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Older People Who Diet Without Exercising Lose Valuable Muscle Mass

ScienceDaily (Sep. 22, 2008) — A group of sedentary and overweight older people placed on a four-month exercise program not only became more fit, but burned off more fat, compared to older sedentary people who were placed on a diet but did not exercise.

The new study also showed that when older people diet without exercising, they lose more lean muscle compared to those who exercise, said senior researcher Bret H. Goodpaster. When they combined weight loss with exercise, it nearly completely prevented the loss of lean muscle mass. The results are important because older people tend to lose muscle mass as they age and too much muscle loss may interfere with activities of daily living.

The study, "Separate and combined effects of exercise training and weight loss on exercise efficiency and substrate oxidation," appears in the current issue of the Journal of Applied Physiology, published by The American Physiological Society. Francesca Amati, John J. Dube, Chris Shay and Goodpaster, all of the University of Pittsburgh, carried out the study.

Study looks at exercise efficiency

The researchers wanted to know the best way to get better (more efficient) at completing a defined exercise task. In particular, they wanted to know if greater fitness could be achieved through exercise training, weight loss (through dieting), or both. In addition, they wanted to know which fuel source the body would draw upon, carbohydrates or fats, under these different conditions.

The 64 participants were 60-75 years of age and were either overweight or obese. All of the participants were sedentary at the outset of the study. The researchers divided the participants into three groups:

- exercise only
- diet only
- exercise plus diet

Those who exercised could either walk on a treadmill or ride a stationary bicycle, although most chose to walk. The dieters reduced their caloric intake to achieve a 10% weight loss by the end of the four-month study period. The final group combined both the daily exercise and the diet.

Exercise increases efficiency, burns more fat

The researchers measured how many calories the participants expended during a set work load on a stationary bicycle at the beginning and at the end of the experiment. They found that the:

- Exercise group expended fewer calories (became more efficient) on the exercise task at the end of the study compared to the beginning.
- Exercise group drew more on fat stores as the source of their body's fuel.
- Diet-only group did not gain efficiency in performing the exercise task, even though they weighed less at the end of the experiment.
- Diet-only group's weight loss resulted from a loss of both muscle and fat.
- Exercise plus diet group was the most efficient at the exercise task at the end of the experiment. This shows an additive effect of both dieting and exercise, but most of that benefit was due to exercise.
- Exercise plus diet group, like the exercise-only group, drew more on fat stores as an energy source.

"The take-home message is that, even among older people and during a fairly short period of time, exercise produces metabolic changes that require the expenditure of fewer calories during physical activity," Goodpaster said. Exercise also allowed older people to more preferentially burn fat, which may be healthier metabolically."

Journal reference:

1. Amati et al. **Separate and combined effects of exercise training and weight loss on exercise efficiency and substrate oxidation**. *Journal of Applied Physiology*, 2008; 105 (3): 825 DOI: 10.1152/japplphysiol.90384.2008

Adapted from materials provided by American Physiological Society.

http://www.sciencedaily.com/releases/2008/09/080917095349.htm

Climate Change, Human Activity And Wildfires

A 2006 wildfire burns boreal forests in the Yukon Flats, central Alaska. (Credit: Phil Higuera)

ScienceDaily (Sep. 22, 2008) — Climate has been implicated by a new study as a major driver of wildfires in the last 2,000 years. But human activities, such as land clearance and fire suppression during the industrial era (since 1750) have created large swings in burning, first increasing fires until the late 1800s, and then dramatically reducing burning in the 20th century.

The study by a nine-member team from seven institutions -- led by Jennifer R. Marlon, a doctoral student in geography at the University of Oregon -- appeared online Sunday ahead of regular publication in the journal Nature Geoscience. The team analyzed 406 sedimentary charcoal records from lake beds on six continents.

A 100-year decline in wildfires worldwide -- from 1870 to 1970 -- was recorded despite increasing temperatures and population growth, researchers found. "Based on the charcoal record," Marlon said, "we believe the reduction in the amount of biomass burned during those 100 years can be attributed to a global expansion of agriculture and intensive grazing of livestock that reduced fuels plus general landscape fragmentation and fire-management efforts."

Observations of increased burning associated with global warming and fuel build-up during the past 30 years, however, are not yet included in the sediment record.

Charcoal levels have drawn attention during the past 25 years because these data can track wildfire activity -- both incidence and severity -- over long time periods, providing information when similar data from satellites or fire-scarred trees do not exist. This study is among early efforts to analyze charcoal records for widespread patterns and trends over such a long period.

The importance of the data presented by Marlon's team is put into perspective of overall information about the history of wildfires in a "News & Views" article, also appearing online, written by Andrew C. Scott, an earth sciences researcher at the University of London.

During the last 2,000 years, fire activity was highest between 1750 and 1870. "This was a period when several factors combined to generate conditions favorable to wildfires," Marlon said. "Population growth and European colonization caused massive changes in land cover, and human-induced increases in atmospheric carbon dioxide concentrations may have started to increase biomass levels and fuels."

From A.D. 1 to about 1750, wildfires worldwide declined from earlier years, probably resulting from a long-term global cooling trend that offset any possible influence of population growth and related land-use changes. Researchers pointed to charcoal evidence in western North America as an example of this trend. Similar records also were found in Central America and tropical areas of South America. In the western U.S. and in Asia, researchers noted, "initial colonization may have been marked by an increased use of fire for land clearance."

Subsequently, expansion of intensive agriculture and grazing, as well as forest management activities, likely reduced wildfire activity, Marlon said. "Our results strongly suggest that climate change has been the main driver of global biomass burning for the past two millennia," the researchers concluded. "The decline in biomass burning after A.D. 1870 is opposite to the expected effect of rising carbon dioxide and rapid warming, but contemporaneous with an unprecedentedly high rate of population increase."

