers were people who had willed their bodies to science.

Robert Chase, the Emile Holman Professor of Surgery, Emeritus, at Stanford University and curator of the Bassett collection, said, "It's never going to be duplicated" because the work was so precise and arduous few institutions could afford to recreate it. "And they're in stereo — that's really a double whammy," Dr. Chase said. Dr. Bassett's widow, Lucille Bassett, gave the collection to Stanford in her will.

Eventually, it will be possible to see the images online in stereo for anyone who owns the increasingly popular eyeglasses that provide a sense of three-dimensional depth in video games, said Robert Austrian, eHuman's chief executive. The devices have rapid electronic shutters that provide the optical illusion of three dimensions when each eye is fed a different perspective.

It was the close collaboration of two very different men that made possible the creation of the collection. Dr. Bassett was an academic and an anatomist, a gregarious man with a great talent for dissection. His daughter recalls that his fingers were so nimble and precise that he once caught a fish with his bare hands.

Mr. Gruber was a former pipe organ maker from Germany; his interest in photography and stereography had led him to create the View-Master, an invention that made him wealthy enough to take on projects simply because they fascinated him. And he chose corpses, formaldehyde and the dissecting skills of Dr. Bassett.

Mrs. Corson provided notes from her mother's unpublished memoir, in which she said that before Mr. Gruber approached her husband about creating a stereoscopic atlas, a similar project intended just to produce two-dimensional images had been attempted at the University of California. An anatomist "tried to work on unembalmed bodies of prisoners who had been executed." The result, she wrote, "was a crude and bloody mess."

By using embalmed bodies, Dr. Bassett and Mr. Gruber reasoned, they could work with better preserved tissues. Dr. Bassett had devised his own embalming fluid that would retain "near normal color" of the tissue, Mrs. Bassett wrote.

Her husband began the great work of his life with the head and neck; Mrs. Corson was 3 years old at the time. "I certainly grew up around bodies, and his dissections," she said — along with her three brothers.

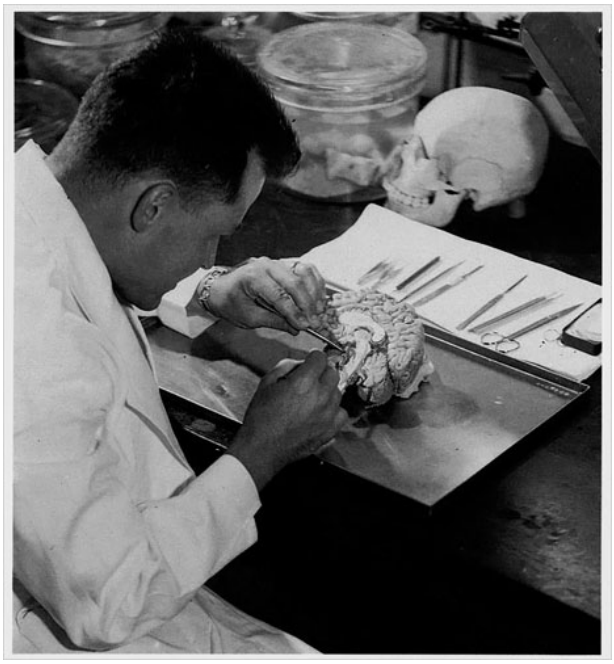
"We would go over there to pick up the mail," and "I grew up with a sense of comfort with the anatomy labs, and with the corpses."

She recalled: "There was nothing gross or ugly about it. It was beautiful."

Dr. Bassett would come home to eat dinner, Mrs. Corson said, and "my mother would scratch his back, and then he would go back to the lab." Often, she recalled, "my mother would go over to the lab and talk to him while he dissected."

Mr. Gruber's visits were frequent; Dr. Bassett would prepare the specimens, and Mr. Gruber would arrive for a three-day visit, staying at the Bassett home. Dr. Bassett would perform the dissections, and Mr. Gruber would shoot from the slightly different angles that provided stereoscopic viewing. They worked into the night. "Bill would take the shots, and my dad would dissect deeper into the area," exposing layer upon layer of anatomical detail. "He was a craftsman," she said.

The images, when presented to the medical profession, were a sensation. In an essay that Dr. Chase wrote in a scientific journal in 1992, he recalled that when Dr. Bassett took three test booklets and six View-Masters to the American Association of Anatomists annual meeting in Detroit in 1951, a line "through the door and down the hall formed to get a glimpse of the unusual anatomical views."



The work was completed by 1962, with the 25 volumes packed with thousands of pictures and diagrams, and hundreds of View-Master reels. That year, Mr. Gruber wrote to Dr. Bassett to congratulate him on having finished the project, saying: "No one outside of Lucile and myself will ever know what torturous 10 years of slavery you went through to reach the top. Let me add my prayer and hope that you will not have to die to earn your just recognition."

He added, "Things should really begin to pop from now on."

But things don't always work out the way people hope. Dr. Bassett died in 1966, at just 52. He had planned to create a less expensive student edition that could get the anatomical knowledge out to a broader audience, but "he was never able to finish that," said Mrs. Corson, 64, a retired United Methodist minister and clinical psychologist in Saratoga, Calif.

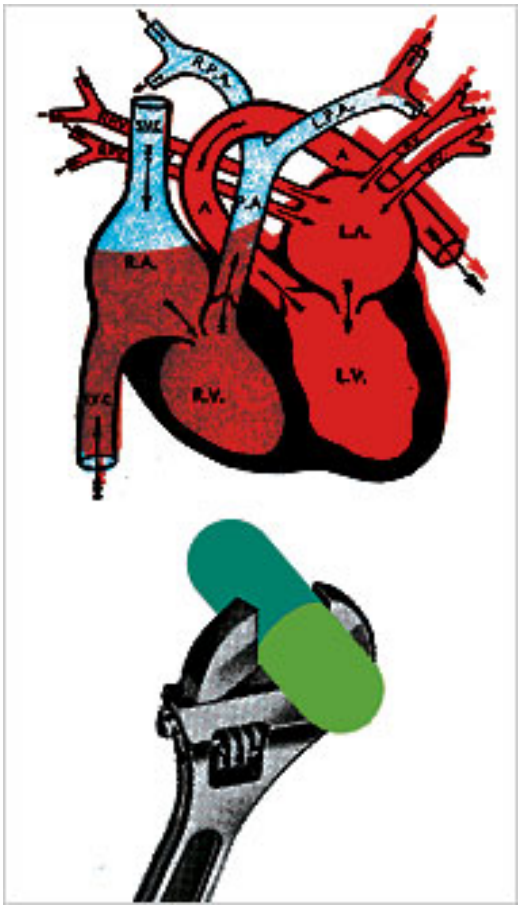
Mrs. Corson said she hoped the Stanford project and its commercial counterpart would bring her father the recognition he deserved, and "finally our dad's atlas will be a valuable contribution to science and the understanding of the human body."She said she believed the formaldehyde that was such a large part of her father's work contributed to his death, from a combination of rare biochemical diseases that caused his heart, lungs and other organs to thicken. "I always wondered," she said.

Still, the work survives. For all his knowledge, Mrs. Corson said, her father retained a sense of "amazement and wonder" at the complexity of the bodies he deconstructed.Once, she recalled, he held up his hand and turned it over before her. "I know every muscle," he told her. "I know ever nerve and every vessel in the hand. But there's so much I will never know."

http://www.nytimes.com/2008/04/22/science/22bass.html?_r=1&nl=8hlth&emc=hltha1&oref=slogin

Hypertension: In Retreat, but Hardly Vanquished

By JANE E. BRODY



As with cholesterol levels, the concept of a normal blood pressure has fallen strikingly as doctors learn what it takes to preserve good health. Decades ago, for example, my brother, Jeff, who had high blood pressure that hovered between 160/80 and 170/90, would have been considered normal.

Lacking good treatments for hypertension, no doctor was concerned when, at age 57, President Franklin D. Roosevelt's blood pressure was 170/90. And so the president's blood pressure rose inexorably over the next six years, and on April 12, 1945, at age 63 and with a pressure of 200/110, he died of a brain hemorrhage caused by severe hypertension.

But in 2000, when Jeff was 54, his cardiologist knew better. Now with excellent treatments, most often used in combination, an elevated pressure can be lowered to normal in most people. His doctor said that, with our family's medical history of three coronaries on our father's side occurring at ages 56 and 58, something should be done to protect Jeff's health.

Jeff's treatment "evolved" until he was taking a daily three-pill cocktail — Diovan HCT, a combination of a diuretic and angiotensin II receptor blocker; Norvasc, a calcium channel blocker; and Toprol XL, a beta blocker. He also works out on a treadmill several times a week, runs up and down stairs at home and at work all day, and eats a mostly heart-healthy diet, including five to 10 servings of fruits and vegetables a day, whole grain breads, nonfat milk and no added salt.

With his blood pressure now at 106/66, the low end of normal, my brother has thus far escaped a premature coronary death.

Hypertension, once known as the "silent killer," is now not so silent. Through campaigns urging doctors to check patients' pressure at every visit, most cases have been detected. Although treatment has been prescribed for nearly all people known to have blood pressures consistently above 140/90, now called the high end of normal, up to half of patients still have elevated pressures.

Still a Common Problem

Why? Because doctors are not aggressive and creative in treating the problem; because unlike my brother, many patients do not follow doctor's orders and fail to fill prescriptions or neglect to take medicine daily; and because the rising weight of Americans and the passion for high-salt processed and restaurant-prepared foods have raised the once-normal pressures of many people to levels that experts say should be treated.

A new report from the American Heart Association describes untreated hypertension as now particularly serious among women. Midsection obesity, an important risk factor for hypertension, is found in 79 percent of hypertensive women as against 64 percent of hypertensive men. About a third of hypertensive women have blood pressure controlled at optimal levels, 120/80 or below.

The problem is particularly common among women taking oral contraceptives, whose risk of hypertension is two to three times as high as that of women their age who use some other form of contraception or none at all.

Hypertension is one of the nation's most common life-threatening diseases, with an overall incidence among adults of nearly 30 percent, a survey of 14,600 people in 2003 and 2004 found. And as many as 66 percent of people 60 and older have elevated pressures that warrant treatment, the survey showed. An increase in blood pressure with age is common only in developed countries, largely a result of a rich and salty diet, overweight and inadequate exercise.

In the United States, the high incidence of hypertension and its inadequate treatment has helped level off a decades-long decline in coronary mortality. In addition to heart attacks, untreated or inadequately treated hypertension can cause strokes, congestive heart failure, kidney failure and diabetes.

According to a report last May in The Journal of Clinical Hypertension, myths persist. Last year, a national online survey of 1,245 adults with high blood pressure found that many people still thought that hypertension meant being tense or anxious and that about 30 percent of people thought that it could be cured by losing weight, Dr. Marvin Moser of the Hypertension Education Foundation in Scarsdale, N.Y., and Dr. Stanley S. Franklin of the University of California, Irvine, reported.

While weight loss and improvements in diet and exercise habits can indeed help people lower an elevated pressure, "most people can't adjust their lifestyles enough to normalize their blood pressure," Dr. Moser said in an interview. "Most people need help from medication, notably a diuretic in combination with one or two other drugs. The majority of patients don't get their pressures to normal without such a combination."

Doctors have more than 100 drugs to choose from. If one or two do not lower pressure to normal or cause unpleasant side effects, patients should insist on trying others, Dr. Moser said. Side effects of blood pressure medications are no longer the problem they once were, the doctor said. "In doses now used, more than 90 percent of people experience very few side effects."

Difficulties of Following a Diet

One problem with a drug-free approach is the difficulty many patients have in adopting and sticking with a diet and exercise program that can significantly lower their pressure. Data from the latest national nutrition survey, described in the Feb. 11 issue of The Archives of Internal Medicine, said that a diet called DASH that effectively lowered blood pressure was poorly followed by people with hypertension. This diet is rich in fruits, vegetables and low-fat dairy products, a mix that provides excellent sources of

fiber, potassium, magnesium and calcium. The diet is most effective if it is low in salt, with a sodium intake of about 1,500 milligrams a day.

The widely publicized value of the DASH diet was demonstrated in a major government-sponsored study published in 1997. But the new report found that in the years since, instead of improving, the dietary quality of people with hypertension has diminished.

Still, as my brother's case showed, even with a good diet, regular exercise and a healthy weight, most hypertensive patients need medication to achieve an optimal blood pressure. And that includes the elderly, who generally do not respond as well as younger people to blood pressure drugs.

"Studies have shown that even a modest reduction in blood pressure is beneficial to the elderly, reducing their risk of strokes, heart attacks, heart failure and death," Dr. Moser said. "And a new study in the very elderly, people 80 and older, showed that treating hypertension also reduces the overall risk of death."

In all age groups, "physician inertia is a major problem," he said, adding, "In 30 percent of patients whose blood pressure remains high despite treatment, nothing is done about changing the medication."

He urged people whose blood pressure is higher than 140/90 to ask their doctors, "Shouldn't we be doing something else?"

http://www.nytimes.com/2008/04/22/health/22brod.html?nl=8hlth&emc=hlthb2

New Calculator Factors Chances for Very Premature Infants

By DENISE GRADY

Researchers are reporting that they have developed a new way to help doctors and parents make some of the most agonizing decisions in medicine, about how much treatment to give tiny, extremely premature infants.

These are infants at the edge of viability, weighing less than 2.2 pounds and born after 22 to 25 weeks of pregnancy, far ahead of the normal 40 weeks. About 40,000 babies a year are born at this very early stage in the United States. The new method uses an online calculator developed for such cases factoring in traits like birth weight and sex and generating statistics on chances of the baby's survival and the likelihood of disabilities (www.nichd.nih.gov/neonatalestimates).

The statistics are not a personal prediction. They estimate risk based on data from similar infants in a large study being published on Thursday in The New England Journal of Medicine. Certain factors gave babies an advantage. At any given gestational age, they were more likely to survive and escape serious disability if they weighed more than others, if they were singletons rather than twins or multiples or if their mothers had been given steroids before birth to help the fetal lungs to mature.

Girls also fared better than boys of the same age, a factor doctors have known a long time without being able to explain. Any of those factors was about as good as being a week older, which makes an enormous difference in development from 22 to 25 weeks' pregnancy, the researchers said. The finding means that a girl at 23 weeks could be as strong as a boy at 24.

"If you could take what the girls have and give it to the boys, we'd be one step ahead of the game," said Dr. Rosemary D. Higgins, an author of the study and a program scientist at the Neonatal Research Network of the National Institute of Child Health and Human Development.

Although some extremely premature infants do well, many die, sometimes after weeks or months of painful invasive procedures in the intensive care unit. Survivors often suffer brain damage, behavior problems, vision and hearing loss and other disabilities.

Outcomes are nearly impossible to predict at birth. Doctors and parents struggle to decide when aggressive treatment seems reasonable — and when death or severe disability seems so likely, even with treatment, that it would be kinder to avoid painful procedures and provide just "comfort care," letting nature take its course and letting the child die.

These decisions, made every day in hospitals around the country, are "heart wrenching and passionate," Dr. Higgins said. "No one ever thinks they're going to be in this situation, and it's difficult, for families and also for physicians."

Dr. Higgins said the study and the calculator were part of an effort to give doctors and parents more solid evidence to make decisions. She said people might be misled by occasional reports of tiny "miracle babies" who beat the odds and wrongly imagined high rates of survival and good health.

Dr. Higgins said she had no idea what overall effect the study and calculator might have on medical practice or whether they would lead to more or less treatment of extremely premature infants. Two families in the exact same situation could easily make opposite decisions about whether to pursue treatment.

Currently, decisions about using respirators, intravenous feeding and other forms of intensive care are mostly based on estimates of a baby's gestational age — how far along the pregnancy was. Intensive care is often given to infants born in the 25th week, but not the 22nd. The hardest judgment calls are for babies in the 23rd and 24th weeks.

Plugging numbers into the calculator shows that two infants with the same gestational age, the usual criterion to decide treatment, can have quite different odds of survival and disability.

For instance, a 24-week-old two-pound male twin whose mother did not receive steroids has survival odds of 69 percent and a 50 percent chance of having a severe impairment. A female twin the same age and weight has survival odds of 86 percent and a 23 percent chance of severe impairment.

In theory, at least, the calculator would seem to favor treating girls, because, all else being equal, their odds for survival are better. The study included 4,446 infants born at 22 to 25 weeks at 19 hospitals in the Neonatal Research Network; 744, generally the smallest and most premature, did not receive intensive care, and all died. The babies were assessed at birth, and the survivors were examined again shortly before turning 2.

Over all, half the infants died, half the survivors had neurological impairments, and half the impairments were severe. Many survivors spent months in the hospital, at a typical cost of $3,400 a day. The researchers estimated that if all babies born at 22 to 23 weeks received intensive care, for every 100 infants treated there would be 1,749 extra hospital days and zero to nine additional survivors, with zero to three having no impairment.

Dr. Eric C. Eichenwald, medical director of the newborn center at Texas Children's Hospital in Houston, said that the study was important and that its most striking finding was how large the benefits of the various factors could be. Dr. Eichenwald said the calculator was "a way in which we can provide more accurate information to the process of counseling parents as to what the burdens of intensive care might be."

Dr. Nehal A. Parikh, another author of the study, from the University of Texas Medical School at Houston, said he thought the statistics would help doctors in advising families.

"We lay out the facts, rather than our own opinions," Dr. Parikh said, "because we're not the ones taking these babies home."

http://www.nytimes.com/2008/04/17/health/17baby.html?nl=8hlth&emc=hltha2

A Panoramic Backdrop for Meaning and Mischief

By KEN JOHNSON

With its breathtaking, panoramic views of Central Park and the Manhattan skyline, the Cantor Roof Garden at the Metropolitan Museum of Art may strike you as an excellent place to mount a seasonal outdoor sculpture show, which it does every year. In truth, it is an inhospitable site for sculpture, as demonstrated by the 2008 display that opens on Tuesday: three wonderful, previously unexhibited works by the celebrated Pop artist Jeff Koons. Each of these sculptures is a greatly enlarged, glossily lacquered, stainless-steel representation of something small: a toy dog made of twisted-together balloons; a chocolate valentine heart wrapped in red foil, standing en pointe; and a silhouette of Piglet from a "Winnie the Pooh" coloring book, randomly colored as if by a small child.

They are mischievously meaningful works. With its pneumatic, sausagelike parts, "Balloon Dog (Yellow)" is a sly Trojan Horse: it seems innocent but is loaded with aesthetic and erotic perversity. "Sacred Heart (Red/Gold)" acidly comments on the commercial debasement of emotional and religious experience. "Coloring Book" reflects the youth-obsessed infantilism of modern culture and society.

But placed on the architecturally nondescript patio, where there are also shaded areas for patrons of the Roof Garden Cafe, the sculptures too easily turn into benign, decorative accessories.

The biggest problem is scale. Seen in an indoor gallery, the elephantine, shiny metallic "Balloon Dog (Yellow)," which rises to 10 feet at its highest point, would have a weirdly imposing, slightly menacing presence. On the roof it appears dwarfed by the vast sky and by the open expanses of space to the south and west of the museum.

The intimacy of Mr. Koons's sculpture is also diminished. Perfectionist attention to detail is one of his work's most compelling aspects: note the exactingly formed knot that serves as the balloon dog's nose, or the folds, pleats and stretch marks in the heart's wrapper. The distracting outdoor environment, though, discourages careful, contemplative looking.

Because it is both the biggest and the simplest, the 18 ½-foot-tall "Coloring Book" is the least undermined by its environment. But it is also the least interesting formally, being little more than a flat, irregularly contoured slab whose colors are thin and watery.

Their setting aside, Mr. Koons's sculptures remain intellectually and sensuously exciting objects — "Balloon Dog" is a masterpiece — and they are worth visiting under any circumstances.

"Jeff Koons on the Roof" is on view through Oct. 26 at the Metropolitan Museum of Art; (212) 535-7710 or metmuseum.org.

http://www.nytimes.com/2008/04/22/arts/design/22koon.html?th&emc=th

APRIL 22

Joining the Guilds

TONY DUGAL/KALAMAZOO COLLEGE

Joan Hawxhurst

Imagine the 21st century college and its alumni network as comprised of a collection of guilds — or associations of individuals involved in the same craft or trade.

At Kalamazoo College, a liberal arts institution in Michigan, the medieval concept is gaining new ground. “Despite some people’s concern that it might be conceived as a medieval, hierarchical term to use, I think people are really latching onto the more positive uses of the word. Perhaps we wouldn’t go so far to say it’s about apprentices learning from masters, but perhaps we would say that we have different generations of people all wanting to become more adept around a particular idea,” says Joan Hawxhurst, guilds coordinator at Kalamazoo.

Building out of the interest from an initial January summit, the college has constructed four guilds around broad, interdisciplinary subjects (business, health, sustainability, and justice and peace), with the idea of connecting students with alumni and, together with faculty and staff, pursuing tangible projects within the shared area of interest.

“The guilds are designed to be that vehicle which puts students and alumni and faculty and community, because we are where we are, together around something that interests all of them,” says Joseph L. Brockington, associate provost for international programs and interim dean for experiential education at Kalamazoo.

Although Kalamazoo officials acknowledge that some other institutions are doing or attempting similar things, the approach takes Kalamazoo beyond the traditional models. Many colleges have alumni events focused around certain career paths or alumni advisory committees for majors or professional areas. The concept behind guilds is to set up a more sustained and more academic interaction between alumni in various fields, students and professors.

This spring, for instance, the Business Guild sponsored a lecture and panel discussion, both featuring alumni, on entrepreneurship. The Justice and Peace Guild is hosting a forum on hunger next week and the Sustainability Guild is helping to coordinate Earth Day activities, to be celebrated Friday and Saturday. The Health Guild is sponsoring a symposium on insect-borne diseases in May: “At that first initial meeting [in January] there were a couple of students who had gotten really excited about the anti-malaria campaign, Nothing But Nets,” says Hawxhurst. Some other students were set to attend a Unite for Sight conference on preventable blindness, and students pinpointed one alumnus who had spent his career at the World Bank focused on river blindness. “They also realized that in our spring quarter here at [Kalamazoo] there was an introduction to public health class, an entomology class and a Hispanic health and culture class,” Hawxhurst says.

So, at the symposium, she continues, the alumnus will give the keynote, students who attended the Unite for Sight conference will present posters and give talks, and students from the three courses will be doing presentations. They’ll be inviting local alumni involved in the medical professions and public health.

"It's an opportunity," Hawxhurst says of the guilds, "for students to take an interdisciplinary issue about which they're passionate and number one, build networks with folks who are in the professional world, also sharing a passion; number two, create a pathway of educational experiences...and number three, have the opportunity to be with a group of people across generations, across disciplines, who are excited about thinking about sustainability or about business or about justice and peace."

About 170 individuals have officially signed up online for guild membership, though Hawxhurst says more are involved than have officially registered. She estimates that about 100 people were involved in the Business Guild's events earlier this month.

The Guilds stem from the strategic planning process at the college, which has made experiential education a cornerstone of its curriculum. The three-year proof of concept phase is funded largely with a quarter-million dollar grant from the McGregor Fund. In terms of growth, Hawxhurst says there has been interest in starting guilds in education, fine arts, media and technology, and public service. This summer, college officials will be training themselves in Web-based software so they can better include alumni who don't live in the local area, says Brockington, the interim dean for experiential education
.
"We've been at this exactly 3.5 months. We're pretty astounded that it's working as well as it is," says Brockington. "And the ideas are almost going faster than our ability to keep up with them."

"We can see that there are many things that we already do that could just naturally fit in" to the guilds, adds Jeff Bartz, an associate professor of chemistry who chaired the task force that fleshed out the concept behind the guilds. He was the principal investigator on the McGregor grant proposal.

Bartz says he roped his physical chemistry students into the Sustainability Guild's community Earth Day celebrations: They'll be coordinating hands-on activities for children.

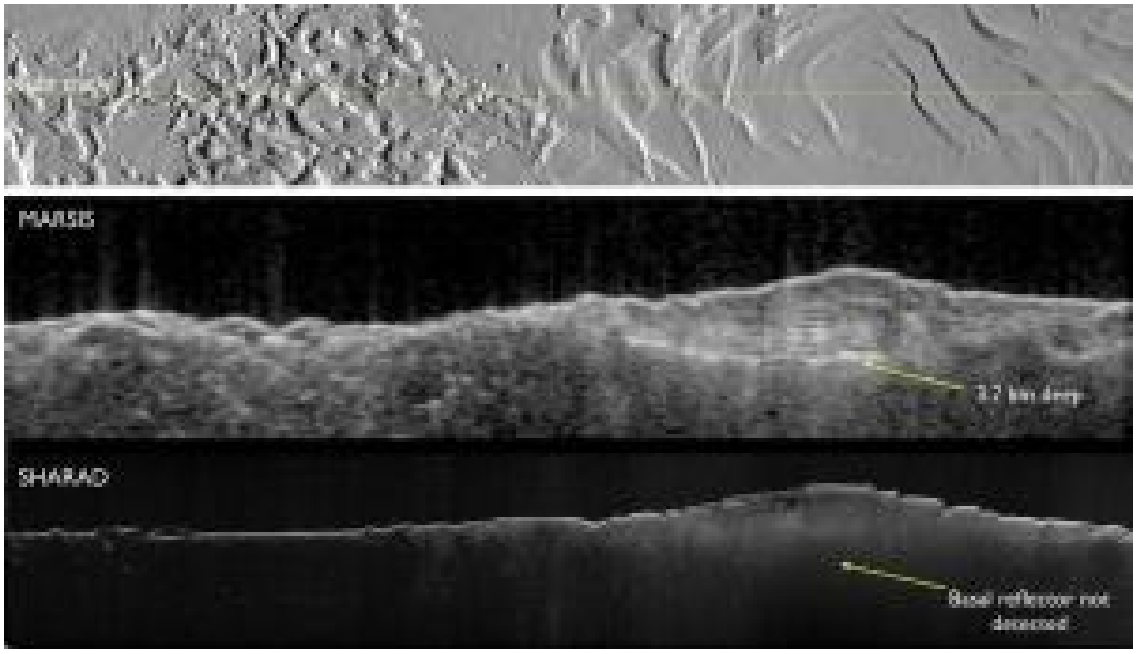
"I think I'll really know if it's taken off if students identify themselves" by guild, says Bartz.

"If they describe what they've been doing as a part of their guild, then I'll know it's become infused in the community."

— Elizabeth Redden

The original story and user comments can be viewed online at
http://insidehighered.com/news/2008/04/22/kalamazoo.

Mars Radar Instruments Work Together To Discover Hidden Martian Secrets



Two complementary radar sounder instruments work together to discover hidden Martian secrets. (Credit: NASA/ESA/JPL-Caltech/University of Rome/Washington Universtiy in St. Louis)

ScienceDaily (Apr. 22, 2008) — A radar instrument co-sponsored by NASA on the European Space Agency's Mars Express orbiter has looked beneath the surface of Mars and opened up a new dimension for planetary exploration.

The technique's success is prompting scientists to think of other places in the solar system where they would like to use radar sounders. The radar sounder on Mars Express is the Mars Advanced Radar for Subsurface and Ionospheric Imaging, or MARSIS. It was built to map the distribution of liquid and frozen water in upper portions of the planet's crust. A complementary radar sounder, the Shallow Subsurface Radar on NASA's Mars Reconnaissance Orbiter, uses a different radio frequency to see greater detail but to a lesser depth.

As these two instruments continue to provide data, the understanding that they provide about how planetary radar sounders work is prompting ideas for using the technology to explore beneath the surfaces of bodies such as Jupiter's moon Europa, Saturn's moons Titan and Enceladus, as well as asteroids and comets. MARSIS was funded by NASA and the Italian Space Agency and developed by the University of Rome, Italy, in partnership with NASA's Jet Propulsion Laboratory, Pasadena, Calif. Italy provided the instrument's digital processing system and integrated the parts. The University of Iowa, Iowa City, built the transmitter for the instrument, JPL built the receiver and Astro Aerospace, Carpinteria, Calif., built the antenna. JPL is a division of the California Institute of Technology in Pasadena.

The shallow Subsurface Radar was provided by the Italian Space Agency. Its operations are led by the University of Rome and its data are analyzed by a joint U.S.-Italian science team. JPL manages the Mars Reconnaissance Orbiter for the NASA Science Mission Directorate, Washington.

Adapted from materials provided by NASA/Jet Propulsion Laboratory.

http://www.sciencedaily.com /releases/2008/04/080420114718.htm

When Positive Thinking Leads To Financial Irresponsibility Like Compulsive Gambling

ScienceDaily (Apr. 22, 2008) — Looking on the bright side can lead to irresponsible financial behavior, reveals an article in the Journal of Consumer Research. In a series of studies, Elizabeth Cowley (University of Sydney) examines repeat gambling in the face of loss. She finds that people often engage in too much positive thinking, selectively focusing on one win among hundreds of losses when they think back on the overall experience.

"When we want to justify engaging in an activity which could potentially be irresponsible -- like gambling -- we may need to distort our memory of the past to rationalize the decision," Cowley explains. "People who have frequently spent more money than planned on gambling edit their memories of the past in order to justify gambling again."

For example, Cowley had participants in one study play a computer game in which they could win credits with the financial equivalent of one cent per credit. Each participant played the game 300 times. Everyone experienced one big win and one big loss. But for the other 298 games, one half of the group experienced all small losses, while the other experienced all small wins.

Cowley also manipulated the distance between the big win and the big loss.

A week later, participants were surveyed for their memories of the experience. Surprisingly, Cowley found that even some losers remembered having a positive experience. If the big win and the big loss occurred far apart, losers had fond memories and indicated a willingness to spend their own money on the game.

As Cowley explains, the further apart the big win and the big loss, the easier it was for losers to isolate their memories and focus only on the positive, a "silver lining" effect.

"The tendency to segregate positive and negative events in a mixed-loss experience is based on the logic that remembering a large gain allows people to feel good even when the objective outcome was negative," Cowley says.

Conversely, Cowley found that winners -- those who experienced 298 small wins -- were happier when the big win and the big loss were closer together, allowing them to lump all the games together and ignore the big loss. She termed this the "cancellation effect."

"When the outcome of an experience including both positive and negative events results in a net gain, people look for ways to integrate positive and negative events to reduce, if not cancel, the pain associated with the negative events," Cowley explains.

The research is the first to consider a motivated memory explanation for justifying irresponsible behavior. Apparently, positive thinking can sometimes be negative.

Journal reference: Elizabeth Cowley, "The Perils of Hedonic Editing." Journal of Consumer Research: June 2008.

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

http://www.sciencedaily.com:80 /releases/2008/04/080421111630.htm

Making Environmentally Friendly Plastics

New breeds of biodegradable and bioavailable plastics are being developed in an effort to reduce the tons of plastic waste that ends up in the nation's landfills each year. (Credit: iStockphoto/Martin Bowker)

ScienceDaily (Apr. 21, 2008) — Every year, more than 30 billion water bottles are added to America's landfills, creating a mountainous environmental problem. But if research at Missouri University of Science and Technology is successful, the plastic bottles of the future could literally disappear within four months of being discarded.

The Missouri S&T research team is constructing new breeds of biodegradable and bioavailable plastics in an effort to reduce the tons of plastic waste that ends up in the nation's landfills each year. Bioavailable plastics contain substances that can be absorbed by living systems during their normal physiological functions.

By combining and modifying a variety of bio-based, oil-based and natural polymers, the team seeks to create optimal blends that can be used to make agricultural films, bottles, biomedical and drug delivery devices, and more.

The team is working under the direction of Dr. K.B. Lee, professor of chemical engineering at Missouri S&T, to improve the properties of the biodegradable plastics for real-life products. Although companies already sell biodegradable polymers, the products are often expensive, of poor quality or developed for specific applications. That's why the team is investigating how bio-based fillers, such as starch and fibers, can be included to reduce the cost in a variety of commercial applications.

The group is also interested in incorporating glycerol – a major byproduct of the biodiesel process – in the new plastics.

Some of the group's new polymers incorporate renewable resources, such as polylactic acid, which is created by fermenting starch. The group is very interested in renewable resources because their research

and development efforts are also focused on developing efficient and cost-effective biodiesel and corn ethanol processes.

“Different chemical and biological mechanisms are responsible for the degradation of polymers,” says Mahin Shahlari, a chemical engineering Ph.D. student at Missouri S&T. “For example, it’s known that polylactic acid will degrade in 45 to 60 days if composted at temperatures between 122 to 140 degrees Fahrenheit.”

As polylactic acid degrades, the material reacts with water to decompose into small molecules, which are then mineralized into water and carbon dioxide.

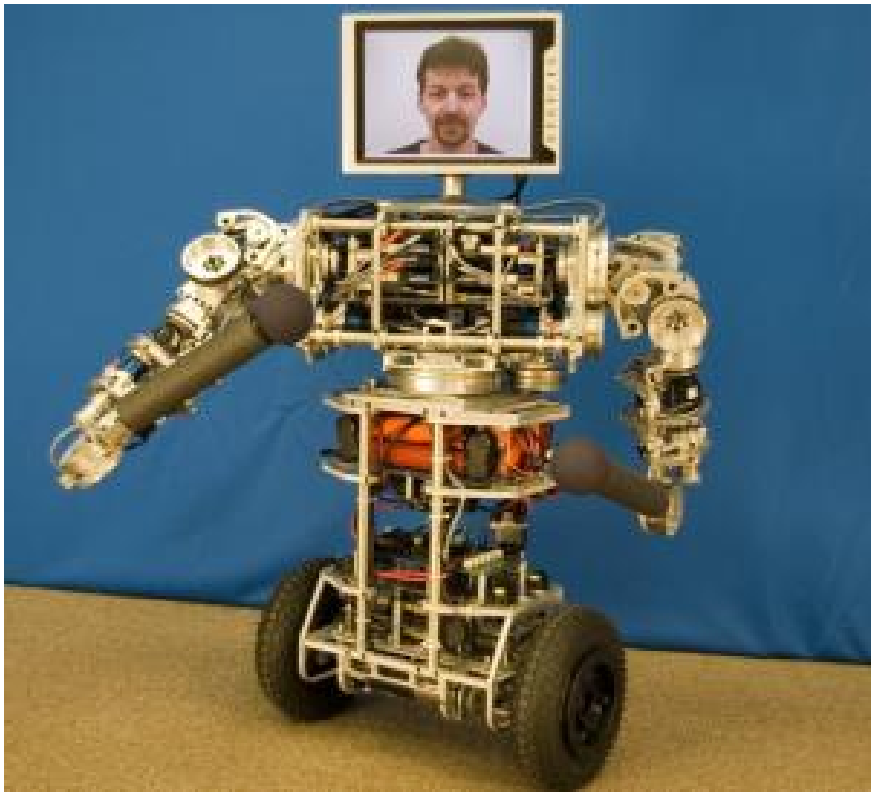
“In general, the main end products of polymer degradation are water and carbon dioxide,” Shahlari explains. “Polylatic acid has the potential of replacing the regular water bottles, and we anticipate that our research could be incorporated into that field too.

“We are not just molding and extruding commercially available biodegrable resins. We also are incorporating nanotechnology, supercritical fluid technology and graft copolymer compatibilization, most of which are developed and patented by our group.”

Adapted from materials provided by Missouri University of Science and Technology.

http://www.sciencedaily.com:80 /releases/2008/04/080416211436.htm

New Robots Can Provide Elder Care For Aging Baby Boomers



A frontal view of the uBot5. (Credit: Image courtesy of University of Massachusetts Amherst)

ScienceDaily (Apr. 21, 2008) — Baby boomers are set to retire, and robots are ready to help, providing elder care and improving the quality of life for those in need. Researchers at the University of Massachusetts Amherst have developed a robotic assistant that can dial 911 in case of emergencies, remind clients to take their medication, help with grocery shopping and allow a client to talk to loved ones and health care providers.

Concerned family members can access the unit and visit their elderly parents from any Internet connection, including navigating around the home and looking for Mom or Dad, who may not hear the ringing phone or may be in need of assistance. Doctors can perform virtual house calls, reducing the need for travel.

“For the first time, robots are safe enough and inexpensive enough to do meaningful work in a residential environment,” says computer scientist Rod Grupen, director of UMass Amherst’s Laboratory for Perceptual Robotics, who developed project ASSIST with computer scientists Allen Hanson and Edward Riseman.

The robot, called the uBOT-5, could allow elders to live independently, and provide relief for caregivers, the medical system and community services, which are expected to be severely stressed by the retirement of over 77 million Americans in the next 30 years.

There is no mistaking the uBot-5 for a person, but its design was inspired by human anatomy. An array of sensors acts as the robots eyes and ears, allowing it to recognize human activities, such as walking or sitting. It can also recognize an abnormal visual event, such as a fall, and notify a remote medical caregiver. Through an interface, the remote service provider may ask the client to speak, smile or raise both arms, movements that the robot can demonstrate. If the person is unresponsive, the robot can call

911, alert family and apply a digital stethoscope to a patient, conveying information to an emergency medical technician who is en route.

The system also tracks what isn't human. If a delivery person leaves a package in a hallway, the sensor array is trained to notice when a path is blocked, and the robot can move the obstruction out of the way. It can also raise its outstretched arms, carry a load of about 2.2 pounds and has the potential to perform household tasks that require a fair amount of dexterity, including cleaning and grocery shopping.

The uBOT-5 carries a Web cam, a microphone, and a touch-sensitive LCD display that acts as an interface for communication with the outside world. "Grandma can take the robot's hand, lead it out into the garden and have a virtual visit with a grandchild who is living on the opposite coast," says Grupen, who notes that isolation can lead to depression in the elderly.

Grupen studied developmental neurology in his quest to create a robot that could do a variety of tasks in different environments. The uBot-5's arm motors are analogous to the muscles and joints in our own arms, and it can push itself up to a vertical position if it falls over. It has a "spinal cord" and the equivalent of an inner ear to keep it balanced on its Segway-like wheels.

The researchers wanted to create a personal robot that could provide many services, such as a medical alert system, or the means to talk to loved ones, all in one human-like package, according to Grupen. To evaluate the effectiveness of potential technologies, the research team worked with social workers, members of the medical community and family members of those in elder care.

The collaborative effort, dubbed project ASSIST, involved researchers from the Smith College School for Social Work, the Veteran's Administration (Connecticut Health Care System, West Haven campus) and elder care community centers in western Massachusetts. Through focus groups, the researchers learned about the preferences of potential users.

Graduate students Patrick Deegan, Emily Horrell, Shichao Ou, Sharaj Sen, Brian Thibodeau, Adam Williams and Dan Xie are also collaborators on project ASSIST.

Adapted from materials provided by University of Massachusetts Amherst.

http://www.sciencedaily.com:80 /releases/2008/04/080416212725.htm

New Model Predicts Where Corals Can Thrive

Acropora red coral. (Credit: Tim McClanahan)

ScienceDaily (Apr. 21, 2008) — The Wildlife Conservation Society (WCS) and the International Institute for Geo-Information Science and Earth Observation (ITC) have developed a new scientific model that accurately maps where coral reefs are in the most trouble and identifies regions where reefs can be protected best. The model, which is being applied in areas throughout the Indian Ocean, is described in a recent issue of the journal Ecological Modelling.

The model synthesizes several ocean conditions, such as seawater temperatures, photosynthetic and ultraviolet light, winds and currents, and the concentration of microscopic plankton on the ocean's surface. These data were factored into previous reports of coral stress or bleaching and were then used to map the distribution of these inhospitable conditions.

The researchers found that much of the northern Indian Ocean contains very stressful environments for corals and that half of its marine parks with the strictest regulations are found within these harsh areas.

Areas of the Maldives and the Seychelles fall in the middle of the most severe conditions; these include some of the best coral reef parks and diving spots. In an area east and just north of Madagascar lie the least-stressed reefs, which include those off the islands of Mauritius, Rodriques, and Reunion. These are now among the reefs the model identifies as the highest priority for conservation.

Corals have been devastated in large areas across the world. Disappearing at rates up to 5.4 percent per year over the past 30 years, they are among the earliest victims of climate change. Bleaching, which climate change exacerbates, occurs when corals become so stressed that they eject the beneficial algae that give them their color. This eventually causes large sections of the reefs to lose much of their biodiversity.

"Despite the large areas in high and severe stress, the model suggests that there are some reefs with less stressful conditions and more reasons for hope," said WCS researcher Dr. Timothy McClanahan, one of the study's authors.

Reference: Joseph Maina, Valentijn Venus, Timothy R. McClanahan, Mebrahtu Ateweberhan. Modelling susceptibility of coral reefs to environmental stress using remote sensing data and GIS models. Ecological Modelling. Volume 212, Issues 3-4, 10 April 2008, Pages 180-199.

Adapted from materials provided by Wildlife Conservation Society, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com:80 /releases/2008/04/080416165732.htm

Neanderthals Speak Again After 30,000 Years

Dr. Robert McCarthy of Florida Atlantic University has reconstructed vocal tracts that simulate the voice of Neanderthals. (Shown above: Model of the Neanderthal man, exhibited in the Dinosaur Park Münchehagen, Germany.) (Credit: iStockphoto/Klaus Nilkens)

ScienceDaily (Apr. 21, 2008) — Dr. Robert McCarthy, an assistant professor of anthropology in the Dorothy F. Schmidt College of Arts and Letters at Florida Atlantic University, has reconstructed vocal tracts that simulate the sound of the Neanderthal voice.

Using 50,000-year-old fossils from France and a computer synthesizer, McCarthy's team has generated a recording of how a Neanderthal would pronounce the letter "e."The brief recording doesn't sound like any letter in modern languages, but McCarthy says that's because Neanderthals lacked the "quantal vowels" modern humans use. Quantal vowels provide cues that help speakers with different size vocal tracts understand one another.

"They would have spoken a bit differently," McCarthy said at the annual meeting of the American Association of Physical Anthropologists in Columbus, Ohio in April. "They wouldn't have been able to produce these quantal vowels that form the basis of spoken language."

Though quantal vowels make subtle differences in speech, their absence would have limited Neanderthal speech. For example, Neanderthals would not be able to distinguish between the words 'beat' and 'bit.'

For scientists, McCarthy's work represents an exploration of life 30,000 years ago when Neanderthal humans, our closest extinct ancestor, lived in parts of Europe, Central Asia and the Middle East. The species died out mysteriously some 28,000 years ago.

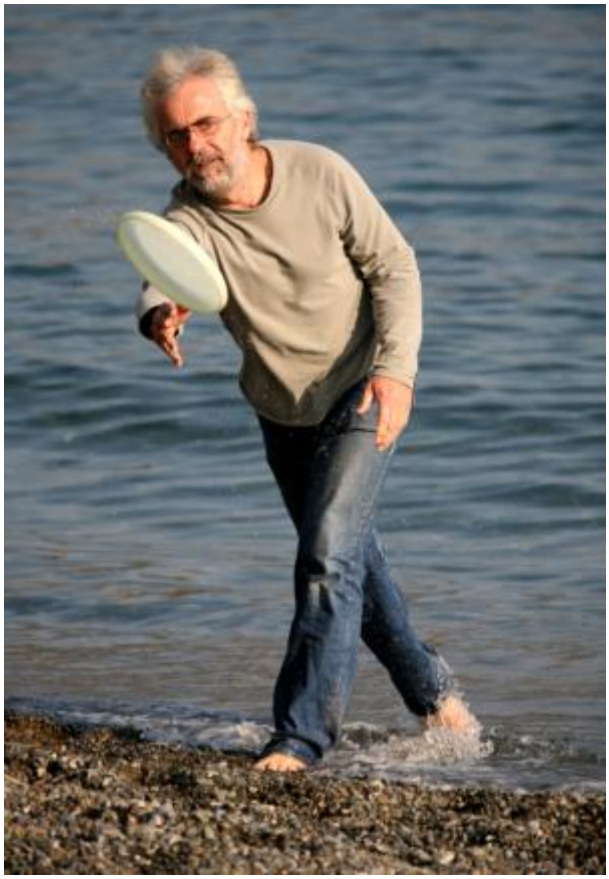
McCarthy has plans to eventually simulate an entire Neanderthal sentence.

McCarthy's simulation of a Neanderthal voice is available here.

Adapted from materials provided by Florida Atlantic University.

http://www.sciencedaily.com:80 /releases/2008/04/080421154426.htm

How Dietary Restriction Slows Down Aging



Slowing down the aging process. Scientists have uncovered details about the mechanisms through which dietary restriction slows the aging process. (Credit: iStockphoto/Seb Chandler)

ScienceDaily (Apr. 21, 2008) — University of Washington scientists have uncovered details about the mechanisms through which dietary restriction slows the aging process. Working in yeast cells, the researchers have linked ribosomes, the protein-making factories in living cells, and Gcn4, a specialized protein that aids in the expression of genetic information, to the pathways related to dietary response and aging. The study, which was led by UW faculty members Brian Kennedy and Matt Kaeberlein, appears in the April 18 issue of the journal Cell.

Previous research has shown that the lifespan-extending properties of dietary restriction are mediated in part by reduced signaling through TOR, an enzyme involved in many vital operations in a cell. When an organism has less TOR signaling in response to dietary restriction, one side effect is that the organism also decreases the rate at which it makes new proteins, a process called translation.

In this project, the UW researchers studied many different strains of yeast cells that had lower protein production. They found that mutations to the ribosome, the cell's protein factory, sometimes led to increased life span. Ribosomes are made up of two parts -- the large and small subunits -- and the researchers tried to isolate the life-span-related mutation to one of those parts.

"What we noticed right away was that the long-lived strains always had mutations in the large ribosomal subunit and never in the small subunit," said the study's lead author, Kristan Steffen, a graduate student in the UW Department of Biochemistry.

The researchers also tested a drug called diazaborine, which specifically interferes with synthesis of the ribosomes' large subunits, but not small subunits, and found that treating cells with the drug made them live about 50 percent longer than untreated cells. Using a series of genetic tests, the scientists then showed that depletion of the ribosomes' large subunits was likely to be increasing life span by a mechanism related to dietary restriction -- the TOR signaling pathway.

"We knew that dietary restriction decreased TOR signaling, and that decreased TOR signaling reduced translation or protein production, but this was the first direct evidence that all three were acting in the same genetic pathway," said Kennedy, an associate professor of biochemistry.

"The big question then became what's happening in these translation-deficient cells to slow aging," added Kaeberlein, an assistant professor of pathology. "That's when Vivian MacKay, a co-author on the study, had the idea to look at Gcn4."

Gcn4 is a specialized protein called a transcription factor, which helps transfer genetic information during cell growth. The protein is activated when a cell is starving for amino acids. What made Gcn4 interesting to the UW team was its unique mode of regulation.

"When ribosomes aren't working at 100 percent capacity, most proteins are made less efficiently, but Gcn4 is different," explained Dr. MacKay, a research professor of biochemistry. "Sometimes, you actually get more Gcn4 produced even when everything else is going down. That's precisely what we found in the longer-lived yeast strains with mutations in the large subunit of the ribosome."

To make the link between Gcn4 and longevity, the scientists then asked whether preventing the increase of Gcn4 would block life span extension. In every case, cells lacking Gcn4 did not respond as strongly as Gcn4-positive cells.

"The increased production of Gcn4 in long-lived yeast strains, combined with the requirement of Gcn4 for full life-span extension, makes a compelling case for Gcn4 as an important downstream factor in this longevity pathway," Kaeberlein said.

Although scientists don't yet know whether Gcn4 plays a similar role in organisms other than yeast, Kennedy points out that worms, flies, mice and humans all have Gcn4-like proteins that appear to be regulated in a similar way.

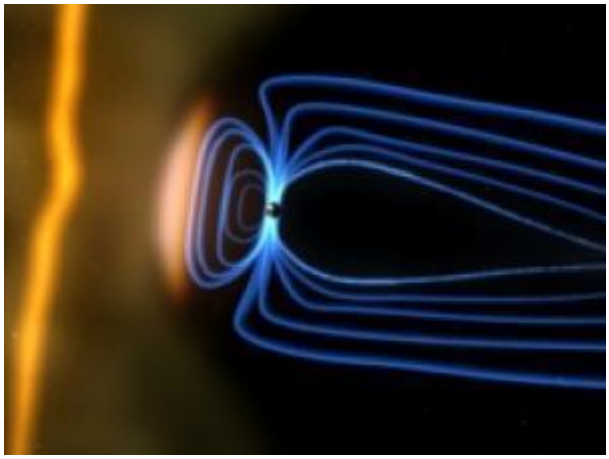
"The role of TOR and translation in aging is known to be conserved across many different species, so it's plausible that this function of Gcn4 is conserved as well," Kennedy said. Future research will be aimed at testing this hypothesis.

"Clearly TOR signaling is one component, and perhaps the major component, of the beneficial health effects associated with dietary restriction," said Kaeberlein. "The difficulty with TOR as a therapeutic target, however, is the potential for negative side effects. As we learn more of the mechanistic details behind how TOR regulates aging, we will hopefully be able to identify even better targets for treating age-associated diseases in people."

Adapted from materials provided by University of Washington.

http://www.sciencedaily.com /releases/2008/04/080417130533.htm

Moon Gets A Lashing From Earth's Magnetotail



Earth's magnetic field responds to the solar wind much like an airport wind sock: It stretches out with its tail pointing downwind. (Credit: NASA/Goddard Space Flight Center- Conceptual Image Lab)

ScienceDaily (Apr. 21, 2008) — Behold the full moon. Ancient craters and frozen lava seas lie motionless under an airless sky of profound quiet. It's a serene, slow-motion world where even a human footprint may last millions of years. Nothing ever seems to happen there, right?

Wrong.

NASA-supported scientists have realized that something happens every month when the moon gets a lashing from Earth's magnetic tail.

"Earth's magnetotail extends well beyond the orbit of the moon and, once a month, the moon orbits through it," says Tim Stubbs, a University of Maryland scientist working at the Goddard Space Flight Center. "This can have consequences ranging from lunar 'dust storms' to electrostatic discharges."

Yes, Earth does have a magnetic tail. It is an extension of the same familiar magnetic field we experience when using a Boy Scout compass to find our way around Earth's surface. Our entire planet is enveloped in a bubble of magnetism, which springs from a molten dynamo in Earth's core. Out in space, the solar wind presses against this bubble and stretches it, creating a long "magnetotail" in the downwind direction.

Anyone can tell when the moon is inside the magnetotail. Just look: "If the moon is full, it is inside the magnetotail," says Stubbs. "The moon enters the magnetotail three days before it is full and takes about six days to cross and exit on the other side."

It is during those six days that strange things can happen.

During the crossing, the moon comes in contact with a gigantic "plasma sheet" of hot charged particles trapped in the tail. The lightest and most mobile of these particles, electrons, pepper the moon's surface and give the moon a negative charge.

On the moon's dayside this effect is counteracted to a degree by sunlight: UV photons knock electrons back off the surface, keeping the build-up of charge at relatively low levels. But on the nightside, in the cold lunar dark, electrons accumulate and surface voltages can climb to hundreds or thousands of volts.

Imagine what it feels like to be a sock pulled crackling from a dryer. Astronauts on the moon during a magnetotail crossing might be able to tell you. Walking across the dusty charged-up lunar terrain, the astronauts themselves would gather a load of excess charge. Touching another astronaut, a doorknob, a

piece of sensitive electronics -- any of these simple actions could produce an unwelcome discharge. “Proper grounding is strongly recommended,” says Stubbs.

The ground, meanwhile, might leap into the sky. There’s growing evidence that fine particles of moondust might actually float, ejected from the lunar surface by electrostatic repulsion. This could create a temporary nighttime atmosphere of dust ready to blacken spacesuits, clog machinery, scratch faceplates (moondust is very abrasive) and generally make life difficult for astronauts.

Stranger still, moondust might gather itself into a sort of diaphanous wind. Drawn by differences in global charge accumulation, floating dust would naturally fly from the strongly-negative nightside to the weakly-negative dayside. This “dust storm” effect would be strongest at the moon’s terminator, the dividing line between day and night.

Much of this is pure speculation, Stubbs cautions. No one can say for sure what happens on the moon when the magnetotail hits, because no one has been there at the crucial time. “Apollo astronauts never landed on a full moon and they never experienced the magnetotail.”

The best direct evidence comes from NASA’s Lunar Prospector spacecraft, which orbited the moon in 1998-99 and monitored many magnetotail crossings. During some crossings, the spacecraft sensed big changes in the lunar nightside voltage, jumping “typically from -200 V to -1000 V,” says Jasper Halekas of UC Berkeley who has been studying the decade-old data.

“It is important to note,” says Halekas, “that the plasma sheet (where all the electrons come from) is a very dynamic structure. The plasma sheet is in a constant state of motion, flapping up and down all the time. So as the moon orbits through the magnetotail, the plasma sheet can sweep across it many times. Depending on how dynamic things are, we can encounter the plasma sheet many times during a single pass through the magnetotail with encounters lasting anywhere from minutes to hours or even days.”

“As a result, you can imagine how dynamic the charging environment on the moon is. The moon can be just sitting there in a quiet region of the magnetotail and then suddenly all this hot plasma goes sweeping by causing the nightside potential to spike to a kilovolt. Then it drops back again just as quickly.”

The roller coaster of charge would be at its most dizzying during solar and geomagnetic storms. “That is a very dynamic time for the plasma sheet and we need to study what happens then,” he says.

What happens then? Next-generation astronauts are going to find out. NASA is returning to the moon in the decades ahead and plans to establish an outpost for long-term lunar exploration. It turns out they’ll be exploring the magnetotail, too.

Other Sources of Plasma

Earth’s magnetotail isn’t the only source of plasma to charge the moon. Solar wind can provide charged particles, too; indeed, most of the time, the solar wind is the primary source. But when the moon enters the magnetotail, the solar wind is pushed back and the plasma sheet takes over. The plasma sheet is about 10 times hotter than the solar wind and that gives it more "punch" when it comes to altering the charge balance of the moon's surface. Two million degree electrons in the plasma sheet race around like crazy and many of them hit the moon's surface. Solar wind electrons are relatively cool at only 140 thousand degrees, and fewer of them zip all the way down to the shadowed surface of the moon's nightside.

For substorm animations see: http://svs.gsfc.nasa.gov/vis/a010000/a010100/a010104/index.html

Adapted from materials provided by NASA/Goddard Space Flight Center.

http://www.sciencedaily.com:80 /releases/2008/04/080420123319.htm

Current Spike In Atmospheric Methane Mirrors Early Climate Change Events

Dr. Hubertus Fischer cutting an ice core at Kohnen Station, Antarctica. (Credit: Gerald Traufetter)

ScienceDaily (Apr. 21, 2008) — Ice cores are essential for climate research, because they represent the only archive which allows direct measurements of atmospheric composition and greenhouse gas concentrations in the past. Using novel isotopic studies, scientists from the European Project for Ice Coring In Antarctica (EPICA) were now able to identify the most important processes responsible for changes in natural methane concentrations over the transition from the last ice age into our warm period.

The study, published in Nature, shows that wetland regions emitted significantly less methane during glacial times. In contrast methane emissions by forest fire activity remained surprisingly constant from glacial to interglacial times.

Members of the EPICA team publish new insights into natural changes in the atmospheric concentrations of the second most important greenhouse gas methane (CH_4). The scientist present the first glacial/interglacial record of the carbon isotopic composition of methane (´$13CH_4$) providing essential information on the sources being responsible for the observed CH_4 concentration changes.

The well known glacial/interglacial changes in atmospheric methane concentrations are quite drastic. Glacial concentration were on average 350 ppbv (part per billion by volume) and increased to approximately 700 ppbv during the last glacial/interglacial transition superimposed by rapid shifts of about 200 ppbv connected to rapid climate changes. During the last centuries human methane emissions artificially increased CH_4 concentrations to approximately 1750 ppbv.

But what caused these substantial changes in natural atmospheric CH_4 concentrations prior to the human impact? To answer this question, the scientists developed a new analytical method that now allows to quantify changes in the isotopic ratio of $12CH_4$ and $13CH_4$ in ice core samples. This ratio provides insight into the responsible methane sources.

"These studies bring us much closer to a quantitative understanding of what happened with wetlands and methane in the past", says Dr. Hubertus Fischer from the Alfred-Wegener-Institute for Polar and Marine Research, who is the lead author of the publication and coordinator of the gas studies on the EPICA ice cores. "This is essential to also improve our predictions of how the methane cycle will respond to an increased warming in the future", he adds.

The study shows, that tropical wetlands emitted substantially less CH_4 during glacials; most likely caused by changes in monsoonal precipitation patterns. Together with a reduced atmospheric lifetime, this explains major parts of the glacial CH_4 reduction. In addition, boreal methane sources located in wetlands in higher northern latitudes were essentially switched off during the glacial due to the expansion of the northern ice sheets and the very cold temperatures in high northern latitude. However, these high latitude wetlands were quickly reactivated when rapid climate warming events occurred. Also forest fires emit a considerable amount of CH_4, which, however, remained surprisingly constant over time. The isotopic measurements show no signs of CH_4 emissions by a destabilization of marine gas hydrate reservoirs when climate was warming.

The current results were published by a team of scientist from Germany, France and Switzerland. As the German partner within EPICA, the Alfred-Wegener-Institute was responsible for the drilling operation of the ice core used for this study. In addition, it specialized on the development of new analytical techniques to measure isotopes in greenhouse gases and the interpretation of changes in biogeochemical cycles in the past. Coordinated by the European Science Foundation (ESF), EPICA is funded by the participating countries and the European Union. EPICA is one of the core projects of the AWI Research Program "Maritime, Coastal and Polar Systems" in the "Earth and Environment" research section of the Helmholtz-Gemeinschaft. For its outstanding effort and large impact on climate research, EPICA has recently received the Descartes Prize for Transnational, Collaborative Research awarded by the European Commission.

The manuscript "Changing boreal methane sources and constant biomass burning during the last termination" by Fischer et al. will be published in Nature on April 17, 2008.

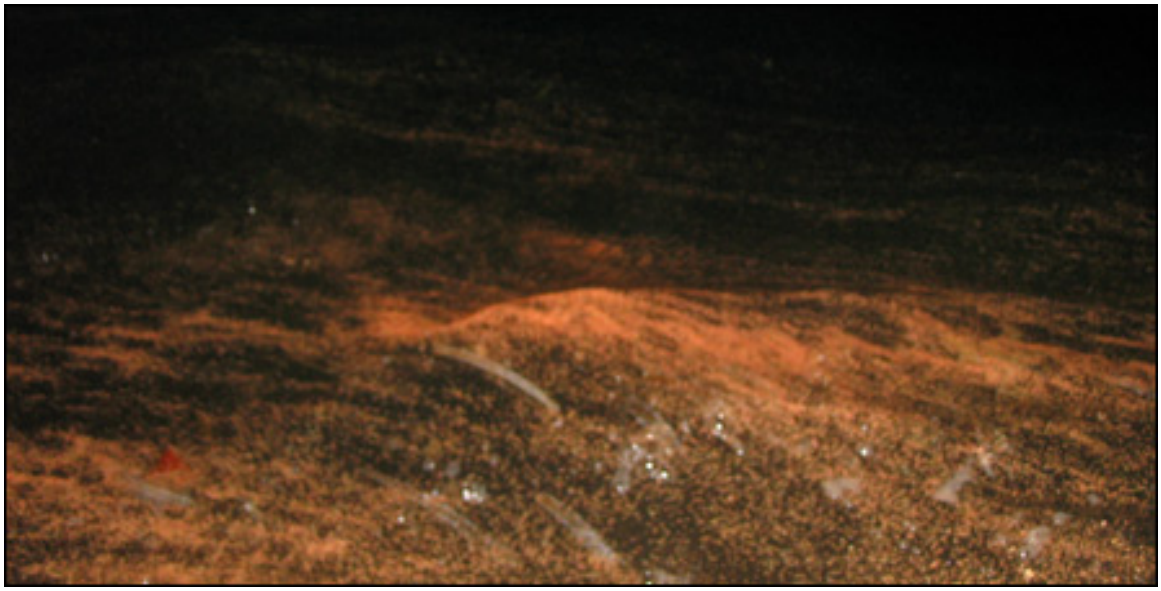
Adapted from materials provided by Helmholtz Association of German Research Centres, via EurekAlert!, a service of AAAS.

from http://www.sciencedaily.com:80 /releases/2008/04/080416140958.htm

Coral spawn turns Palau seas pink

By Andrew Luck-Baker
BBC Radio 4, Palau

The annual mass spawning of corals on the Palau archipelago in the western Pacific has occurred right on cue.



With Sunday night's full moon, coral polyps let forth a huge swathe of sperm and egg, to seed the next generation.

The event was short-lived - only about 30 minutes - but so vast in its scale that it turned the sea water pink.

Scientists from Palau, Australia and the UK are studying the practicality of collecting coral larvae to help restore damaged reefs elsewhere.

Please turn on JavaScript. Media requires JavaScript to play.

See what a mass spawning at Palau looks like (Reefvid.org)

As we got into the boat for our trip to Luke's reef, I admit I was not really expecting to see the mass spawning on the exact night of the full Moon.

All the visiting scientists here thought it was more likely the reproductive extravaganza would happen the next evening or the following one - based on what had happened the last two years.

The only person who seemed sure it would happen on cue was Steven Victor, the Palauan director of the Palau International Coral Reef Center. Local knowledge was spot on, as it turned out.

Almost as soon as the boat engine switched off, we got a sense that something might be brewing.

I was snorkelling in what looked like a reverse snow storm of orange and pink particles

Andrew Luck-Baker

There was a faint fishy whiff in the air, and then in the torchlight, one, then two orange particles - coral spawn - suspended in the water.

Scanning from the other side of the boat, the excitement went up another notch - a steady stream of orange spat was rising to the surface in one small isolated patch.

Scuba gear was flung on and the marine biologists were overboard. I paddled on the surface with snorkel, mask and diving torch, watching the scientists check the coral colonies on the reef bed five metres below.

The minutes ticked by - lots of them. If our first stream of spawn was the warm up act, was the main attraction having a mighty tantrum and refusing to come on tonight? Apparently not. Sonia Bejarano, from the University of Exeter, UK, surfaced with an update. A great many of the branching table corals and stag horn corals - the chief reef builders - were close to spawning.

The little egg and sperm bundles were visible in the open mouths of most of the individual coral polyps of each colony.

Depending on the size of the colony, the number of tiny sea anemone-like polyps ranges from hundreds to thousands.

At 8.29pm the mass spawning began. Across the reef, polyps contracted into their stony skeletons. Spawn particles popped out of their mouths.

Because the egg and sperm bundles contain waxy yolk, they are buoyant and rise in the water column.

Within minutes, I was snorkelling in what looked like a reverse snow storm of orange and pink particles. It became thicker and thicker as more and more colonies across the reef fired their latest shots at founding a new generation.

The spawn just kept coming - the sea was becoming a pink soup. Pink was emerging as the dominant colour.

Akin to taramosalata

There was a rising pale rose particle for every cubic centimetre of seawater at least. Above water, the odour of spawn was also thick in the air - it smelt like taramosalata, the pink Greek dish made of fish roe.

I spent most of the time in a state of amazement at the surface but I managed to get down a couple of times to the reef bed to see a colony close-up as it released its spawn.

Profusions of pink blobs, each with a little tail of mucus, wafted from the antler branches of a stag horn colony.

The reef fish were also excited. Earlier most of them were hidden, lurking in dark crevices and overhangs for safety away from night-time predators. But with the spawn bonanza, many threw caution to the winds and came out to feast.

Back on the boat, Peter Mumby, also from Exeter, estimated it was about half hour from the time the first colony unleashed its spawn to the time the last one spewed forth to multiply.

The time it all started was almost exactly the same as the moment the mass spawning began the previous year he'd visited Luke's reef to video the event.

Somehow all the colonies are running with synchronised biological clocks.

In some way not really understood by scientists, they are entrained by factors such as light levels and durations from the Sun and the Moon over a year and over individual months. The result is they spawn within minutes of each other.

That synchrony is vital if you reproduce as most corals do. The majority are hermaphrodites which release their eggs and sperm into the open water for fertilisation.

The chances they will have any offspring would be terrible if they did not have tight coordination so that eggs of one colony meet sperm from another.

By now, at the surface, the number of egg and sperm bundles was staggering. Dense rafts and slicks of pink were coalescing all around the boat for as far as we could see. The ripe smell of taramosalata hung in the air.

And we could see the water below the floating spawn begin to cloud up. Seawater was penetrating every spawn particle - breaking apart separate compartments of eggs and sperm. The visibility was falling as billions of coral sperm were liberated for fertilisation.

Andrew Luck-Baker is preparing a Frontiers programme to be broadcast on BBC Radio 4 on Monday 26 May. The programme will also be broadcast on Discovery on the BBC World Service.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/science/nature/7358423.stm

Published: 2008/04/21 10:48:24 GMT

First contact to earthquake zone

By Richard Black
Environment correspondent, BBC News website, Vienna

Scientists have completed the first stage of an ambitious plan to drill down into an earthquake-generating region near Japan.

The project saw holes bored 1.4km into the sea floor, producing 3D images of stresses inside the quake zone.

The Nankai Trough produced major lethal earthquakes and tsunami during the last century.

The eventual aim is to place instruments 6km deep in the crust, possibly as an early warning system.

Findings from the initial phase of the Nankai Trough Seismogenic Zone Experiment (NanTroSEIZE) were presented here at the European Geosciences Union (EGU) annual meeting.

> **We have to go to sea to study the plate boundaries, the actual faults, that generate those earthquakes**
> Harold Tobin

"Maybe it's a bit obvious after the 2004 tsunami why we're interested in doing this," said the project's co-chief scientist Harold Tobin.

"The Sumatra quake is a good example of the fact that the greatest quakes on the planet happen in subduction zones, where one tectonic plate is sliding beneath another.

"And virtually all of the big quakes, the ones of magnitude eight or nine or above, happen at sea; so we have to go to sea to study the plate boundaries, the actual faults, that generate those earthquakes," the University of Michigan researcher told reporters.

The Nankai Trough off the south-eastern coast of Japan, centre of the 1944 Tonankai and 1946 Nankaido earthquakes which both exceeded Magnitude 8, is structurally similar to the Sunda Trench where the 2004 tsunami originated, he added.

Fault in vision

The five months from last September saw eight holes drilled to various depths in the Nankai Trough, using the new Japanese research vessel Chikyu.

The drill bits travelled through the "megasplay zone", the region above the actual subduction path, which is riddled with faults.

Three-dimensional scans performed aboard Chikyu on cores taken from these boreholes reveal some of the stresses that the rock is placed under as the Philippines tectonic plate descends underneath Japan.

"We use this medical CT (computed tomography) scanner that scans through core samples instead of the human body," said co-chief scientist Masataka Kinoshita from the Japan Agency for Marine-Earth Science and Technology (Jamstec), which runs operations on behalf of the international Integrated Ocean Drilling Program (IODP).

"This gives 3D density images, just like in the human body we would see brain or bones or other things."

Most of the stress lines, as researchers anticipated, lie along the direction that the plates are travelling.

But one core showed strong stress lines at 90 degrees.

Mapping these stress lines could indicate which portions along the subduction zone are "locked" - where the descending plate snags and sticks to the one above - and which are loose and able to move freely.

That in turn would set some parameters for the likely scale of a tsunami, which is believed to occur in this region when the forces on the snagged upper plate grow too large and the plate snaps upward violently, releasing its accumulated energy into the water above.

The first set of boreholes also broke through into the "accretionary prism", where material such as mud, water and loose rock is carried downwards by the descending Philippines plate.

Some of the cores revealed evidence of past undersea landslides.

Deep plans

This first phase of NanTroSEIZE has only scratched the surface of where the scientists want to go.

"Later this year we will do some more shallow drilling," said Dr Tobin. "Then in 2010 or 2012 we aim to drill two deep holes down to about 6km.

"We can then get cores through the fault zone where it branches down there; and we will also place instruments down inside the boreholes."

The Japanese government plans to run an undersea cable out to the Nankai Trough. That will allow data from seismometers, tiltmeters and other instruments inside the subduction zone itself to be carried back to the mainland and analysed in real time.

At the very least, this will provide unprecedented insights into the processes happening in a major earthquake zone.

At best, it will become a tool for forecasting quakes and tsunami.

The Japanese government puts the chances of a major event happening in the Nankai Trough over the next 30 years at more than 50%.

And eventually the findings here, or the technologies developed, could be applied in other similar regions, including the Sunda Trench which caused so much devastation back in 2004.

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Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/science/nature/7353866.stm

Published: 2008/04/21 12:47:30 GMT

Growing Up for Dummies

By CHARLES McGRATH

MILLENNIALS, Quarter-lifers, Generation Y, Twixters, Oh-Ohs — it's hard to know what we parents of a certain age are supposed to call the young people now coming through the pipeline, the ones born after 1982. Oh, I forgot one: the Boomerangs. They're the children of baby boomers who, after graduating from college, return to the nest and sponge off their families. In 2006, if you believe the studies, almost half of all newly minted college graduates did this.

Mark Bauerlein has a catchall term for all these young people, especially the ones now in high school: he labels them "the dumbest generation," which is also what he calls his new book, subtitled "How the Digital Age Stupefies Young Americans and Jeopardizes Our Future."

Despite all the stories about über-achievers — students with near-perfect SAT scores who juggle six or seven Advanced Placement classes while also captaining the swim team, taking oboe lessons and working a couple of nights a week at the soup kitchen — most high school students, Mr. Bauerlein says, don't really do a whole lot. They don't read, they don't go to museums or get involved in community life, they don't do much homework.

And according to Mr. Bauerlein, they know next to nothing. Fewer than 30 percent know what the Reconstruction was, and practically a quarter of them cannot identify Dick Cheney as the vice president. They're six times more likely to be able to name the current American Idol than the speaker of the House of Representatives. On tests of competence in math and science, American high-schoolers do worse than students from countries that we used to think of as backward.

In fact, that's the great paradox of the dumbest generation, Mr. Bauerlein says: never have American students had it so easy, and never have they achieved less. Material gains and intellectual performance seem almost inversely related. Until he starts finger-pointing and hand-wringing in the last couple of chapters, which also go in for a certain amount of sermonizing, Mr. Bauerlein, a professor of English at Emory, delivers this bad news in surprisingly brisk and engaging fashion, blowing holes in a lot of conventional educational wisdom. Full of stats and charts, his book is like a PowerPoint presentation you can actually stay awake for.

As you read along, it all seems pretty convincing (if depressing), especially when he gets around to naming a culprit: the digital revolution, which he says has empowered students in certain ways while also eroding their attention spans and analytical abilities. Sounds about right. But then you pick up William Damon's book, "The Path to Purpose: Helping Our Children Find Their Calling in Life."

Mr. Damon, director of the Center on Adolescence at Stanford, says that students today are "working harder and learning a bit more, at least judging from the most recent test-score results." (Not the ones Mr. Bauerlein has been reading.) But he also says that most of these students are drifting aimlessly, with no clue as to what they want to do or become in the future. The only thing they seem to know for sure is that they don't want to run for public office. (Mr. Bauerlein also picks up on this trait, though you could argue that, given the spectacle of American political life recently, it's actually a sign of intelligence.)

Young people are now so purposeless, Mr. Damon says, so uncertain and fearful of commitment even when it comes to finding mates, that many of them may never marry, and they're so hesitant about picking a career that they may wind up living at home forever. (He says there are "plentiful employment opportunities for the young," which may come as news to some recent college grads.)

"The Path to Purpose" also gets a little preachy and hand-wringy at the end, and some of the conclusions are drawn from a pretty small sample of interviews, but its diagnosis, too, is hard to quarrel with, especially when applied to the many slackers and Boomerangers who really do seem to lack a sense of direction.

According to Christine Hassler, author of "20 Something Manifesto: Quarter-Lifers Speak Out About Who They Are, What They Want and How to Get It," they're not just floundering, they're often anxious and miserable, suffering from something like menu overload: there are just too many choices to make. The result is often a feeling of stasis and letdown that Ms. Hassler calls Expectation Hangover, a phrase she is so fond of she has trademarked it.

"20 Something Manifesto" is actually less a manifesto than a breathlessly optimistic self-help book designed to help its audience peel back the layers of their "identity onion" and sort out the poles of the "20s triangle": "Who am I, what do I want, how do I get what I want?" She talks a lot about the need for the floundering to feel self-gratitude and spend "quality time" with themselves; for the lovelorn, she suggests palliative remedies, like sending yourself flowers and writing yourself a note of appreciation.

In fact, "20 Something Manifesto" is an almost perfect illustration of the kinds of things that both Mr. Bauerlein and Mr. Damon are worried about. It's a book about purposelessness that's written not just for dummies but for people who are practically comatose.

In its format — lots of boxes, subheads, summaries and lists — it resembles a lot of textbooks these days, and it's written in an annoying, ingratiating style that presumes that Expectation Hangovers must also damage concentration and the attention span: "You may notice that I use a lot of analogies — it has become part of my coaching and writing style. Why? Well, it actually has to do with the way the brain works. . . . Analogies evoke the pictures we need to 'turn on' our right brain, which supports us in solving problems and dealing with emotions. And, hey, if you are going to take the time to delve into this book, you might as well get the full-brain-experience guarantee."

One thing Ms. Hassler is smart about, though, is the role of parents in creating the quarter-lifers' condition of aimlessness and anomie. Parental expectations these days can have smothering, crippling effects on their offspring, she points out.

Mr. Bauerlein and Mr. Damon see it a little differently. They both note that young people regard their families more highly, and generally get along with them better, than people the same age did a couple of generations ago. But they see this as a sort of accidental anomaly — the one bright spot in an otherwise dismal picture.

It stands to reason, though, that parents must be part of the problem. Some of us have raised dummies and the disengaged not on purpose, surely, but perhaps because we listened to Mr. Rogers and told them too often that we liked them just the way they were.

Charles McGrath, the former Book Review editor, is a writer at large at The Times.

http://www.nytimes.com/2008/04/20/education/edlife/books.html?ref=edlife

The Accidental Rebel

By PAUL AUSTER

IT was the year of years, the year of craziness, the year of fire, blood and death. I had just turned 21, and I was as crazy as everyone else.

There were half a million American soldiers in Vietnam, Martin Luther King had just been assassinated, cities were burning across America, and the world seemed headed for an apocalyptic breakdown.

Being crazy struck me as a perfectly sane response to the hand I had been dealt — the hand that all young men had been dealt in 1968. The instant I graduated from college, I would be drafted to fight in a war I despised to the depths of my being, and because I had already made up my mind to refuse to fight in that war, I knew that my future held only two options: prison or exile.

I was not a violent person. Looking back on those days now, I see myself as a quiet, bookish young man, struggling to teach myself how to become a writer, immersed in my courses in literature and philosophy at Columbia. I had marched in demonstrations against the war, but I was not an active member of any political organization on campus. I felt sympathetic to the aims of S.D.S. (one of several radical student groups, but by no means the most radical), and yet I never attended its meetings and not once had I handed out a broadside or leaflet. I wanted to read my books, write my poems and drink with my friends at the West End bar.

Forty years ago today, a protest rally was held on the Columbia campus. The issue had nothing to do with the war, but rather a gymnasium the university was about to build in Morningside Park. The park was public property, and because Columbia intended to create a separate entrance for the local residents (mostly black), the building plan was deemed to be both unjust and racist. I was in accord with this assessment, but I didn't attend the rally because of the gym.

I went because I was crazy, crazy with the poison of Vietnam in my lungs, and the many hundreds of students who gathered around the sundial in the center of campus that afternoon were not there to protest

the construction of the gym so much as to vent their craziness, to lash out at something, anything, and since we were all students at Columbia, why not throw bricks at Columbia, since it was engaged in lucrative research projects for military contractors and thus was contributing to the war effort in Vietnam?

Speech followed tempestuous speech, the enraged crowd roared with approval, and then someone suggested that we all go to the construction site and tear down the chain-link fence that had been erected to keep out trespassers. The crowd thought that was an excellent idea, and so off it went, a throng of crazy, shouting students charging off the Columbia campus toward Morningside Park. Much to my astonishment, I was with them. What had happened to the gentle boy who planned to spend the rest of his life sitting alone in a room writing books? He was helping to tear down the fence. He tugged and pulled and pushed along with several dozen others and, truth be told, found much satisfaction in this crazy, destructive act.

After the outburst in the park, campus buildings were stormed, occupied and held for a week. I wound up in Mathematics Hall and stayed for the duration of the sit-in. The students of Columbia were on strike. As we calmly held our meetings indoors, the campus was roiling with belligerent shouting matches and slugfests as those for and against the strike went at one another with abandon. By the night of April 30, the Columbia administration had had enough, and the police were called in. A bloody riot ensued. Along with more than 700 other people, I was arrested — pulled by my hair to the police van by one officer as another officer stomped on my hand with his boot. But no regrets. I was proud to have done my bit for the cause. Both crazy and proud.

What did we accomplish? Not much of anything. It's true that the gymnasium project was scrapped, but the real issue was Vietnam, and the war dragged on for seven more horrible years. You can't change government policy by attacking a private institution. When French students erupted in May of that year of years, they were directly confronting the national government — because their universities were public, under the control of the Ministry of Education, and what they did initiated changes in French life. We at Columbia were powerless, and our little revolution was no more than a symbolic gesture. But symbolic gestures are not empty gestures, and given the nature of those times, we did what we could.

I hesitate to draw any comparisons with the present — and therefore will not end this memory-piece with the word "Iraq." I am 61 now, but my thinking has not changed much since that year of fire and blood, and as I sit alone in this room with a pen in my hand, I realize that I am still crazy, perhaps crazier than ever.

Paul Auster is the author of the forthcoming "Man in the Dark."

http://www.nytimes.com/2008/04/23/opinion/23auster.html?_r=1&th&emc=th&oref=slogin

Microsoft Reveals a Web-Based Software System

By JOHN MARKOFF

SAN FRANCISCO — Microsoft is preparing to take its most ambitious step yet in transforming its personal computer business into one tied more closely to software running in remote data centers.

The software giant announced on Tuesday a data storage and Web software system, called Live Mesh, that is intended to blur the distinction between software running on the Windows operating system and an elaborate array of services that will be delivered to a growing collection of electronic gadgets. Live Mesh is Microsoft's late entry into a rapidly growing market described as cloud computing. The term refers to the movement of software applications and services from PCs to centralized data centers, where they are made available via the Internet. Companies like Amazon.com, Google, Salesforce and dozens of others are building computing centers that will effectively outsource data processing and make it a commodity that companies purchase as they would electricity.

The introduction of Live Mesh is a significant strategic shift for Microsoft, whose operating system helped popularize personal computers. Bill Gates, the company's co-founder, chairman and chief architect, said in an interview on CNN a year ago, "We're making the PC the place where it all comes together."

However, a strategy document circulated to company employees on Tuesday that was written by Ray Ozzie, one of the Microsoft's two chief technology officers, countered that view.

"The Web is the hub of our social mesh and our device mesh," he wrote. That statement is the first of a set of three "guiding principles" that Mr. Ozzie outlined in the five-page document entitled "Services Strategy Update." In taking the PC off center stage, Microsoft is refocusing some of its resources to catch its cloud computing rivals.

"This is a pretty significant public statement that the battle is really a cloud battle," said Mark Stahlman, a research vice president at Gartner, an industry consulting group. "It's not an ad search battle or a desktop operating system battle. Those are fought and won already. This is the one that's wide open."

Marc Benioff, chief executive of Salesforce, a company that began by offering software that managed customer relations through a Web browser, said Microsoft's entry "means that the Internet is the center of the world." Salesforce has more recently begun broadening its product line to a wide range of computing services, also available through a browser. "Consumer services have shown us the way to the next generation of computing," Mr. Benioff said.

Microsoft refers to its strategy as "software plus services." However, the new vision is built on Web-based software that will help deliver entertainment as well as business software to devices like Microsoft's Xbox game console, to Zune music player, to cellphones running Windows Mobile software, even to Apple's Mac computers and other consumer devices in the home.

The company now believes that no single device will dominate the Web-oriented consumer electronic world of the future. Underscoring that belief, Live Mesh's logo is a Tolkienesque graphical ring intended to give the user a visual sense that all the devices are interconnected.

Displayed within a Web browser, the Live Desktop page will not be so much a Web-based operating system, said Jeff Hansen, general manager of Microsoft's Live Services group, but a control mechanism that blurs the location of documents ranging from MP3 and video files to spreadsheets and text documents.

"We're adopting a wider and wider diversity of increasingly powerful devices," Mr. Hansen said.

The Live Mesh system, however, is viewed by the company as a software platform in the data center for an evolving array of services, ranging from remote control of computers and electronic devices to data storage. Microsoft also hopes that software and service developers will create applications based on the service.

In the plan outlined by Mr. Ozzie, he refers to the power of choice for customers and acknowledges that software development will be based on "small pieces loosely coupled." Both of those concepts echo industry buzzwords in the open-source Web development community that has grown outside of Microsoft during the last half decade.

In a telephone interview this week, Mr. Hansen said that the current version of Live Mesh was a "technology preview" that would be available only to a group of about 10,000 test users and software developers. "We want to engage the Web community and software developers," he said.

On Tuesday evening Microsoft described 15 components of the new Live Mesh service, including a notification feature, a news feature and an information window displayed by the service, but only two user-oriented applications. One synchronizes files on multiple computers. The other, Live Mesh Remote Desktop, is a free software service that will permit users to control computers and other devices over the Internet.

Mr. Hansen, who has been using Live Mesh in a private Microsoft test, said he was able to surprise his wife using the Live Mesh Remote Desktop. From work, he was able to start a song playing on his Xbox at home.

Microsoft said it would begin a public test later this year. The basic service, which will be available initially on devices running Windows XP and Mobile, will later support Mac computers and other mobile devices. Five gigabytes of free data storage will be included, but the company declined to speculate about charges for additional features and services.

http://www.nytimes.com/2008/04/23/technology/23soft.html?th&emc=th

Europe Turns to Coal Again, Raising Alarms on Climate

By ELISABETH ROSENTHAL

CIVITAVECCHIA, Italy — At a time when the world's top climate experts agree that carbon emissions must be rapidly reduced to hold down global warming, Italy's major electricity producer, Enel, is converting its massive power plant here from oil to coal, generally the dirtiest fuel on earth.

Over the next five years, Italy will increase its reliance on coal to 33 percent from 14 percent. Power generated by Enel from coal will rise to 50 percent.

And Italy is not alone in its return to coal. Driven by rising demand, record high oil and natural gas prices, concerns over energy security and an aversion to nuclear energy, European countries are expected to put into operation about 50 coal-fired plants over the next five years, plants that will be in use for the next five decades.

In the United States, fewer new coal plants are likely to begin operations, in part because it is becoming harder to get regulatory permits and in part because nuclear power remains an alternative. Of 151 proposals in early 2007, more than 60 had been dropped by the year's end, many blocked by state governments. Dozens of other are stuck in court challenges.

The fast-expanding developing economies of India and China, where coal remains a major fuel source for more than two billion people, have long been regarded as among the biggest challenges to reducing carbon emissions. But the return now to coal even in eco-conscious Europe is sowing real alarm among environmentalists who warn that it is setting the world on a disastrous trajectory that will make controlling global warming impossible.

They are aghast at the renaissance of coal, a fuel more commonly associated with the sooty factories of Dickens novels, and one that was on its way out just a decade ago.

There have been protests here in Civitavecchia, at a new coal plant in Germany, and at one in the Czech Republic, as well as at the Kingsnorth power station in Kent, which is slated to become Britain's first new coal-fired plant in more than a decade.

Europe's power station owners emphasize that they are making the new coal plants as clean as possible. But critics say that "clean coal" is a pipe dream, an oxymoron in terms of the carbon emissions that count most toward climate change. They call the building spurt shortsighted.

"Building new coal-fired power plants is ill conceived," said James E. Hansen, a leading climatologist at the NASA Goddard Institute for Space Studies. "Given our knowledge about what needs to be done to stabilize climate, this plan is like barging into a war without having a plan for how it should be conducted, even though information is available.

"We need a moratorium on coal now," he added, "with phase-out of existing plants over the next two decades."

Coal's Advantages

Enel and many other electricity companies say they have little choice but to build coal plants to replace aging infrastructure, particularly in countries like Italy and Germany that have banned the building of nuclear power plants. Fuel costs have risen 151 percent since 1996, and Italians pay the highest electricity costs in Europe.

In terms of cost and energy security, coal has all the advantages, its proponents argue. Coal reserves will last for 200 years, rather than 50 years for gas and oil. Coal is relatively cheap compared with oil and natural gas, although coal prices have tripled in the past few years. More important, hundreds of countries export coal — there is not a coal cartel — so there is more room to negotiate prices.

"In order to get over oil, which is getting more and more expensive, our plan is to convert all oil plants to coal using clean-coal technologies," said Gianfilippo Mancini, Enel's chief of generation and energy management. "This will be the cleanest coal plant in Europe. We are hoping to prove that it will be possible to make sustainable and environmentally friendly use of coal."

"Clean coal" is a term coined by the industry decades ago, referring to its efforts to reduce local pollution. Using new technology, clean coal plants sharply reduced the number of sooty particles spewed into the air, as well as gases like sulfur dioxide and nitrous oxide. The technology has minimal effect on carbon emissions.

In fact, the technology that the industry is counting on to reduce the carbon dioxide emissions that add to global warning — carbon capture and storage — is not now commercially available. No one knows if it is feasible on a large, cost-effective scale.

The Struggle to Be Green

The task — in which carbon emissions are pumped into underground reservoirs rather than released — is challenging for any fuel source, but particularly so for coal, which produces more carbon dioxide than oil or natural gas.

Under optimal current conditions, coal produces more than twice as much carbon dioxide per unit of electricity as natural gas, the second most common fuel used for electricity generation, according to the Electric Power Research Institute. In the developing world, where even new coal plants use lower grade coal and less efficient machinery, the equation is even worse.

Without carbon capture and storage, coal cannot be green. But solving that problem will take global coordination and billions of dollars in investment, which no one country or company seems inclined to spend, said Jeffrey D. Sachs, director of the Earth Institute at Columbia University.

"Figuring out carbon capture is really critical — it may not work in the end — and if it is not viable, the situation, with respect to climate change, is far more dire," Mr. Sachs said.

There are a few dozen small demonstration projects in Europe and in the United States, most in the early stages. But progress has not been promising.

At the end of January, the Bush administration canceled what was previously by far the United States' biggest carbon-capture demonstration project, at a coal-fired plant in Illinois, because of huge cost overruns. The costs of the project, undertaken in 2003 with a budget of $950 million, had spiraled to $1.5 billion this year, and it was far from complete.

The European Union had pledged to develop 12 pilot carbon-capture projects for Europe, but says that is not enough.

Many have likened carbon capture's road from the demonstration lab to a safe, cheap, available reality as a challenge equivalent to putting a man on the moon. Norway, which is investing heavily to test the technology, calls carbon capture its "moon landing."

It may be even harder than that. It is a moon landing that must be replicated daily at thousands of coal plants in hundreds of countries — many of them poor. There is a new coal-fired plant going up in India or China almost every week, and most of those are not constructed in a way that is amenable to carbon capture, even if it were developed.

Plants that could someday be adapted to carbon capture cost 10 to 20 percent more to build, and only a handful exist today. For most coal power plants the costs of converting would be "phenomenal," concluded a report by the United States Environmental Protection Agency.

Then there is the problem of storing the carbon dioxide, which is at some level an inherently local issue. Geologists have to determine if there is a suitable underground site, calculate how much carbon dioxide it can hold and then equip it in a way that prevents leaks and ensures safety. A large leak of underground carbon dioxide could be as dangerous as a leak of nuclear fuel, critics say.

As for its plant here, Enel says it will start experimenting with carbon-capture technology in 2015, in the hopes of "a solution" by 2020.

"That's too late," Mr. Sachs said.

In the meantime, it and other new coal plants will be spewing more greenhouse gas emissions into the atmosphere than ever before, meaning that current climate predictions — dire as they are — may still be "too optimistic," Mr. Sachs said. "They assume the old energy mix, even though coal will be a larger and larger part."

An Efficient Plant

On many other fronts, the new Enel plant is a model of efficiency and recycling. The nitrous oxide is chemically altered to generate ammonia, which is then sold. The resulting coal ash and gypsum are sold to the cement industry. An on-site desalination plant means that the operation generates its own water for cooling. Even the heated water that comes out of the plant is not wasted: it heats a fish farm, one of Italy's largest.

But Enel's plan to deal with the new plant's carbon emissions consists mostly of a map of Italy with several huge white ovals superimposed — subterranean cavities where carbon dioxide potentially could be stored. The sites have not been fully studied by geologists as yet to make sure they are safe storage sites and well sealed. There is no infrastructure or equipment that could move carbon into them.

The new Enel plant here opens its first boiler in two months. It will immediately produce fewer carbon emissions than the ancient oil boiler it replaces, but only because it will produce less electricity, officials here admit.

Unhappy Neighbors

In the towns surrounding Civitavecchia, the impending arrival of a huge coal plant, with its three silvery domes, is being greeted with a hefty dose of dread.

"They call it clean coal because they use some filters, but it is really nonsense," said Marza Marzioli of the No Coal citizens group in the nearby ancient Etruscan town of Tarquinia. "If you compare it to old plants, yes it's better, but it's not 'clean' in any way."

The group says that Enel has won approval for a dangerous new coal plant by buying machines for a local hospital and by carrying out a public relations campaign. Enel advertisements for the project show a young girl erasing a plant's smokestack. Most people who took part in a 2007 local referendum voted no, but the plant went ahead anyway, the group said.

The European Union, through its emissions trading scheme, has tried to make power plants consider the costs of carbon, forcing them to buy "permits" for emissions. But with the price of oil so high, coal is far cheaper, even with the cost of permits to pollute factored in, Enel has calculated.

Stephan Singer, who runs the European energy and climate office of WWF, formerly the World Wildlife Fund, in Brussels, said that math was shortsighted: the cost of coal and permits will almost certainly rise over the next decade.

"If they want coal to be part of the energy solution, they have to show us that carbon capture can be done now, that they can really reduce emissions" to an acceptable level, Mr. Singer said.

http://www.nytimes.com/2008/04/23/world/europe/23coal.html?ref=science

A CONVERSATION WITH DANIEL GILBERT

The Smiling Professor

By CLAUDIA DREIFUS

At Harvard, the social psychologist Daniel Gilbert is known as Professor Happiness. That is because the 50-year-old researcher directs a laboratory studying the nature of human happiness. Dr. Gilbert's "Stumbling on Happiness" was a New York Times paperback best seller for 23 weeks and won the 2007 Royal Society Prize for Science Books.

Q. HOW DID YOU STUMBLE ONTO YOUR AREA OF STUDY?

A. It was something that happened to me roughly 13 years ago. I spent the first decade of my career studying what psychologists call "the fundamental attribution error," which is about how people have the tendency to ignore the power of external situations to determine human behavior.

Why do many people, for instance, believe the uneducated are stupid?

I'd have been content to work on this for many more years, but some things happened in my own life.

Within a short period of time, my mentor passed away, my mother died, my marriage fell apart and my teenage son developed problems in school. What I soon found was that as bad as my situation was, it wasn't devastating. I went on.

One day, I had lunch with a friend who was also going through difficult times. I told him: "If you'd have asked me a year ago how I'd deal with all this, I'd have predicted that I couldn't get out of bed in the morning."

He nodded and added, "Are we the only people who could be so wrong in predicting how we'd respond to extreme stress?"

That got me thinking. I wondered: How accurately do people predict their emotional reactions to future events?

Q. HOW DOES THAT RELATE TO UNDERSTANDING HAPPINESS?

A. Because if we can't predict how we'd react in the future, we can't set realistic goals for ourselves or figure out how to reach to them.

What we've been seeing in my lab, over and over again, is that people have an inability to predict what will make us happy — or unhappy. If you can't tell which futures are better than others, it's hard to find happiness. The truth is, bad things don't affect us as profoundly as we expect them to. That's true of good things, too. We adapt very quickly to either.

So the good news is that going blind is not going to make you as unhappy as you think it will. The bad news is that winning the lottery will not make you as happy as you expect.

Q. ARE YOU SAYING THAT PEOPLE ARE HAPPY WITH WHATEVER CARDS ARE DEALT TO THEM?

A. As a species, we tend to be moderately happy with whatever we get. If you take a scale that goes from zero to 100, people, generally, report their happiness at about 75. We keep trying to get to 100. Sometimes, we get there. But we don't stay long.

We certainly fear the things that would get us down to 20 or 10 — the death of a loved one, the end of a relationship, a serious challenge to our health. But when those things happen, most of us will return to our emotional baselines more quickly than we'd predict. Humans are wildly resilient.

Q. DO MOST OF US HARBOR UNREASONABLE NOTIONS OF WHAT HAPPINESS IS?

A. Inaccurate, flawed ideas. Few of us can accurately gauge how we will feel tomorrow or next week. That's why when you go to the supermarket on an empty stomach, you'll buy too much, and if you shop after a big meal, you'll buy too little.

Another factor that makes it difficult to forecast our future happiness is that most of us are rationalizers. We expect to feel devastated if our spouse leaves us or if we get passed over for a big promotion at work.

But when things like that do happen, it's soon, "She never was right for me," or "I actually need more free time for my family." People have remarkable talent for finding ways to soften the impact of negative events. Thus they mistakenly expect such blows to be much more devastating than they turn out to be.

Q. SO, IF WE DIDN'T HAVE THESE MECHANISMS, WOULD WE BE TOO DEPRESSED TO GO ON?

A. There may be something to that. People who are clinically depressed often seem to lack the ability to reframe events. That suggests that if the rest of us didn't have this, we might be depressed as well.

Q. AS THE AUTHOR OF A BEST SELLER ABOUT HAPPINESS, DO YOU HAVE ANY ADVICE ON HOW PEOPLE CAN ACHIEVE IT?

A. I'm not Dr. Phil.

We know that the best predictor of human happiness is human relationships and the amount of time that people spend with family and friends.

We know that it's significantly more important than money and somewhat more important than health. That's what the data shows. The interesting thing is that people will sacrifice social relationships to get other things that won't make them as happy — money. That's what I mean when I say people should do "wise shopping" for happiness.

Another thing we know from studies is that people tend to take more pleasure in experiences than in things. So if you have "x" amount of dollars to spend on a vacation or a good meal or movies, it will get you more happiness than a durable good or an object. One reason for this is that experiences tend to be shared with other people and objects usually aren't.

Q. HAVE YOU JUST EXPRESSED A VERY ANTI-AMERICAN IDEA?

A. Oh, you can spend lots of money on experiences. People think a car will last and that's why it will bring you happiness. But it doesn't. It gets old and decays. But experiences don't. You'll "always have Paris" — and that's exactly what Bogart meant when he said it to Ingrid Bergman. But will you always have a washing machine? No.

Today, I'm going to Dallas to meet my wife and I'm flying first class, which is ridiculously expensive. But the experience will be far more delightful than a new suit. Another way I follow what I've learned from data is that I don't chase dollars now that I have enough of them, because I know that it will take a very large amount of money to increase my happiness by a small amount.

You couldn't pay me $100,000 to miss a play date with my granddaughters.

And that's not because I'm rich. That's because I know that a hundred grand won't make me as happy as nurturing my relationship with my granddaughters will.

Q. SO YOU HOLD WITH THE NOTION THAT "MONEY CAN'T BUY YOU HAPPINESS"?

A. I wouldn't say that. The data says that with the poor, a little money can buy a lot of happiness. If you're rich, a lot of money can buy you a little more happiness. But in both cases, money does it.

Q. ARE YOU, DAN GILBERT, HAPPY?

A. I am. I think good things are happening to me and will continue. I am not optimistic about the rest of the species, but I'm so blessed, it's almost scary. I'm sorry to disappoint you, but I have a wildly sunny disposition. I love to laugh. My book is full of jokes.

http://www.nytimes.com/2008/04/22/science/22conv.html?ref=science

No sex for all-girl fish species

A fish species, which is all female, has survived for 70,000 years without reproducing sexually, experts believe.

Scientists from the University of Edinburgh think the Amazon Molly may be employing special genetic survival "tricks" to avoid becoming extinct.

The species, found in Texas and Mexico, interacts with males of other species to trigger its reproduction process.

The offspring are clones of their mother and do not inherit any of the male's DNA.

Typically, when creatures reproduce asexually, harmful changes creep into their genes over many generations.

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The species will eventually have problems reproducing and can often fall victim to extinction.

Scientists at Edinburgh University have been studying complex mathematical models on a highly powerful computing system to look at the case of the Amazon Molly.

Researchers calculated the time to extinction for the fish based on modelling genetic changes over many thousands of generations.

They are now able to say conclusively, for the first time, the fish ought to have become extinct within the past 70,000 years, based on the current simple models.

Scientists believe the fish, which are still thriving in rivers in south-east Texas and north-east Mexico, are using special genetic survival "tricks" to help them stay alive.

One theory is that the fish may occasionally be taking some of the DNA from the males that trigger reproduction, in order to refresh their gene pool.

Species tricks

Dr Laurence Loewe, of the university's School of Biological Sciences, said: "What we have shown now is that this fish really has something special going on and that some special tricks exist to help this fish survive.

"Maybe there is still occasional sex with strangers that keeps the species alive. Future research may give us some answers."

He added that their findings could also help them understand more about how other creatures operate.

"I think one of the interesting things is that we are learning more about how other species might use these tricks as well," he said.

"It might have a more general importance."

The Edinburgh-led study was carried out in collaboration with the Austrian Academy of Sciences.

The research is published in the journal BMC Evolutionary Biology.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/uk_news/scotland/edinburgh_and_east/7360770.stm

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High-calorie diet linked to boys

Do regular breakfasts boost baby boy numbers? Christine McGourty reports

A woman's diet around the time of conception may influence the gender of her baby, research suggests.

The study suggests a high-calorie diet at this time - and regular breakfasts - might increase the odds of a boy.

The researchers say the modern trend to opt for low calorie diets might explain why the proportion of boys is falling in developed countries.

The study, by the Universities of Exeter and Oxford, appears in the Royal Society journal Biological Sciences.

The study focused on 740 first-time pregnant mothers in the UK, who were asked to provide records of their eating habits before and during the early stages of pregnancy.

> **If a mother has plentiful resources then it can make sense to invest in producing a son because he is likely to produce more grandchildren than would a daughter**
> Dr Fiona Mathews
> University of Exeter

The researchers found 56% of women with the highest energy intake around the time of conception had boys, compared to just 45% among women with the lowest energy intake.

The average calorie intake for women who had sons was 2,413 a day, compared to 2,283 calories a day for women who had girls.

Women who had sons were also more likely to have eaten a higher quantity and wider range of nutrients, including potassium, calcium and vitamins C, E and B12.

They were also more likely to have eaten breakfast cereals.

Fewer boys

Over the last 40 years there has been a small but consistent decline, of about one per 1,000 births annually, in the proportion of boys being born in industrialised countries, including the UK.

Previous research has also shown a reduction in the average energy intake in the developed world, and there is also evidence that more people now skip breakfast.

Scientists already know that in many animals, more males are produced when a mother has plentiful resources or is high ranking.

The phenomenon has been most extensively studied in invertebrates, but is also seen in horses, cows and some species of deer.

The explanation is thought to lie with the evolutionary drive to produce descendants.

Lead researcher Dr Fiona Mathews said: "Potentially, males of most species can father more offspring than females, but this can be strongly influenced by the size or social status of the male, with poor quality males failing to breed at all.

I would urge women to not to start starving themselves in order to try influence the sex of their baby
Dr Allan Pacey
University of Sheffield

"Females, on the other hand, reproduce more consistently.

"If a mother has plentiful resources then it can make sense to invest in producing a son because he is likely to produce more grandchildren than would a daughter.

"However, in leaner times having a daughter is a safer bet."

Glucose levels

It is known from IVF research that high levels of glucose encourage the growth and development of male embryos while inhibiting female embryos.

In humans, skipping breakfast depresses glucose levels and so may be interpreted by the body as indicating poor environmental conditions and low food availability.

Dr Allan Pacey, an expert in fertility at the University of Sheffield, said there was good evidence that nature had subtle ways of changing the sex ratio of a population in response to a variety of circumstances.

However, he said: "I would urge women to not to start starving themselves in order to try influence the sex of their baby.

"It has been observed in some animal studies that even small changes in female diet can affect the life long health of the offspring, so it is important that the mother has appropriate nutrition at the time of conception and throughout her pregnancy."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/7358384.stm

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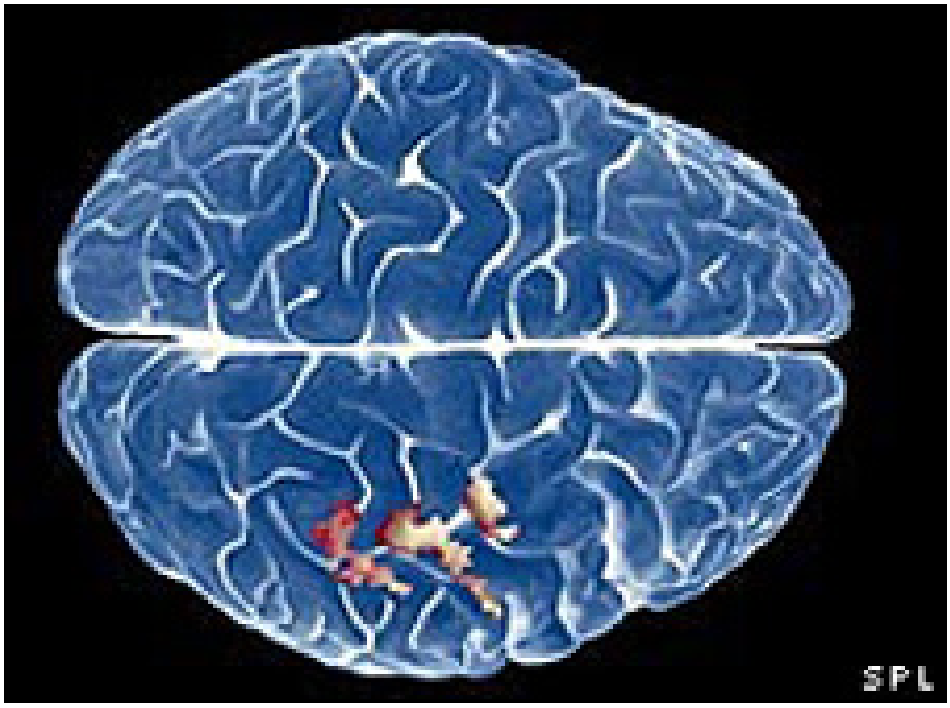
Dull jobs really do numb the mind

Boring jobs turn our mind to autopilot, say scientists - and it means we can seriously mess up some simple tasks.



Monotonous duties switch our brain to "rest mode", whether we like it or not, the researchers report in Proceedings of National Academy of Sciences.

They found mistakes can be predicted up to 30 seconds before we make them, by patterns in our brain activity.

The team hopes to design an early-warning brain monitor for pilots and others in "critical situations".

The scientists say the device would be particularly suitable for monotonous jobs where focus is hard to maintain - such as passport and immigration control.

Mistakes 'foreshadowed'

"We might be able to build a device (that could be placed) on the heads of people that makes these easy decisions," said Dr Eichele, of the University of Bergen, Norway.

"We can measure the signal and give feedback to the user that your brain is in the state where your decisions are not going to be the right one."

In the study, Dr Eichele and his colleagues asked participants to repeatedly perform a "flanker task" - an experiment in which individuals must quickly respond to visual clues.

As they did so, brain scans were performed using functional magnetic resonance imaging (fMRI).

They found the participants' mistakes were "foreshadowed" by a particular pattern of brain activity.

"To our surprise, up to 30 seconds before the mistake we could detect a distinct shift in activity," said Dr Stefan Debener, of Southampton University, UK.

"The brain begins to economise, by investing less effort to complete the same task.

"We see a reduction in activity in the prefrontal cortex. At the same time, we see an increase in activity in an area which is more active in states of rest, known as the Default Mode Network (DMN)."

Workplace safety

This is not a sign of the brain going to sleep, says Debener.

"Autopilot would be a better metaphor," he explains. "We can assume that the tendency to economise task performance leads to an inappropriate reduction of effort, thus causing errors."

Since this state begins about 30 seconds prior to a mistake being made, it could be possible to design an early-warning system that alerts people to be more focused or more careful, said the researchers.

That could significantly improve workplace safety and also improve performance in key tasks, such as driving, analysis of X-rays, or airport security screening.

But MRI scanners are neither portable enough nor fast enough to be practical for these real life scenarios, so the next step is to see if more mobile EEG devices are able to detect the phenomenon.

A prototype of a wireless, mobile, and lightweight EEG amplifier is currently in development and could be ready for the market in "10 to 15 years", says Dr Debener, who is based at the MRC Institute of Hearing Research, at Royal South Hants Hospital.

"But first, we must establish what is causing these mistakes," he adds.

"We do not know whether the change in brain activity we see has a causal link to the mistakes. After we establish that, we can try to develop monitoring devices."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/science/nature/7358863.stm

Published: 2008/04/22 11:17:24 GMT

Random art for a new age of egoists

Robert Fulford, National Post Published: Monday, April 21, 2008

Edmonton Art Gallery

William Burroughs, the author of Naked Lunch, was always glad to tell how his cut-up technique stimulated his thinking. He would slice through two unrelated books, down the middle of the page, then put the cut pages side by side and discover what wild ideas this random combination created. A fragment from, say, a 19th-century Italian novel would lead into a fragment from a guide to growing rhododendrons. No one, least of all Burroughs, knew what Burroughs would come up with next. Thus he produced novelish books that got him called, for some years, a genius.

Burroughs learned this system from an unknown Canadian artist and writer, Brion Gysin (1916-1986), who was born in England, brought up in Edmonton, and over five decades lived the drugged-out, hand-to-mouth, avant-garde life in Paris and North Africa. In recent years, Gysin and his work have been carefully analyzed in two books by John Geiger, a former National Post editor, now at the Globe and Mail - Chapel of Extreme Experience: A Short History of Stroboscopic Light and the Dream Machine (2002) and Nothing Is True, Everything Is Permitted: The Life of Brion Gysin (2005).

Now Gysin is at the centre of a new documentary, FLicKeR, by Nik Sheehan, which plays at the Hot Docs festival in Toronto tomorrow and Saturday and will later show up on television, on Bravo! first.

Gysin taught Burroughs randomness, which was already a part of visual art and experimental music. This was 45 years ago. It was the age of random music, random painting, and Burroughs added random writing. The idea was to elude the mind's inner censor, cast off the shackles of the protective ego, soar through the empyrean of imagination, and produce - art! It was fun, a treat for everybody except maybe the audience.

At the time, culture dealt in metaphor. Nobody had thought of selling an actual dead shark to a museum. Artists were still just depicting sharks. The idea was to represent and interpret reality rather than floating it, Damien Hirst-style, in a tank of formaldehyde. Literalness carried to the level of tomfoolery was only a distant dream. This week a German artist, Gregor Schneider, announced that he'll have someone arrange to die during his next installation; a clinic in Düsseldorf has promised to help him recruit a volunteer willing to expire in public, to show the beauty of death. Many will call Schneider an art-thought pioneer. His work will be shown at Dokumenta. Soon people will compete to die for art at the Venice Biennale.

A peak experience like that wasn't even a dream back in Gysin's day. His career strategies were, by comparison, humdrum. He wanted to become rich and famous by expanding imagination.

But unlike Damien Hirst, or even William Burroughs, he was no world beater. Burroughs and his pal Allen Ginsberg stumbled in a druggy daze from success to success. Even if money was short, people took them seriously.

Not Gysin. In his career, failure followed failure. This could have been the result of his personality (anger-management was not among his talents) or his self-intoxicated delusions. He believed himself the reincarnation of a notorious and evil wizard, the 10th-century King of the Assassins in Persia. Somehow this failed to make him popular.

In the 1930s, he became friends with the Surrealists in Paris and was chosen to show his paintings alongside those of Max Ernst, Picasso, Magritte, etc. But on the day of the exhibition's opening, he was abruptly exiled by the king of the Surrealists, André Breton, who ordered young Gysin's paintings taken down. For years afterward, that rejection shadowed his life. Easily hurt and often discouraged, Gysin attributed later failures to Breton's arbitrary decision.

In Tangier, around 1950, Gysin helped found a restaurant, The 1001 Nights. It was a success (he got to know one customer, Burroughs, very well), but he lost his piece of the business. Something about not getting the right signatures on the contract. Later, as a friend of Burroughs, Gysin wrote a movie script for Naked Lunch. Alas, it was never produced. He collaborated with Burroughs on a large manuscript. Unfortunately, it was never published. Gysin's most daring bid for success was a machine with a flickering strobe-like light that would bend the imagination in creative directions if you sat for a while in front of it with your eyes closed. Ideally, it would have an effect something like LSD, but without chemistry. That's why Sheehan calls his 75-minute film about it FLicKer. (Possibly Sheehan borrowed his capitalization policy from Sarah Jessica Parker's character in L.A. Story; she's named Sandy but writes SanDeE* on her palm, informing Steve Martin how to spell it.)

Before shooting the film, Sheehan commissioned his own dream machine, following designs developed by Gysin and his friend Ian Sommerville in 1961. It has a 100-watt light bulb, a motor and a cylinder with cut-out shapes that rotate, altering the random images the machine projects. Sheehan set it up for anyone he interviewed on film, so the documentary's viewers can see people with closed eyes experiencing various states of ecstasy or illumination as light flashes across their eyelids. At the end, no one seems altogether convinced that the thing works, except maybe Sheehan. He discovered that it made him see a flight of angels streaming toward him. Soon we understand that the machine isn't the point of this enterprise. FLicKer plays as a lively, well-shaped and often engrossing parade of freaks who knew or were influenced by Gysin, such as Marianne Faithful, Kenneth Anger, Iggy Pop and someone named Genesis P-Orridge, a transsexual of strong opinions and wild eyes, heavily ringed with kohl.

Burroughs thought the machine could "storm the citadels of enlightenment," but it never got manufactured and in the end joined the list of Gysin's might-have-beens. He consoled himself by claiming, "I enjoy inventing things out of fun. After all, life is a game, not a career." But Geiger has made sure that Gysin's not forgotten in the libraries. There, along with Geiger's books, you can find Back in No Time: The Brion Gysin Reader, published in 2001 by the Wesleyan University Press. Now Gysin and his fantasies, including even the one about the King of the Assassins, have been given their place in the history of documentary film.

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http://www.nationalpost.com:80/arts/story.html?id=461788

Herbicide-tolerant Crops Can Improve Water Quality

ScienceDaily (Apr. 23, 2008) — The residual herbicides commonly used in the production of corn and soybean are frequently detected in rivers, streams, and reservoirs at concentrations that exceed drinking water standards in areas where these crops are extensively grown. When these bodies of water are used as sources of drinking water this contamination can lead to increased treatment costs or a need to seek alternative sources of supply.

Additionally, these herbicides can have negative effects on aquatic ecosystems at concentrations well below their drinking water standards. When genetically modified, herbicide-tolerant, corn and soybean became commercially available in the 1990s it became possible to replace some of the problematic residual herbicides with strongly sorbed, short half-life, contact herbicides that may be more environmentally benign. By 2004 almost 90% of the soybean grown in the US was genetically modified for tolerance to the contact herbicide glyphosate (Roundup), which is currently the most widely used herbicide in the world.

In a four-year study, researchers at the USDA-ARS's North Appalachian Experimental Watershed near Coshocton, OH compared relative losses of both herbicide types when applied at normal rates to seven small watersheds planted with Liberty-Linked corn or Roundup Ready soybean. In their report, published in the March-April issue of the Journal of Environmental Quality, soil scientists Martin Shipitalo and Lloyd Owens, and agricultural engineer Rob Malone, noted that losses of contact herbicides in surface runoff were usually much less than those for the residual herbicides, as a percentage of the amount of herbicide applied.

Averaged for all soybean crop years, glyphosate loss was about one-seventh that of metribuzin and one half that of alachlor, residual herbicides it can replace. Similarly, average loss of the contact herbicide glufosinate (Liberty) was one-fourth that of atrazine, a residual corn herbicide it can replace.

More importantly, according to project leader Martin Shipitalo, "The concentrations of the contact herbicides in the runoff never exceeded their established or proposed drinking water standards while the residual herbicides frequently exceeded their standards, particularly in the first few runoff events after application". Concentrations of atrazine in runoff were up to 240 times greater than its drinking water standard while alachlor concentrations were up to 700 times greater than its standard. Conversely, the maximum glyphosate concentration noted was nearly four times less than its standard. Glufosinate currently has no established standard, but was only detected at low concentrations and was below its detection limit 80 days after application.

In light of increased economic incentives to grow more corn and soybean for biofuel production, these results suggest to farmers and the regulatory community that herbicide losses and concentrations in runoff can be reduced by planting herbicide-tolerant varieties of these crops and replacing some of the residual herbicides with the contact herbicides compared in this study.

The full article is available for no charge until May 30. View the abstract at http://jeq.scijournals.org/cgi/content/abstract/37/2/401.

http://www.sciencedaily.com /releases/2008/04/080422103853.htm

Link Between Ozone Air Pollution And Premature Death Confirmed

Los Angeles shrouded in brown smog, with blue sky above. (Credit: iStockphoto/Giuseppe Pons)

ScienceDaily (Apr. 23, 2008) — Short-term exposure to current levels of ozone in many areas is likely to contribute to premature deaths, says a new National Research Council report, which adds that the evidence is strong enough that the U.S. Environmental Protection Agency should include ozone-related mortality in health-benefit analyses related to future ozone standards.The committee that wrote the report was not asked to consider how evidence has been used by EPA to set ozone standards, including the new public health standard set by the agency in March.

Ozone, a key component of smog, can cause respiratory problems and other health effects. In addition, evidence of a relationship between short-term -- less than 24 hours -- exposure to ozone and mortality has been mounting, but interpretations of the evidence have differed, prompting EPA to request the Research Council report. In particular, the agency asked the committee to analyze the ozone-mortality link and assess methods for assigning a monetary value to lives saved for the health-benefits assessments.

Based on a review of recent research, the committee found that deaths related to ozone exposure are more likely among individuals with pre-existing diseases and other factors that could increase their susceptibility. However, premature deaths are not limited to people who are already within a few days of dying.

In addition, the committee examined research based on large population groups to find how changes in ozone air concentration could affect mortality, specifically to determine the existence of a threshold -- a concentration of ozone below which exposure poses no risk of death. The committee concluded that if a threshold exists, it is probably at a concentration below the current public health standard. As people have individual susceptibilities to ozone exposure, not everyone may experience an altered risk of death if ozone air concentration also changes. Further research should explore how personal thresholds may vary and the extent to which they depend on a person's frailty, the committee said.

The research on short-term exposure does not account for all ozone-related mortality, and the estimated risk of death may be greater than if based solely on these studies, the committee noted. To better understand all the possible connections between ozone and mortality, future research should address whether exposure for more than 24 hours and long-term exposure -- weeks to years -- are associated with mortality, including how ozone exposure could impact life expectancy. For example, deaths related to short-term exposure may not occur until several days afterward or may be associated with multiple short-term exposures.

Additionally, EPA should monitor ozone during the winter months when it is low and in communities with warmer and cooler winters to better understand seasonal and regional differences in risk. More research could also look at how other pollutants, such as airborne particulate matter, may affect ozone and mortality risk.

EPA, like other federal agencies, is required to carry out a cost-benefit analysis on mitigation actions that cost more than $100 million per year. EPA recently used the results of population studies to estimate the number of premature deaths that would be avoided by expected ozone reductions for different policy choices, and then assigned a monetary value to the avoided deaths by using the value of a statistical life (VSL).

The VSL is derived from studies of adults who indicate the "price" that they would be willing to pay -- i.e. what benefits or conveniences someone would be willing to forgo -- to change their risk of death in a given period by a small amount. The monetary value of the improved health outcome is based on the value the group places on receiving the health benefit; it is not the value selected by policymakers or experts.

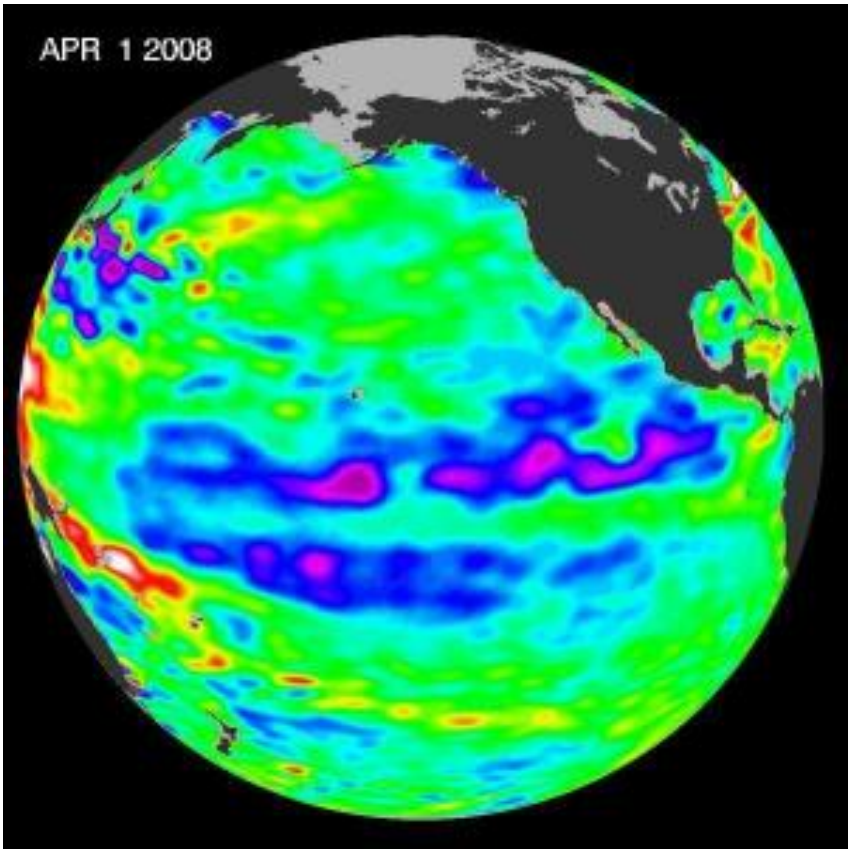
EPA applies the VSL to all lives saved regardless of the age or health status. For instance, a person who is 80 years old in poor health is estimated to have the same VSL as a healthy 2-year-old. To determine if an approach that accounts for differences in remaining life expectancy could be supported scientifically, EPA asked the committee to examine the value of extending life. For example, EPA could calculate VSL to estimate the value of remaining life, so a 2-year-old would have a higher VSL than an 80-year-old. It is plausible that people with shorter remaining life expectancy would be willing to devote fewer resources to reducing their risk of premature death than those with longer remaining life expectancy. In contrast, if the condition causing the shortened life expectancy could be improved and an acceptable quality of life can be preserved or restored, people may put a high value on extending life, even if they have other health impairments or are quite elderly.

The committee concluded that EPA should not adjust the VSL because current evidence is not sufficient to determine how the value might change according to differences in remaining life expectancy and health status. However, the committee did not reject the idea that such adjustments may be appropriate in the future. To move toward determining a value of remaining life, alternative approaches should be explored in sensitivity analyses, and further research should be conducted to answer the questions raised about the validity of EPA's current approach.

The study was sponsored by the U.S. Environmental Protection Agency. The National Academy of Sciences, National Academy of Engineering, Institute of Medicine, and National Research Council make up the National Academies. They are private, nonprofit institutions that provide science, technology, and health policy advice under a congressional charter. The Research Council is the principal operating agency of the National Academy of Sciences and the National Academy of Engineering.

http://www.sciencedaily.com:80 /releases/2008/04/080422135728.htm

Larger Pacific Climate Event Helps Current La Nina Linger



This La Niña is indicated by the blue area in the center of the image along the equator. Blue indicates lower than normal sea level (cold water). (Credit: NASA/JPL)

ScienceDaily (Apr. 22, 2008) — Boosted by the influence of a larger climate event in the Pacific, one of the strongest La Niñas in many years is slowly weakening but continues to blanket the Pacific Ocean near the equator, as shown by new sea-level height data collected by the U.S.-French Jason oceanographic satellite.

This La Niña, which has persisted for the past year, is indicated by the blue area in the center of the image along the equator. Blue indicates lower than normal sea level (cold water). The data were gathered in early April.

The image also shows that this La Niña is occurring within the context of a larger climate event, the early stages of a cool phase of the basin-wide Pacific Decadal Oscillation. The Pacific Decadal Oscillation is a long-term fluctuation of the Pacific Ocean that waxes and wanes between cool and warm phases approximately every five to 20 years. In the cool phase, higher than normal sea-surface heights caused by warm water form a horseshoe pattern that connects the north, west and southern Pacific, with cool water in the middle. During most of the 1980s and 1990s, the Pacific was locked in the oscillation's warm phase, during which these warm and cool regions are reversed. For an explanation of the Pacific Decadal Oscillation and its present state, see: http://jisao.washington.edu/pdo/ and http://www.esr.org/pdo_index.html .

A La Niña is essentially the opposite of an El Niño. During El Niño, trade winds weaken and warm water occupies the entire tropical Pacific Ocean. Heavy rains tied to the warm water move into the central Pacific Ocean and cause drought in Indonesia and Australia while altering the path of the atmospheric jet stream over North and South America. During La Niña, trade winds are stronger than normal. Cold water

that usually sits along the coast of South America is pushed to the middle of the equatorial Pacific. A La Niña changes global weather patterns and is associated with less moisture in the air, and less rain along the coasts of North and South America.

“This multi-year Pacific Decadal Oscillation 'cool' trend can intensify La Niña or diminish El Niño impacts around the Pacific basin," said Bill Patzert, an oceanographer and climatologist at NASA's Jet Propulsion Laboratory, Pasadena, Calif. "The persistence of this large-scale pattern tells us there is much more than an isolated La Niña occurring in the Pacific Ocean."

Sea surface temperature satellite data from the National Oceanic and Atmospheric Administration also clearly show a cool Pacific Decadal Oscillation pattern, as seen at: http://www.cdc.noaa.gov/map/images/sst/sst.anom.gif . The shift in the Pacific Decadal Oscillation, with its widespread Pacific Ocean temperature changes, will have significant implications for global climate. It can affect Pacific and Atlantic hurricane activity, droughts and flooding around the Pacific basin, marine ecosystems and global land temperature patterns.

“The comings and goings of El Niño, La Niña and the Pacific Decadal Oscillation are part of a longer, ongoing change in global climate,” said Josh Willis, a JPL oceanographer and climate scientist. Sea level rise and global warming due to increases in greenhouse gases can be strongly affected by large natural climate phenomenon such as the Pacific Decadal Oscillation and the El Nino-Southern Oscillation. “In fact,” said Willis, “these natural climate phenomena can sometimes hide global warming caused by human activities. Or they can have the opposite effect of accentuating it.”

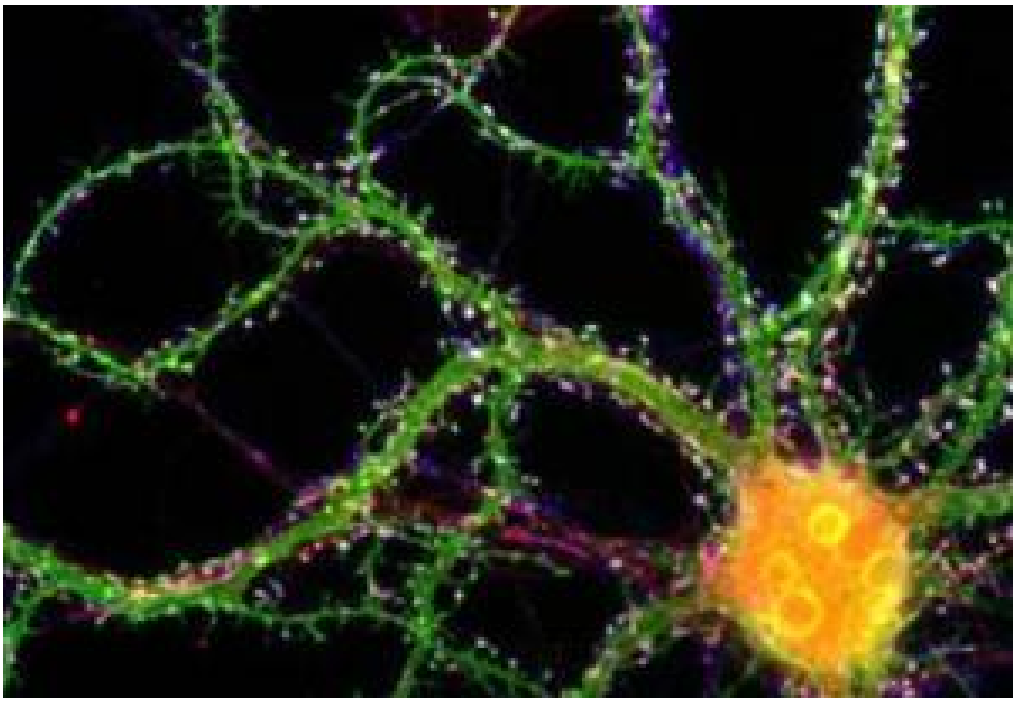
Jason's follow-on mission, the Ocean Surface Topography Mission/Jason-2, is scheduled for launch this June and will extend to two decades the continuous data record of sea surface heights begun by Topex/Poseidon in 1992. JPL manages the U.S. portion of the Jason mission for NASA's Science Mission Directorate, Washington, D.C.

For more information on NASA's ocean surface topography missions, see: http://sealevel.jpl.nasa.gov/ ; or to view the latest Jason data, visit: http://sealevel.jpl.nasa.gov/science/jason1-quick-look/ .

Adapted from materials provided by NASA/Jet Propulsion Laboratory.

http://www.sciencedaily.com:80 /releases/2008/04/080421195005.htm

Data Transfer In The Brain: Newfound Mechanism Enables Reliable Transmission Of Neuronal Information



Fluorescence image of a neuron labeled with three colors: a pre-synaptic marker (blue), a post-synaptic marker (red) and glutamate receptors (green). The white color at the tip of the dendritic spines indicates an accumulation of receptors. (Credit: Copyright Magali Mondin and Daniel Choquet / CNRS)

ScienceDaily (Apr. 22, 2008) — The receptors of neurotransmitters move very rapidly. This mobility plays an essential, and hitherto unsuspected, role in the passage of nerve impulses from one neuron to another, thus controlling the reliability of data transfer. This has recently been demonstrated by scientists in the "Physiologie cellulaire de la synapse" Laboratory (CNRS/Université Bordeaux 2) coordinated by Daniel Choquet, senior researcher at CNRS.

By enabling a clearer understanding of the mechanisms involved in neuronal transmissions, this work opens the way to new therapeutic targets for the neurological and psychiatric disorders that depend on poor neuronal communication (Parkinson's disease, Alzheimer's disease, OCD, etc.). Fruit of a collaboration with physicists in the Centre de physique moléculaire optique et hertzienne (CPMOH, CNRS/Université Bordeaux 1) and German and American research teams(1), these findings were published on April 11, 2008 in Science.

The processing of information by the brain is mainly based on the coding of data by variations in the frequency of neuronal activity."Good" communication thus implies the reliable transmission of this "code" by the connections between neurons, or synapses. Under normal circumstances, this junction comprises a pre-synaptic element from which the information arises, and a post-synaptic element which receives it.

It is at this point that neuronal communication occurs. Once the pre-synaptic neuron has been stimulated by an electrical signal with a precise frequency, it releases chemical messengers into the synapse: neurotransmitters. And the response is rapid! These neurotransmitters bind to specific receptors, thus provoking a change to the electrical activity of the post-synaptic neuron and hence the birth of a new signal.

The mobility of receptors controls the reliability of neuronal transmission. Working at the interface between physics and biology, the teams in Bordeaux led by Choquet, CNRS senior researcher in the "Physiologie cellulaire de la synapse"(2) laboratory, working in close collaboration with the group led by

Brahim Lounis at the Centre de physique moléculaire optique et hertzienne(2) have been studying synaptic transmission and, more particularly, the role of certain receptors of glutamate, a neurotransmitter present in 80% of neurons in the brain.

Focusing on the dynamics of these receptors, the researchers have revealed that a minor modification to their mobility has a major impact on high frequency synaptic transmission, i.e. at frequencies between 50 and 100 Hz (those which intervene during memorization, learning or sensory stimulation processes). More specifically, they have established that this mobility enables the replacement in a few milliseconds of desensitized receptors by "naïve" receptors in the synapse. This phenomenon reduces synaptic depression(3) and allows the neurons to transmit the information at a higher frequency. By contrast, if the receptors are immobilized, this depression is notably enhanced, preventing transmission of the nerve impulse in the synapses above around ten Hertz.

More profoundly, the scientists have demonstrated that prolonged series of high frequency stimulations, which induce an increase in calcium levels in the synapses, cause the immobilization of receptors. They have also proved that these series of stimulations diminish the ability of neurons to transmit an activity at high frequency. Receptor mobility is thus correlated with the frequency of synaptic transmission and consequently, the reliability of this transmission.

A real advance for research

When the brain is functioning under normal conditions, we can suppose that the immobilization of receptors following a series of high frequency stimulations constitutes a safety mechanism. It will prevent subsequent series from overexciting the post-synaptic neuron. A reliable transmission of information between two neurons is obviously crucial to satisfactory functioning of the brain.

These results, of prime importance, suggest that some dysfunctions of neuronal transmission are due to a defect in receptor stabilization. However, high frequency electrical stimulation of certain regions of the brain is used to treat Parkinson's disease or obsessive-compulsive disorders (OCD). Its mechanism of action, still poorly understood, may therefore involve receptor mobility. This work has thus made it possible to identify new therapeutic targets and could augur well for potential drugs to treat neurological and psychiatric disorders which often result from poor communication between neurons.

Notes

1. Teams at the Leibniz Institute, Magdeburg and Johns Hopkins University School of Medicine, Baltimore, USA.
2. CNRS/Université Bordeaux 2.
3. CPMOH, CNRS/Université Bordeaux 1.
4. When a pre-synaptic neuron is stimulated at very frequent intervals (high frequencies of around 50-100 Hertz), the post-synaptic response generally diminishes over time: this is called synaptic depression. The higher the stimulation frequency, the more this depression increases.

Journal reference: Surface Mobility of Post-synaptic AMPARs Tunes Synaptic Transmission. Martin Heine, Laurent Groc, Renato Frischknecht, Jean-Claude Béïque, Brahim Lounis, Gavin Rumbaugh, Richard L. Huganir, Laurent Cognet and Daniel Choquet. Science. 11 April 2008.

Adapted from materials provided by CNRS.

http://www.sciencedaily.com:80 /releases/2008/04/080416220639.htm

Ancient Buddhist Paintings From Bamiyan Were Made Of Oil, Hundreds Of Years Before Technique Was 'Invented' In Europe

A detail of a painting in the cave. (Credit: National Research Institute for Cultural Properties, Tokyo (Japan).)

ScienceDaily (Apr. 22, 2008) — The world was in shock when in 2001 the Talibans destroyed two ancient colossal Buddha statues in the Afghan region of Bamiyan. Behind those statues, there are caves decorated with precious paintings from 5th to 9th century A.D. The caves also suffered from Taliban destruction, as well as from a severe natural environment, but today they have become the source of a major discovery. Scientists have proved, thanks to experiments performed at the European Synchrotron Radiation Facility (ESRF), that the paintings were made of oil, hundreds of years before the technique was "invented" in Europe.

In many European history and art books, oil painting is said to have started in the 15th century in Europe. But scientists from the National Research Institute for Cultural Properties in Tokyo (Japan), the Centre of Research and Restoration of the French Museums-CNRS (France), the Getty Conservation Institute (United States) and the ESRF have recently identified drying oils in some of the samples they studied from the Bamiyan caves. Painted in the mid-7th century A.D., the murals show scenes with Buddhas in vermilion robes sitting cross-legged amid palm leaves and mythical creatures. The scientists discovered that 12 out of the 50 caves were painted with oil painting technique, using perhaps walnut and poppy seed drying oils.

A combination of synchrotron techniques such as infrared micro-spectroscopy, micro X-ray fluorescence, micro X-ray absorption spectroscopy or micro X-ray diffraction was crucial for the outcome of the work. "On one hand, the paintings are arranged as superposition of multiple layers, which can be very thin. The micrometric beam provided by synchrotron sources was hence essential to analyze separately each of these layers. On the other hand, these paintings are made with inorganic pigments mixed in organic binders, so we needed different techniques to get the full picture" Marine Cotte, a research scientist at CNRS and an ESRF scientific collaborator explains.

The results showed a high diversity of pigments as well as binders and the scientists identified original ingredients and alteration compounds. Apart from oil-based paint layers, some of the layers were made of natural resins, proteins, gums, and, in some cases, a resinous, varnish-like layer. Protein-based material can indicate the use of hide glue or egg. Within the various pigments, the scientists found a high use of lead whites. These lead carbonates were often used, since Antiquity up to modern times, not only in paintings but also in cosmetics as face whiteners.

"This is the earliest clear example of oil paintings in the world, although drying oils were already used by ancient Romans and Egyptians, but only as medicines and cosmetics", explains Yoko Taniguchi, leader of the team.

The paintings are probably the work of artists who traveled on the Silk Road, the ancient trade route between China, across Central Asia's desert to the West. However, there are very few studies about this region. "Due to political reasons research on paintings in Central Asia is scarce. We were fortunate to get the opportunity from UNESCO, as a part of conservation project for the World Heritage site Bamiyan, to study these samples and we hope that future research may provide deeper understanding of the painting techniques along the Silk Road and the Eurasian area", says Taniguchi.

The results were presented in a scientific conference in Japan last January and published April 22 in the peer-reviewed Journal of Analytical Atomic Spectrometry.

Adapted from materials provided by European Synchrotron Radiation Facility, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com:80 /releases/2008/04/080422083309.htm

Chemotherapy's Damage To The Brain Detailed

While it is increasingly acknowledged by the scientific community that many chemotherapy agents may have a negative impact on brain function in a subset of cancer patients, the precise mechanisms that underlie this dysfunction have not been identified. (Credit: iStockphoto/Vasiliy Yakobchuk)

ScienceDaily (Apr. 22, 2008) — A commonly used chemotherapy drug causes healthy brain cells to die off long after treatment has ended and may be one of the underlying biological causes of the cognitive side effects -- or "chemo brain" -- that many cancer patients experience. That is the conclusion of a study published today in the Journal of Biology.A team of researchers at the University of Rochester Medical Center (URMC) and Harvard Medical School have linked the widely used chemotherapy drug 5-fluorouracil (5-FU) to a progressing collapse of populations of stem cells and their progeny in the central nervous system.

"This study is the first model of a delayed degeneration syndrome that involves a global disruption of the myelin-forming cells that are essential for normal neuronal function," said Mark Noble, Ph.D., director of the University of Rochester Stem Cell and Regenerative Medicine Institute and senior author of the study. "Because of our growing knowledge of stem cells and their biology, we can now begin to understand and define the molecular mechanisms behind the cognitive difficulties that linger and worsen in a significant number of cancer patients."Cancer patients have long complained of neurological side effects such as short-term memory loss and, in extreme cases, seizures, vision loss, and even dementia. Until very recently, these cognitive side effects were often dismissed as the byproduct of fatigue, depression, and anxiety related to cancer diagnosis and treatment. Now a growing body of evidence has documented the scope of these conditions, collectively referred to as chemo brain. And while it is increasingly acknowledged by the scientific community that many chemotherapy agents may have a negative impact

on brain function in a subset of cancer patients, the precise mechanisms that underlie this dysfunction have not been identified.

Virtually all cancer survivors experience short-term memory loss and difficulty concentrating during and shortly after treatment. A study two years ago by researchers with the James P. Wilmot Cancer Center at the University of Rochester showed that upwards of 82% of breast cancer patients reported that they suffer from some form of cognitive impairment.While these effects tend to wear off over time, a subset of patients, particularly those who have been administered high doses of chemotherapy, begin to experience these cognitive side effects months or longer after treatment has ceased and the drugs have long since departed their systems. For example, a recent study estimates that somewhere between 15 and 20 percent of the nation's 2.4 million female breast cancer survivors have lingering cognitive problems years after treatment. Another study showed that 50 percent of women had not recovered their previous level of cognitive function one year after treatment.

Two years ago, Noble and his team showed that three common chemotherapy drugs used to treat a wide range of cancers were more toxic to healthy brain cells than the cancer cells they were intended to treat. While these experiments were among the first to establish a biological basis for the acute onset of chemo brain, they did not explain the lingering impact that many patients experience.The scientists conducted a similar series of experiments in which they exposed both individual cell populations and mice to doses of 5-fluorouracil (5-FU) in amounts comparable to those used in cancer patients. 5-FU is among a class of drugs called antimetabolites that block cell division and has been used in cancer treatment for more than 40 years. The drug, which is often administered in a "cocktail" with other chemotherapy drugs, is currently used to treat breast, ovarian, stomach, colon, pancreatic and other forms of cancer.

The researchers discovered that months after exposure, specific populations of cells in the central nervous -- oligodendrocytes and dividing precursor cells from which they are generated -- underwent such extensive damage that, after 6 months, these cells had all but disappeared in the mice.Oligodendrocytes play an important role in the central nervous system and are responsible for producing myelin, the fatty substance that, like insulation on electrical wires, coats nerve cells and enables signals between cells to be transmitted rapidly and efficiently. The myelin membranes are constantly being turned over, and without a healthy population of oligodendrocytes, the membranes cannot be renewed and eventually break down, resulting in a disruption of normal impulse transmission between nerve cells.

These findings parallel observations in studies of cancer survivors with cognitive difficulties. MRI scans of these patients' brains revealed a condition similar to leukoencephalopathy. This demyelination -- or the loss of white matter -- can be associated with multiple neurological problems."It is clear that, in some patients, chemotherapy appears to trigger a degenerative condition in the central nervous system," said Noble. "Because these treatments will clearly remain the standard of care for many years to come, it is critical that we understand their precise impact on the central nervous system, and then use this knowledge as the basis for discovering means of preventing such side effects."Noble points out that not all cancer patients experience these cognitive difficulties, and determining why some patients are more vulnerable may be an important step in developing new ways to prevent these side effects. Because of this study, researchers now have a model which, for the first time, allows scientists to begin to examine this condition in a systematic manner.

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Other investigators participating in the study include Ruolan Han, Ph.D., Yin M. Yang, M.D., Anne Luebke, Ph.D., Margot Mayer-Proschel, Ph.D., all with URMC, and Joerg Dietrich, M.D., Ph.D., formerly with URMC and now with Harvard Medical School. The study was funded by the National Institutes of Neurological Disorders and Stroke, the Komen Foundation for the Cure, and the Wilmot Cancer Center.

Adapted from materials provided by University of Rochester Medical Center.

http://www.sciencedaily.com:80 /releases/2008/04/080422103947.htm

Water Needed To Produce Various Types Of Energy

One 60-watt incandescent bulb may use up to 6,000 gallons of water a year. (Credit: Virginia Tech Photo)

ScienceDaily (Apr. 22, 2008) — It is easy to overlook that most of the energy we consume daily, such as electricity or natural gas, is produced with the help of a dwindling resource – fresh water. Virginia Tech professor Tamim Younos and undergraduate student Rachelle Hill are researching the water-efficiency of some of the most common energy sources and power generating methods.

Younos, associate director at the Virginia Water Resources Research Center based at Virginia Tech and research professor of water resources in the College of Natural Resources and undergraduate researcher Hill, of Round Hill, Va., majoring in environmental science and aquatic resource concentration, in the College of Agriculture and Life Sciences, have analyzed 11 types of energy sources, including coal, fuel ethanol, natural gas, and oil; and five power generating methods, including hydroelectric, fossil fuel thermoelectric, and nuclear methods.

Younos said they based their calculations on available governmental reports by using a standard measurement unit, which makes this study unique. “Our unit is gallons of water per British Thermal Unit (BTU),” explained Younos. “We selected BTU as a standard unit because it indicates pure energy as heat and is applicable to all energy production and power generation methods.”

According to the study, the most water-efficient energy sources are natural gas and synthetic fuels produced by coal gasification. The least water-efficient energy sources are fuel ethanol and biodiesel.

In terms of power generation, Younos and Hill have found that geothermal and hydroelectric energy types use the least amount of water, while nuclear plants use the most.

Hill took the study one step further and calculated how many gallons of water are required to burn one 60-watt incandescent light bulb for 12 hours a day, over the course of one year. She found that the bulb would consume between 3,000 and 6,000 gallons of water, depending on how water-efficient the power plant that supplies the electricity is.

Hill added that the results are estimates of the water consumption based on energy produced by fossil fuel thermoelectric plants, which produce most of the Unites State's power – about 53 percent. "The numbers are even more staggering if you multiply the water consumed by the same light bulb by the approximately 111 million U.S. homes," said Hill. "The water usage then gets as high as 655 billion gallons of water a year."

By contrast, burning a compact fluorescent bulb for the same amount of time would save about 2,000 to 4,000 gallons of water per year.

Younos noted that the results of this analysis should be interpreted with a grain of salt. "There are several variables such as geography and climate, technology type and efficiency, and accuracy of measurements that come into play. However, by standardizing the measurement unit, we have been able to obtain a unique snapshot of the water used to produce different kinds of energy."

Adapted from materials provided by Virginia Tech, via Newswise.

from http://www.sciencedaily.com:80 /releases/2008/04/080417173953.htm

Chemical In Plastic Bottles Raises Some Concern, According To New Report

Canada is now considering banning baby bottles containing bisphenol A, a chemical widely used in consumer plastic products. (Credit: iStockphoto/Kathryn Gruber)

ScienceDaily (Apr. 22, 2008) — Concern about the potential health effects of bisphenol A (BPA), a chemical widely used in consumer plastic products, is growing, following the release this week of a draft report from the US National Toxicology Program (NTP). That report says there's "some concern" about the potential negative health effects of BPA on infants and children and calls for more research to determine just what the risks of BPA exposure might be.

On Friday, the government of Canada said it would begin a 60-day public comment period on whether to ban baby bottles containing bisphenol A. And water bottle manufacturer Nalgene announced April 18 it would phase out use of BPA in its containers in response to public concern about the chemical.

The NTP report focuses primarily on the possible reproductive and developmental effects of BPA (such as changes in fertility, birth weight, and the development of certain brain regions), not on cancer. However it does note that in some animal studies, BPA has shown effects on breast and prostate tissue, as well as on how early puberty occurs. These effects could be linked to cancer, the report says, but the authors caution that there is not enough evidence to know whether BPA causes cancer -- in animals or in people.

The health effects of BPA are being studied because so many people are exposed to it on a daily basis. The chemical is widely used in plastic water and baby bottles, food packaging, compact discs, and other consumer products; plastics made with BPA usually have the number 7 on the bottom. One survey conducted by the US Centers for Disease Control and Prevention detected BPA in the urine of 93% of people age 6 years and older.

Most Studies in Animals, Not People

The effects on breast and prostate tissue were seen in baby rats. When pregnant rats were injected with BPA, their female pups showed breast tissue changes that some researchers suspected might eventually progress to breast cancer, and male pups showed prostate tissue changes that researchers thought might eventually lead to prostate cancer. Some studies also showed that female mice entered puberty earlier than normal. In humans, early puberty is linked to higher breast cancer risk.

However, the report is careful to explain that these animal results are difficult to apply to humans.

For one thing, the studies did not follow the pups long enough to see whether cancer actually developed. Another problem is that while people are primarily exposed to BPA through their diet, the rats and some of the mice were injected with BPA (some mice got oral doses). The different methods of exposure may affect how the body processes the chemical -- and therefore how BPA affects the body.

The report concludes that there is "some concern" about the adverse health effects of BPA in fetuses, infants and children. "Some concern" is the third level on a scale of 5; "negligible concern" is the lowest level, while "serious concern" is highest.

Even though the evidence isn't conclusive about BPA's link to cancer or other problems, Michael Thun, the American Cancer Society's vice president of Epidemiology and Surveillance Research, says limiting exposure is "prudent."

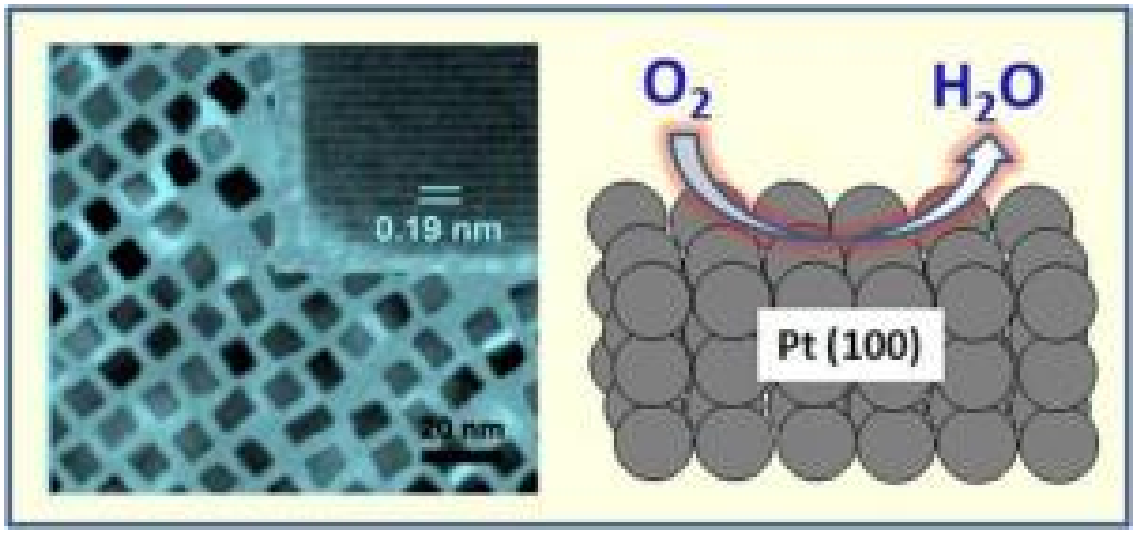
For those who are concerned about BPA exposure, the US National Institute of Environmental Health Sciences recommends these steps:

- Don't microwave polycarbonate plastic food containers. Polycarbonate is strong and durable, but over time it may break down from over use at high temperatures.
- Polycarbonate containers that contain BPA usually have a #7 on the bottom.
- Reduce your use of canned foods.
- When possible, opt for glass, porcelain or stainless steel containers, particularly for hot food or liquids.
- Use baby bottles that are BPA free.
- Citation: Draft NTP Brief on Bisphenol A [CAS No. 80-05-7]. Published April 14, 2008. Authored by the National Toxicology Program.

Adapted from materials provided by American Cancer Society.

from http://www.sciencedaily.com:80 /releases/2008/04/080422114734.htm

Platinum Nanocube Makes Hydrogen Fuel Cells Cheaper And More Efficient



Making a Platinum Nanocube. Transmission electron microscopy, far left, shows 7-nm. platinum nanocubes used for oxygen reduction reaction. In the upper right corner is a high-resolution picture of a single nanocube. The illustration depicts oxygen reduction on the surface of a nanocube. (Credit: Chao Wang/Brown University)

ScienceDaily (Apr. 22, 2008) — Two great obstacles to hydrogen-powered vehicles lie with fuel cells. Fuel cells, which like batteries produce electrical power through chemical reactions, have been plagued by their relatively low efficiency and high production costs. Scientists have tested a wide assortment of metals and materials to overcome the twin challenge.

Now a team led by Shouheng Sun, professor of chemistry at Brown, has mastered a Rubik's Cube-like dilemma for dealing with platinum, a precious metal coveted for its ability to boost a chemical reaction in fuel cells. The team shows that shaping platinum into a cube greatly enhances its efficiency in a phase of the fuel cell's operation known as oxygen reduction reaction. Sun's results have been published online in the journal Angewandte Chemie. The paper was selected as a Very Important Paper, a distinction reserved for less than 5 percent of manuscripts submitted to the peer-reviewed journal.

Platinum helps reduce the energy barrier – the amount of energy needed to start a reaction – in the oxidation phase of a fuel cell. It is also seen as beneficial on the other end of the fuel cell, known as the cathode. There, platinum has been shown to assist in oxygen reduction, a process in which electrons peeled from hydrogen atoms join with oxygen atoms to create electrical energy. The reaction also is important because it only produces water. This byproduct – rather than the global warming gas carbon dioxide – is a big reason why hydrogen fuel cells are a tantalizing area of research from automakers in Detroit to policy-makers in Washington.

Scientists, however, have had trouble maximizing platinum's potential in the oxygen reduction reaction. The barriers chiefly revolve around shape and surface area – geometry and geography, so to speak. What Sun has learned is that molding platinum into a cube on the nanoscale enhances its catalysis – that is, it boosts the rate of a chemical reaction.

"For the first time, we can control the morphology of the particle to make it more like a cube," Sun said. "People have had very limited control over this process before. Now we have shown it can be done uniformly and consistently."

During his experiments, Sun, along with Brown graduate engineering student Chao Wang and engineers from the Japanese firm Hitachi Maxwell Ltd., created polyhedron and cube shapes of different sizes by

adding platinum acetylacetonate ($Pt(acac)_2$) and a trace amount of iron pentacarbonyl ($Fe(CO)_5$) at specific temperature ranges. The team found that cubes were more efficient catalysts, owing largely to their surface structure and their resistance to being absorbed by the sulfate in the fuel cell solution.

“For this reaction, the shape is more important than the size,” Sun said.

The next step, Sun added, is to build a polymer electrolyte membrane fuel cell and test the platinum nanocubes as catalysts in it. The team expects the experiments will yield fuel cells with a higher electrical output than previous versions.

“It’s like science fiction, but we’re a step closer now to the reality of developing a very efficient platinum catalyst for hydrogen cars that produce only water as exhaust,” Sun said.

Hitachi Maxell chemical engineers Hideo Daimon, Taigo Ondera and Tetsunori Koda, a visiting engineer at Brown, contributed to the research.

The research was funded by the National Science Foundation and by the Office of the Vice President for Research at Brown University through its Research Seed Fund.

Adapted from materials provided by Brown University.

http://www.sciencedaily.com:80 /releases/2008/04/080418090427.htm

Arctic Ice More Vulnerable To Sunny Weather, New Study Shows

This June 7, 2007 NASA satellite image, taken under mostly cloud-free conditions, shows the beginning of last summer's Arctic sea ice melt. (Credit: NASA)

ScienceDaily (Apr. 22, 2008) — The shrinking expanse of Arctic sea ice is increasingly vulnerable to summer sunshine, new research concludes. The study, by scientists at the National Center for Atmospheric Research (NCAR) and Colorado State University (CSU), finds that unusually sunny weather contributed to last summer's record loss of Arctic ice, while similar weather conditions in past summers do not appear to have had comparable impacts.

The study, which draws on observations from instruments on a new group of NASA satellites known as the "A-Train," will be published tomorrow in Geophysical Research Letters. It was funded by NASA and the National Science Foundation, which is NCAR's principal sponsor.

"In a warmer world, the thinner sea ice is becoming increasingly sensitive to year-to-year variations in weather and cloud patterns," says NCAR's Jennifer Kay, the lead author. "A single unusually clear summer can now have a dramatic impact."

The findings indicate that summer sunshine in the Arctic produces more pronounced melting than in the past, largely because there is now less ice to reflect solar radiation back into space. As a result, the presence or absence of clouds now has greater implications for sea ice loss.

Satellite data offer clues to record-shattering 2007 melt

Last summer's loss of Arctic sea ice set a modern-day record, with the ice extent shrinking to a minimum of about 1.6 million square miles (4.1 million square kilometers) in September. That was 43 percent less ice coverage than in 1979, when accurate satellite observations began.

Looking at the first two years of data from radar and lidar on the A-Train satellites, Kay and her colleagues found that total summertime cloud cover in the Western Arctic was 16 percent less in 2007 than the year before. A strong high-pressure system centered north of Alaska kept skies relatively clear. Over a three-month period in the summer, the increased sunshine was strong enough to melt about a foot of surface ice. Over open water, it was sufficient to increase sea-surface temperatures by 4.3 degrees Fahrenheit (2.4 degrees Celsius). Warmer ocean waters can contribute to sea ice loss by melting the ice from the bottom, thereby thinning it and making it more susceptible to future melt.

"Satellite radar and lidar measurements allow us to observe Arctic clouds in a new way," says CSU scientist Tristan L'Ecuyer, a co-author of the study. "These new instruments not only provide a very precise view of where clouds exist but also tell us their height and thickness, which are key properties that determine the amount of sunlight clouds reflect back to space."

The research team also examined longer-term records of Arctic cloud and weather patterns, including a 62-year-long record of cloudiness from surface observations at Barrow, Alaska. They found that the 2007 weather and cloud pattern was unusual but not unprecedented. At Barrow, five other years--1968, 1971, 1976, 1977, and 1991--had less summertime cloud cover than 2007, but without the same impact on sea ice.

Summer feedback cycle

The research suggests that warmth from the Sun will increasingly affect Arctic sea ice loss in the summer. As the ice shrinks, incoming sunshine triggers a spiraling effect: the newly exposed dark ocean waters, much darker than the ice, absorb the Sun's radiation instead of reflecting it. This warms the water and melts more ice, which in turn leads to more absorption of radiation and still more warming.

"Our research indicates that the relative importance of solar radiation in the summer is changing," Kay says. "The sunshine reaching the Arctic is increasingly influential, as there is less ice to reflect it back into space. Dry, sunny conditions in a single summer can now act as a potent force to melt sea ice."

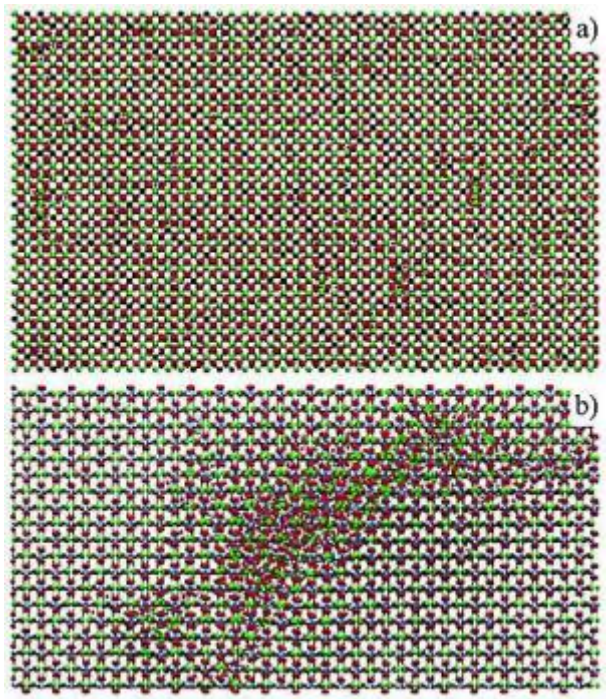
The authors note that, in addition to solar radiation, other factors such as changes in wind patterns and possibly shifts in ocean circulation patterns also influence sea ice loss. In particular, strong winds along regions of sea ice retreat were important to last year's loss of ice. The relative importance of these factors, and the precise extent to which global climate change is driving them, are not yet known.

Journal reference: Jennifer Kay, Tristan L'Ecuyer, Andrew Gettelman, Graeme Stephens, and Chris O'Dell. "Contribution of cloud and radiation anomalies to the 2007 Arctic sea ice extent minimum" *Geophysical Research Letters*.

Adapted from materials provided by National Center for Atmospheric Research/University Corporation for Atmospheric Research.

http://www.sciencedaily.com:80 /releases/2008/04/080421124230.htm

Self-healing Ceramic Modeled: Potentially Useful Material For Nuclear Waste Storage



In yttria-stabilized zirconia (top), the defects produced by radiation are few and far between, having less impact on the properties of the material. In zircon (bottom), the defects are clustered, which could compromise the material's integrity. (Credit: Image courtesy of DOE/Pacific Northwest National Laboratory)

ScienceDaily (Apr. 22, 2008) — A new computer simulation has revealed a self-healing behavior in a common ceramic that may lead to development of radiation-resistant materials for nuclear power plants and waste storage.

Researchers at the Department of Energy's Pacific Northwest National Laboratory found that the restless movement of oxygen atoms heals radiation-induced damage in the engineered ceramic yttria-stabilized zirconia.

Scientists Ram Devanathan and Bill Weber modeled how well that ceramic and other materials stand up to radiation. "If you want a material to withstand radiation over millennia, you can't expect it to just sit there and take it. There must be a mechanism for self-healing," said Devanathan.

"This research raises the possibility of engineering mobile defects in ceramics to enhance radiation tolerance," Weber said. He noted that materials capable of handling high-radiation doses also "could improve the durability of key equipment and reduce the costs of replacements."

The researchers approached their investigation in three steps. First, they analyzed yttria-stabilized zirconia, a compound of yttrium and zirconium oxides that contains random structural defects called "vacancies." The defects occur because yttrium has a smaller electrical charge than zirconium. To correct the charge imbalance, zirconia gives up oxygen atoms. But the loss of these oxygen atoms leaves empty oxygen sites. The remaining oxygen atoms constantly jump in and out of those sites.

"It is like a classroom full of fidgety kids," said Devanathan. "When the teacher turns her back, the kids constantly jump into empty chairs, leaving their own chairs vacant until another kid leaps into the seat."

Next, the scientists simulated an atom undergoing alpha decay. An alpha particle shoots out of the atomic nucleus with such force that the remainder of the atom recoils in the opposite direction. The recoiling atom can cause significant damage to surrounding atomic structures.

Finally, the researchers used data analysis algorithms developed at PNNL to look for atoms knocked out of place. The results showed that displaced oxygen atoms in the yttria-stabilized zirconia "found seats" in the pre-existing vacancies throughout the ceramic.

Although the self-healing activity does not completely repair the material, the defects are less apt to cause problems because they are spread out. This characteristic indicates that yttria-stabilized zirconia, which is used today in such items as solid oxide fuel cells and oxygen sensors, might be suitable for nuclear applications.

The researchers also simulated the impact of radiation on zircon, a ceramic that is a candidate for immobilizing high-level nuclear waste. The simulation defects clustered together in simulations of zircon, changing the properties of the material. "Clustered defects are much more difficult to repair than isolated defects, Devanathan said.

The scientists now are refining the simulations and applying them to other materials.

DOE's Office of Basic Energy Sciences funded the research, which was performed on massively parallel supercomputers in the William R. Wiley Environmental Molecular Sciences Laboratory (EMSL) at PNNL, and the National Energy Research Scientific Computer Center at Lawrence Berkeley National Laboratory.

Reference: Ram Devanathan and William J. Weber. "Dynamic annealing of defects in irradiated zirconia-based ceramics," published in the Journal of Materials Research, March 2008, 23(3):593-597.

Adapted from materials provided by DOE/Pacific Northwest National Laboratory.

http://www.sciencedaily.com:80 /releases/2008/04/080418141246.htm

Physical Grace, Propelled to a Higher Ground

By CLAUDIA LA ROCCO

If only every dance had a Christopher Antonio William Lancaster.

Mr. Lancaster, a cellist, is something of a fixture on the contemporary dance scene, and his mere presence, tuning his instrument in one corner of the stage before the show, is enough to make an audience lean forward in delighted anticipation.It may have a similar effect on choreographers, who often do their most muscular work in collaborations with him. So it was on Tuesday at Dance Theater Workshop, when the Sean Curran Company performed three pieces that concluded with the New York premiere of "Force of Circumstance." Mr. Lancaster's score, a richly layered construction employing looped samples, pockets of silence and cello as percussive accompaniment to itself, was a marvel. It elevated the choreography and the dancing. Mr. Curran, who does not perform in this program, is at that point in his career when the age gap between choreographer and company members begins to force certain choices about the older artist's place in his own vision. Working in collaboration with the dancers in "Force of Circumstance," Mr. Curran set robust skeins of movement against an elegiac tone. "You can do all of these incredible physical feats that I no longer attempt," he seemed to be saying, "But just wait: I know what lies ahead."Occasionally one of the six dancers would turn upstage and go still, in pregnant counterpoint to the aggressive diagonal trajectories or taut partnering work of the others. Joe Doran's often slanted lighting and Mr. Lancaster's surging, moody music were juxtaposed against the performers' tight black shorts and Technicolor mock turtlenecks. Everywhere, exuberant force met fraught contemplation.Juxtaposition was the name of the game again in the 2005 dance "Aria/Apology," whose score spliced Handel with Allan Bridge's "Apology Line," a set of recorded confessions concerning everything from rape and murder to youthful lies. Mr. Doran alternately suffused the stage in warm pinks and purples and shocked it with stark colorless light as Mr. Curran set formal, balletic modern dance for the aria sections against a more idiosyncratic language of gestures to match the often upsetting apologies.Was this classical art as escape, as balm? Mr. Curran didn't go far enough with his construct to pose any truly provocative questions, and the formulaic nature of the more formal sections soon grew tedious.The same was true for the work in progress "Fire Weather," a purgatory of sorts for the half-naked dancers who crawled and convulsed in desultory fashion. A stark Charles Wuorinen piano piece set the tone, perhaps too well — no percussive cello work here, and no choreography to make you sit up straight.*Performances continue through Saturday at Dance Theater Workshop, 219 West 19th Street, Chelsea; (212) 924-0077, dtw.org.*

http://www.nytimes.com/2008/04/24/arts/dance/24curr.html?ref=dance

Short breastfeeds 'best for baby'

Giving regular, short breastfeeds is more beneficial than the "baby-led" method, a British study suggests.

Allowing a baby to choose when it feeds, and for how long, is often recommended to new mothers.

A study of 63 mothers in Bradford found regular feeds of up to 10 minutes on each breast led to increased weight gain and a higher breastfeeding rate.

However, midwives said the method suggested in Archives of Disease in Childhood would not apply to everyone.

The World Health Organization recommends that babies are exclusively breastfed until they are six months old, but only around one in four UK mothers follows that advice.

Feeding gaps

The researchers, led by Dr Anne Walshaw, a GP, had noticed poor weight gain among breastfed babies after baby-led feeding became more common.

They set up a study at one Bradford GP practice of 63 mothers who exclusively breastfed their babies.

In general, baby-led feeding is best
Hilary English
National Childbirth Trust

Half were told to feed as and when the baby wanted to, and to offer the second breast only if the baby showed signs of still being hungry.

The rest were advised to feed their babies for a maximum of 10 minutes on each breast around every three hours during the day and, if necessary, at night.

The women in the second group were also told to leave at least two hours between feeds.

Fewer than half of the babies in the baby-led group were still breastfeeding after 12 weeks, compared with over three-quarters of those whose mothers followed the traditional method.

In addition, baby-led feeding and feeding for more than 10 minutes from the first breast, were both linked with poorer weight-gain in the first six to eight weeks of life.

The researchers say baby-led feeding disrupts the body's system for producing breast-milk.

A dose of a hormone called oxytocin is needed to trigger the "let-down reflex", which causes milk to travel from cells in the breast via ducts to the nipple.

But if babies stay on the breast for too long, this oxytocin production is disrupted.

The researchers also said if babies are not put onto the second breast, which will also be full of milk, at each feed, a protein is produced which stops further milk being made, disrupting the feeding process for hours and perhaps days.

'Baby will know'

Writing in Archives of Disease in Childhood, the team led by Dr Walshaw, said: "Babies feeding from both breasts at each feed receive more milk than babies feeding from one breast, and those feeding for shorter average lengths experience increased weight gain and other positive outcomes."

But Hilary English, a breastfeeding adviser for the National Childbirth Trust, said it was possible that limiting feeds to 10 minutes per side would reduce milk production and babies would be under-nourished.

"In general, baby-led feeding is best. A baby will know how much he or she needs."

And Janet Fyla, professional policy adviser for the Royal College of Midwives, said mothers should be guided by if their baby is growing well.

"You cannot generalise. A baby who is getting enough milk will feed for long enough and then come off," she said.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/7355094.stm

Published: 2008/04/19 23:19:37 GMT

Why Don't Modern Poems Rhyme, Etc.

Frequently asked questions about the business of verse.

By Robert Pinsky
POSTED THURSDAY, APRIL 17, 2008, AT 12:39 PM ET

1. Sometimes I see a poem in *Slate* or another magazine, and it doesn't do a thing for me. Half of the time I can't figure out what it means—what is that all about?

Generalizing won't do. We'd have to discuss a particular poem. At times prominent magazines publish things that aren't very good.

Magazines sometimes make me think of four lines the 18th-century actor David Garrick wrote as part of his poem praising poet Thomas Gray. About a certain kind of reader, Garrick wrote:

The gentle reader loves the gentle Muse.
That little dares, and little means;
Who humbly sips her learning from Reviews,
Or flutters in the Magazines.

2. Isn't so-called "free verse" just prose chopped into lines?

Read the following aloud, listening to the vowels and consonants, the sentence movements:

William Carlos Williams, "Fine Work With Pitch and Copper"

Now they are resting
in the fleckless light
separately in unison

like the sacks
of sifted stone stacked
regularly by twos

about the flat roof
ready after lunch
to be opened and strewn

The copper in eight
foot strips has been
beaten lengthwise

down the center at right
angles and lies ready
to edge the coping

One still chewing
picks up a copper strip
and runs his eye along it

Wallace Stevens, "The Snow Man"

3. How come modern poets don't write in rhyme?

Read the following aloud, listening to the vowels and consonants, the sentence movements:

Thom Gunn, "Still Life"

I shall not soon forget
The greyish-yellow skin
To which the face had set:
Lids tight: nothing of his,
No tremor from within,
Played on the surfaces.

He still found breath, and yet
It was an obscure knack.
I shall not soon forget
The angle of his head,
Arrested and reared back
On the crisp field of bed,

Back from what he could neither
Accept, as one opposed,
Nor, as a life-long breather,
Consentingly let go,
The tube his mouth enclosed
In an astonished O.

Thom Gunn, "The Reassurance"

About ten days or so
After we saw you dead
You came back in a dream.
I'm all right now you said.

And it was you, although
You were fleshed out again:
You hugged us all round then,
And gave your welcoming beam.

How like you to be kind,
Seeking to reassure.
And, yes, how like my mind
To make itself secure.

4. How come *real* poetry—in our great-grandparents' time or, anyway, some other long-ago time—was easy to understand *and* great?

Do you mean like this?

Emily Dickinson, "I tie my Hat—I crease my Shawl"

I tie my Hat—I crease my Shawl—
Life's little duties do—precisely—
As the very least
Were infinite—to me—

I put new Blossoms in the Glass—
And throw the old—away—
I push a petal from my Gown
That anchored there—I weigh
The time-twill be till six o'clock
I have so much to do—
And yet—Existence—some way back—
Stopped—struck—my ticking—through—
We cannot put Ourself away
As a completed Man
Or Woman—When the Errand's done
We came to Flesh—upon—
There may be—Miles on Miles of Nought—
Of Action—sicker far—
To simulate—is stinging work—
To cover what we are
From Science—and from Surgery—
Too Telescopic Eyes
To beat on us unshaded—
For their—sake—not for Ours—
'Twould start them—
We—could tremble—
But since we got a Bomb—
And held it in our Bosom—
Nay—Hold it—it is calm—
Therefore—we do life's labor—
Though life's Reward—be done—
With scrupulous exactness—
To hold our Senses—on—

Or do you mean like this?

Edgar Guest, "Home"

It takes a heap o' livin' in a house t' make it home,
A heap o' sun an' shadder, an' ye sometimes have t' roam
Afore ye really 'preciate the things ye lef' behind,
An' hunger fer 'em somehow, with 'em allus on yer mind.
It don't make any differunce how rich ye get t' be,
How much yer chairs an' tables cost, how great yer luxury;
It ain't home t' ye, though it be the palace of a king,
Until somehow yer soul is sort o' wrapped round everything.

Home ain't a place that gold can buy or get up in a minute;
Afore it's home there's got t' be a heap o' livin' in it;
Within the walls there's got t' be some babies born, and then
Right there ye've got t' bring 'em up t' women good, an' men;
And gradjerly as time goes on, ye find ye wouldn't part
With anything they ever used—they've grown into yer heart:
The old high chairs, the playthings, too, the little shoes they wore
Ye hoard; an' if ye could ye'd keep the thumb-marks on the door.

Ye've got t' weep t' make it home, ye've got t' sit an' sigh
An' watch beside a loved one's bed, an' know that Death is nigh;
An' in the stillness o' the night t' see Death's angel come,
An' close the eyes o' her that smiled, an' leave her sweet voice dumb.
Fer these are scenes that grip the heart, an' when yer tears are dried,

Ye find the home is dearer than it was, an' sanctified;
An' tuggin' at ye always are the pleasant memories
o' her that was an' is no more—ye can't escape from these.

Ye've got t' sing an' dance fer years, ye've got t' romp an' play,
An' learn t' love the things ye have by usin' 'em each day;
Even the roses 'round the porch must blossom year by year
Afore they 'come a part o' ye, suggestin' someone dear
Who used t' love 'em long ago, an' trained 'em jes t' run
The way they do, so's they would get the early mornin' sun;
Ye've got t' love each brick an' stone from cellar up t' dome:
It takes a heap o' livin' in a house t' make it home.

5. Who is Edgar Guest?

The most popular poet in American history. Sold a million copies when a million was a million; wrote a syndicated poem-a-day column; had his own radio show and even, for a while, his own TV show in the early days of that medium. Here's a poem by a poet more or less his contemporary, less popular than Guest was though more read today:

Marianne Moore, "Silence"

My father used to say,
"Superior people never make long visits,
have to be shown Longfellow's grave
or the glass flowers at Harvard.
Self-reliant like the cat—
that takes its prey to privacy,
the mouse's limp tail hanging like a shoelace from its mouth—
they sometimes enjoy solitude,
and can be robbed of speech
by speech which has delighted them.
The deepest feeling always shows itself in silence;
not in silence, but restraint."
Nor was he insincere in saying, "Make my house your inn."
Inns are not residences.

6. How come American poets don't write about politics or current events?

Read the following:

Allen Ginsberg, "America"

America I've given you all and now I'm nothing.
America two dollars and twentyseven cents January 17, 1956.
I can't stand my own mind.
America when will we end the human war?
Go fuck yourself with your atom bomb.
I don't feel good don't bother me.
I won't write my poem till I'm in my right mind.
America when will you be angelic?
When will you take off your clothes?
When will you look at yourself through the grave?
When will you be worthy of your million Trotskyites?
America why are your libraries full of tears?
America when will you send your eggs to India?

I'm sick of your insane demands.
When can I go into the supermarket and buy what I need with my
.....good looks?
America after all it is you and I who are perfect not the next world.
Your machinery is too much for me.
You made me want to be a saint.
There must be some other way to settle this argument.
Burroughs is in Tangiers I don't think he'll come back it's sinister.
Are you being sinister or is this some form of practical joke?
I'm trying to come to the point.
I refuse to give up my obsession.
America stop pushing I know what I'm doing.
America the plum blossoms are falling.
I haven't read the newspapers for months, everyday somebody goes
.....on trial for murder.
America I feel sentimental about the Wobblies.
America I used to be a communist when I was a kid I'm not sorry.
I smoke marijuana every chance I get.
I sit in my house for days on end and stare at the roses in the closet.
When I go to Chinatown I get drunk and never get laid.
My mind is made up there's going to be trouble.
You should have seen me reading Marx.
My psychoanalyst thinks I'm perfectly right.
I won't say the Lord's Prayer.
I have mystical visions and cosmic vibrations.
America I still haven't told you what you did to Uncle Max after he
.....came over from Russia.

I'm addressing you.
Are you going to let your emotional life be run by Time Magazine?
I'm obsessed by Time Magazine.
I read it every week.
Its cover stares at me every time I slink past the corner candystore.
I read it in the basement of the Berkeley Public Library.
It's always telling me about responsibility. Businessmen are serious.
.....Movie producers are serious. Everybody's serious but me.
It occurs to me that I am America.
I am talking to myself again.

Asia is rising against me.
I haven't got a chinaman's chance.
I'd better consider my national resources.
My national resources consist of two joints of marijuana millions of
.....genitals an unpublishable private literature that jetplanes 1400
.....miles an hour and twentyfive-thousand mental institutions.
I say nothing about my prisons nor the millions of underprivileged who
live in my flowerpots under the light of five hundred suns.
I have abolished the whorehouses of France, Tangiers is the next
.....to go.
My ambition is to be President despite the fact that I'm a Catholic.

America how can I write a holy litany in your silly mood?
I will continue like Henry Ford my strophes are as individual as his
.....automobiles more so they're all different sexes.
America I will sell you strophes $2500 apiece $500 down on your
.....old strophe

America free Tom Mooney
America save the Spanish Loyalists
America Sacco & Vanzetti must not die
America I am the Scottsboro boys.
America when I was seven momma took me to Communist Cell
.....meetings they sold us garbanzos a handful per ticket a ticket
.....costs a nickel and the speeches were free everybody was
.....angelic and sentimental aboutthe workers it was all so sincere
.....you have no idea what a good thing the party was in 1835 Scott
.....Nearing was a grand old man a real mensch Mother Bloor the
.....Silk-strikers' Ewig-Weibliche made me cry I once saw the Yiddish
.....orator Israel Amter plain. Everybody must have been a spy.
America you don't really want to go to war.
America it's them bad Russians.
Them Russians them Russians and them Chinamen. And them
.....Russians.
The Russia wants to eat us alive. The Russia's power mad. She wants
.....to take our cars from out our garages.
Her wants to grab Chicago. Her needs a Red *Reader's Digest*. Her
.....wants our auto plants in Siberia. Him big bureaucracy running
.....our fillingstations.
That no good. Ugh. Him make Indians learn read. Him need big black
.....niggers. Hah. Her make us all work sixteen hours a day. Help.
America this is quite serious.
America this is the impression I get from looking in the television set.
America is this correct?
I'd better get right down to the job.
It's true I don't want to join the Army or turn lathes in precision parts
.....factories, I'm nearsighted and psychopathic anyway.
America I'm putting my queer shoulder to the wheel.

Robert Lowell, "Waking Early Sunday Morning"

Muriel Rukeyser, "Mearl Blankenship"

7. But what about living American poets—how come they don't write about politics or current events?

C.K. Williams, "Fear"

1.

At almost the very moment an exterminator's panel truck,
the blowup of a cockroach airbrushed on its side,
pulls up at a house across from our neighborhood park,
a battalion of transient grackles invades the picnic ground,

and the odd thought comes to me how much in their rich sheen,
their sheer abundance, their hunger without end, if I let them
they can seem akin to roaches; even their curt, coarse cry:
mightn't those subversive voices beneath us sound like that?

Roaches, though … Last year, our apartment house was overrun,
insecticides didn't work, there'd be roaches on our toothbrushes
.....and combs.
The widower downstairs—this is awful—who'd gone through

.....deportation
and the camps and was close to dying now and would sometimes
.....faint,

was found one morning lying wedged between his toilet and a wall,
naked, barely breathing, the entire surface of his skin alive
with the insolent, impervious brutes, who were no longer daunted
by the light, or us—the Samaritan neighbor had to scrape them off.

2.

Vermin, poison, atrocious death: what different resonance they have
in our age of suicide as armament, anthrax, resurrected pox.
Every other week brings new warnings, new false alarms;
it's hard to know how much to be afraid, or even how.
The second world war was barely over, in annihilated cities
children just my age still foraged for scraps of bread,

and we were being taught that our war would be nuclear,
that if we weren't incinerated, the flesh would rot from our bones.
By the time Kennedy and Khrushchev faced off over Cuba,
rockets primed and aimed, we were sick with it, insane.

And now these bewildering times, when those whose interest is
to consternate us hardly bother to conceal their purposes.
Yes, we have antagonists, and some of their grievances are just,
but is no one blameless, are we all to be combatants, prey?

3.

We have offended very grievously, and been most tyrannous,
wrote Coleridge, invasion imminent from radical France;
the wretched plead against us … then, *Father and God,*
spare us, he begged, as I suppose one day I will as well.

I still want to believe we'll cure the human heart, heal it
of its anxieties, and the mistrust and barbarousness they spawn,
but hasn't that metaphorical heart been slashed, dissected,
cauterized and slashed again, and has the carnage relented, ever?

Night nearly, the exterminator's gone, the park deserted,
the swings and slides my grandsons play on forsaken.
In the windows all around, the flicker of the television news:
more politics of terror; war, threats of war, war without end.

A half-chorus of grackles still ransacks the trash;
in their intricate iridescence they seem eerily otherworldly,
negative celestials, risen from some counter-realm to rescue us.
But now, scattering towards the deepening shadows, they go, too.

Frank Bidart, "To the Republic"

Ann Winters, "The Displaced of Capital"

8. Aren't a lot of contemporary song lyrics the real poetry of our time?

Read them aloud in your own voice, without the music, and see how they hold up compared with this:

Robert Hayden, "Those Winter Sundays"

Sundays too my father got up early
and put his clothes on in the blueblack cold,
then with cracked hands that ached
from labor in the weekday weather made
banked fires blaze. No one ever thanked him.

I'd wake and hear the cold splintering, breaking.
When the rooms were warm, he'd call,
and slowly I would rise and dress,
fearing the chronic angers of that house,

speaking indifferently to him,
who had driven out the cold
and polished my good shoes as well.
What did I know, what did I know
of love's austere and lonely offices?

Or this:

Jack Gilbert, "Measuring the Tyger"

Or this:

Yusuf Komunyakaa, "Facing It"

Or this:

Louise Bogan, "Several Voices Out of a Cloud"

9. Well, I like poetry that is amusing, that maybe makes me chuckle a little. I'd rather read something reassuring and light than something complicated or gloomy. Is that bad? Does that mean I am a jerk?

Yes.

Former Poet Laureate Robert Pinsky's latest book of poems is Jersey Rain*.*

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BOOKS

Young authors embrace the thought process

Leading a contemplative literary life isn't dead even in these hectic times, and here are three lively examples.

By Scott Timberg
Los Angeles Times Staff Writer

April 20, 2008

NEW YORK -- Is it possible to lead a dedicated literary life in the billionaire-filled, media-crazed New York of today? To be heedless of the material world as you burrow into novels and ideas the way the old Partisan Review gang did in the '40s and '50s, to come up with notions that rock the intellectual landscape? And if so, who exactly is still paying attention?

Those are questions three reasonably young men are asking now in much-awaited first novels that emerge over the next few weeks. Each novelist takes a very different position toward rendering literary life in a city where bohemian writers have been forced out by hedge-fund guys. And each co-edits a journal that is proud, almost defiant about its print status -- in a nation where the image has been replacing the word for at least half a century now, and even some well-funded publications are in free-fall.

Outside of a few college towns, perhaps, it's hard now to embrace the cerebral unapologetically without a sense of irony, of operating a bit out of time. But that didn't stop Keith Gessen and some Ivy League-educated friends from launching, in 2004, the ambitious and pugilistic journal n+1, which was greeted by some as a kind of knowing, intellectual stunt. "Oh, no," Gessen, who has heavy brows and a wide Russian mouth, said one recent evening. "It wasn't a joke."

That first issue was dedicated mostly to outlining what it opposed. "We were against the New Republic, we were against McSweeney's, we were against the war, we were against exercise," Gessen continued, sitting in a dive bar on the Upper West Side, where he once lived in an illegal sublet before decamping for Brooklyn, like most of the city's other literati. "And *to this day* we're against many things."

At this point he's kidding, but he's a serious guy: His journal is dedicated first and foremost, he said, to bringing "a fighting spirit" back to a conflict-averse literary culture.

The Moscow-born Gessen, 33, may be the end of the line, the last of the bold, hungry, text-based thinkers, a throwback to the heyday of Dissent, the quarterly at which he once toiled. His semi-autobiographical novel, "All the Sad Young Literary Men," came out last week to mostly strong reviews. His journal, meanwhile, takes what might be called the hard-line position on intellectual life: We don't need more creativity, it says, we need more rigorous argument and political commitment. With Nathaniel Rich, a Paris Review editor whose surreal novel, "The Mayor's Tongue," came out last week, and Ed Park, the Believer co-founder and author of the upcoming "Personal Days," which takes the glamour entirely out of the world of literary journalism, Gessen shows the pleasures and perils of taking ideas seriously in a city attuned more to Dow Jones than Irving Howe.

Greenwich's golden era

"It was like Paris in the twenties, with the difference that it was our city," critic Anatole Broyard wrote in "Kafka Was the Rage," his memoir of post-World War II Greenwich Village. "The Village was charming, shabby, intimate, accessible, almost like a street fair. We lived in the bars and on the benches of Washington Square. We shared the adventure of trying to be, starting to be, writers or painters."

These were also the days when the brilliant young sons -- and much more rarely, daughters -- of immigrants from the *shtetl* rolled up their sleeves and developed a brand of criticism both modern and vital. It was a tonic to the genteel tradition that held sway in the academy.

As the title of Alfred Kazin's 1995 recollection had it, "Writing Was Everything." Literature and ideas were akin to religion.

But that was a long time ago. "I always kind of cringe when I hear people talk about literary things as if they're separate from everyday life," said Rich, who's also interested in old movies and indie rock. "Some specialized, rarefied region of the mind or something."

Park, Gessen and Rich -- who as editors and novelists serve as gatekeepers and creators simultaneously -- show how the idea of the New York Intellectual has fragmented.

Rich, who wears blazers and has a mop of dark hair and delicate features that make him seem almost elfin, has the smooth manner of someone born into a tradition and trying not to take unfair advantage. (He's the Dalton-and-Yale-educated son of New York Times columnist Frank Rich.) He's the intellectual as gentleman: Rich spent a full five years writing his novel before telling anyone but his closest friends.

"I didn't want to be the guy at the party," he said from an airy TriBeCa cafe near his office, "where everyone was saying, 'When's Nat's novel coming out?' " He'd rather talk about his favorite obscure writers -- the cynical and obsessive but also compassionate Italo Svevo, the wildly comic Irishman Flann O'Brien -- or the hills of Italy, than discuss himself.

Park is the eldest of the three at 37 but also the one with the most contemporary sensibility: He's a fan of postmodern authors and what he calls "the outer edge of realism," especially slipstream -- fiction that blends literary ambition with genres like horror and fantasy. (He also writes a monthly science-fiction column, called Astral Weeks, for latimes.com.)

While many people live around the world and draw their paychecks from New York -- still the nation's financial capital -- Park lives the reverse: His day job is with the Poetry Foundation in Chicago, which he visits several times a month. The Believer, which he co-edits, is based in San Francisco.

A literary celebrity in an old-school way, Gessen is well enough known in the New York media world -- he broke into the New York Review of Books while still in his 20s -- that his novel went through the entire cycle of hype and backlash before publication. The media blog Gawker has been rather unhealthily obsessed with him and his co-conspirator, novelist Benjamin Kunkel, describing Gessen as having "the soulful looks of a Greenwich Village bohemian and the oh-so-erotic arrogance of a Russian-Jewish intellectual." The site chronicles his love life as though he were George Clooney, not a largely untested writer who spends most of his days hunched over a computer.

Inside the literary media swirl these days, the books can seem beside the point. Does literature retain any of that old prestige? Rich, for his part, takes a pragmatic approach.

"I think there are more people engaged with literature than there ever have been," he said. "When people think about the golden age of the novel in the 19th century, literacy rates were absurdly low. There wasn't electricity to read by: People weren't just sitting around reading all day then either."

Rich may be living a charmed life in a sense: Despite some post-college drift, he managed to intern at the New York Review of Books, live in San Francisco and write a book on the city's noir cinema, all before his 25th birthday. His time at the Paris Review, which he joined in June 2005, has coincided with a renaissance of the quarterly under editor Philip Gourevitch, with circulation now at 16,000, exceeding its early '60s apogee. He's come by his optimism honestly.

Is it becoming more difficult, with the incredible cost of living, to live the life of the mind? "I don't really know what it means to live the life of the mind," Rich said."It's becoming a lot more difficult to live in *Manhattan*. The things that were great about New York are still here, they're just in different places."

Finding his own voice

For a sense of a spell that's broken, talk to Ed Park, whose novel comes out at the end of May. With his rumpled-preppy dress and pointy glasses, Park, sitting at an eatery near his West 95th Street apartment, could be one of the geek-chic protagonists in Adrian Tomine's "Optic Nerve" comic. Inspired more by the hip taste and fanboy ethos of the alternative press than the intellectually striving postwar "little magazine," he worships Philip K. Dick instead of Philip Rahv.

In the years after he started at the Village Voice in 1995 -- first as a copy editor -- he thrived on the paper's cerebral and politically progressive tone. But as he rose through the ranks over a decade, eventually heading the Voice Literary Supplement, things turned dour.

"Whatever romantic view I had of what I was doing," he said of the period around '05, "I started to see it was all driven by money and profit."

"Personal Days," much of which he wrote right before and after being fired by the paper's new owners, New Times Media, in 2006, looks at the curdling of that young writer's dream: We see the hyper-intellectual workplace of the Voice -- never identified as such -- with all its literary or political idealism burned off. With its gossip and minutiae, elevator flirtations, Orwellian e-mails and looming layoffs, it could be the Dunder-Mifflin paper mill of television's "The Office" -- the Village as Scranton, Penn.

"I never say what they do," he said of the office's employees. "I wanted it to stay focused on the universal workplace environment and interactions. Everybody knows what an office is like."

But Park also burns, in his gently obsessive and sometimes tongue-tied way, with a bit of Rich's optimism. In 2003, as things were going from bad to worse at the Voice, he and some of the McSweeney's crew started the Believer, an impassioned and sometimes precious magazine that, with its retro typefaces and eccentric illustrations, seemed to revel self-consciously in its identity as printed matter.

"It was an interesting year to launch a print magazine," Park said. "It's really something you can't get on the Web. The beauty of each issue isn't simply cosmetic -- a 'cool design'; the attractiveness also has to do with a marriage of form and function."

Under the radar

The old office for n+1 -- which, notwithstanding its detractors, has also been hailed as the most important new journal in decades -- sat in what Gessen called a "dank dungeon" in the no-man's land between SoHo and the Lower East Side. Staffers would descend for entire days at a time to write, edit and think deep thoughts.

"In the time we were there," Gessen recalled, "all these clubs opened up. We would sort of emerge from the office on a Friday night, and there would be velvet ropes . . . people in line, drinking."

It was a startling way to end a day spent contemplating the Frankfurt School. But n+1's soldiers were undaunted.

"With n+1, there was a time when people thought we were kidding: 'This is just a way of drawing attention to themselves.' But we weren't kidding. About two years ago, when we were putting out Issue 5, people really started hating us a lot. Because it really became clear that we were not kidding."

The journal, which has since moved, to Brooklyn, is often seen as a manifesto of elitist, male-centered high culture, living off the fumes from bound copies of Dissent. Gessen admits he and the gang were

"perhaps too conscious" of their forebears.

But his war against mediocrity and for seriousness in writing and thought, he insists, does not require living in the past. "I think it's very much a living culture," he said over his Brooklyn ale. "There are a lot of people who really share these values, who were raised on this literature but who have talked themselves out of it."

It's what drove an attack on the website Gawker in the latest issue.

"These are people who were raised on print culture, everything they know they know from print culture, who now say, *'Those values are dead*. You and I,' they say, 'believe in them, but those people *out there* do not.' And I'm telling you, they do! There are a lot of people who believe in this stuff, and they don't think it's a joke. They don't think the only way literature can survive is as this whimsical plaything of the upper class, which is frankly what McSweeney's is doing."

He's aware of the threats, the problems in publishing and elsewhere: Gessen doesn't want insularity and chumminess to kill literature and ideas as they killed poetry, "where really nobody but poets read poetry." The forces antagonistic to intellectualism, he insisted, usually come from inside.

"It's a self-inflicting kind of thing: '*Only we* who are so privileged can indulge in this thing.' " He sees reasons for hope in Oprah Winfrey choosing Tolstoy's "Anna Karenina" for her book club, in the people from India and Turkey who want to write for n+1.

"For people from that part of the world," he said, "high culture is extremely democratic, it's not elitist! It costs $2 to buy a paperback classic; they're the cheapest things in the bookstore."

This struggle to engage with the world of ideas animates "All the Sad Young Literary Men." His model, he said, is Bellow, "who was able to make his intellectuals ridiculous at the same time" as he took their ideas seriously.

"This is where the humor of the book comes from, the collision of those ideas with the actual living world. 'How do I become part of this world I've been reading about?' It turns out that the process of wondering how you do it, is how you do it. . . . What I've witnessed happen is the people who stick to it, who believe in that, end up creating that culture -- either poorly or well. And the people who say, 'That culture doesn't exist anymore,' go off and do other things.

"But those people have always existed!" he said, really getting rolling. "Read Balzac! There have always been people who went off and did other things!"

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Keith Gessen will appear at Vroman's Books on April 28; Ed Park will appear at Book Soup on June 20; Nathaniel Rich appears at Skylight Books tonight.

http://www.calendarlive.com/books/cl-ca-firsts20apr20,0,1573800.story?track=rss

Where a 75-Story Tower Blends Right In

The "contextualists" have it all wrong: Jean Nouvel's beast is exactly what 53rd Street needs.

By Justin Davidson

- Published Apr 17, 2008

Why is it so much easier in New York to erect a dreary tower than a marvelous one? Hundreds of great gray glass blobs and mouse-colored moneymakers have gone up all over Manhattan in recent years with barely a shrug of protest. The conspiracy of ugliness has no opposition. Yet Jean Nouvel's spectacular, soul-strengthening design for a 75-story tower on West 53rd Street has gotten some neighbors high on parochial outrage. The community board urged that the proposal be rejected, and the crowd at a recent Landmarks Preservation Committee meeting reacted as if the architect had floated a plan to dump nuclear waste in Central Park. Such attacks may represent the opinions of a few malcontents with afternoon sunlight to protect, but the shrillest voices can have a disproportionate effect on a proposal, and this project's specialness makes it vulnerable.

Nouvel's design for a condo and hotel resting on three floors of new galleries for the Museum of Modern Art is an ecstatic reproach to Manhattan's regularity. It would be to the skyline what Broadway is to the street grid: an indispensable violation and a zagging flourish. This is no prim modernist shaft; as with Norman Foster's Hearst Tower, the structural supports push to the exterior, forming an eccentric exoskeleton. The Hearst building revels in rigor, wrapping itself in diamond shapes that could extend another eight floors without loosening its logic. Nouvel's tower, by contrast, narrows, slopes, and twists, reaching for one particular point in the sky. Its athletic, muscular contortions recall Daniel Libeskind's original concept for a 1,776-foot skyscraper at ground zero that would echo the Statue of Liberty's raised arm. No other high-rise in New York reaches its pinnacle with such kinetic precision.

Opponents complain that a 75-story building next door to the Museum of Modern Art would violate the area's integrity, which is not only a preposterous objection in midtown but also a constipated sense of context. Yes, 53 West 53rd will needle up from a side street, where very tall buildings are usually unwelcome. Yes, it will obscure views, cut light, strain sewers, and crowd subway lines and sidewalks. So have a zillion other new structures that aspire to nothing. Let's be honest: What would fit uncontroversially into the gap on West 53rd Street is something stubbier, squarer, and blander.

The phrase "out of scale," which is invoked to block tall buildings in low-rise areas, means one thing in the West Village and quite another here. To walk through midtown is to dwell at a subaqueous level, at the base of glass-and-steel reeds rising toward the sun. The tallest-seeming tower is usually the closest,

dwarfing loftier ones farther away. An accurate sense of scale in midtown depends on not actually being in midtown. The magic of the Empire State Building is best appreciated from miles away, where the eye can savor how proudly out of scale it is. This is an argument not for green-lighting every megatower but for acknowledging that the city has yet to reach its full height, and that to try to stop its growth spurts would be as hobbling as binding a child's feet. Nouvel's future landmark gets its height via air rights from two extant ones, St. Thomas Episcopal Church and the University Club, which is why Landmarks has a say. Yet preservation is about guiding the future more than it is about gripping the past, and it makes no sense to quash this plan in the expectation of a duller, more modest alternative.

In many ways, Nouvel's design is in fact craftily contextual. Wrapping around the American Folk Art Museum by Tod Williams and Billie Tsien to join Yoshio Taniguchi's expanded MoMA, the tower would complete a suite of early-21st-century designs, giving the block a period integrity that the future will want to protect. MoMA itself has gradually evolved on its way down 53rd Street, from the pearly 1939 building by Goodwin and Stone to Philip Johnson's small black wing, César Pelli's Museum Tower, and now Taniguchi's connective tissue. Believe it or not, the museum wants to expand again, and the new building would enclose its galleries in a rattan of huge tilting columns and skewed beams. The structure becomes a street-level conversation with the museum's previous incarnations. The sense of being at once enclosed and exposed intensifies on upper floors, with great glass walls slashed by startling trusses.

This is not MoMA's project: The museum has sold the lot to the developer, Hines. But its 2004 exhibit "Tall Buildings" did implicitly argue for Nouvel's brand of provocation. In that global anthology of radical height, the skyscraper took the form of a corkscrew, a pagoda, and a giant pretzel, leaving New Yorkers wondering why their city had surrendered its claim to galloping architectural fantasy. With this plan, Nouvel brings it back. Please, let it be built.

Find this article at:
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Bullies, Addicts and Losers: A Poet Loves Them All

By DWIGHT GARNER

SLEEPING IT OFF IN RAPID CITY

Poems, New and Selected

By August Kleinzahler

234 pages. Farrar, Straus & Giroux. $26.

A couple of years ago, writing in Poetry magazine, August Kleinzahler lighted a string of firecrackers under Garrison Keillor and his "Writer's Almanac" segments on National Public Radio.

Mr. Kleinzahler criticized the "anecdotal, wistful" poems Mr. Keillor often chooses to read — poems he summarized as "middle-aged creative writing instructor catching whiff of mortality in the countryside." Mr. Kleinzahler wasn't very nice about Mr. Keillor's "treacly baritone" either.

Ultimately Mr. Kleinzahler boiled his case against Mr. Keillor down to these three-and-a-half sentences: "Multivitamins are good for you. Exercise, fresh air, and sex are good for you. Fruit and vegetables are good for you. Poetry is not."

It makes a certain kind of sense, then, that Mr. Kleinzahler's career-spanning new book of poems, "Sleeping It Off in Rapid City," features on its cover a nighttime photograph of a White Castle hamburger franchise. Like White Castle's pint-size hamburgers, Mr. Kleinzahler's poems are of uncertain if not dubious nutritional value. And while there is nothing made-to-order about them, his poems arrive salty and hot; you'll want to devour them on your lap, with a stack of napkins to mop up the grease.

Mr. Kleinzahler is an American eccentric, a hard man to pin down. Born in New Jersey, he writes poems that have a pushy exuberance and an expert recall of that state's tougher schoolyards — of bullies with names like Stinky Phil and of "fire trucks and galoshes,/the taste of pencils and Louis Bocca's ear." And he writes with elegiac insight about life's losers, the people he calls "strange rangers," the addicted, insane or destitute.

Yet for all his gruffness and love of dive bars, he is no Bukowski. Mr. Kleinzahler, who has lived for several decades in San Francisco, writes most often in a strongly accented free verse that is among the most articulate and alive sounds American poetry is currently making. He plays effortlessly with forms, voices, registers. And his range of cultural reference — from Catullus to Custer, from Lorca to Eric Dolphy — is wide and artfully deployed. Rarely does high, learned poetic art sound this casual.

As "Sleeping It Off in Rapid City" demonstrates, you can find in Mr. Kleinzahler's verse echoes of poets as disparate as Frank O'Hara (the appraising eye and metropolitan ease), Jim Harrison (the life-affirming appetites), Tony Hoagland (the deft grasp of high culture and low) and Charles Simic (a certain satirical angularity, and attention paid to food and drink and their sorrows and delights).

It's easy to troll through any of Mr. Kleinzahler's books and pick out fresh, alert observations. (Flipping almost at random through this one I find: "Say, who among us does not care to be undressed?" and "If butter can't cure what ails you,/no cure is there to be found.") But beneath their surface charms, the reverberating subjects of nearly all of Mr. Kleinzahler's poems, particularly his later ones, are brute human longing and loneliness.

He writes often about travel, of people in transit, and in a poem called "San Francisco/New York," he suggests:

> What is more touching
> than a used-book store on Saturday night,
> dowdy clientele haunting the aisles:
> the girl with bad skin, the man with a tic,
> some chronic ass at the counter giving his art speech?

In another poem a man in an airplane drops "down through the clouds,/into the rain and old quarrels."

Mr. Kleinzahler's poems find their center of gravity at gut level, and often enough the longing in them is for a place at the table — any table. His hungry-man poems (about everything from steam-table Chinese food to good marinara sauce) can leave you famished. Others may make you a bit queasy. In a poem titled "Meat," he wonders:

> How much meat moves
> Into the city each night
> The decks of its bridges tremble
> In the liquefaction of sodium light
> And the moon a chemical orange

Sometimes the longing is comically sexual. Mr. Kleinzahler observes, in a poem called "Tanka-Toys: A Memoir":

> The wet stain her bathing suit left
> on the bench
> the shape of Bolivia,
> drying, drying into atolls
> Ursa Minor, a thumbprint.

Mr. Kleinzahler is no admirer of poets who write in "Nobel-ese" — that is, poets who specialize in delivering important-sounding poems about important-sounding themes. He rarely has this problem, although once in a while he has its opposite. When a Kleinzahler poem fails to lift off, it's usually because he is casual to a fault; his lesser work feels thin and adrift, wandering far from any distinct path. Still, his misses have more wit and feeling in them than many other poets' hits.

There's a moment in a poem called "Where Souls Go" in which a woman waits for the narrator and another man, and she is "trying/to have the best song on as we arrive." In "Sleeping It Off in Rapid City" the best song always seems to be on the turntable, with the D.J. shouting — as Mr. Kleinzahler does in one poem collected here — "Those aren't stars, darling/That's your nervous system."

http://www.nytimes.com/2008/04/24/books/24garn.html?_r=1&th=&oref=slogin&emc=th&pagewanted=print

What Audiences Haven't Seen Before

By ALASTAIR MACAULAY

SAN FRANCISCO — Novelty as cause for celebration! In ballet, an art so often stuffed with the same old chestnuts, it takes real courage to promote creativity rather than conservation. Diaghilev remains the exemplar here, but in this regard the United States has led the world for several decades. The concept of presenting a multiple-program bonanza of new choreography goes back to the 1972 Stravinsky Festival of New York City Ballet. That event included old works too, but its wealth of innovation became the stuff of legend. At least four of the new works choreographed then have gone into international ballet repertory.

One of that festival's dancers was Peter Martins, who now runs City Ballet. In 1988 he staged its American Music Festival along the same lines, and then, starting in 1992, he began a series of occasional, somewhat festival-like spring Diamond Projects, each of which has produced multiple new works within weeks. Another of those 1972 dancers was Helgi Tomasson. Since 1985 he has run San Francisco Ballet, which is now reaching the climax of its 75th-anniversary season by presenting a New Works Festival that bids to rival City Ballet in the new-choreography stakes.

Ten world premieres by 10 choreographers are occurring over three nights; some of the scores are commissioned, and these programs will continue for just over two weeks. Since the choreographers include Paul Taylor, Mark Morris, Christopher Wheeldon, James Kudelka, Jorma Elo, Stanton Welch and Yuri Possokhov, the season is automatically of national and international significance.

The festival began on Tuesday with a gala-type account of Program A (most of the audience was in evening dress): a triple bill of Mr. Possokhov's "Fusion," Mr. Wheeldon's "Within the Golden Hour" and Mr. Taylor's "Changes." "Fusion" and "Within the Golden Hour" feature handsome décors and costumes and are set to attractively interesting music; both show their creators extending their ranges and adding to their craft.

"Fusion" is an East-meets-West ballet. Set mainly to jazz-

related music by the British composer Graham Fitkin, but opening with Middle Eastern-sounding music composed by Rahul Dev Burman, as arranged by the Kronos Quartet, it includes four men dressed approximately as (sometimes whirling) dervishes; four women who might be modern odalisques; and four other men whose bare-armed look is more Western. Above, a row of small screens hang like flags; James L. Ingall's lighting changes them from orange to blue and back again. (At one point dervish movement is projected onto some of them.)

Though separate style ingredients are shown — the dervishes bend their thoraxes in and out like bellows; the women (on point) have jumps and positions with winged arms — this is, as the title indicates, a melting pot ballet. Both women and men even get to do, daffily, the same little pelvic wiggles. There are male-female pas de deux and single-sex group dances, but the emphasis is on flow, on overlap, on coexistence. It's not without structural intelligence, and all of it is mildly agreeable.

"Within the Golden Hour" shows from first to last that Mr. Wheeldon's gifts of construction are more complex and skilled: it's generally beautiful. The music, by the Italian composer Ezio Bosso, is an appealing series of strings-only numbers, sometimes featuring solo violin and viola, and in parts drawing on Baroque material (in the manner of Tippett's delectable "Fantasia Concertante on a Theme of Corelli"); the costumes are in sensuous shades of green, amber and blue (with women wearing dresses over tights of the same color).

Magpielike, Mr. Wheeldon includes — as he often has before — choreographic devices better known from a wide range of other dancemakers, including Mr. Taylor (perhaps for the first time) and, certainly, Frederick Ashton (a favorite Wheeldon source, especially in his American commissions). There are 14 dancers, used in various groups, arranged to frame and separate four distinct pas de deux. Of these, the second is for two men, bright, brisk and winning; sharing the same material; moving together but without physical contact.

In each of the three other duets, however, man partners woman. The focus, here as in other Wheeldon male-female pairings, is almost always on the lines and shapes shown by the woman, so that we may hardly realize that the guiding impulse comes as a rule from the man, who pushes or pulls, lifts and lowers, turns and steers her. Each duet successfully establishes and sustains its own different mood.

Though all the women (Katita Waldo, Sarah van Patten and Maria Kochetkova) are responsive and handsome, I couldn't help wishing, here as in previous pieces, that Mr. Wheeldon would allow even one of them some serious signs of independence. There are memorable lifts, but these tend to be ends in themselves, without real expressive integrity, dynamically shaped as if they should be applauded. The larger group dances are entirely well shaped, and the ending — everyone joining into a machinelike group that pulsates from side to side — is the work's masterstroke.

Because Mr. Possokhov and Mr. Wheeldon have evidently enriched their own lexicons and capabilities, I ought to applaud them here more than I do. For the same reason, perhaps I should applaud Mr. Taylor less than I do them, for there's hardly a jump or lift or pose in his new "Changes" that he hasn't often shown before. Unlike "Within the Golden Hour," "Changes" doesn't end on a wow note but instead recapitulates its opening scene, as the curtain falls.

Yet “Changes” reminds me how, in 1988, Mr. Taylor’s contribution to City Ballet’s American Music Festival (“Danbury Mix”) was, brilliantly, set to the most imaginatively original of all American composers, Charles Ives, and so went to the heart of that festival’s idea. Likewise, “Changes” addresses a core era of San Francisco history: the 1960s. Danced to songs by the Mamas and the Papas, it recreates, in affectionate but near-cartoon terms, the nonconformist liberalism of Haight-Ashbury and the Berkeley campus.

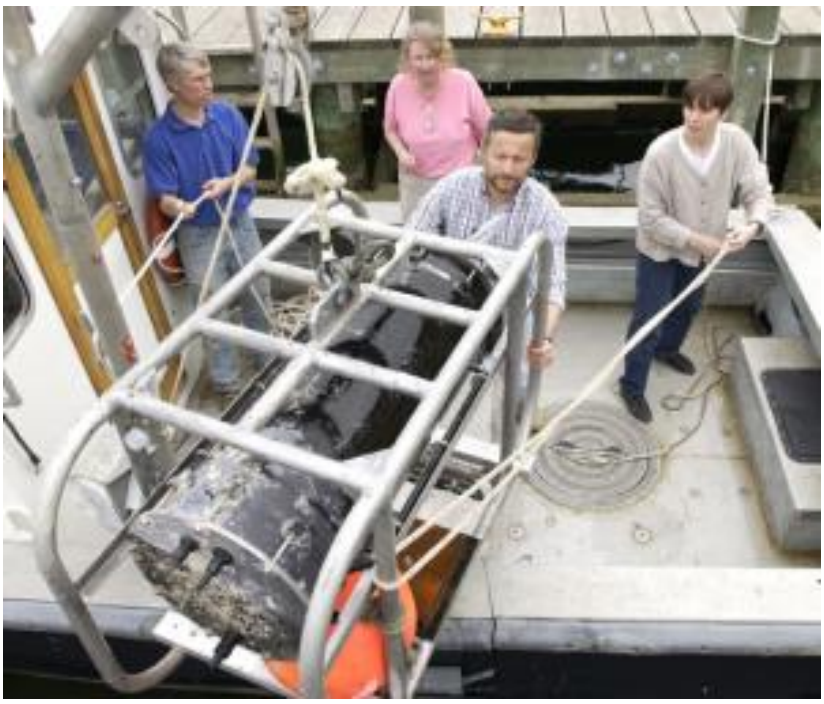
We see the haircuts, the fashions, the dances (the hitchhike, the mashed potato, the Watusi) of that era; we see the characters, the actions (dope-sharing is mimed), the vitality and the surprising innocence. Mr. Taylor, as is his wont in these circumstances, rehearsed it with his own company; his former star Patrick Corbin then taught it to 11 San Francisco dancers. And seldom if ever have any performers who were not Taylor specialists ever caught the features of the Taylor style so well, always using their weight and three-dimensional physicality to make the movement strong, always filling a phrase sharply against its music.

In “California Earthquake” Courtney Elizabeth is a wild and liberated star who keeps, literally, knocking a crowd dead. In “I Call Your Name” Pauli Magierek dances radiantly with four men who lift her, upend her but always show that she is queen bee. Aaron Orza and Benjamin Stewart make “Dancing Bear” a work of childish dreams and adult protectiveness. And in “California Dreams” the ensemble surges, rotates and throbs in a joyously mixed paean. Forty years on Mr. Taylor’s “Changes” has given San Francisco images of itself in the 1960s, the very time when it seemed to change world culture.

The New Works Festival continues through May 6 at the War Memorial Opera House, San Francisco; (415) 865-2000, sfballet.org.

http://www.nytimes.com/2008/04/24/arts/dance/24tayl.html?ref=dance

Underwater Microscope Helps Prevent Shellfish Poisoning Along Gulf Coast Of Texas



Researchers lower the FlowCytobot onto the WHOI research vessel Mytilus. (Credit: Photo by Tom Kleindinst, Woods Hole Oceanographic Institution)

ScienceDaily (Apr. 16, 2008) — Through the use of an automated, underwater cell analyzer developed at the Woods Hole Oceanographic Institution (WHOI), researchers and coastal managers were recently able to detect a bloom of harmful marine algae in the Gulf of Mexico and prevent human consumption of tainted shellfish.Shellfish beds in parts of Texas have been closed since mid-March, and are expected to re-open in mid-April.

Working with Rob Olson and Heidi Sosik—plankton biologists and instrument developers at WHOI—biological oceanographer Lisa Campbell of Texas A&M University used their "Imaging FlowCytobot" instrument to detect a substantial increase in the abundance of the algae Dinophysis acuminata in the waters of Port Aransas, Texas.Dinophysis acuminata produces okadaic acid, a toxin that accumulates in shellfish tissues and can cause diarrhetic shellfish poisoning (DSP) in humans. DSP is not life-threatening, but symptoms include nausea, cramping, vomiting, and diarrhea. Cooking does not destroy the toxin in the shellfish.

The Imaging FlowCytobot, which is automated and submersible, counts microscopic plants in the water and photographs them. The images and data are relayed back to a shore-based laboratory, where specially developed software automatically classifies the plankton into taxonomic groups."It is very satisfying to find that a technology we developed as a research tool can be so effective for protecting human health," said Olson, who has worked with Sosik for several years to prototype and modify flow cytometers, which are more typically used in many biological and medical laboratories.

"We designed the Imaging FlowCytobot for continuous monitoring of a wide range of plankton, and that turns out to be just what was needed to detect a harmful algal bloom that no one expected."

The discovery of the Dinophysis bloom came while the researchers were actually looking for something else. Campbell, Olson, Sosik, and colleagues deployed the instrument in the fall of 2007 at the University of Texas Marine Sciences Institute laboratory in the Mission Bay Aransas National Estuarine Research Reserve.

Their principal goal was to observe Karenia brevis, another toxic alga that blooms periodically in the Gulf and can lead to neurotoxic shellfish poisoning. The research team would like to observe the next K. brevis bloom before it happens; such blooms are most common and most extreme in the Gulf of Mexico in the late summer and fall.The team is also working to catalog the types and relative abundances of marine plants in the area throughout the year.

In mid-February 2008, Campbell reviewed plankton images collected by the Imaging FlowCytobot and detected a substantial increase in the abundance of the dinoflagellate Dinophysis, which occurs naturally in ocean waters worldwide but not usually in harmful quantities.

“We have never before observed a bloom of Dinophysis acuminata at such levels in the Gulf of Mexico,” Campbell said.

After reporting the increase to fellow researchers in coastal Texas, Campbell and colleagues collected water samples to confirm that algal toxins were present in the water.

Other researchers collected oyster samples and sent them for toxin analysis at a U.S. Food and Drug Administration laboratory.

On March 8, the Texas Department of State Health Services closed Aransas, Corpus Christi, and Copano bays to shellfish harvesting and recalled Texas oysters, clams, and mussels that had been sold between March 1-7.

A week later, six other bays and estuaries along the coast were closed. As of April 11, most shellfishing areas had been re-opened, and the Aransas, Copano, and Corpus Christi were expected to re-open in a matter of days.

The bloom and subsequent warnings occurred just days before the Fulton Oysterfest, a major shellfish festival in the region. At last report, no shellfish-related human illnesses have been reported in Texas this spring.

“This is exactly what an early warning system should be,” said Campbell. “It should detect a bloom before people get sick. So often, we don’t figure out that there is a bloom until people are ill, which is too late. The Imaging FlowCytobot has proven itself effective for providing an early warning.”

“With time, we have come to see that the instrument has obvious practical uses,” added Sosik. “It now appears ready to make the transition from basic research tool to operative tool."

Funding for Campbell’s monitoring program and construction of the instrument was provided by the National Oceanic and Atmospheric Administration’s Cooperative Institute for Coastal and Estuarine Environmental Technology (CICEET).

Funding for instrument development and earlier prototypes of the FlowCytobot and the Imaging Flow Cytobot was provided by WHOI—through its Ocean Life Institute, Coastal Ocean Institute, Bigelow Chair, and Access to the Sea Fund—and by the National Science Foundation.

The Woods Hole Oceanographic Institution is a private, independent organization in Falmouth, Mass., dedicated to marine research, engineering, and higher education. Established in 1930 on a recommendation from the National Academy of Sciences, its primary mission is to understand the oceans and their interaction with the Earth as a whole, and to communicate a basic understanding of the oceans' role in the changing global environment.

Adapted from materials provided by Woods Hole Oceanographic Institution.

from http://www.sciencedaily.com /releases/2008/04/080411150845.htm

Antioxidant Users Don't Live Longer, Analysis Of Studies Concludes

A new review of studies found no evidence that the nutrition supplements extend life. (Credit: iStockphoto/Marcela Barsse)

ScienceDaily (Apr. 16, 2008) — The vitamin industry has long touted antioxidants as a way to improve health by filling in gaps in diet, but a new review of studies found no evidence that the nutrition supplements extend life. Worse, the review authors said that some antioxidants could increase risk for death.

The reviewers want more regulation of the nutraceuticals industry, but an antioxidant researcher with the U.S. Department of Agriculture said that call for stricter monitoring overreaches the conclusions of the review.

The meta-analysis of 67 randomized studies found that supplemental antioxidants do not reduce mortality and that some -- including vitamin A, beta-carotene and vitamin E -- could increase mortality. The review combined evidence from more than 200,000 people.

"The harmful effects of antioxidant supplements are not confined to vitamin A," said review co-author Christian Gluud, M.D. "Our analyses also demonstrate rather convincingly that beta-carotene and vitamin E lead to increased mortality compared to placebo."

The review appears in a recent issue of The Cochrane Library, a publication of The Cochrane Collaboration, an international organization that evaluates medical research. Systematic reviews draw evidence-based conclusions about medical practice after considering both the content and quality of existing medical trials on a topic.

Most people do eat not enough fruits and vegetables to ensure an adequate intake of vital nutrients. However, it is unclear if supplementation can provide benefits akin to a healthy diet and if some antioxidants are, in fact, harmful. Antioxidants are nutrients such as vitamin E, vitamin C, or beta carotene that have been marketed as a way to counter the damaging effects of oxygen in the tissues.

The review included studies of healthy adults and adults diagnosed with specific, stable medical conditions. The authors excluded studies with children or pregnant women, or studies that evaluated supplements as treatment for acute diseases, such as malignant cancer. It also excluded studies that used supplements for replacement of nutrient deficits.

The review authors recommend greater regulation of antioxidant supplements and make a "plea for urgent political action," said Gluud, director of medical science, associate professor and department head of the Copenhagen Trial Unit at the Centre for Clinical Intervention Research and Copenhagen University Hospital in Denmark.

"We should request that the regulatory authorities dare to regulate the industry without being financially dependent on the very same industry," Gluud said.

However, nutrition science expert Jeffrey Blumberg, Ph.D., said the reviewers go too far in their recommendations for more stringent regulation of antioxidant supplements.

"I could find nowhere in this report any review of regulatory practices and effectiveness or the evaluation of public health policies, procedures or perspectives," Blumberg said.

Blumberg is director of the Antioxidants Research Laboratory at the USDA Human Nutrition Research Center on Aging and a professor with the Friedman School of Nutrition Science and Policy at Tufts University. He was not involved in the review.

A supplement-industry trade group questions both the review conclusions and the study selection process for the analysis.

"Four hundred five studies which showed no deaths were excluded from the meta-analysis, which if included, clearly would have altered the outcome of the meta-analysis," said Andrew Shao, Ph.D., vice president of scientific and regulatory affairs for the Council for Responsible Nutrition, a supplement industry trade association in Washington, D.C.

Shao maintained that antioxidant supplements are safe additions to a healthy diet.

The review only includes studies in which someone died.

Gluud defended his methodology, saying it is important to include only large, randomized controlled trials to assess mortality. Most of the trials that showed no deaths were not "proper preventative trials," he said.

Blumberg raised concerns about the use of "all-cause mortality" as a yardstick for antioxidants' influence on health and life. "All-cause mortality" includes deaths resulting from everything from cancer to a train wreck.

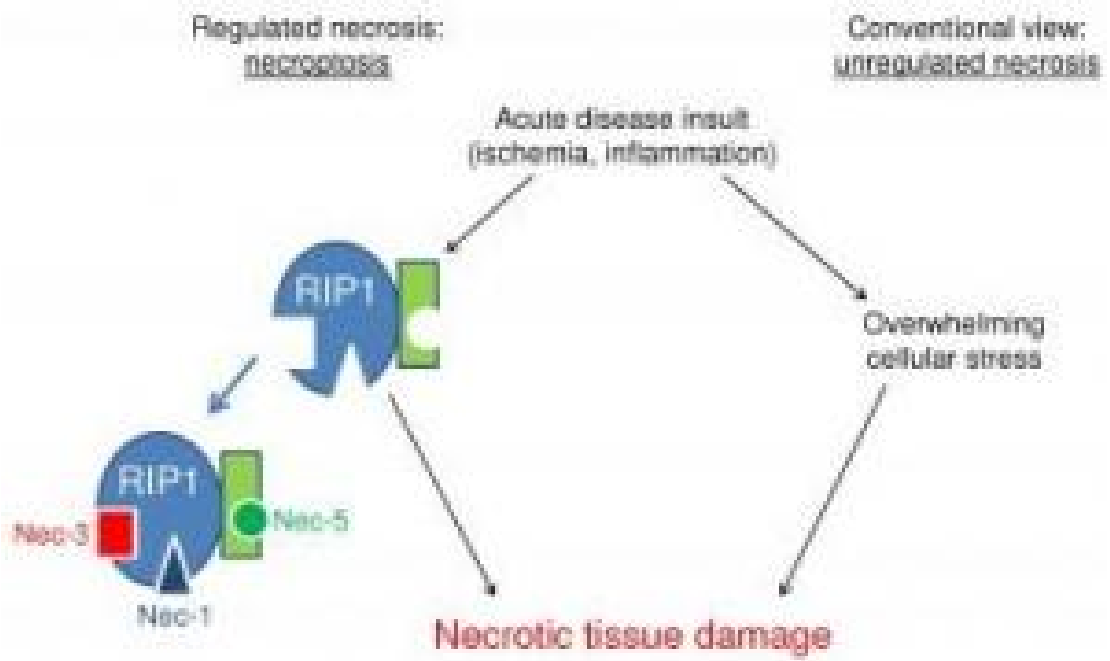
Blumberg said: "There is no basis in biology to presume that one or more of these nutrients can kill through any and all possible mechanisms of action."

Reference: Bjelakovic G, et al. Antioxidant supplements for prevention of mortality in healthy participants and patients with various diseases (Review). Cochrane Database of Systematic Reviews 2008, Issue 2.

Adapted from materials provided by Center for the Advancement of Health.

http://www.sciencedaily.com:80 /releases/2008/04/080415194233.htm

Stopping Unwanted Cell Death: Implications For Drug Discovery



Degterev, Yuan and colleagues have discovered that RIP1 kinase is a specific cellular target of necrostatins, unique small molecules previously shown to reduce damage from necrosis. (Credit: Alexei Degterev)

ScienceDaily (Apr. 16, 2008) — Degterev, Yuan and colleagues have discovered that RIP1 kinase is a specific cellular target of necrostatins, unique small molecules previously shown to reduce damage from necrosis.

Research published in Nature Chemical Biology reveals that three specific inhibitors of a cell death pathway, termed necroptosis, all target and inhibit RIP1 kinase, a protein that can direct cells into necrosis. Induced by trauma such as a heart attack or stroke, this form of necrotic death can result in tissue damage contributing to death or long-term disability. The findings present a novel avenue for drug development.

"Our research found that RIP1 kinase can be inhibited by three small molecules: necrostatin-1, -3 and -5," reports first author Alexei Degterev, PhD, assistant professor at Tufts University School of Medicine and member of the biochemistry program faculty of the Sackler School of Graduate Biomedical Sciences. "Overall, these data establish RIP1 kinase as a new target for therapeutic drug development for human diseases involving necrotic tissue injury, and they establish necrostatins as first-in-class potent and selective inhibitors of RIP1 kinase," the authors write, including last author, Junying Yuan, PhD, professor at Harvard Medical School.

Necrosis is relevant to many diseases, particularly those that involve an acute event, such as heart attack or stroke. "Cells are programmed to die when they reach the end of their lifecycle and that regulated process is called apoptosis. Cells can also be killed through pathways not controlled by apoptosis. Until recently, this type of cell death, termed necrosis, was believed to be unregulated, a type of accidental cell death caused when cells are placed under extreme stress such as during a heart attack, stroke or organ failure," says Degterev.

Previous research, as well as research by others, determined that necroptosis, one type of necrosis, is regulated (like apoptosis) and has a specific biochemical pathway. "Through our previous work, we have developed potent and specific small molecules capable of preventing necroptosis in isolated cells,"

explains Degterev. This work, done in Yuan's lab at Harvard, was subsequently awarded patents. "The next step, then, was to look for the target of the inhibition by necrostatins to understand how they inhibit necroptosis. We were particularly interested in RIP1 kinase because it was previously reported by other groups to be important for necroptosis and necrostatin-1 looked similar to known kinase inhibitors."

The researchers employed several molecular techniques to determine the role these necrostatins played in inhibiting necroptosis. To test whether necrostatin-1 is a RIP1 kinase inhibitor in vitro, researchers added necrostatin-1 in incremental doses to purified RIPI kinase, and observed a dose-dependent decrease in its activity (phosphorylation). To validate their discovery, the researchers made small and specific structural changes to necrostatin-1, to see if loss of the RIP1 kinase inhibition resulted in the inability of the necrostatin-1 analogs to prevent necrosis. Similar experiments were conducted for necrostatin-3 and necrostatin-5 with similar results, which was surprising as the structure of these two molecules are very different from necrostatin-1. Further, based on the results of their analysis, researchers put forward the model describing mechanisms of RIP1 inhibition by necrostatin-1.

"Next, research needs to determine the cellular pathway initiated by RIP1 kinase activity, develop better tools to further investigate its role in human disease, and establish how necrostatins are able to prevent RIP1 kinase from signaling the cell to kill itself," says Degterev. "This may one day result in effective therapies, currently not available, for many life-threatening diseases."

"These findings on RIP1 kinase inhibitors suggest entirely new possibilities to investigating the role of necroptosis in disease and indicate that these inhibitors may provide ways to prevent extensive tissue damage," says Naomi Rosenberg, PhD, dean at the Sackler School of Graduate Biomedical Sciences and vice dean for research at Tufts University School of Medicine. "Discoveries like this reveal how basic science research provides the foundation to our understanding of disease and can point toward possible novel therapeutic strategies to ease the burden of those diseases."

This work was supported in part by grants to Harvard from the National Institute of General Medicines (NIGMS), the National Institute on Aging (NIA), and the National Institute of Neurological Disorders and Stroke (NINDS), and by funding from the Harvard Center for Neurodegeneration and Repair. Alexei Degterev is a recipient of a NIA Mentored Research Scientist Career Development Award and a Massachusetts Medical Foundation Smith Family New Investigator Award. NIGM, NIA, NINDS are institutes of the National Institutes of Health.

Journal reference: Degterev A, Hitomi J, Germscheid M, Ch'en IL, Korkina O, Teng X, Abbott D, Cuny GD, Yuan C, Wagner G, Hedrick SM, Gerber SA, Lugovskoy A, Yuan J. Nature Chemical Biology. 2008 (May);Vol 4, Issue 5. "Identification of RIP1 kinase as a specific cellular target of necrostatins." Published online: April 13 2008, doi 10.1038/nchembio.83

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http://www.sciencedaily.com:80 /releases/2008/04/080413161042.htm

Road Safety: The Uncrashable Car?

Look in your blind spot, too! The 'uncrashable car' is part of basic research undertaken by the largest research initiative into road safety ever undertaken in Europe. (Credit: PReVENT, Volvo)

ScienceDaily (Apr. 15, 2008) — The largest road safety research project ever launched in Europe will usher in a series of powerful road-safety systems for European cars. But, in the long term, its basic, experimental research could lead to a car that is virtually uncrashable.

A truck exits suddenly from a side road, directly into your lane only dozens of metres ahead. Suddenly, your car issues a warning, starts applying the brakes and attempts to take evasive action. Realising impact is unavoidable; in-car safety systems pre-tension the safety belts and arm the airbag, timing its release to the second before impact.

Such is the promise of the uncrashable car, coming to a dealer near you in the perhaps not-too-distant future. The system is part of the basic research undertaken by the largest research initiative into road safety ever undertaken in Europe.

PReVENT has a budget of over €50 million and 56 partners pursuing a broad, but highly complementary programme of research. A dozen sub-projects focus on specific road-safety issues, but all projects support and feed into each other in some way.

PReVENT is studying relatively cheap, even simple, technologies – such as parking sensors and existing satellite navigation – that can be retooled to enhance driver safety. But as part of its broad and deep approach to car safety, it is also diving into more experimental and medium- to long-term systems, innovations that could appear in five-to-ten years.

The uncrashable car is a theoretical construct that concerned a handful of PReVENT's sub-projects. But it could become far more of a reality than anyone expected.

Of course, it is impossible to stop all car collisions, but the technology could be pushed to make it increasingly unlikely and mitigate crashes when they do occur.

For example, PReVENT project WILLWARN uses wireless communication with other vehicles to alert the driver about potentially dangerous situations ahead, while MAPS&ADAS reads sat-nav maps to track approaching hazards, like bends, dips or intersections. SASPENCE looks at safe driving distances and speed, while LATERALSAFE finally brings active sensing to the blind spot.

All have their role in the uncrashable car, as do many others within the broader project. But two projects, APALACI and COMPOSE, take this a step further, actively tracking the speed and trajectories of surrounding vehicles and other road users in real time. If one vehicle suddenly stops, or a pedestrian suddenly steps onto the road, they swing into action to rapidly calculate the implications.

Predictive collision detection

APALACI is an advanced pre-crash mitigation system built round the registration of other motorists and cyclists. In the APALACI system, sensors monitor the street or road immediately around the vehicle and collect as much information about a collision as possible, before it even starts to take place.

The system uses this data to decide on the ideal safety reaction strategy. Examples include controlled braking manoeuvres, controlled activation of the occupant restraint systems or pre-arming airbag systems. The car can react far faster than the driver, cutting speed by crucial amounts to ensure unavoidable accidents are less severe.

APALACI also developed a so-called 'Start Inhibit System' for trucks. It surveys the blind spot immediately in front of a truck and protects pedestrians or cyclists by preventing dangerous manoeuvres.

APALACI was tested in a series of vehicles like the Fiat Stilo, the Volvo FH12 truck, the Alfa Romeo 156 and Mercedes E350. It used laser sensors, radar, software decision assistance and a variety of other technologies to achieve the goal.

Tiny changes have a huge impact

COMPOSE, on the other hand, aims more specifically to keep others, as well as its driver, safe. It can apply the brakes if a pedestrian steps onto the road, or extend the bumper, and raise the bonnet to enhance occupant protection.

Tiny differences have a huge impact on car safety. Dropping speed by 1km/h can reduce accidents with injury by 3 per cent, while braking fractions of a second sooner is enough to reduce the damage caused dramatically.

The systems were tested in the BMW 545i and the Volvo FH12 truck, and they do appreciably enhance safety. But, for all their potential, these systems remain, for now, the preserve of the future.

"The teams developed sophisticated algorithms to track all these elements in the landscape," explains Matthias Schulze, coordinator of the EU-funded PReVENT project and Senior Manager for ITS & Services at Daimler AG. "But they require enormous computer power to keep track of all the various elements, so this work is aimed at basic research, establishing how it could be done. It will be a while before in-car computers are sophisticated enough to use these systems."

Nonetheless, they do provide tools that automakers can use to mitigate the potential for accidents, and they provide a clear research roadmap for the uncrashable car of the future.

Adapted from materials provided by ICT Results.

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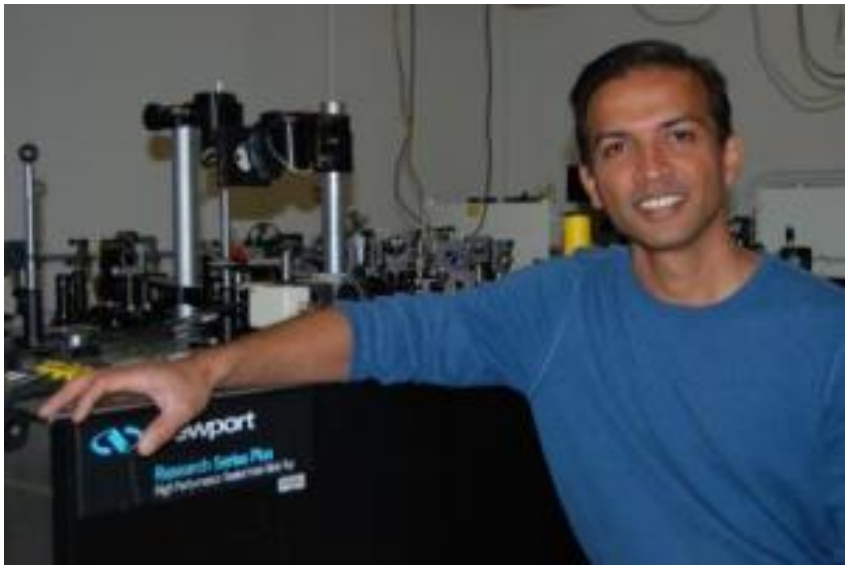
Getting Wired For Terahertz Computing



Ajay Nahata, a University of Utah professor of electrical and computer engineering, with equipment he uses to test devices aimed at harnessing terahertz radiation -- also known as far-infrared light or T-rays -- to run superfast computers of the future. In a new study, Nahata and his students created waveguides that successfully transmitted, bent, split and combined terahertz radiation. (Credit: Lee Siegel)

ScienceDaily (Apr. 15, 2008) — University of Utah engineers took an early step toward building superfast computers that run on far-infrared light instead of electricity: They made the equivalent of wires that carried and bent this form of light, also known as terahertz radiation, which is the last unexploited portion of the electromagnetic spectrum.

"We have taken a first step to making circuits that can harness or guide terahertz radiation," says Ajay Nahata, study leader and associate professor of electrical and computer engineering. "Eventually -- in a minimum of 10 years -- this will allow the development of superfast circuits, computers and communications."

Electricity is carried through metal wires. Light used for communication is transmitted through fiberoptic cables and split into different colors or "channels" of information using devices called waveguides. In a study to be published April 18 in the online journal Optics Express, Nahata and colleagues report they designed stainless steel foil sheets with patterns of perforations that successfully served as wire-like waveguides to transmit, bend, split or combine terahertz radiation.

"A waveguide is something that allows you to transport electromagnetic radiation from one point to another point, or distribute it across a circuit," Nahata says.

If terahertz radiation is to be used in computing and communication, it not only must be transmitted from one device to another, "but you have to process it," he adds. "This is where terahertz circuits are important. The long-term goal is to develop capabilities to create circuits that run faster than modern-day electronic circuits so we can have faster computers and faster data transfer via the Internet."

Nahata conducted the study with two doctoral students in electrical and computer engineering: Wenqi Zhu and Amit Agrawal.

Developing Terahertz Technology

The electromagnetic spectrum, which ranges from high to low frequencies (or short to long wavelengths), includes: gamma rays, X-rays, ultraviolet light, visible light (violet, blue, green, yellow, orange and red), infrared light (including radiant heat and terahertz radiation), microwaves, FM radio waves, television, short wave and AM radio.

Fiberoptic phone and data lines now use near-infrared light and some visible light. The only part of the spectrum not now used for communications or other practical purposes is terahertz-frequency or far-infrared radiation -- also nicknamed T-rays -- located on the spectrum between mid-infrared and microwaves.

With so much of the spectrum clogged by existing communications, engineers would like to harness terahertz frequencies for communication, much faster computing and even for anti-terrorism scanners and sensors able to detect biological, chemical or other weapons. Nahata says the new study is relevant mainly to computers that would use terahertz radiation to run at speeds much faster than current computers.

In March 2007, Nahata, Agrawal and others published a study in the journal Nature showing it was possible to control a signal of terahertz radiation using thin stainless steel foils perforated with round holes arranged in semi-regular patterns.

This February, British researchers reported they used computer simulations and some experiments to show that indentations punched across an entire sheet of copper-clad polymer could hold terahertz radiation close to the sheet's surface. That led them to conclude the far-infrared light could be guided along such a material's surface.

But the London researchers did not actually manipulate the direction the terahertz radiation moved, such as by bending or splitting it.

"We have demonstrated the ability to do this, which is a necessary requirement for making terahertz guided-wave circuits," Nahata says.

Circuits: From Electrical to Optical to Terahertz

Wires act as waveguides for electricity. Wires connect active devices such as transistors, which switch or adjust the electric signal. That is the basis for how computers work today. An electronic integrated circuit is a computer processor made of wires, transistors, resistors and capacitors on a semiconductor chip made of silicon.

In optical communications, the waveguides carry laser-generated light in fiberoptic cables and lines etched or deposited on an insulator or semiconductor surface. Nahata says photonic integrated circuits now are used for phone and Internet communications, mainly for combining or "multiplexing" different colors or channels of light entering a fiber-optic cable and separating or "demultiplexing" the different wavelengths exiting the cable.

"Electronic circuits today work at gigahertz frequencies -- billions of cycles per second. Electronic devices like a computer chip can operate at gigahertz," Nahata says. "What people would like to do is develop capabilities to transport and manipulate data at terahertz frequencies [trillions of hertz.] It's a speed issue. People want to be able to transfer data at higher speeds. People would like to download a movie in a few seconds."

"In this study, we've demonstrated the first step toward making circuits that use terahertz radiation and ultimately might work at terahertz speeds," or a thousand times faster than today's gigahertz-speed computers, Nahata says.

Channeling, Bending, Splitting and Coupling T-Rays

"People have been working on terahertz waveguides for a decade," he says. "We've shown how to make these waveguides on a flat surface so that you can make circuits just like electronic circuits on silicon chips."

The researchers used pieces of stainless steel foil about 4 inches long, 1 inch wide and 625 microns thick, or 6.25 times the thickness of a human hair. They perforated the metal with rectangular holes, each measuring 500 microns (five human hair widths) by 50 microns (a half a hair width). The rectangular holes were arranged side by side in three different patterns to form "wires" for terahertz radiation:

One line of rectangles that served as a "wire" and carried terahertz radiation.

A line that becomes two lines -- like the letter Y -- to split the far-infrared light, similar to a splitter used to route a home cable TV signal to separate television sets.

Two lines that curve close to each other in the middle -- like an X where the two lines come close but don't touch -- so the radiation could be "coupled," or moved from one line or "wire" to another.

The straight pattern successfully carried terahertz radiation in a straight line. The other two patterns "changed the direction the terahertz radiation was moving" by splitting it or coupling it, Nahata says. The study showed the terahertz radiation was closely confined both vertically (within 1.69 millimeters of the foil's surface) and horizontally (within 2 millimeters of the pattern of rectangles as it moved over them).

"All we've done is made the wires" for terahertz circuits, Nahata says. "Now the issue is how do we make devices [such as switches, transistors and modulators] at terahertz frequencies?"

When terahertz radiation is fed into the stainless steel waveguides, it spans a range of frequencies. One frequency is guided across the steel surface. That frequency is determined by the size of perforations in the foil. The engineers chose a frequency they could generate and measure: about 0.3 terahertz, or 300 gigahertz. Terahertz radiation is defined as ranging from 0.1 terahertz (or 100 gigahertz) to 10 terahertz.

The design of the waveguide means that it carries terahertz radiation in the form of surface plasma waves -- also known as plasmons or plasmon polaritons -- which are analogous to electrons in electrical devices or photons of light in optical devices. The surface plasma waves are waves of electromagnetic radiation at a terahertz frequency that are bound to the surface of the steel foil because they are interacting with moving electrons in the metal, Nahata says.

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

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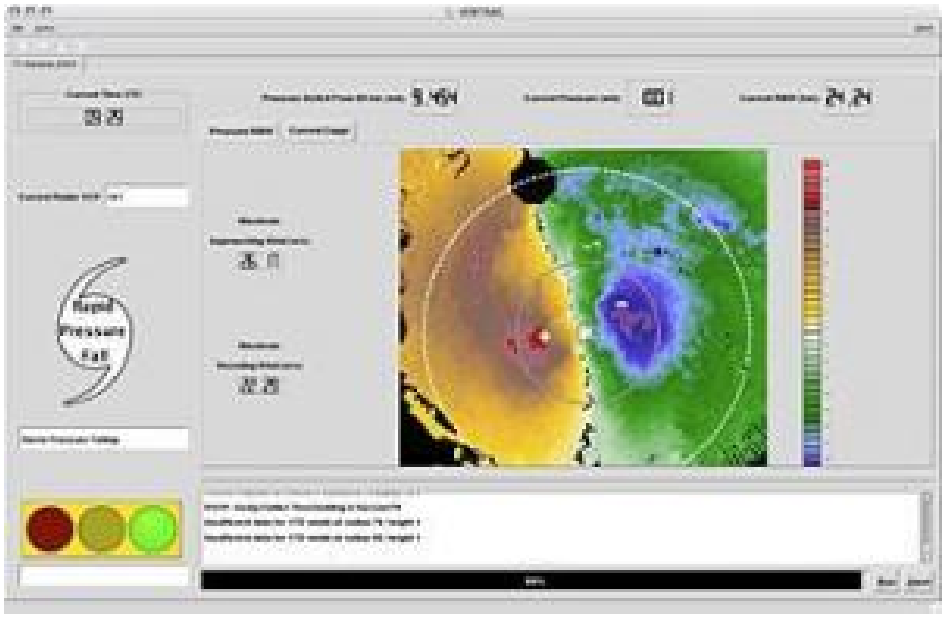
Forecasters Implement New Hurricane-tracking Technique



VORTRAC will provide hurricane forecasters with detailed updates on hurricanes as storms approach land. (Credit: Michael Bell, NCAR)

ScienceDaily (Apr. 15, 2008) — A new technique that helps forecasters continuously monitor landfalling hurricanes, giving them frequent and detailed images of a storm's location, will be implemented this summer.

The new system, developed by National Science Foundation (NSF)-funded researchers at the National Center for Atmospheric Research (NCAR) in Boulder, Colo., and the Naval Research Laboratory (NRL) in Washington, D.C., will be implemented at the National Hurricane Center (NHC).

The technique, known as VORTRAC (Vortex Objective Radar Tracking and Circulation), was successfully tested by the hurricane center last year.

"VORTRAC is an excellent example of the application of basic research to help improve short-term hurricane warnings," says Steve Nelson, program director in NSF's Division of Atmospheric Sciences.

The system, which relies on existing Doppler radars along the U.S. coast, provides details on hurricane winds and central pressure every six minutes, indicating whether the storm is gathering strength in the final hours before reaching shore.

"We are very gratified by the decision of the National Hurricane Center to adopt this new now-casting tool," says NCAR scientist Wen-Chau Lee. "VORTRAC will enable hurricane specialists, for the first time, to continuously monitor the trend in central pressure as a dangerous storm nears land. With the help of VORTRAC, vulnerable communities can be better informed of sudden changes in hurricane intensity."

Lee, NRL's Paul Harasti, and NCAR's Michael Bell led the technique's development. Funding came from NSF and the National Oceanic and Atmospheric Administration (NOAA).

One of VORTRAC's strengths is that it can use radar data to calculate the barometric pressure at the center of a hurricane, a key measure of its intensity.

"VORTRAC allows us to take the wind measurements from the radar, turn the crank, and have a central pressure drop out of a calculation," says Colin McAdie, a meteorologist at NHC. "This will be a valuable addition to the tools available to the forecaster."

Rapidly intensifying storms can catch vulnerable coastal areas by surprise. Last year, Hurricane Humberto struck near Port Arthur, Texas, after unexpectedly strengthening from a tropical depression to a hurricane in less than 19 hours. In 2004, parts of Florida's southwest coast were caught unprepared when Hurricane Charley's top winds increased from 110 to 145 miles per hour in just six hours as the storm neared land.

Lee and his collaborators applied VORTRAC retroactively to the two hurricanes and found that the technique would have accurately tracked their quick bursts in intensity.

"VORTRAC has demonstrated that it can capture sudden intensity changes in potentially dangerous hurricanes in the critical time period when these storms are nearing land," Bell says.

VORTRAC uses the Doppler radar network established by NOAA in the 1990s.

About 20 of these radars are scattered along the Gulf and Atlantic coastlines from Texas to Maine. Each radar can measure winds blowing toward or away from it, but no single radar could provide an estimate of a hurricane's rotational winds and central pressure until now.

The VORTRAC team developed a series of mathematical formulas that combine data from a single radar near the center of a landfalling storm with general knowledge of Atlantic hurricane structure in order to map the approaching system's rotational winds. VORTRAC also infers the barometric pressure in the eye of the hurricane, a very reliable index of its strength.

"By merging several techniques, we can now provide a missing link in short-term hurricane prediction," Harasti says.

Forecasters using VORTRAC can update information about a hurricane each time a Doppler radar scans the storm, which can be as often as about every six minutes. Without such a technique, forecasters would need at least two coastal radars in close proximity to each other in order to obtain the same information. But most of the network's radars are too far apart to qualify.

Each radar can sample conditions out to about 120 miles. This means VORTRAC can track an incoming hurricane for at least several hours, and possibly even as long as a day or more, depending on the storm's speed, trajectory, and size.

To monitor the winds of a landfalling hurricane, forecasters now rely on aircraft to drop instrument packages into the storm that gather data on winds and pressure. But due to flight logistics, the aircraft can take readings no more than every few hours, which means that coastal communities may not be swiftly alerted to changes in approaching hurricanes.

VORTRAC may also help improve long-range hurricane forecasts by using data from airborne Doppler radars or spaceborne radars to produce detailed information about a hurricane that is far out to sea.

Forecasters could input the data to computer models to improve three- and five-day forecasts.

Adapted from materials provided by National Science Foundation.

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Tourist Information Wherever You Are, On Your Phone

The eye-Phone runs on mobile telephones and works like this: If you see something interesting while out walking for instance, you take a photograph with your mobile phone and select the item of interest with the cursor. The object selected is then recognised and transmitted to a central system interfacing to databases on the internet to get information on the object. The information found is sent back to the phone and displayed to you. (Credit: SuperWise Technologies)

ScienceDaily (Apr. 15, 2008) — Would you like instant access to information on the buildings and scenery you see on your travels? A novel mobile phone programme, able to provide information on what you see when you see it, was a regional winner in the European Satellite Navigation Competition, sponsored by ESA's Technology Transfer Programme.

This novel use of satellite technology, created by Ernst Pechtl and Hans Geiger, combines three of today's modern technologies: satellite navigation localisation services, advanced object recognition and relevant internet retrieved information.

Ernst Pechtl, and Hans Geiger are co-owners of the company SuperWise Technologies AG, which has developed the Apollo image-recognition system that lies behind the eye-Phone.

How does it work? If you see something interesting while out walking for instance, you take a photograph with your mobile phone, select the item of interest with the cursor and in real time preprocessed information on the object selected is sent to your mobile phone."It could be a building, a mountain, a tree, plant or a special event such as a local festival," explain Pechtl. "The amount of information you receive depends on you, if you want to know more you just click the 'more button' and you trigger a more detailed search responding to your profile of interest. Applications include tourism, education, remote healthcare, security, science, etc."

Regional winner in European Satellite Navigation Competition

The eye-Phone won the regional prize for Bavaria, Germany in the 2007 European Satellite Navigation Competition. This competition, also known as the Galileo Masters, is sponsored by ESA Technology

Transfer Programme (TTP) to encourage the innovative use of satellite navigation systems to develop new products and services.

"The eye-Phone is a good illustration of the potential of satellite navigation systems when their positioning information is combined with other communication and information technology. With the improved accuracy of the European Galileo system in comparison to existing systems, the prospects will be amazing," says Frank M. Salzgeber, head of ESA's Technology Transfer Programme Office. "Galileo can create new businesses in Europe and strengthen Europe's competitiveness in space spin-offs."

The system has been developed using Apollo technology, an innovative artificial intelligence system. "It's a unique piece of software that can carry out object recognition within images, a very tricky task. It is self-learning and after a short and very simple training session it can identify any object in the world," says Pechtl.Apollo technology can identify objects in a digital image regardless of the angle from which it is taken, the lighting conditions or quality of the image. To support object recognition, it uses navigation positioning information.

It uses also an 'angle-sensor', a new function now being introduced in digital cameras that identifies the angle from which an image is taken and the direction in which the camera is pointing. Once the object in the picture is recognised the system can then interface to any database on the internet to select user-specific information on the object selected."The key to the eye-Phone system is the object recognition done by the Apollo software. Nothing in the world is able to do what our software does," says Pechtl.

Concept proved – prototype on the way

SuperWise Technologies plans to team up with mobile phone operators who would provide the eye-Phone functionality as an additional function for subscription. It will be partly located on the phone and partly in a central processing system of a cooperating image archives.

"The Apollo software is basically ready, and there is already one camera available with what we need: GPS, angle-sensor and on-board processing power. All we have to do is to integrate our system with the camera, i.e. load our software on the camera chip, to have a prototype ready and working."

A prototype should be ready during the mid of 2008, then Pechtl expects that it will take another 12 to 18 months to work out deals with mobile phone operators, find partners and negotiate agreements with database information providers, before the eye-Phone functionality can be offered to mobile phone users.

If all goes according to plan, mobile phones could soon provide a mobile tourist guide.

European Satellite Navigation Competition, the Galileo Masters

The European Satellite Navigation Competition was initiated in 2004 with the aim to encourage small enterprises in participating European regions to come up with new ideas for satellite navigation applications.

Supported by ESA through its Technology Transfer Programme (TTP) and the German Aerospace Center (DLR) it is run by Anwendungszentrum GmbH Oberpfaffenhofen, together with the Munich International Trade Fair SYSTEMS under the patronage of the Bavarian Ministry for Economics, Transport, and Technology.

Adapted from materials provided by European Space Agency.

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Quicker, Faster, Better Calibration And Machine Calibration In The Workplace

Laser tracer. (Credit: NPL/Etalon)

ScienceDaily (Apr. 15, 2008) — The National Physical Laboratory (NPL) in the UKis launching a revolutionary new measurement system that will bring laboratory level standards to the shop floor. The technology enables significantly improved calibration times and thereby, minimises machine downtime for industries across the manufacturing sector.NPL and its partner ETALON are unveiling Laser TRACER at MACH 2008 in Birmingham. This is a high-speed, ultra precise, mobile system for the calibration and verification of coordinate-measuring machines (CMM), CNC machine tools, and other leading-edge measurement applications.Laser TRACER relies on a highly stable laser source and an NPL patented internal design that is mechanically and thermally decoupled from the tracking mechanism, providing the ultimate in stability and accuracy of measurement.Like conventional laser techniques, laser tracer locks out the machine during tool or CMM probe. It uses the laser to track a reflector mounted on the machine during tool or CMM probe. The system automatically drives the tool during the measurement cycle for the machine test and then guides the user in simple steps through the testing process. The internal algorithm ensures self-calibration of the system during the test and enables all machine error contribution with unprecedented precision.

Measurement routines can be performed without the need for highly skilled technicians and are significantly quicker than existing traditional methods. Uncertainties of measurements are generated in real time with a comprehensive test report or UKAS calibration certificate produced at the point of measurement.Automatic correction of stored error-maps is also available for many machine types with new machines being supported every month and the measurement procedure is designed to meet the requirements of the emerging standard ISO10360-2.David Lowther, Laser TRACER Product Manager, said: "With the Laser TRACER NPL is bringing cutting edge measurement standards only ever seen before in National Standards Laboratories direct to the customer in their place of work. Machines can now be calibrated in less than three hours, rather than the current time of up to 2 days, and with greatly improved accuracy that will ultimately save time and increase productivity for businesses. NPL can also provide complementary consultancy and support, on site, to diagnose and solve production critical measurement problems for companies. "

Adapted from materials provided by National Physical Laboratory, via EurekAlert!, a service of AAAS.

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Impairments In Language Development Can Be Detected In Infants As Young As 3 Months Old

Professor April Benasich (upper right) gently covers a baby's head with sensors that reveal how babies process rapidly occurring sounds, a key factor in language development. (Credit: Image courtesy of Rutgers University)

ScienceDaily (Apr. 15, 2008) — Uncover how the brains of infants distinguish differences in sounds and it may become possible to correct language problems even before children start to speak, sparing them the difficulties that come from struggling with language.

New studies conducted by Professor of Neuroscience April Benasich and her Infancy Studies Laboratory at Rutgers University in Newark are revealing new and exciting clues about how infant brains begin to acquire language and paving the way for correcting language difficulties at a time when the brain is most able to change.

Benasich and her lab were the first to determine that how efficiently a baby processes differences between rapidly occurring sounds is the best predictor of future language problems. Using methods developed by Benasich and her lab, it can be determined as early as three to six months whether a baby will struggle with language development.

Benasich's research is now focused on uncovering in specific detail how the developing brain processes and distinguishes acoustic differences that arrive in rapid succession. The ability to differentiate those sounds, such as the difference between "ba" and "da," is critically important because decoding language requires us to process tiny auditory differences occurring as quickly as 40 milliseconds. During the first months of life, the baby's developing brain also is involved in constructing an acoustic map of the sounds of his or her native language. That map allows the baby to efficiently acquire language. Apparently, however, in some infants the process seems to go awry.

About 5 to 10 percent of all children beginning school are estimated to have language-learning impairments (LLI) leading to reading, speaking and comprehension problems, according to Benasich. In families with a history of LLI, 40 to 50 percent of children are likely to have a similar problem. Many of these children go on to develop dyslexia.

Using several novel methods, including dense array EEG/ERP recordings, Benasich and her lab are able to analyze EEG, ERPs and the proportion of gamma power in infant brains. The dense sensor array allows the researchers to gently measure a full range of brain activity. Those measurements are obtained by placing a soft bonnet of sensors, resembling a hairnet with lots of little sponges, on a baby's head and then having the infant listen to different series of rapid tone sequences.

"We are finding that children who have difficulty processing rapid auditory input are not just showing a simple maturational lag, but are actually processing incoming acoustic information differently," says Benasich.

Specifically, the research shows that babies who struggle with rapid auditory processing appear to be using different brain areas (as shown by neural patterns) and perhaps different analysis strategies to accomplish that task than children who do not have such difficulties. Included among their initial findings, the researchers have found less left hemisphere activity in the brains of children who struggle with rapid auditory processing as compared with matched control children. By pinpointing the exact differences in how the brain handles incoming acoustic information, it may become possible to guide the brains of babies at risk of developing language problems to work more efficiently before the children even begin to speak.

"We can predict with about 90 percent accuracy what a baby's language capabilities will be just by their response to tones," says Benasich. "Our hope now is that we will be able to gently guide the brains of infants who are at the highest risk for language learning impairments to be more efficient processors so they can avoid the difficulties that result from struggling with language."

To shed additional light on how inefficiencies in rapid auditory processing might be corrected, Benasich and her team have developed a Magnetic Resonance Imaging (MRI) protocol for scanning naturally sleeping healthy babies. This technique will allow better localization of active brain areas. To solve the challenge of imaging the brains of young children who typically are unable to lie still for extended periods in a scanner, Benasich's team conducts the scans in the evening and asks the parents to go through their child's normal bedtime routine, such as reading their infant a story, nursing them, rocking and snuggling. Once the child is asleep, headphones providing a steady stream of lullabies and an acoustic foam bonnet are placed on the baby's head to reduce the sound of the MRI.

"Our goal is not only to develop training techniques to correct rapid auditory processing problems, but to identify the period during infant development when the brain is most "plastic," or most able to change through learning," explains Benasich.

The lab's work is funded by several sources, including grants from the Solomon Center for Neurodevelopmental Research, the Don and Linda Carter Foundation, the National Institute of Child Health and Human Development, and a new $460,000 grant from the Ellison Medical Foundation.

Adapted from materials provided by Rutgers University.

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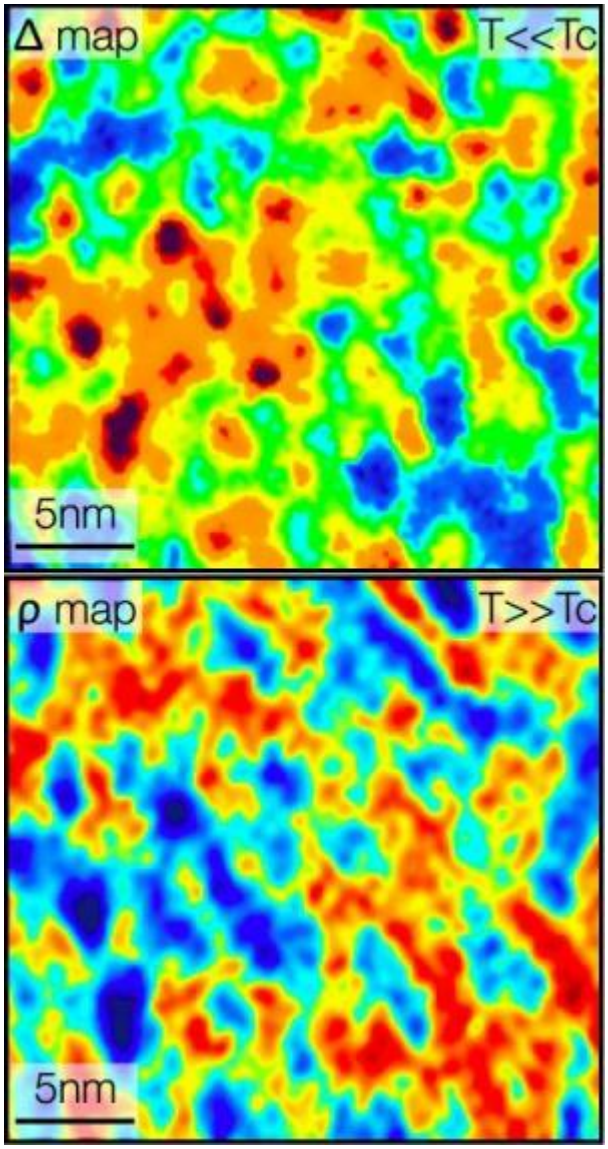
Where's The Glue? Scientists Find A Surprise When They Look For What Binds In Superconductivity



The two figures show the results obtained with a specialized scanning tunneling microscope at temperatures well above and well below when the electrons pair up in high temperature superconductors. The top figure shows an atomic scale map of the strength (delta) for pairing of electrons while superconducting, in which red shows the strongest pairing regions and blue the weakest. The bottom figure shows a measurement related to electron-electron interaction on the exact same atomic sites at a temperature, well above the superconducting transition temperature, when electrons repel one another. (Credit: Yazdani Group)

ScienceDaily (Apr. 15, 2008) — For more than 20 years since the discovery of high-temperature superconductivity, scientists have been debating the underlying physical mechanism for this exotic phenomenon, which has the potential to revolutionize the electrical power distribution network.

They've argued at length over the origin of what some have imagined to be a microscopic "glue" that binds the electrons into pairs so they glide effortlessly, overcoming their normal repulsion in typical metals. Is it magnetism or vibrations in the lattice structure of the material or something else?

Now, provocative results yielded by two years of experiments carried out at Princeton University have a group of scientists saying that high-temperature superconductivity does not hinge on a magical glue binding electrons together. The secret to superconductivity, they say, may rest instead on the ability of electrons to take advantage of their natural repulsion in a complex situation.

Reporting in the April 11 issue of the journal Science, the team has uncovered an unexpected connection between the behavior of electrons when they pair up -- a key requirement for superconductivity -- and when the electrons are repelling one another at temperatures far above the critical temperature at which a material superconducts. Their experiments have shown that electrons exhibit a characteristic behavior when repelling each other that, strangely enough, signals their special talent for pairing and flowing without resistance when these complex materials are cooled to low temperatures.

"It appears that the electrons with the strongest repulsion in one situation are the most adept at superconductivity in another," said Ali Yazdani, a professor of physics at Princeton and the senior author of the paper. "It's counterintuitive, but that's what's happening."

High-temperature superconductors are ceramic materials that can conduct electricity across huge distances without losing any energy. They are also relatively cheap to make and have enormous potential in many areas of technology.

Superconductivity was first observed in mercury in 1911 by the Dutch physicist Heike Kamerlingh Onnes. When he cooled the material to the temperature of liquid helium, 4 degrees Kelvin (-452F, -269C), its resistance suddenly disappeared. Scientists in later years would come to understand low-temperature superconductivity as a phenomenon that occurs when electrons interact with vibrations of the material's lattice structure and join into pairs that are able to travel through a conductor without being scattered by atoms.

The copper oxide, "high-temperature" superconductors that have been intensely studied since they were discovered in 1986 can become superconducting at higher temperatures than the older materials -- up to about 150 Kelvin (-253F, -123C) -- making them of greater interest to industry. They can be cooled with liquid nitrogen, which is cheaper than liquid helium. But do electrons bond in these materials, scientists have wondered, the same general way as in the lower temperature materials"

The team with the new results has determined they do not.

The findings came as a result of an effort to track down physical indicators of the microscopic "glue," which in the case of low-temperature superconductors are known to show up in delicate measurements of quantum properties of superconducting electrons. In the 1960s, scientists at Bell Laboratories in New Jersey, conducting such experiments, proved beyond a doubt that lattice vibrations bind electrons, paving the way for them to flow in low-temperature superconductors.

Until now, scientists have not been able to repeat the Bell Labs experiments in high-temperature superconducting material. The ceramic conductors, which consist of up to five different elements, have been particularly challenging to prepare for such precision measurements. Researchers have found it impossible to perform similar measurements on the highest quality crystals without destroying their superconducting properties. The Princeton team triumphed by taking a novel approach and using a specialized scanning tunneling microscope with unique tracking capabilities. This technique allowed the researchers to fix their sight on the same atom, as the electrons moving in the sample went from repelling each other at high temperatures to pairing up at low temperatures.

Other recent searches in the microscopic realm for "glue," using different techniques, have turned up conflicting evidence. "This is a very controversial subject, partly because of the complexity of the material, which has a varying chemical structure on the atomic scale," Yazdani said.

"What we have found is that the traditional signatures of what some might call the 'glue' are there -- we can measure them with high accuracy on the atomic scale," he added. "They don't seem to control the formation of the superconducting pairs, though. They are more like spectators."

Having developed the ability to measure with high precision how nature allows electron pairs to form, the team, which included postdoctoral fellow Abhay Pasupathy and graduate students Aakash Pushp and Kenjiro Gomes, looked to see if there were other types of experimental signatures that could give clues to the mechanism of pairing. Their microscope gave them a big advantage as it allowed them to visualize electrons' quantum behavior in these complex materials with varying chemical structure on the atomic scale. To their surprise, they found that atomic locations of the sample in which electrons show signs of stronger repulsion for each other -- at very high temperature -- formed the strongest bonded pairs of electrons at low temperatures. This observation runs contrary to the behavior of electrons in low-temperature superconducting materials, in which electron-electron repulsion is not conducive to electron pairing up and superconductivity.

They found that when the samples were heated up to very high temperatures at which electrons no longer paired up, the electrons that had been superconducting at colder temperatures exhibited unique quantum properties at warmer temperatures indicating they possessed extremely strong repulsive forces.

Unlike the electrons studied in low-temperature superconducting materials, the electrons in high-temperature superconductors that are most likely to bond and flow effortlessly are the ones that repel others the strongest when the environment is not conducive to superconductivity.

While these experiments alone may not end the 20-year debate on what causes high-temperature superconductivity, they have at least one long-time proponent of the importance of electron-electron repulsion in the mechanism paying close attention. "The data is a gold mine which we're only beginning to exploit," said Philip Anderson, Princeton's Joseph Henry Professor of Physics, Emeritus, who won a physics Nobel in 1977 and was not involved in the research.

The scientists studied a compound made of strontium, bismuth, calcium and copper oxide. They used a specially rigged scanning tunneling microscope with a probe so small its tip is a single atom wide. Positioned a hair's breadth above the sample, the device can move in increments smaller than an atom and measure current that flows between the tip and the surface.

The team also included other researchers from Princeton, the University of Illinois-Urbana/Champaign and the U.S. Department of Energy's Brookhaven National Laboratory, as well as Osaka University and the Central Research Institute of Electric Power Research, both in Japan.

The Princeton scientists worked in the Princeton Nanoscale Microscopy Laboratory, a state-of-the-art, ultra-low-noise lab constructed at the site of an old cyclotron in the basement of Jadwin Hall. Yazdani and his group study condensed matter physics, searching for simple, unifying explanations for complicated phenomena observed in liquids and solids.

Scientists hope the findings will help crack the 20-year puzzle and may also boost efforts to find new varieties of materials that become superconducting at ever-higher temperatures. Such materials would make practical the dream of a new electrical world with high-powered computers, magnetically levitating trains and super-efficient power transmission lines.

The work was supported by the U.S. Department of Energy's Office of Basic Energy Sciences and by the National Science Foundation through the Princeton Center for Complex Materials.

Adapted from materials provided by Princeton University.

http://www.sciencedaily.com:80 /releases/2008/04/080410140538.htm

California Has More Than 99% Chance Of A Big Earthquake WIthin 30 Years, Report Shows

Golden Gate Bridge with San Francisco in background. California has more than a 99% chance of having a magnitude 6.7 or larger earthquake within the next 30 years. (Credit: Michele Hogan)

ScienceDaily (Apr. 15, 2008) — California has more than a 99% chance of having a magnitude 6.7 or larger earthquake within the next 30 years, according scientists using a new model to determine the probability of big quakes.

The likelihood of a major quake of magnitude 7.5 or greater in the next 30 years is 46%-and such a quake is most likely to occur in the southern half of the state.

The new study determined the probabilities that different parts of California will experience earthquake ruptures of various magnitudes. The new statewide probabilities are the result of a model that comprehensively combines information from seismology, earthquake geology, and geodesy (measuring precise locations on the Earth's surface).For the first time, probabilities for California having a large earthquake in the next 30 years can be forecast statewide.

"This new, comprehensive forecast advances our understanding of earthquakes and pulls together existing research with new techniques and data," explained USGS geophysicist and lead scientist Ned Field. "Planners, decision makers and California residents can use this information to improve public safety and mitigate damage before the next destructive earthquake occurs."

The new information is being provided to decision makers who establish local building codes, earthquake insurance rates, and emergency planning and will assist in more accurate planning for inevitable future large earthquakes.

The official earthquake forecasts, known as the "Uniform California Earthquake Rupture Forecast (UCERF)," were developed by a multidisciplinary group of scientists and engineers, known as the Working Group on California Earthquake Probabilities. Building on previous studies, the Working Group updated and developed the first-ever statewide, comprehensive model of California.

The organizations sponsoring the Working Group include the U.S. Geological Survey, the California Geological Survey and the Southern California Earthquake Center. An independent scientific review

panel, as well as the California and National Earthquake Prediction Evaluation Councils, have evaluated the new UCERF study.

The consensus of the scientific community on forecasting California earthquakes allows for meaningful comparisons of earthquake probabilities in Los Angeles and the San Francisco Bay Area, as well as comparisons among several large faults.

The probability of a magnitude 6.7 or larger earthquake over the next 30 years striking the greater Los Angeles area is 67%, and in the San Francisco Bay Area it is 63%, similar to previous Bay Area estimates. For the entire California region, the fault with the highest probability of generating at least one magnitude 6.7 quake or larger is the southern San Andreas (59% in the next 30 years).

For northern California, the most likely source of such earthquakes is the Hayward-Rodgers Creek Fault (31% in the next 30 years). Such quakes can be deadly, as shown by the 1989 magnitude 6.9 Loma Prieta and the 1994 magnitude 6.7 Northridge earthquakes.

Earthquake probabilities for many parts of the state are similar to those in previous studies, but the new probabilities calculated for the Elsinore and San Jacinto Faults in southern California are about half those previously determined. For the far northwestern part of the State, a major source of earthquakes is the offshore 750-mile-long Cascadia Subduction Zone, the southern part of which extends about 150 miles into California. For the next 30 years there is a 10% probability of a magnitude 8 to 9 quake somewhere along that zone. Such quakes occur about once every 500 years on average.

The new model does not estimate the likelihood of shaking (seismic hazard) that would be caused by quakes. Even areas in the state with a low probability of fault rupture could experience shaking and damage from distant, powerful quakes. The U.S. Geological Survey (USGS) is incorporating the UCERF into its official estimate of California's seismic hazard, which in turn will be used to update building codes. Other subsequent studies will add information on the vulnerability of manmade structures to estimate expected losses, which is called "seismic risk." In these ways, the UCERF will help to increase public safety and community resilience to earthquake hazards.

The results of the UCERF study serve as a reminder that all Californians live in earthquake country and should be prepared. Although earthquakes cannot be prevented, the damage they do can be greatly reduced through prudent planning and preparedness. The ongoing work of the Southern California Earthquake Center, USGS, California Geological Survey, and other scientists in evaluating earthquake probabilities is part of the National Earthquake Hazard Reduction Program's efforts to safeguard lives and property from the future quakes that are certain to strike in California and elsewhere in the United States.

Adapted from materials provided by U.S. Geological Survey.

from http://www.sciencedaily.com:80 /releases/2008/04/080414203459.htm

Extreme Ocean Storms Have Become More Frequent Over Past Three Decades, Study Of Tiny Tremors Shows

Data from faint earth tremors caused by wind-driven ocean waves -- often dismissed as "background noise" at seismographic stations around the world -- suggest extreme ocean storms have become more frequent over the past three decades. (Credit: iStockphoto/Eric Gevaert)

ScienceDaily (Apr. 21, 2008) — Data from faint earth tremors caused by wind-driven ocean waves -- often dismissed as "background noise" at seismographic stations around the world -- suggest extreme ocean storms have become more frequent over the past three decades. The International Panel on Climate Change (IPCC) and other prominent researchers have predicted that stronger and more frequent storms may occur as a result of global warming trends. The tiny tremors, or microseisms, offer a new way to discover whether these predictions are already coming true, said Richard Aster, a geophysics professor at the New Mexico Institute of Mining and Technology.

Unceasing as the ocean waves that trigger them, the microseisms show up as five- to 30-second oscillations of Earth's surface at seismographic stations around the world. Even seismic monitoring stations "in the middle of a continent are sensitive to the waves crashing all around the continent," Aster said.

As storm winds drive ocean waves higher, the microseism signals increase their amplitude as well, offering a unique way to track storm intensities across seasons, over time, and at different geographical locations. For instance, Aster and colleagues Daniel McNamara from the U.S. Geological Survey and Peter Bromirski of the Scripps Institution of Oceanography recently published analysis in the Seismological Society of America journal Seismological Research Letters showing that microseism data collected around the Pacific Basin and throughout the world could be used to detect and quantify wave activity from multi-year events such as the El Niño and La Niña ocean disruptions.

The findings spurred them to look for a microseism signal that would reveal whether extreme storms were becoming more common in a warming world. In fact, they saw "a remarkable thing," among the

worldwide microseism data collected from 1972 to 2008, Aster recalled. In 22 of the 22 stations included in the study, the number of extreme storm events had increased over time, they found.

While the work on evaluating changes in extreme storms is "still very much in its early stages", Aster is "hoping that the study will offer a much more global look" at the effects of climate change on extreme storms and the wind-driven waves that they produce. At the moment, most of the evidence linking the two comes from studies of hurricane intensity and shoreline erosion in specific regions such as the Pacific Northwest Gulf of Mexico, he noted.

The researchers are also working on recovering and digitizing older microseism records, potentially creating a data set that stretches back to the 1930s. Aster praised the work of the long-term observatories that have collected the records, calling them a good example of the "Cinderella science"--unloved and overlooked--that often support significant discoveries.

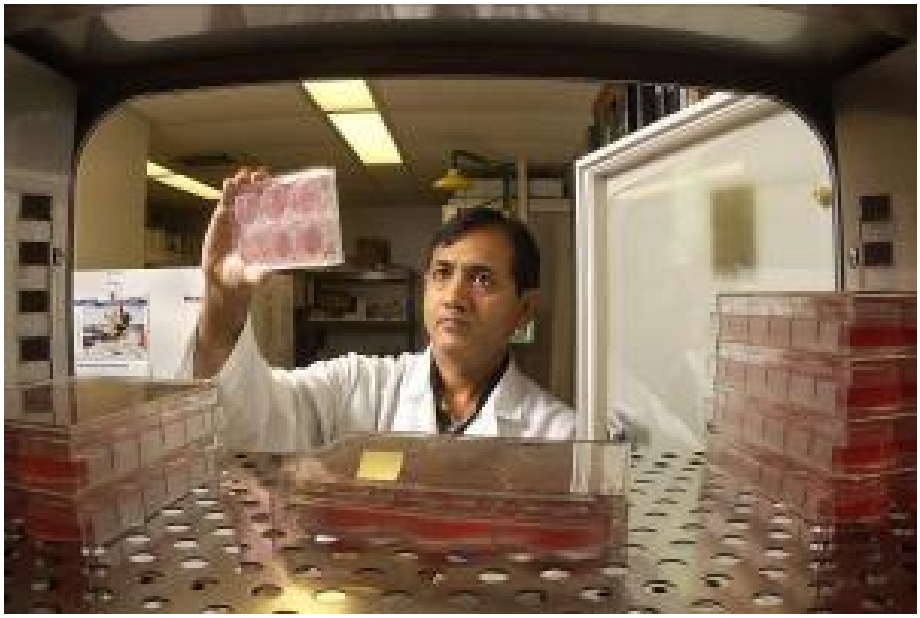
"It's absolutely great data on the state of the planet. We took a prosaic time series, and found something very interesting in it," he said.

The presentation of "Microseism-Based Climate Monitoring" was made in the session: Models, Methods, and Measurements: Seismic Monitoring Research on April 17, 2008 at the annual meeting of the Seismological Society of America. Authors include Aster, R. New Mexico Institute of Mining and Technology; McNamara, D., U.S. Geological Survey in Golden, CO; Bromirski, P., Scripps Institution of Oceanography; and Gee, L., and Hutt, C.R., U.S. Geological Survey in Albuquerque, NM.

Adapted from materials provided by Seismological Society of America, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com:80 /releases/2008/04/080417105456.htm

New Vaccine May Give Long-term Defense Against Deadly Bird Flu And Its Variant Forms



A new vaccine that apparently can provide long-lasting protection for pathogenic bird flu, H5N1, and its mutations, has been developed by Purdue researchers in collaboration with the Centers for Disease Control and Prevention. Purdue virologist Suresh Mittal said that compared to traditional vaccines, the new vaccine would have the advantages of not being based on eggs, would be easy and fast to produce, and could easily be modified to changes in the flu virus. (Credit: Purdue Agricultural Communication photo/Tom Campbell)

ScienceDaily (Apr. 20, 2008) — A new vaccine under development may provide protection against highly pathogenic bird flu and its evolving forms, according to researchers at Purdue University and the Centers for Disease Control and Prevention who discovered the new preventative drug and have tested it in mice.

Unlike traditional influenza vaccines, the new vaccine could be produced quickly and stored for long periods in preparation for a pandemic of dangerous disease-causing avian influenza - H5N1 - and its variants, said Suresh Mittal, a Purdue virologist. In an earlier study with mice, he and his colleagues found that the vaccine protected against H5N1 for a year or longer. Because the studies have only been done in mice, it's not yet known whether the same results will be obtained in humans.

"We want to have a vaccine that can be stored in advance and have the potential to provide protection for a period of time until we can change the vaccine to match the latest form of avian influenza," Mittal said. "The combination of flu genes that we've used to produce the vaccine, I think, will provide that capability."

The importance of having a long-lasting, broadly protective vaccine is that it would give some cross-protection against new viruses with pandemic potential caused by mutations in currently circulating H5N1 viruses. This would give scientists time to develop a better vaccine that would match the latest form of the bird flu.

Mittal and his colleagues, including Suryaprakash Sambhara, the CDC principal investigator on the project, report their findings on the vaccine in the April 15 issue of The Journal of Infectious Diseases. In the December issue of Clinical Pharmacology and Therapeutics, Mittal, Sambhara and their collaborators published their findings of the long-lasting capabilities of the vaccine.

"In humans we want a vaccine to be fully effective for at least a year," said Mittal, a professor of comparative pathobiology. "How long it will last in humans, we don't know yet."

To produce the new vaccine, the scientists used a mutated common cold virus, known as an adenovirus, as a delivery system for important genes from two types of the H5N1 avian influenza. The adenovirus is incapable of multiplying and so cannot cause illness to people. By using the adenovirus vector technology, a couple of problems with existing vaccines used to fight annual flu outbreaks are solved.

Problems with current influenza vaccines include that they are made from eggs, a process that can take as long as six months. The vaccine Mittal and his research team has developed isn't grown in eggs, making vaccine production much faster.

Additionally it would be difficult under normal conditions to produce the hundreds of millions of doses needed to protect everyone at risk for highly pathogenic forms of bird flu. With the beginning of a pandemic, since H5N1 decimates poultry populations, the egg supply needed to produce vaccines would be drastically cut.

The new vaccine uses an adjuvant, molecules added to the vaccine that stimulate the body's immune system, so that lower doses of the vaccine can be used. The adjuvant also allows the vaccine to be stockpiled so more people can be vaccinated, and it helps the vaccine protect against variant forms of the H5N1. The only FDA-approved H5N1 vaccine protects against only that specific strain of flu and only works in about 60 percent of those immunized with a high dose.

"Adenoviral vector-based pandemic vaccines are an attractive option for developing countries where egg-independent cell-based vaccine technologies for other vaccines already are available," Sambhara said. "Since this process is already in place, our vaccine could be produced locally at an affordable price."

Since H5N1 has been known, it has changed so that there are now two main subgroups, called clades. Within one of the clades, five subclades have emerged. This has complicated the task of developing a "perfect match" vaccine for the highly pathogenic bird flu. Other avian influenza viruses exist, but they have not proved to be as lethal to humans or other animals as has H5N1.

Influenza viruses are classified according to the combination of two types of proteins found on the virus cell surface. Different combinations of the 16 types of hemagglutinin (H) protein and nine types of neuraminidase (N) protein form a large number of influenza viruses for which birds are the natural hosts.

New, often more dangerous flu strains develop when the H and N combinations change and combine with other genes from circulating influenza viruses. When the genes of a human or swine influenza mix with an avian variety, a highly pathogenic human flu likely will result, Mittal said.

The first bird-to-human H5N1 case was recorded in 1997 in Hong Kong. The deadly virus has been documented in more than 60 countries, according to the World Health Organization (WHO). Though it mainly has struck wild birds and poultry, there have been more than 300 human cases in 14 countries in the past decade with a 60 percent fatality rate. Most of the human cases have occurred in people who live and work closely with their poultry, but a few cases have been documented of the disease spreading from person to person.

In a typical case, WHO this week reported the most recent fatality - the death of a 30-year-old Egyptian woman who became ill on April 2 after handling sick birds. She did not respond to the antiviral treatment Tamiflu, which can be given after contact with a flu carrier.

The next step in the bird flu vaccine project will be to test the vaccine on new viruses that are appearing, Mittal said.

The scientific team's vaccine work is being developed by PaxVax Inc., which has licensed the technology. Mittal is a scientific adviser for the company but has no financial stake in the commercial development of the vaccine, nor do his colleagues.

National Institute of Allergy and Infectious Diseases and the CDC's National Center for Infectious Diseases and National Vaccine Program provided funding for the study.

The other researchers involved with The Journal of Infectious Diseases study were paper co-lead researcher Mary Hoelscher, postdoctoral researcher Sanjay Garg, research scientists Vic Veguilla and Yumi Matsuoka, and principal investigators Jacqueline Katz and Ruben Donis, all of the CDC; and co-lead researcher Neetu Singh, postdoctoral researcher Lakshmi Jayashankar, and graduate student Aseem Pandey, all of Mittal's Purdue laboratory.

The other researchers involved with the Clinical Pharmacology and Therapeutics study were Hoelscher, Garg, Veguilla, Katz and Xuihua Lu of the CDC; and Singh and Jayashankar of Purdue. Hoelscher and Jayashankar were equal contributors for this study.

Adapted from materials provided by Purdue University.

http://www.sciencedaily.com:80 /releases/2008/04/080417152027.htm

How Arsenic Can Cure One Type Of Leukemia

ScienceDaily (Apr. 19, 2008) — Arsenic is a remarkably effective treatment against a rare form of leukemia. Researchers from a CNRS / Université Paris Diderot research unit, based at the Institut Universitaire d'Hématologie at Hôpital Saint Louis, have shown how arsenic cures this type of leukemia. This research should lead to a better understanding of the therapy, and thus to medical strategies which are better adapted to this disease.

Arsenic is a poison which has been used in medicine for more than 3000 years.It is now regularly used to treat acute promyelocytic leukemia. This type of leukemia is characterized by the fusion of PML and RARA proteins, which is sufficient to make cells leukemic. Earlier, Pr. Hugues de Thé's team had shown that arsenic induces the SUMOylation of PML/RARA, SUMO being a peptide that regulates interaction between proteins. But the nature of the degradation pathway remained a mystery, because SUMO generally works against degradation.

A new enzyme which participates in this mechanism, RNF4, has recently been identified by the researchers. This enzyme plays a key role in the recognition and degradation of PML/RARA forms which have been modified by arsenic (PML/RARA-SUMO). The work of the French team, like that of an English team publishing in the same journal, shows that RNF4 binds to PML-SUMO or PML/RARA-SUMO. It then fixes another peptide, ubiquitin, onto this complex. Ubiquitin is known to lead to the degradation of proteins to which is binds. Ubiquitin then modifies the PML/RARA-SUMO protein.

The existence of a degradation pathway, initiated by SUMO and completed by ubiquitin, had been predicted by genetic studies on yeast, but no susbtrate had been identified. This research should lead to a better understanding of the molecular bases for therapy, and to better strategies for treating this illness.

Journal reference : Arsenic degrades PML or PML-RARA through a SUMO-triggered RNF4/ubiquitin-mediated pathway, Lallemand-Breitenbach, V., Jeanne, M., Benhenda, S., Nasr, R., Lei, M., Peres, L., Zhou, J., Zhu, J., Raught, B., and de The, H., Nature Cell Biology, 13 April 2008 (online)

Adapted from materials provided by CNRS.

http://www.sciencedaily.com:80 /releases/2008/04/080416220013.htm

Nation at a Loss

By EDWARD B. FISKE

Durham, N.C.

TOMORROW is the 25th anniversary of "A Nation at Risk," a remarkable document that became a milestone in the history of American education — albeit in ways that its creators neither planned, anticipated or even wanted.

In August 1981, Education Secretary T. H. Bell created a National Commission on Excellence in Education to examine, in the report's words, "the widespread public perception that something is seriously remiss in our educational system." Secretary Bell's expectation, he later said, was that the report would paint a rosy picture of American education and correct all those widespread negative perceptions.

Instead, on April 26, 1983, the commission released a sweeping 65-page indictment of the quality of teaching and learning in American primary and secondary schools couched in a style of apocalyptic rhetoric rarely found in blue-ribbon commission reports.

"The educational foundations of our society are presently being eroded by a rising tide of mediocrity that threatens our very future as a nation and as a people," it warned. "If an unfriendly foreign power had attempted to impose on America the mediocre educational performance that exists today, we might well have viewed it as an act of war."

To his credit, Secretary Bell, a moderate Republican who had been hoping for some political relief from critics on his right, stood by these unexpected words from his commission — and thereby became the unwitting father of the modern school reform movement.

Secretary Bell's boss, President Ronald Reagan, was also taken aback by "A Nation at Risk," although for different reasons. He took office in 1981 with a three-fold agenda for education: abolishing the Department of Education, promoting tuition tax credits and vouchers and restoring voluntary prayer in the schools. Using the bully pulpit and purse of the federal government to promote "excellence" in teaching and learning was not on the list.

When members of the White House staff saw an early copy of "A Nation at Risk," they were distressed to find no mention of their political agenda and threatened to cancel the ceremony in which the president would receive the first copy. Secretary Bell and commission members replied that such topics were at best tangential to their assigned topic of excellence in teaching and learning.

Eventually a compromise was reached. The president agreed to receive the commission and accept the first copy of "A Nation at Risk" at a White House ceremony, and he used his remarks to reaffirm his political objectives — none of which were mentioned in the report. Several members of the commission later confided that they left Washington that day in a depressed mood, convinced that they had been "used" and were destined to be ignored.

Then came the biggest twist of all. "A Nation at Risk" resonated with Americans, who seemingly agreed that there was indeed something "seriously remiss" in their schools. White House pollsters picked this up. The president began visiting schools all over the country, usually in the company of Secretary Bell, who until then, as head of a department scheduled for elimination, had never seen the inside of Air Force One.

The most important legacy of "A Nation at Risk" was to put the quality of education on the national political agenda — where it has remained ever since. The last 25 years have seen a succession of projects and movements aimed at increasing the quality of American primary and secondary schools: standards-based reform, the 1989 "education summit" that set six "national goals" for education, the push for school choice and, most recently, the No Child Left Behind legislation. Proponents of each have taken pains to portray themselves as the heirs of "A Nation at Risk."

The apocalyptic rhetoric of the opening section of "A Nation at Risk" isn't the only element of the report that has had a lasting impact. One of the main ideas enshrined in the document — that quality of schooling is directly linked to economic competitiveness — has also shaped the way Americans think about education. This particular theory, however, hasn't been borne out by history.

In 1983, the causal connection between education and the economy seemed obvious. Americans were living in awe of the Japanese "economic miracle" and assumed that it was made possible by a school system whose students consistently routed ours on all those comparative international achievement tests. But then the Japanese economy soured — even though it still had the same education system — and we began asking ourselves another question: If American schools are so bad, why is our economy doing so well?

With the wisdom of hindsight, it is clear that the link between educational excellence and economic security is not as simple as "A Nation at Risk" made it seem. By the mid-1980s, policymakers in Japan, South Korea and Singapore were already beginning to complain that their educational systems focused too much on rote learning and memorization. They continue to envy American schools because they teach creativity and the problem-solving skills critical to prospering in the global economy.

Indeed, a consensus seems to be emerging among educational experts around the world that American schools operate within the context of an enabling environment — an open economy, strong legal and banking systems, an entrepreneurial culture — conducive to economic progress.

To put it bluntly, American students may not know as much as their counterparts around the Pacific Rim, but our society allows them to make better use of what they do know. The question now is whether this historic advantage will suffice at a time when knowledge of math, science and technology is becoming increasingly critical. Maybe we need both the enabling environment and more rigor in these areas.

But while the theory behind "A Nation at Risk" may no longer hold (mediocre education inevitably leads to a weak economy), the report's desperate language may be more justified than ever, for American education is in turmoil.

Most troubling now are the numbers on educational attainment. One reason that the American economy was so dominant throughout the 20th century is that we provided more education to more citizens than other industrialized countries. "A Nation at Risk" noted with pride that American schools "now graduate 75 percent of our young people from high school."

That figure has now dropped to less than 70 percent, and the United States, which used to lead the world in sending high school graduates on to higher education, has declined to fifth in the proportion of young

adults who participate in higher education and is 16th out of 27 industrialized countries in the proportion who complete college, according to the National Center for Public Policy and Higher Education.

The striking thing about the performance of American students on international comparisons is not that, on average, they are in the middle of the pack — which was also true in 1983 — but that we have a disproportionate share of low-performing students. We are failing to provide nearly one-third of our young people with even the minimal education required to be functioning citizens and workers in a global economy.

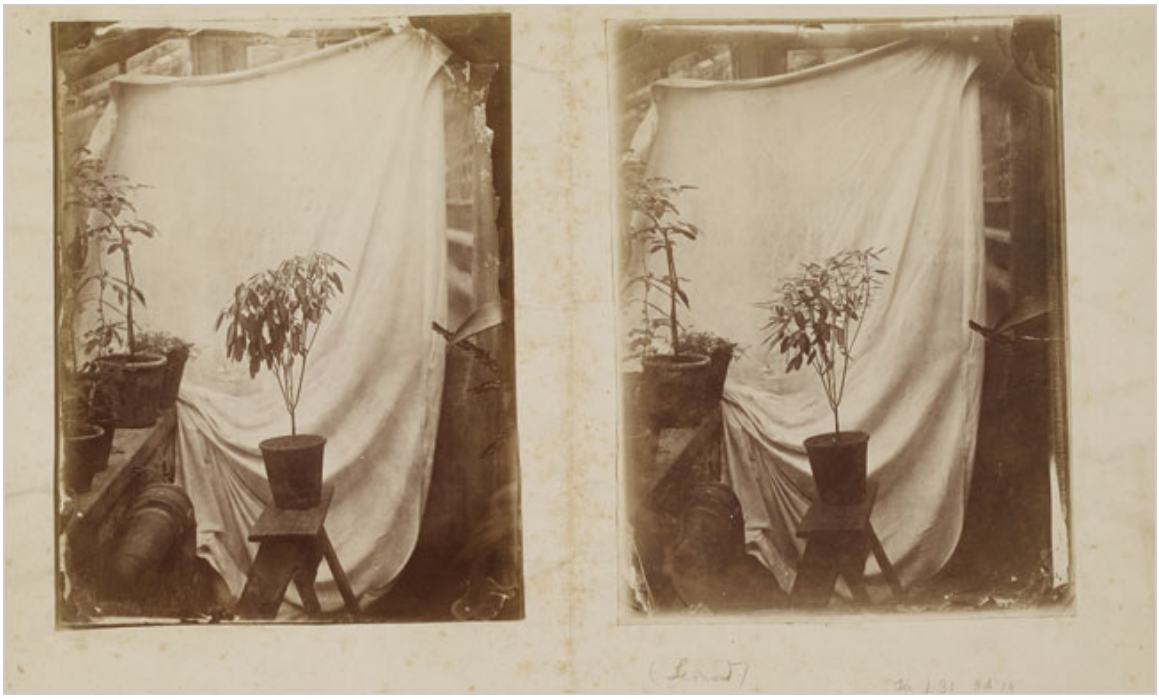
This is particularly distressing news at a time when the baby boomers are aging and a growing proportion of the future work force comes from groups — members of ethnic and racial minorities, students from low-income families, recent immigrants — that have been ill served by our education system. The challenge today is to build access as well as excellence. That's the new definition of "a nation a risk" — and ample reason for a new commission to awaken the nation to the need to educate all our young people.

Edward B. Fiske, a former Times education editor, is the author of the Fiske Guide to Colleges.

http://www.nytimes.com/2008/04/25/opinion/25fiske.html?_r=1&th&emc=th&oref=slogin

What Darwin Saw Out Back

By CORNELIA DEAN



IN 1860, while studying primroses in the garden of Down House, his home in Kent, England, Charles Darwin noticed something odd about their blooms.

While all the flowers had both male and female parts — anthers and pistils — in some the anthers were prominent and in others the pistils were longer. So he experimented in his home laboratory and greenhouses, cross-pollinating some plants with their anatomical opposites. The results were striking.

“He determined that if they cross-pollinate, they produce more seed and more vigorous seedlings,” said Margaret Falk, a horticulturalist and associate vice president at the New York Botanical Garden. The variation is evolution’s way of increasing cross-pollination, she said.

Now the Botanical Garden is replicating this work, and more of Darwin’s Down House experiments, in a stunning, multipart exhibition called “Darwin’s Garden: An Evolutionary Adventure.”

In all, the tour is 33 stops, spread throughout about half of the garden’s 250 acres. Visitors who enter the exhibition through the Enid A. Haupt Conservatory will encounter a replica of a room in Darwin’s house, designed so they can look through the window, as he did, to a profusion of plants and bright flowers: hollyhocks, flax and of course primroses, what Todd Forrest, the garden’s vice president for horticulture, calls “a typical British garden.” On a table stands a tray holding quills, brushes, sealing wax and tweezers, the kinds of simple tools Darwin used to conduct his world-shaking research.

Darwin grew the flowers not just for their own sake, Mr. Forrest said, but as subjects for observation and experiment, work he carried out in his home laboratory and greenhouses, on workbenches like those in the exhibition. The work displayed on the benches is typical of studies Darwin made of pollination, how plants grow, even what happens when a carnivorous plant devours an insect. Orchids on display remind visitors of the varieties Darwin studied, and how his observations and dissections of their blooms led him to conclude that particular species were pollinated by particular species of insects, a conclusion later research confirmed.

The exhibition also includes a "tree of life" map that guides visitors to the garden's plants and describes where they fit in the natural scheme of things; books, drawings and notes, some in Darwin's own hand; and an interactive exhibit for children.

It anticipates two Darwin anniversaries next year — his 200th birthday and the 150th of his world-changing book, "The Origin of Species."

Though most people associate that book and Darwin's ideas generally with his voyage to the Galápagos and his study of finches there, his work with plants was far more central to his thinking, said David Kohn, a Darwin expert and science historian who is a curator of the exhibition.

Even in the Galapágos he focused on plants, said Dr. Kohn, who is general editor of the Darwin Digital Library of Evolution at the American Museum of Natural History. "He did not even label the finches," he said. "He was fascinated by plants," particularly the way their variation and sexual reproduction challenged the idea that species were stable, a key idea in botany at the time.

As Dr. Kohn writes in the exhibition catalogue, "plants were the one group of organisms that he studied with most consistency and depth over the course of a long scientific career" of collecting, observing, experimenting and theorizing. But Darwin studied more than flowers. He was intrigued by what Dr. Kohn calls the "behavior" of plants — how they move, respond to light, consume insects and otherwise act in the world.

So another exhibit in the Garden conservatory replicates Darwin's studies of climbing plants. Mr. Forrest said Darwin studied plants whose roots move along walls, whose stems twine, whose tendrils curl around other plants and which climb as their leaves grow into tendrils. Visitors who stop to ponder this display will also be able to see, in the garden library, the wispy, primitive drawings Darwin made as he studied plant movement and insect eating. Dr. Kohn said the drawings, which remind him of time-lapse photography, are among his favorite items here even though, as he noted, "Darwin was a terrible drawer."

In his orchard at Down House, Darwin established a "weed garden" by clearing a patch of sod and tracking the germination and growth of every seed that sprouted there. The Botanical Garden has done much the same thing with a small patch in the conservatory.

Most seedlings in Darwin's weed garden vanished, Ms. Falk said, losses he attributed to slugs. ("That's a gardener for you," Mr. Forrest said, "always complaining about something.")

The work Darwin carried out in his gardens, greenhouses and home laboratory is particularly impressive, Ms. Falk said, given that he was limited to a simple microscope and equipment like "quills, matchsticks, bits of wire."

"It was really in his own garden that many of his ideas came together," she added.

As visitors walk through the Botanical Garden they will be able to follow an illustrated maps of the tree of life — the plant part of it, anyway — that tell them where the plants they can see fit in the evolutionary framework.

In the garden's LuEsther T. Mertz Library, they will encounter what Jane Dorfman, its exhibitions coordinator, calls "treasures": some on loan from Cambridge University, where Darwin studied, some from Harvard and some the fruit of what Dr. Kohn called "rummaging" in the garden's extensive collection of Darwiniana. Among them are Darwin's notes from university botany class, a plant specimen he collected on the Galápagos and his preliminary sketch of the tree of life with his note, "I think," at the top.

The gallery also displays his "Experiment Book" with notes and drawings of experiments he carried out in his garden, and studies of flowers that led him to predict — accurately — what kind of bird or insect would pollinate them.

Nearby is Darwin's 1857 letter to Asa Gray, the American botanist who was a major supporter, in which he laid out, one by one, the ideas he would shortly turn into "The Origin of Species." Among other things, Dr. Kohn said, the letter is notable because it "proves Darwin's priority" by demonstrating that it was he, and not his fellow naturalist Alfred Russel Wallace, who developed the theory first.

"It shows he's got it," Dr. Kohn said.

The tree of life exhibits, comprising an unusual mix of living plants, laboratory expertise and historical documents, show that many plants are surprisingly close relatives of others that seem quite different, a concept that helps botanists when they look for likely sources of useful plant chemicals or worry about maintaining biodiversity.

For example, "squashes and oaks are related," said Dennis W. Stevenson, the garden's vice president for laboratory science. "Who'd a thunk it?"

But while many branches move off simply and neatly in ways botanists understand — they are "totally resolved," Dr. Stevenson said — other evolutionary branchings occur in clumps called polytomies, areas where the family history of plants is still unknown.

One major polytomy involves cycads, like palm trees (of which the garden has an unusually large collection), and conifers, like pine trees. Dr. Stevenson is among researchers working with the support of the National Science Foundation to unravel this evolutionary mystery. So far, he said, researchers have come up with two possible explanations. Although they contradict each other, "I like them both," Dr. Stevenson said.

Garden officials recognize that there are those who challenge Darwin's ideas, but for them there is nothing controversial about them. "Our whole science is based on evolution," Gregory Long, the Botanical Garden's president, said, as he surveyed the team of horticulturalists installing the flowers that replicate Darwin's experiments.

"It's the heart of our science," he said. "We wouldn't be here if it hadn't been for Darwin."

"Darwin's Garden: An Evolutionary Adventure" opens Friday and runs through June 15 at the New York Botanical Garden, Southern Boulevard and 200th Street, Bedford Park, the Bronx; (718) 817-8700, nybg.org.

http://www.nytimes.com/2008/04/25/arts/design/25darw.html?th&emc=th

On Texts, Tech and Teens

The finding that 38 percent of high-school-age students have used abbreviations like "LOL" in school assignments — with 25 percent admitting to having slipped in an emoticon or two — sounds like enough to make the typical English instructor dread the next incoming freshman class. After all, according to a report released on Thursday, half of those teenagers "sometimes use informal writing styles instead of proper capitalization and punctuation" in essays and other school assignments.

It's a finding that might prompt some to ask, as the report did: "What, if anything, connects the formal writing teens do and the informal e-communication they exchange on digital screens?"

Is there a steady decline of writing ability at the hands of technology? Or do new media and online communications actually encourage students to write more, providing an opening for educators to focus on boosting their composition and critical thinking skills?

The report, from the Pew Internet & American Life Project and the College Board's National Commission on Writing for America's Families, Schools and Colleges, leaves open the latter as a possibility even as it calls for more research on how technology can best be marshaled in the writing classroom.

For now, it's clear from the findings that the vast majority of students (86 percent of respondents) think that writing is important to their future success. At the same time, 85 percent of them use "some form of electronic personal communication" — such as e-mail, instant messaging and text messages — on at least an occasional basis, even though most of them don't classify it as "writing" per se.

"[D]espite the nearly ubiquitous use of these tools by teens, they see an important distinction between the 'writing' they do for school and outside of school for personal reasons, and the 'communication' they enjoy via instant messaging, phone text messaging, e-mail and social networking sites," the report states.

It later continues: "At the core, the digital age presents a paradox. Most teenagers spend a considerable amount of their life composing texts, but they do not think that a lot of the material they create electronically is real writing. The act of exchanging e-mails, instant messages, texts, and social network posts is communication that carries the same weight to teens as phone calls and between-class hallway greetings."

The report, "Writing, Technology and Teens," is based on a survey conducted last year of 700 children from ages 12 to 17, each accompanied by a parent, in addition to eight focus groups in four different cities. While it focuses on students currently in middle or high school, the portrait it paints is applicable to many of the incoming freshmen at colleges across the nation who will surely enter their first composition or English class. As such, it provides a window into some of the issues educators at the postsecondary level will increasingly have to grapple with: students' increasing expectations for shorter and less nuanced assignments, for example, as well as changing reading and writing habits.

About 93 percent of respondents said they wrote for their own pleasure outside of school, and evidence suggests that an increasing fraction of that writing is done online, either on social networking sites or in blogs. But in class, 82 percent said their assignments tend to be a paragraph to a page long. Part of the problem, the authors suggested, is finding ways to move that excitement about writing into rich, engaging assignments in the classroom.

"We always want more from students. I think that this explosion of writing is actually a very good thing," said Richard Sterling, an adjunct professor at the University of California at Berkeley's Graduate School of Education and the departing executive director of the National Writing Project. "Society at large is fast, quick-paced; a lot of the media is in small bites, and that does get reflected in their writing. There tends to be a kind of breathless pace to a lot of the work that they produce," he said.

So the job of educators is to "get students to slow down and be more thoughtful and more reflective about what they're reading and what they're writing," added Sterling, who also contributed to the survey.

And the smilies? Sterling suggested that if a ";)" ever shows up in an assignment, "you actually have an opportunity ... a teachable moment" to instruct students on when such expressions are acceptable and in which contexts more formal language is required.

Cheryl Ball, a professor of English at Illinois State University who is chairing the Conference on College Composition and Communication's Committee on Computers in Composition and Communication (which employs what an English professor would recognize as alliteration), said that there is still not enough knowledge about students' writing habits at home versus at school, and how technology should be used to best improve the teaching of writing.

But she also stressed that writing instruction shouldn't necessarily be restricted to typical forms like the academic essay, and that educators should consider how to incorporate newer modes into their teaching.

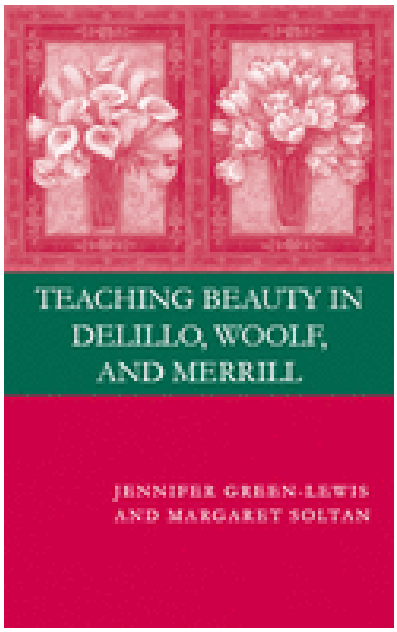
Ball suggested, in an e-mail, that "educators need to attend to the ways that students conceive of 'what counts' as writing, be capacious in our own definitions of writing and recognize that writing will continue to expand to include forms such as the report mentions [like] IM, social networking and multimedia. I look forward to teaching more students who have such an expansive view of writing, even if they don't call it that."

— Andy Guess

The original story and user comments can be viewed online at http://insidehighered.com/news/2008/04/25/teens.

Teaching Beauty

By Jennifer Green-Lewis and Margaret Soltan



When his turn came to speak at Norman Mailer's recent memorial service in New York, the novelist Don DeLillo began by simply holding up his creased and worn 50-year-old copy of Mailer's first novel, *The Naked and the Dead.*

All lovers of literature understand the nature of DeLillo's gesture; they understand that behind the little paperback that he lifted for the audience to see lay years of private aesthetic pleasure in its pages — from the college student marveling at its prose to the venerated author of *Underworld* marveling at the same thumbed passages. That's the sort of writer Mailer was, DeLillo meant to say: He wrote novels you're never finished with; and the scuffs and scratches and stains you put in them over the years add up to the archaeology of your own literary life.

Alexander Nehamas says that beauty of any kind is "a call to look more attentively." Readers of poetry, lovers of music, gardeners gardening — all people who engage actively with beauty by paying close and lasting attention to it know this to be true. Yet because, in recent decades, we have misperceived the value of beauty, literary scholars have neglected the crucial work of thinking through our relationship with beautiful forms, and have failed to teach our students about the way that relationship sustains and enlightens us.

Who would ever enter a classroom and invite their students to consider the beauty of a work because, as Nicolas Malebranche puts it, "Attentiveness is the natural prayer of the soul"? The word "soul" doesn't get much exercise in English departments any more, and neither do concepts associated with it — inspiration, consolation, communality, transcendence, love. What do these have to do nowadays with the study of literature? In our public neglect of such concepts in favor of the political and the material, our answer is clear: nothing.

Of course, literature professors who graduated from English departments in the past 30 years can defend their neglect of matters related to the soul, since in their studies no one talked much about these things either. An English professor recalls the facile "contingency" arguments of her day, which did so much to undermine judgments of aesthetic value: "I felt I had to hide or smuggle in my humanist convictions about 'what sustains people' — my faith for example in some quality of shared humanity that makes literary experience meaningful.... I was writing about [James] Joyce's insights into the touching human need to bury, burn, or otherwise take care of the bodies of the dead — an impulse that is universal, however differently loss and the communal response to it are experienced across cultures. I was afraid

I'd be attacked for 'essentializing' — for supposing that there are features, shared across cultures, that constitute the essence of being human."

Surely "essentializing" — a poor choice of word for an acknowledgment of shared humanity — is necessary in the imaginative work involved in recognizing the existence of someone else. As Iris Murdoch argues, that recognition is difficult and demands a leap into the sort of empathy which the imaginative demands of literature encourage. When Murdoch expresses her admiration for T.E. Lawrence because he "let the agonizing complexities of situations twist [his] heart instead of tying his hands," she reminds us that the real-world value of great and complex art can accustom us to the intricate and often painful ambiguities of the world.

The aesthetic disposition, we argue in our book, *Teaching Beauty*, is actually much less quietist than theoretically convoluted dispositions which see everything as "always already" inscribed; much less quietist, indeed, than a social constructivism which regards individuals as importantly or even definitively constrained by the particularities of their race, class, and gender.

Indeed the experience of beauty cultivates confidence in one's own perceptions and preferences, expressing itself, for instance, in the "oddness" that Henry James's Strether, in *The Ambassadors*, praises in Chad, whose shabby but singular Paris apartment seems to Strether part of his "small sublime indifferences and independences, [his] odd and engaging dignity." Nehamas has the same accomplishment of individuality in mind when he writes that a life of aesthetic experiences and choices is one in which he has been able to "put things together in my own manner and form." The judgment of beauty, he writes, "is a judgment of value," implicating us "in a web of relationships with people and things." The conscious choices behind this implication "lead toward individuality." In that achieved individuality, with its bracing sense of independence, authenticity, and personal agency, resides beauty's promise of happiness. For implicit in this accomplishment of autonomy and agency is a larger reassurance about the ability of humanity in general to shape and improve the world.

Critics of aesthetics tend to dismiss the "better world" orientation that often accompanies a serious interest in beauty as sentimental, religious, and naïve, an indulgent distraction from the hard truths of our time. But they are mistaken in this dismissal. The ability to establish strong personal agency, and then project certain futures, certain human potentialities, as novelists often do, and the ability to enter into and respond emotionally to those projections, as strong readers do, is a realistic and mature way of expressing faith in the possibility of humanity's capacity to improve itself.

Dmitri Tymocko, in describing Beethoven's brilliance, evokes precisely this disposition of passion and reason: "[We] can have tremendous, Beethovenian passions without losing all sense of our own limitation. (As one can have powerful political convictions while still recognizing that reasonable people may disagree.) Beethoven himself may not have achieved the perfect synthesis of these two, complementary qualities. But the evidence of both his music and his life suggests that he tried. Passionate maturity, neither resignation nor moderation nor fanaticism: that, perhaps, is what is truly sublime."

The display of "passionate maturity" may be in fact the best that we could ever hope for in our teaching of literature. The centrality of aesthetic experience in the struggle toward adaptation to a world forever changed by the particular political traumas of our time, and in the struggle toward the creation of a more humane world, means that professors of literature have in fact a special, even extraordinary, responsibility. In conveying the fullness of powerful aesthetic gestures, they must convey more than the form and content of particular poems, plays, and novels. They must embody in their very mode of teaching the paradox of passionate control which so often characterizes the greatest works of art; and they must embody the moral value for each individual of this dynamic act of balance.

As William Arrowsmith writes: "[The] enabling principle [of the humanities is] the principle of personal influence and personal example. [Professors should be] visible embodiments of the realized humanity of our aspirations, intelligence, skill, scholarship.[The] humanities are largely Dionysiac or Titanic; they cannot be wholly grasped by the intellect; they must be suffered, felt, seen. This inexpressible turmoil of our animal emotional life is an experience of other chaos matched by our own chaos. We see the form and order not as pure and abstract but as something emerged from chaos, something which has suffered

into being. The humanities are always caught up in the actual chaos of living, and they also emerge from that chaos. If they touch us at all, they touch us totally, for they speak to what we are too."

A student of Wayne Booth's at the University of Chicago remembers an independent study on Joyce's *Ulysses* that he and eight other students had with Booth: "Each week the nine of us gathered in a tight circle in his office at the top of the west Harper tower, surrounded by walls of books and a window looking out over the quad. We read aloud from each chapter and Mr. Booth guided our conversations through that great maze of a book. During our last meeting, Mr. Booth read the final section of Molly's soliloquy. As he approached the end, his voice began to tremble. I looked up from my text to see Wayne Booth crying as he read "yes I said yes I will yes."

Weeping's not required, of course; but there's nothing wrong with professors expressing in their own skin the way in which sustaining fictive truths suffer into being. For those who have carried their literary affections with them through a long life it may even be impossible to keep one's private emotion at bay when a work recalls vividly moments from that life. Paul Fussell has written movingly about the difficulty of keeping his emotions checked when teaching certain works: "During my final years of teaching, I had to be very careful what I talked about, and quoted, in front of a class, for I found I could not navigate unmoved through certain things."

In the age of distance learning, downloaded lecture content, and Death by Powerpoint, it's all the more important that humanities professors resist the ugly mechanization of the classroom, the new and primitive industrial age we're in, and take more seriously than ever their function as living embodiments of the power of beauty. Raimond Gaita, a moral philosopher, puts the matter most strongly: "To be more than a high-flying dilettante you need more than intellectual skills. You must develop a certain kind of moral seriousness: you must try to overcome vanity, to have courage, to care more for truth than for status, and so on. That's as obvious as the need to be kind and just if you are to be a good person and it's just as hard. Critical thinking can be taught. How and why really to care for the truth can't be, not, at any rate, in the same way. For that you need examples in your teachers and in the texts that you study. The examples won't all come from the humanities, but only the humanities can give what you need to reflect on their significance."

It is an interesting idea that the humanities might nurture "moral seriousness," and that such seriousness is in fact required if one is to be more than merely clever, or well versed in one's subject. The return of beauty to literary studies, which we think to be both underway and overdue, is one step toward the revitalization of the liberal arts. That will be its grand, social, public accomplishment.

Jennifer Green-Lewis and Margaret Soltan (known to IHE readers as the proprietor of one of its blogs, University Diaries) are the authors of the just-released book *Teaching Beauty in DeLillo, Woolf, and Merrill* (Palgrave Macmillan), from which this piece is a revised excerpt and appears here with permission of Palgrave Macmillan. They are English professors at George Washington University.

The original story and user comments can be viewed online at http://insidehighered.com/views/2008/04/21/beauty.

APRIL 25

Validation for RateMyProfessors.com?

You've heard the reasons why professors don't trust RateMyProfessors.com, the Web site to which students flock. Students who don't do the work have equal say with those who do. The best way to get good ratings is to be relatively easy on grades, good looking or both, and so forth.

But what if the much derided Web site's rankings have a high correlation with markers that are more widely accepted as measures of faculty performance? Last year, a scholarly study found a high correlation between RateMyProfessors.com and a university's own system of student evaluations. Now, a new study is finding a high correlation between RateMyProfessors and a student evaluation system used nationally.

A new study is about to appear in the journal *Assessment & Evaluation in Higher Education* and it will argue that there are similarities in the rankings in RateMyProfessors.com and IDEA, a student evaluation system used at about 275 colleges nationally and run by a nonprofit group affiliated with Kansas State University.

What is notable is that while RateMyProfessors.com gives power to students, IDEA gives a lot of control over the process to faculty members. Professors identify the teaching objectives that are important to the class, and those are the measures that count the most. In addition, weighting is used so that adjustments are made for factors beyond professors' control, such as class size, student work habits and so forth — all variables that RateMyProfessors doesn't really account for (or try to account for).

The study looked at the rankings of 126 professors at Lander University, in South Carolina, and compared the two ratings systems. The findings:

Student rankings on the ease of courses were consistent in both systems and correlated with grades.

Professors' rankings for "clarity" and "helpfulness" on RateMyProfessors.com correlated with overall rankings for course excellence on IDEA.

The similarities were such that, the journal article says, they offer "preliminary support for the validity of the evaluations on RateMyProfessors.com."

The study was conducted by Michael E. Stonntag, who formerly taught at Lander and who is now vice president for academic affairs at the University of Maine at Presque Isle, and by two psychology professors at Lander, Jonathan F. Bassett and Timothy Snyder.

Sonntag said that there are two ways to read the results: One is to say that RateMyProfessors.com is as good as an educationally devised system and the other would be to say that the latter is as poor as the former. But either way, he suggested, it should give pause to critics to know that the students' Web site "does correlate with a respected tool."

William H. Pallett, president of IDEA, said he was "surprised a bit" by the correlation between his organization's rankings and those of RateMyProfessors.com. That's because much of the criticism he has heard of the student oriented site is that rankings aren't representative, while much of the effort at IDEA is based on assuring representative samples.

"I am surprised, given that we do attend to issues of reliability and validity and they acknowledge that they don't," he said.

Pallett cautioned, however, that IDEA is not intended to be a sole basis for evaluating a course or professor. He said that he would always advise departments to have professors evaluate on another, and to use student evaluations as just one part of that review.

Sonntag said that his current institution uses a home-grown student evaluation system, and that he has no plans to seek a change to IDEA or RateMyProfessors.com — and that the evaluation system is covered

by a collective bargaining contract anyway. But he said that he hoped the study might prompt some to think about the online rankings in new ways.

For his part, Sonntag acknowledged that some RateMyProfessors.com reviews are "so mean-spirited" that they aren't worth anyone's time. But he said that if you cast those aside, there are valuable lessons to be learned. He said that he does check what the site says about his teaching — and has found reinforcement for some innovations and reason to question whether some of his tests were too difficult.

"I've been an instructor for 10 years. I look at it," he said, adding that he has found insights "that weren't on my teaching evaluations and I have thought: 'Wow. I believe what the student has said is valid and perhaps I can change the way I teach."

— Scott Jaschik

The original story and user comments can be viewed online at http://insidehighered.com/news/2008/04/25/rmp.

Autism Risk Linked To Distance From Power Plants, Other Mercury-releasing Sources

Is the risk of autism greater for children who live closer to the pollution source? (Credit: iStockphoto/Marcin Pawinski)

ScienceDaily (Apr. 25, 2008) — How do mercury emissions affect pregnant mothers, the unborn and toddlers? Do the level of emissions impact autism rates? Does it matter whether a mercury-emitting source is 10 miles away from families versus 20 miles? Is the risk of autism greater for children who live closer to the pollution source?

A newly published study of Texas school district data and industrial mercury-release data, conducted by researchers at The University of Texas Health Science Center at San Antonio, indeed shows a statistically significant link between pounds of industrial release of mercury and increased autism rates. It also shows—for the first time in scientific literature—a statistically significant association between autism risk and distance from the mercury source.

"This is not a definitive study, but just one more that furthers the association between environmental mercury and autism," said lead author Raymond F. Palmer, Ph.D., associate professor of family and community medicine at the UT Health Science Center San Antonio. The article is in the journal Health & Place.

Dr. Palmer, Stephen Blanchard, Ph.D., of Our Lady of the Lake University in San Antonio and Robert Wood of the UT Health Science Center found that community autism prevalence is reduced by 1 percent to 2 percent with each 10 miles of distance from the pollution source.

"This study was not designed to understand which individuals in the population are at risk due to mercury exposure," Dr. Palmer said. "However, it does suggest generally that there is greater autism risk closer to the polluting source."

The study should encourage further investigations designed to determine the multiple routes of mercury exposure. "The effects of persistent, low-dose exposure to mercury pollution, in addition to fish consumption, deserve attention," Dr. Palmer said. "Ultimately, we will want to know who in the general

population is at greatest risk based on genetic susceptibilities such as subtle deficits in the ability to detoxify heavy metals."

The new study findings are consistent with a host of other studies that confirm higher amounts of mercury in plants, animals and humans the closer they are to the pollution source. The price on children may be the highest.

"We suspect low-dose exposures to various environmental toxicants, including mercury, that occur during critical windows of neural development among genetically susceptible children may increase the risk for developmental disorders such as autism," the authors wrote.

Study highlights

- Mercury-release data examined were from 39 coal-fired power plants and 56 industrial facilities in Texas.
- Autism rates examined were from 1,040 Texas school districts.
- For every 1,000 pounds of mercury released by all industrial sources in Texas into the environment in 1998, there was a corresponding 2.6 percent increase in autism rates in the Texas school districts in 2002.
- For every 1,000 pounds of mercury released by Texas power plants in 1998, there was a corresponding 3.7 percent increase in autism rates in Texas school districts in 2002.
- Autism prevalence diminished 1 percent to 2 percent for every 10 miles from the source.
- Mercury exposure through fish consumption is well documented, but very little is known about exposure routes through air and ground water.
- There is evidence that children and other developing organisms are more susceptible to neurobiological effects of mercury.

Implications

"We need to be concerned about global mercury emissions since a substantial proportion of mercury releases are spread around the world by long-range air and ocean currents," Dr. Palmer said. "Steps for controlling and eliminating mercury pollution on a worldwide basis may be advantageous. This entails greener, non-mercury-polluting technologies."

The U.S. Environmental Protection Agency (EPA) estimated environmental mercury releases at 158 million tons annually nationwide in the late 1990s, the time period studied by the Texas team. Most exposures were said to come from coal-fired utility plants (33 percent of exposures), municipal/medical waste incinerators (29 percent) and commercial/industrial boilers (18 percent). Cement plants also release mercury.

With the enactment of clean air legislation and other measures, mercury deposition into the environment is decreasing slightly.

Limitations

Dr. Palmer and his colleagues pointed out the study did not reflect the true community prevalence rates of autism because children younger than school age are not counted in the Texas Education Agency data system. The 1:500 autism rates in the study are lower than the 1:150 autism rates in recent reports of the U.S. Centers for Disease Control and Prevention.

Furthermore, the authors note that distance was not calculated from individual homes to the pollution source but from central points in school districts that varied widely in area.

Data sources

Data for environmentally released mercury were from the United States Environmental Protection Agency Toxics Release Inventory. Data for releases by coal-fired power plants came from the same inventory and from the Texas Commission for Environmental Quality. Data for school district autism came from the Texas Education Agency.

Journal reference: Palmer, R.F., et al., Proximity to point sources of environmental mercury release as a predictor of autism prevalence. Health & Place (2008), doi:10.1016/j.healthplace.2008.02.001.

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

http://www.sciencedaily.com:80 /releases/2008/04/080424120953.htm

Testing And Improving The Exceptional Vision Of Athletes

Kevin Gee, an optometrist with the University Eye Institute, and the Sports Vision Performance Center staff in front of the Dynavision, a machine that measures eyesight beyond the standard 20/20 vision. (Credit: Photo by David Gee)

ScienceDaily (Apr. 25, 2008) — The standard eye chart only covers letters and numbers, but athletes need above average vision to track balls hurtling toward them at alarming speeds. To test those special skills, a University of Houston optometrist has founded the Sports Vision Performance Center, a facility where athletes perform while a strobe light is flashing, play tag with a board of lights and engage in other activities designed to improve their visual abilities.

"The biggest problem that athletes face is not knowing they can potentially see much better than 20/20 vision," said Kevin Gee, a Fellow of the American Academy of Optometry and an assistant clinical professor with the UH College of Optometry. Gee opened the Sports Vision Performance Center in January to individual athletes and teams from various sports, and utilizes a range of tests to analyze what is called the "visual system."

"The visual system is more than just 'what's the smallest line on the chart you can see,'" Gee said. "The visual system consists of many things, but specifically for sports, depth perception, color, speed and accuracy of movements and contrast sensitivity -- or the ability to detect an object off a background."

To assess these skills, Gee and his staff use instruments, such as a 3-D movie projected on a computer screen with shimmering objects that pop up to measure depth perception, a lighted batting test that can time up to one-thousandth of a second to gauge timing and accuracy, and a Dynavision™ board -- a vertical lighted peg board -- that determines reaction time, peripheral awareness and accuracy of movement.

Gee has worked with several amateur and professional sports clubs and has been testing the skills of the UH women's softball team since 2006. Some initial meetings during the 2006-07 season turned into weekly meetings during the offseason to test, train and condition the female athletes and their eyes in preparation for the 2007-08 season.

"We started out by examining every player on the team," Gee said. "Through our testing methods, we identified where improvements in the visual system could be made. We timed the player's swings to see if they were ahead or slightly behind. We customized the tests to focus on vision skills needed for infielders versus outfielders, and batters versus pitchers. Most importantly, we were able to enhance their vision with different shades, filters and correction through sports-specific eyewear."

UH softball coach Kyla Holas jumped at the opportunity to work with Gee and his staff, and believes her team's efforts now will pay off in the long run.

"The eye is a very intricate thing and although the differences are slight, I think it is one of those things that we have improved," Holas said. "From his in-office tests to the field tests, the girls love the challenge and the way he presents the tests.

"We had to make some sacrifices in order to make this happen, but I would absolutely recommend this training for other teams," Holas said.

April is Sports Eye Safety Month and Gee's clinic is open to both individual athletes and teams as new patients. Along with softball and baseball, Gee has developed tests for tennis, football and soccer players. Gee hopes that ultimately his clinic will improve performance, but athletes must not neglect the need for eye protection.

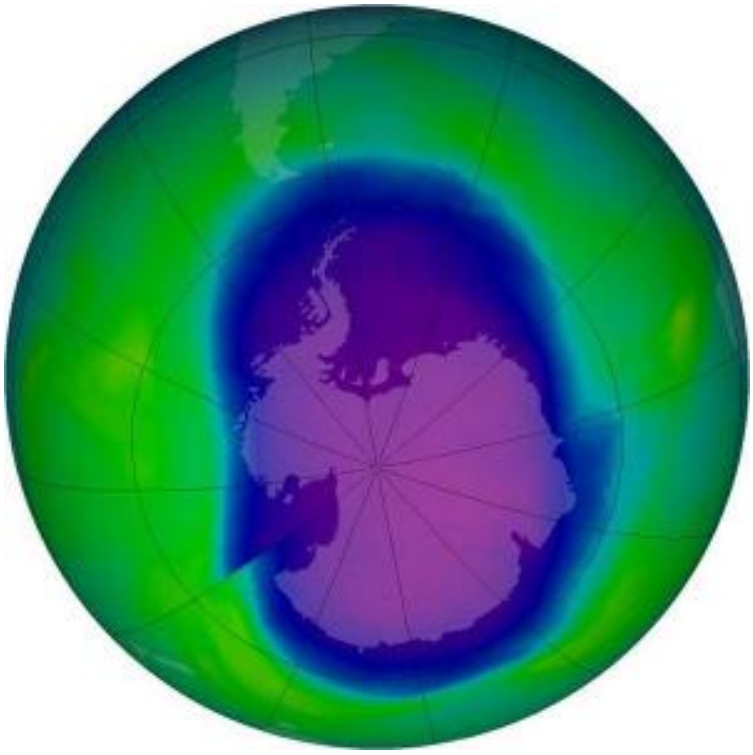
"The easiest way to protect your eyes as an athlete is to get regular eye exams and to wear proper eye protection, as well as sunglasses, if needed," Gee said. "A lot of athletes think polarized sunglasses are the way to go, but those are really for water sports or driving. The best types for athletes are impact resistant and sports-specific with a wraparound design to reduce the light but not the entire glare. Some athletes actually use the shadows and the reflection of the ball off the grass to see it better."

To provide the best eye protection for athletes, Gee also spends time educating the athletics trainers and sports medicine groups on how to distinguish eye injuries, which can range from scratches, pokes or the simple loss of a contact lens, and how to treat those injuries while on the field.

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

http://www.sciencedaily.com:80 /releases/2008/04/080421170215.htm

Stratospheric Injections To Counter Global Warming Could Damage Ozone Layer



Earth's ozone hole, shown here (in blue) in 2006, could be negatively affected by some efforts to mitigate climate change. (Credit: NASA)

ScienceDaily (Apr. 25, 2008) — A much-discussed idea to offset global warming by injecting sulfate particles into the stratosphere would have a drastic impact on Earth's protective ozone layer, new research concludes. The study, led by Simone Tilmes of the National Center for Atmospheric Research (NCAR), warns that such an approach might delay the recovery of the Antarctic ozone hole by decades and cause significant ozone loss over the Arctic.

"Our research indicates that trying to artificially cool off the planet could have perilous side effects," Tilmes says. "While climate change is a major threat, more research is required before society attempts global geoengineering solutions."

In recent years, climate scientists have studied "geoengineering" proposals to cool the planet and mitigate the most severe impacts of global warming. Such plans could be in addition to efforts to reduce greenhouse gas emissions. One of the most-discussed ideas, analyzed by Nobel laureate Paul Crutzen and other researchers, would be to regularly inject large amounts of Sun-blocking sulfate particles into the stratosphere. The goal would be to cool Earth's surface, much as sulfur particles from major volcanic eruptions in the past have resulted in reduced surface temperatures.

Sulfates and ozone

Since major volcanic eruptions temporarily thin the ozone layer in the stratosphere, Tilmes and her colleagues looked into the potential impact of geoengineering plans on ozone over the poles. Sulfates from volcanoes provide a surface on which chlorine gases in the cold polar lower stratosphere can become activated and cause chemical reactions that intensify the destruction of ozone molecules, although the sulfates themselves do not directly destroy ozone.

The new study concluded that, over the next few decades, hypothetical artificial injections of sulfates likely would destroy between about one-fourth to three-fourths of the ozone layer above the Arctic. This would affect a large part of the Northern Hemisphere because of atmospheric circulation patterns. The impacts would likely be somewhat less during the second half of this century because of international agreements that have essentially banned the production of ozone-depleting chemicals.

The sulfates would also delay the expected recovery of the ozone hole over the Antarctic by about 30 to 70 years, or until at least the last decade of this century, the authors conclude.

Recovery of the ozone hole has been a major goal of policymakers worldwide. Nations agreed in 1987 to a landmark accord, known as the Montreal protocol, to restrict the production of industrial chemicals, known as CFCs (chlorofluorocarbons), that cause ozone-destroying chemical reactions. The ozone layer is critical for life on Earth because it blocks dangerous ultraviolet radiation from the Sun.

"This study highlights another connection between global warming and ozone depletion," says co-author Ross Salawitch of the University of Maryland. "These traditionally had been thought of as separate problems but are now increasingly recognized to be coupled in subtle, yet profoundly important, manners."

Ozone impacts

To determine the relationship between sulfates and ozone loss, the authors used a combination of measurements and computer simulations. They then estimated future ozone loss by looking at two geoengineering schemes--one that would use volcanic-sized sulfates and a second that would use much smaller injections.

The study found that injections of small particles, over the next 20 years, could reduce the ozone layer by 100 to 230 Dobson Units. This would represent a significant loss of ozone because the average thickness of the ozone layer in the Northern Hemisphere is 300 to 450 Dobson Units. (A Dobson Unit is equivalent to the number of ozone molecules that would create a layer 0.01 millimeters thick under conditions at Earth's surface).

With large particles, the Arctic loss would range from 70 to 150 Dobson Units. In each case, the larger figure is correlated with colder winters.

The ozone loss would drop in the later part of the century to about 60 to 150 Dobson Units, depending on the size of the sulfates and the severity of winters.

In the Antarctic, most of the ozone is already depleted and the sulfate injections would not significantly reduce the thickness of the ozone layer. Instead, they would significantly delay the recovery of the ozone hole.

The authors caution that the actual impacts on ozone could be somewhat different than estimated if atmospheric changes led to unusually warm or cold polar winters. They also warn that a geoengineering project could lead to even more severe ozone loss if a major volcanic eruption took place at the same time.

"Clearly much more research needs to be conducted to determine the full implications of geoengineering before we may seriously consider the injection of sulfate aerosols into the stratosphere," says co-author Rolf Moeller of the Joelich Research Center in Germany.

The University Corporation for Atmospheric Research manages the National Center for Atmospheric Research under primary sponsorship by the National Science Foundation (NSF). Opinions, findings, conclusions, or recommendations expressed in this document are those of the author(s) and do not necessarily reflect the views of the National Science Foundation, NASA, or other funding agencies.

Journal reference: Simone Tilmes, Rolf Moeller, and Ross Salawitch. The sensitivity of polar ozone depletion to proposed geo-engineering schemes. Science Express, April 24, 2008

The study was funded by the National Science Foundation, which is NCAR's principal sponsor, as well as by NASA and European funding agencies.

Adapted from materials provided by National Center for Atmospheric Research/University Corporation for Atmospheric Research.

http://www.sciencedaily.com:80 /releases/2008/04/080424140407.htm

Lying? The Face Betrays Deceiver's True Emotions, But In Unexpected Ways

Graduate student, Leanne ten Brinke presents two faces to the world. (Credit: Danny Abriel)

ScienceDaily (Apr. 24, 2008) — How can we tell who's lying, who's not? New research out of Stephen Porter's Forensic Psychology Lab at Dalhousie University determines the face will betray the deceiver's true emotion, but not in the stereotypical ways we think.

In making a public appeal for the safe return of his missing wife, Michael White broke down in tears and sobbed.

"My wife is a good person, never hurts anybody. If she's out there and you see me or you see this, just stay out there and we'll find you,' said the tearful husband, sitting on the sofa in his living room in Edmonton after his pregnant wife Liana White disappeared in July 2005. Canadians watching his plea couldn't help but be moved by the plight of the distressed man.

Three days later, flashes of anger broke through his sadness when talking with reporters. He said he was so frustrated with the police investigation that he was going to go and find his wife himself. He led volunteer searchers directly to her body in a ditch on the outskirts of the city, and was immediately arrested by police.

He'd been lying all along. Michael White was charged and convicted with second-degree murder and committing an indignity to a dead body.

How can we tell who's lying, who's not? New research out of Stephen Porter's Forensic Psychology Lab at Dalhousie University determines the face will betray the deceiver's true emotion, but not in the stereotypical ways we think. It's not the shifty eyes or sweaty brow or an elongated nose (à la Pinocchio) the lie detector should look for. Instead, other elements of a liar's face will give them away – "cracking" briefly and allowing displays of true emotion to leak on to the face. In fact, when Porter and his team analyzed White's plea frame by frame, they found hints of anger and disgust in his face, not noticed by most of the supportive public.

"The face and its musculature are so complex—so much more complex than anywhere else in our external bodies," says Leanne ten Brinke, a graduate student in experimental psychology who collaborated on the new research. "There are some muscles in the face you can't control … and those muscles won't be activated in the absence of genuine emotion—you just can't do it."

Adds Dr. Porter: "If someone is telling a really important lie in which the consequences are dire, say life imprisonment, the lie will be revealed anyway. Because unlike body language, you can't monitor or completely control what's going on your face. This research was the first detailed experimental demonstration of the secrets revealed when people put on a "false face," faking or inhibiting various universal emotions."

An article based on their research, "Reading between the Lies: Identifying Concealed and Falsified Emotions in Universal Facial Expressions," appears in the May issue of Psychological Science. The research is the first comprehensive study of the secrets revealed by the human face for four of the universal emotions: happiness, sadness, disgust, and fear. They also tested a hypothesis originating with Charles Darwin in 1872—that there are certain specific facial actions that cannot be created just because we want them to. As well, facial actions may be involuntarily expressed in the presence of a genuine emotion. In The Expression of the Emotions in Man and Animals, Darwin noted: "A man when moderately angry, or even when enraged, may command the movements of his body, but … those muscles of the face which are least obedient to the will, will sometimes alone betray a slight and passing emotion."

In conducting the research, Dr. Porter and Ms. ten Brinke enlisted adult participants to view images that ranged from happy (puppies playing) to fearful (a close-up of open-mouthed rabid dog) and disgusting (a severed hand) and were instructed to respond with genuine or deceptive emotional expressions. (For example, they'd be directed to smile when viewing the severed-hand photo.) Their reactions were watched and judged by other volunteer observers, who could not see the corresponding images, and recorded on video. The 697 emotion clips were exhaustively analyzed frame by frame for more than 100,000 frames.

The results were that no one participant was able to falsify emotions perfectly. Odd or out-of-place expressions—such as smirking or rapid blinking in a supposedly sad face—were more likely to show up when the participant was attempting to be deceptive. Some emotions were harder to falsify than others: happiness is easier to fake than disgust or fear.

The researchers were able to discern rare "microexpressions," flashes of true emotion that show briefly, from one-fifth to one-25th of a second, on the faces of participants when instructed to deceive."The facial expression appears to crack and another emotion leaks on the face, however briefly," says Ms. ten Brinke. "When you see a facial expression like this, you've got to probe with questions to find out why the person is feeling this way." The authors noted that most flashes of inconsistent emotion usually showed in either the upper or lower face only. Further, meaningless muscle twitches sometimes occurred even in genuine expressions, meaning that correct interpretation can only occur by following up with the right questions.

Detecting liars is a tricky business and one that most people—especially people who are highly motivated to catch liars—are particularly bad at."There are all kinds of potential applications for this research, from our daily lives to settings like police interrogations, security checks in airports and courtrooms," says Dr. Porter. "Everyone's trying to figure out who's telling the truth, who's not … we're just so sick of being lied to."

The next step in the research is examining the faces of known liars, liars like Michael White, who've fabricated stories and made highly publicized appeals. Ms. ten Brinke and Dr. Porter have collected and are analyzing more than 60 videos of such real-life, high-stakes cases from Canada, the United States, Britain and Australia."It's to try and give the police a more objective look at whether people in these kinds of situations might be lying," Ms. ten Brinke explains.

It seems the face does reveal all.

Adapted from materials provided by Dalhousie University.

http://www.sciencedaily.com:80 /releases/2008/04/080422200952.htm

Archaeologists Find 18th Century Log Road In Annapolis, Maryland, US

A piece of wood from the 18th century excavated corduroy road. (Credit: Image courtesy of University of Maryland)

ScienceDaily (Apr. 24, 2008) — A University of Maryland archaeological team has uncovered traces of a very early log road deep under an Annapolis street – the first ever found in the city and perhaps one of the oldest such finds in the Washington, D.C. area. The discovery comes in the midst of Annapolis' 300th anniversary.

"We're getting a very rare glimpse of the Annapolis waterfront as it existed 300 years ago," says University of Maryland archaeologist Mark Leone, who directs the Archaeology in Annapolis project. "Very little of the city survives intact from the first quarter of the 18th century, and almost nothing from the late 17th century. These log roads existed in a number of places, but very few have survived so long. No others have been found in Annapolis and none of comparable age in Maryland."

The logs were discovered four feet under Fleet Street in the Annapolis Historic District, once the site of the city's early waterfront. The city Department of Public Works is paying for the Fleet/Cornhill archaeological excavation ahead of a project to lay underground utility cables.

"Wood rots fast, but this was a marshy area so the logs became waterlogged," Leone says. "That's what saved them. The road was probably designed to help people and freight maneuver through the mud."

The road consists of six parallel, shaped logs, each about an inch and a half apart.

The logs are flat on the top and sides, curved on the bottom. So far about three feet worth of road has been discovered, and the researchers hope to continue their excavation to see how far it extends.

"It is truly serendipitous to uncover another piece of our city's beginnings just as we celebrate our 300th birthday," says Annapolis Mayor Ellen Moyer, one of the main partners with the University of Maryland

in the archaeological work in the historic district. “These artifacts are important because they help us visualize what this area looked like around the time of the city’s charter. They create a vivid image.”

The Maryland archaeologists date the corduroy road to at least the early 18th century, based on pottery discovered nearby. But local Annapolis historians Tony Lindauer and Jane McWilliams say it could be even older.

“This pathway may date back as far as 1684 when Annapolis was a settlement, not a city,” says McWilliams. “A town plan was drawn up in that year, though no map of it survives, only a few cryptic sentences. But based on existing documentary evidence, it is possible that today’s Fleet Street corresponds with a road on the 1684 town plan. I can’t say with certainty that what the archaeologists have found dates from these very early years, but I believe the potential is strong enough for everyone involved to give it serious attention. Further research and excavation is definitely warranted.”

Adapted from materials provided by University of Maryland, College Park.

http://www.sciencedaily.com:80 /releases/2008/04/080423180059.htm

Sexual Harassment At School -- More Harmful Than Bullying

ScienceDaily (Apr. 24, 2008) — Schools' current focus on bullying prevention may be masking the serious and underestimated health consequences of sexual harassment, according to James Gruber from the University of Michigan-Dearborn and Susan Fineran from the University of Southern Maine in the US. Their research shows that although less frequent, sexual harassment has a greater negative impact on teenagers' health than the more common form of victimization, bullying.

Gruber and Fineran's study, the first of its kind to compare bullying and sexual harassment victimization using equivalent measurements and time frames, looked at the frequency and health implications of both bullying and sexual harassment among 522 middle and high school students. The teenagers completed a questionnaire which asked how often they had experienced each behavior during the school year, who the perpetrators were, and their reaction.

Bullying was more frequent than sexual harassment for both boys and girls - just over half the students (52%) had been bullied and just over a third (35%) were sexually harassed. Almost a third (32%) had been subject to both behaviors. Girls were bullied or harassed as frequently as boys, but gays, lesbians and bisexuals – sexual minorities – were submitted to greater levels of both.

Both behaviors have a negative effect on victims' health. After taking into account the effects of other stressful life events, ranging from parents' divorce, moving house, falling in love and getting into trouble with the law, Gruber and Fineran found that sexual harassment causes more harm than bullying in both boys and girls. Girls and sexual minorities, however, appeared to be the most affected by sexual harassment, suffering from lower self-esteem, poorer mental and physical health, and more trauma symptoms (thoughts and feelings arising from stressful experiences) than boys.

In the authors' view, schools' current focus on preventing bullying, as well as the tendency to regard sexual harassment as a form of bullying rather than an issue in its own right, draws attention away from a serious health issue. They argue that sexual harassment prevention should receive equal attention as a distinct focus, so that schools can continue to provide a healthy environment for children.

Journal reference: Gruber JE & Fineran S (2008). Comparing the impact of bullying and sexual harassment victimization on the mental and physical health of adolescents.Sex Roles (DOI 10.1007/s11199-008-9431-5)

Adapted from materials provided by Springer.

Mystery Of Ancient Supercontinent's Demise Revealed

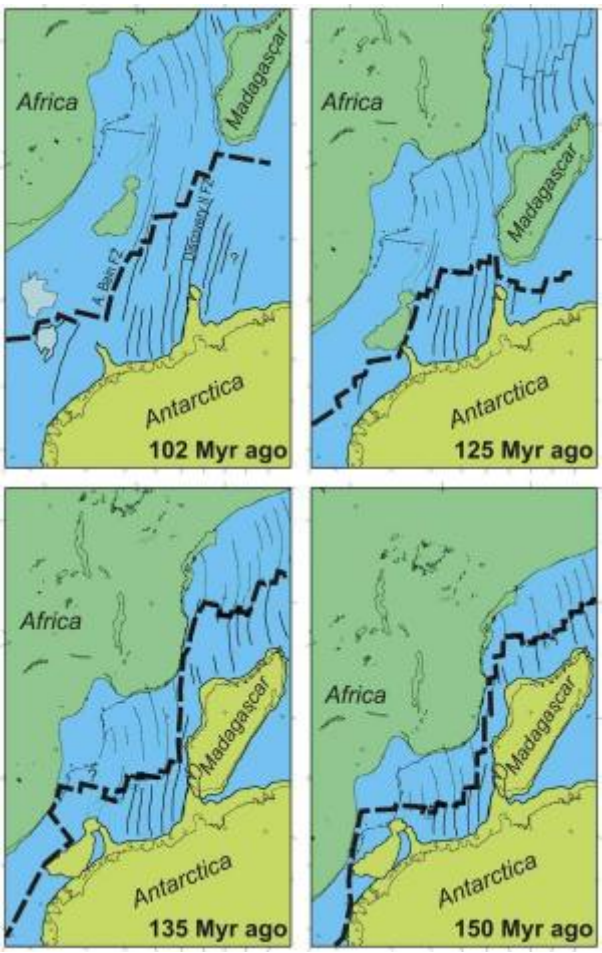


Image showing the movement of Gondwana over millions of years. (Credit: Dr. Graeme Eagles (Royal Holloway, University of London))

ScienceDaily (Apr. 24, 2008) — In a paper published in Geophysical Journal International, Dr Graeme Eagles from the Earth Sciences Department at Royal Holloway, University of London, reveals how one of the largest continents ever to exist met its demise.

Gondwana was a 'supercontinent' that existed between 500 and 180 million years ago. For the past four decades, geologists have debated how Gondwana eventually broke up, developing a multitude of scenarios which can be loosely grouped into two schools of thought – one theory claiming the continent separated into many small plates, and a second theory claiming it broke into just a few large pieces. Dr Eagles, working with Dr Matthais König from the Alfred Wegener Institute for Polar and Marine Research in Bremerhaven, Germany, has devised a new computer model showing that the supercontinent cracked into two pieces, too heavy to hold itself together.

Gondwana comprised of most of the landmasses in today's Southern Hemisphere, including Antarctica, South America, Africa, Madagascar, Australia-New Guinea, and New Zealand, as well as Arabia and the Indian subcontinent of the Northern Hemisphere. Between around 250 and 180 million years ago, it formed part of the single supercontinent 'Pangea'.

Evidence suggests that Gondwana began to break up at around 183 million years ago. Analysing magnetic and gravity anomaly data from some of Gondwana's first cracking points – fracture zones in the Mozambique Basin and the Riiser-Larsen Sea off Antarctica – Dr Eagles and Dr König reconstructed the

paths that each part of Gondwana took as it broke apart. The computer model reveals that the supercontinent divided into just two large, eastern and western plates. Approximately 30 million years later, these two plates started to split to form the familiar continents of today's Southern Hemisphere.

'You could say that the process is ongoing as Africa is currently splitting in two along the East African Rift,' says Dr Eagles. 'The previously held view of Gondwana initially breaking up into many different pieces was unnecessarily complicated. It gave fuel to the theory that a plume of hot mantle, about 2,000 to 3,000 kilometres wide, began the splitting process. A straight forward split takes the spotlight off plumes as active agents in the supercontinent's breakup, because the small number of plates involved resembles the pattern of plate tectonics in the rest of Earth's history during which plumes have played bit parts.'

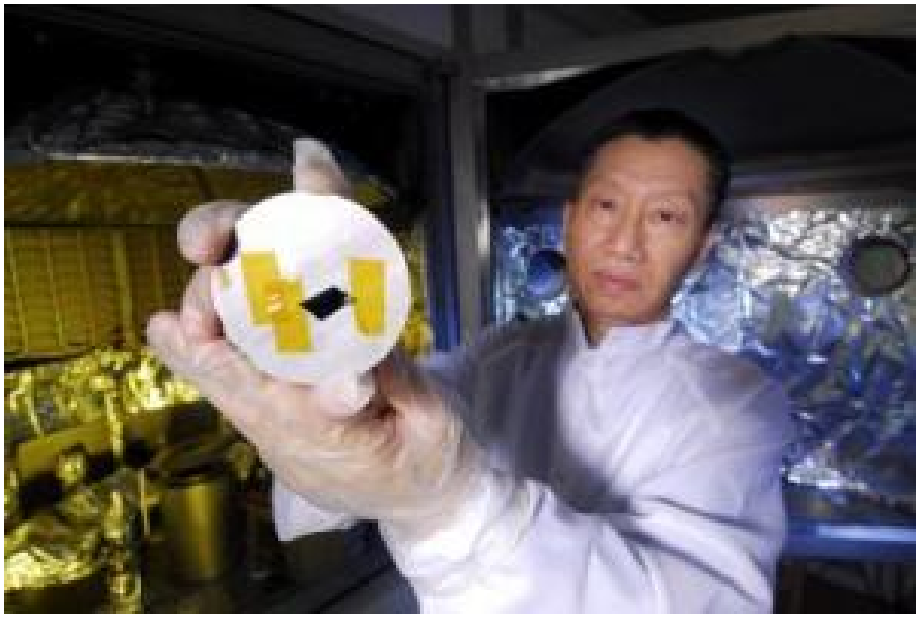
According to Dr Eagles and Dr König's study, because supercontinents like Gondwana are gravitationally unstable to begin with, and have very thick crusts in comparison to oceans, they eventually start to collapse under their own weight.

Says Dr Eagles, 'These findings are a starting point from which more accurate and careful research can be made on the supercontinent. The new model challenges the positions of India and Sri Lanka in Gondwana which have been widely used for the past 40 years, assigning them very different positions in the supercontinent. These differences have major consequences for our understanding of Earth.'

Adapted from materials provided by Royal Astronomical Society.

http://www.sciencedaily.com:80 /releases/2008/04/080423185112.htm

Energy Saving Lights: Organic Light Emitting Diode Made To Last Longer, Resist Moisture



GTRI senior research scientist Wusheng Tong uses ion assisted deposition to produce a high-density, pinhole-free thin silicon oxynitride film on an organic light emitting diode surface, which reduces moisture intrusion. (Credit: Georgia Tech, Photo by Gary Meek)

ScienceDaily (Apr. 24, 2008) — Researchers have developed an improved organic light emitting diode (OLED) sealing process to reduce moisture intrusion and improve device lifetime.

OLEDs are promising for the next generation of displays and solid state lighting because they use less power and can be more efficiently manufactured than current technology. However, the intrusion of moisture into the displays can damage or destroy an OLED's organic material.

"OLEDs have better color and flexibility and the capability of larger displays, but companies still need an inexpensive encapsulation method that can be used to mass produce organic electronics that don't allow moisture in," said Wusheng Tong, a senior research scientist at the Georgia Tech Research Institute (GTRI).

Manufacturers now seal displays in an inert atmosphere or in a vacuum environment. They glue a glass lid on top of the display substrate with a powder inside the display to absorb moisture that diffuses through the glue. These seals are expensive and labor-intensive to assemble.

With funding from GTRI's independent research and development program, Tong and his GTRI collaborators -- senior research scientist Hisham Menkara and principal research scientist Brent Wagner -- have replaced the glass enclosure with a thin-film barrier formed by a less expensive conventional deposition method.

"We chose a passivation coating process that could be performed at room temperature so that the organic material remained intact," said Tong.

The researchers selected advanced ion assisted deposition, which utilizes reactive ions to deposit a high-density, pinhole-free thin silicon oxynitride (SiON) film on the OLED surface.

"Ideally, the film should be as thin as possible, but if it's too thin, a pinhole or other defect could appear and cause a problem," explained Tong. "We found that a film of 50-200 nanometer thickness was perfect."

During testing, the SiON-encapsulated OLEDs showed no sign of degradation after seven months in an open-air environment, while the OLEDs without the coating degraded completely in less than two weeks under the same conditions.

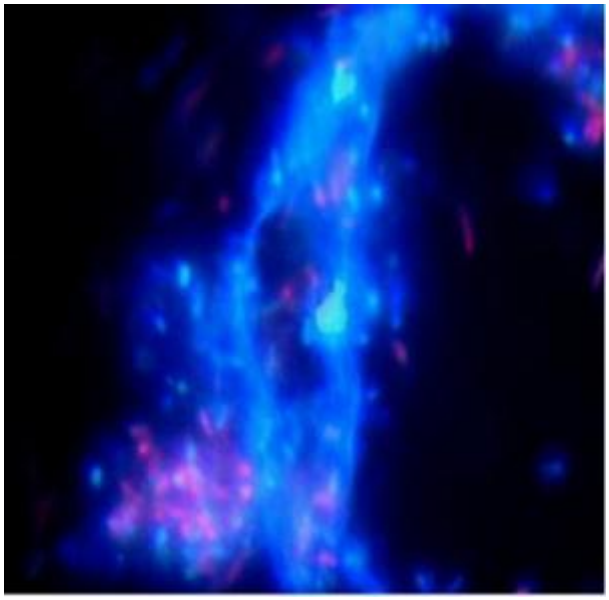
When Tong conducted accelerating aging tests in an environmental chamber that maintained a temperature of 50 degrees Celsius and 50 percent relative humidity, the OLEDs encapsulated with SiON films showed little degradation for at least two weeks. The OLEDs without encapsulation, however, decomposed immediately.

"We've demonstrated that this deposition process improves the lifetime of the OLEDs by blocking the intrusion of moisture, so now we're hoping to work with industry partners to develop a mass production process for our encapsulation technique," added Tong.

Adapted from materials provided by Georgia Institute of Technology, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com:80 /releases/2008/04/080422123102.htm

Newly Created Microbe Produces Cellulose And Sugars For Biofuels



A photosynthetic cyanobacterium with chlorophyll (red) and the cellulose material (blue) it produced. (Credit: Brown and Nobles, the University of Texas at Austin)

ScienceDaily (Apr. 24, 2008) — A newly created microbe produces cellulose that can be turned into ethanol and other biofuels, report scientists from The University of Texas at Austin who say the microbe could provide a significant portion of the nation's transportation fuel if production can be scaled up.

Along with cellulose, the cyanobacteria developed by Professor R. Malcolm Brown Jr. and Dr. David Nobles Jr. secrete glucose and sucrose. These simple sugars are the major sources used to produce ethanol.

"The cyanobacterium is potentially a very inexpensive source for sugars to use for ethanol and designer fuels," says Nobles, a research associate in the Section of Microbiology and Molecular Genetics.

Brown and Nobles say their cyanobacteria can be grown in production facilities on non-agricultural lands using salty water unsuitable for human consumption or crops.

Other key findings include:

- The new cyanobacteria use sunlight as an energy source to produce and excrete sugars and cellulose
- Glucose, cellulose and sucrose can be continually harvested without harming or destroying the cyanobacteria (harvesting cellulose and sugars from true algae or crops, like corn and sugarcane, requires killing the organisms and using enzymes and mechanical methods to extract the sugars)
- Cyanobacteria that can fix atmospheric nitrogen can be grown without petroleum-based fertilizer input

Nobles made the new cyanobacteria (also known as blue-green algae) by giving them a set of cellulose-making genes from a non-photosynthetic "vinegar" bacterium, Acetobacter xylinum, well known as a prolific cellulose producer.

The new cyanobacteria produce a relatively pure, gel-like form of cellulose that can be broken down easily into glucose.

"The problem with cellulose harvested from plants is that it's difficult to break down because it's highly crystalline and mixed with lignins [for structure] and other compounds," Nobles says.

He was surprised to discover that the cyanobacteria also secrete large amounts of glucose or sucrose, sugars that can be directly harvested from the organisms.

"The huge expense in making cellulosic ethanol and biofuels is in using enzymes and mechanical methods to break cellulose down," says Nobles. "Using the cyanobacteria escapes these expensive processes."

Sources being used or considered for ethanol production in the United States include switchgrass and wood (cellulose), corn (glucose) and sugarcane (sucrose). True algae are also being developed for biodiesel production.

Brown sees a major benefit in using cyanobacteria to produce ethanol is a reduction in the amount of arable land turned over to fuel production and decreased pressure on forests.

"The pressure is on all these corn farmers to produce corn for non-food sources," says Brown, the Johnson & Johnson Centennial Chair in Plant Cell Biology. "That same demand, for sucrose, is now being put on Brazil to open up more of the Amazon rainforest to produce more sugarcane for our growing energy needs. We don't want to do that. You'll never get the forests back."

Brown and Nobles calculate that the approximate area needed to produce ethanol with corn to fuel all U.S. transportation needs is around 820,000 square miles, an area almost the size of the entire Midwest.

They hypothesize they could produce an equal amount of ethanol using an area half that size with the cyanobacteria based on current levels of productivity in the lab, but they caution that there is a lot of work ahead before cyanobacteria can provide such fuel in the field. Work with laboratory scale photobioreactors has shown the potential for a 17-fold increase in productivity. If this can be achieved in the field and on a large scale, only 3.5 percent of the area growing corn could be used for cyanobacterial biofuels.

Cyanobacteria are just one of many potential solutions for renewable energy, says Brown.

"There will be many avenues to become completely energy independent, and we want to be part of the overall effort," Brown says. "Petroleum is a precious commodity. We should be using it to make useful products, not just burning it and turning it into carbon dioxide."

Brown and Nobles are now researching the best methods to scale up efficient and cost-effective production of cyanobacteria. Two patent applications, 20080085520 and 20080085536, were recently published in the United States Patent and Trade Office.

This work was recently published in the journal Cellulose.

Adapted from materials provided by University of Texas at Austin, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com:80 /releases/2008/04/080423115917.htm

Humans May Lose Battle With Bacteria, Medicinal Chemist's Research Shows

A color-enhanced scanning electron micrograph showing Salmonella typhimurium (red) invading cultured human cells. (Credit: Courtesy of National Institute of Allergy and Infectious Diseases of the NIH)

ScienceDaily (Apr. 24, 2008) — It may not be an ideal topic for polite conversation, but human beings are swarming with bacteria: Even the average healthy adult plays host to about 100 trillion microscopic organisms. Infection takes place when the bacteria get out of hand.

Now, a University of Kansas researcher has penned a history of the struggle between man and bacteria — and warns that humankind someday may lose its advantage.

In the March 28 issue of the American Chemical Society's Journal of Natural Products, Lester A. Mitscher, a University Distinguished Professor of Medicinal Chemistry, calls for the development of more potent antibiotics necessary for humanity to manage drug-resistant breeds of microbes.

"Antibiotics are essentially selective poisons that kill bacteria and that do not kill us," Mitscher said.

In his article, "Coevolution: Mankind and Microbes," Mitscher chronicles the advent of antibiotics in the 20th century. Sulfonamides, the first anti-infectives, were introduced the mid-1930s. Penicillin — "the first true antibiotic" — was employed widely during World War II. In the decades since, dozens of important antibiotics have been developed and marketed around the world.

"These were called 'miracle drugs,' " said Mitscher. "Unfortunately, that had a downside. They were so relatively safe and so effective that we became careless in their use and in our personal habits. That has caused much of the resistance phenomenon we have today."

Microbial resistance to these drugs has been an ever-increasing problem because of the speedy reproduction and evolution of microorganisms.

"Bacteria that survive the initial onslaught of antibiotics then are increasingly resistant to them," said Mitscher. "The sensitive proportion of the bacterial population dies, but then the survivors multiply quickly — and they are less sensitive to antibiotics. The sensitivity goes all the way from requiring a longer course of therapy or a higher dose, to being totally unaffected by the antibiotic."

Humans have overused antibiotics in areas such as agriculture, worsening the dilemma of highly resistant bacteria.

"People are surprised to learn that almost half of all the antibiotics produced in the world are used in animal husbandry," said Mitscher. "I'm not referring to using antibiotics for curing infections of animals — what I mean is use of antibiotics in relatively small doses as an animal-feed supplement. Animals then grow quicker to a marketable size, and this is seen as a universal good. The difficulty is that use of antibiotics in that setting is an invitation towards resistance. Unfortunately, humans get infected with resistant strains that were generated in animals in this manner."

These days, with so-called "super-bugs" like Methacillin-resistant Staphylococcus aureus (MRSA) making news, resistance is becoming a major public health problem.

"Resistance that started in a hospital setting quickly spread into the community, and now resistance is essentially all around us," Mitscher said. "That does not mean to say we're all going to die in agony in the immediate future. But this is an important phenomenon that needs to be addressed more carefully than we have in the past."

Part of the solution is to use antibiotics sparingly for industrial, agricultural and medical purposes. When an antibiotic is called for to treat an infection the best one should be used with appropriate intensity.

Mitscher said that drug corporations must develop antibiotics with the potential not only to kill microbes but also to inhibit their ability to mutate. These new drugs would be made more effective still if they enlisted the body's own immune system to battle infections.

Alas, because of the economics of the drug industry, Mitscher said such "triple treat" antibiotics might be a long time coming.

"The pace of antibiotic discovery has fallen off, partly because the intensive research on them has lead to increasingly diminishing returns," said Mitscher. "Pharmaceutical firms have, for a variety of commercial reasons, de-emphasized antibiotic research in recent decades."

Mitscher adapted his article from a July 2007 speech in Portland, Maine, accepting the American Society of Pharmacognosy's Norman R. Farnsworth Research Achievement Award, the highest award the society bestows.

Adapted from materials provided by University of Kansas.

http://www.sciencedaily.com:80 /releases/2008/04/080423181124.htm