The eight co-authors with Marlon were: Patrick J. Bartlein and Daniel G. Gavin, professors in the geography department and members of the Environmental Change Research Group; C. Carcaillet of the Centre for Bio-Archaeology and Ecology in Montpellier, France; S.P. Harrison and I.C. Prentice, both of the University of Bristol in the United Kingdom; P.E. Higuera of Montana State University in Bozeman, Mont.; F. Joos of the Physics Institute and Oeschger Centre for Climate Change Research in Bern, Switzerland; and Mitchell .J. Power of the University of Utah in Salt Lake City and a curator at the Utah Museum of Natural History. The National Science Foundation and U.K. Natural Environment Research Council funded the research.

Adapted from materials provided by University of Oregon.

http://www.sciencedaily.com:80/releases/2008/09/080921162046.htm

Obesity 'raises miscarriage risk'

Women who have had a miscarriage could be at greater risk of miscarrying again if they are obese, research suggests.

A team from London's St Mary's Hospital followed the progress of 696 women whose miscarriages were classed as "unexplained" by a specialist clinic.

The team told a conference in Canada the risk of a further miscarriage was raised by 73% if the woman was obese.

However, an obesity specialist said it was potentially dangerous to try to lose weight when already pregnant.

All women with recurrent miscarriage should be weighed at their first consultation
Winnie Lo
St Mary's Hospital

Although the links between being obese and having problems conceiving and complications during pregnancy are well known, this study claims to be the first to look specifically at "recurrent" miscarriage, for which there is often no obvious cause.

Of the 696 women whose cases were followed, more than half were of "normal" weight, 30% were overweight, and 15% were obese, meaning they had a body mass index (BMI) of 30 or above.

The older the woman, the higher chance she had of having another miscarriage, but, when the figures were adjusted to account for this, obesity emerged as another possible factor.

While there was no difference in the miscarriage rates for overweight, normal and underweight women, the risk of further miscarriage increased sharply for obese women.

Foetal malformation

Winnie Lo, a clinical nurse specialist at St Mary's, who presented the research at the Royal College of Obstetrics and Gynaecology's international meeting in Montreal, said: "This is the first study to look directly at the link between BMI and recurrent miscarriage.

"It shows that obese women who experience recurrent miscarriage are at greater risk of subsequent pregnancy loss.

"All women with recurrent miscarriage should be weighed at their first consultation.

"Those who are found to be obese should be counselled regarding the benefits of weight loss."

Dr Nick Finer, an endocrinologist with an interest in obesity from Addenbrooke's Hospital near Cambridge, said that the findings were "unsurprising".

"We already know that the chances of fertility are less with increasing BMI, the risks of foetal malformation increase, alongside the risks of other adverse pregnancy outcomes."

He said that, while the reason why obesity might cause such problems was not clear, it was possible that it increased inflammation, harming the chances of a successful pregnancy.

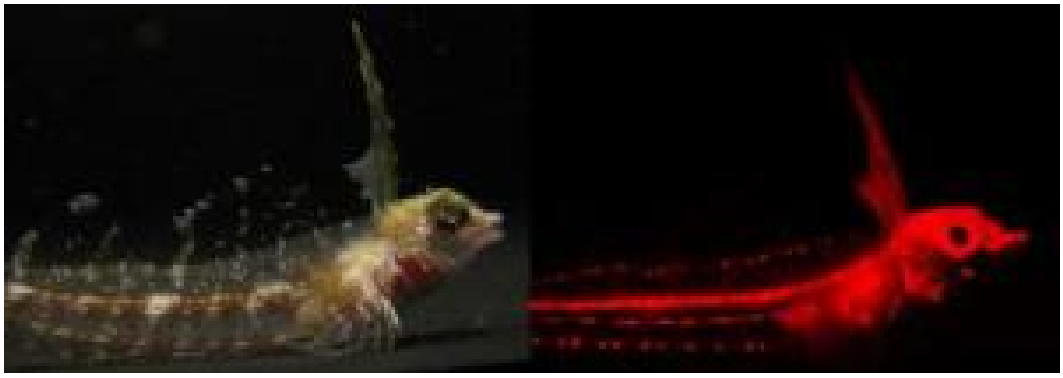
However, he warned that crash diets during pregnancy would never be recommended as a means of increasing the chances of success.

"There are good reasons to try to lose weight before getting pregnant, but it is recommended that women do not try to do this once pregnancy is established, as it could cause problems."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/7625218.stm

Published: 2008/09/21 00:01:10 GMT

Fantastic Photographs Of Fluorescent Fish



Striking image of fish fluorescing vivid red light. (Credit: Michiels et al.)

ScienceDaily (Sep. 17, 2008) — Scientists have discovered that certain fish are capable of glowing red.

Due to absorption of 'red' wavelengths of sunlight by sea-water, objects which look red under normal conditions appear grey or black at depths below 10m. This has contributed to the belief among marine biologists that red colours are of no importance to fish.

Nico Michiels, from the University of Tübingen, Germany, led a team of researchers who captured the striking images in the article which, as he describes, "Shows that red fluorescence is widespread among marine fish. Our findings challenge the notion that red light is of no importance to marine fish, calling for a reassessment of its role in fish visual ecology".

The authors identified at least 32 reef fish species belonging to 16 genera in 5 families that fluoresced visibly in red. Because the light is coming from the fish themselves and not filtering down from the surface, the red glow remains visible at depth and is easily seen at close distances.

The authors speculate that red fluorescence may function as a communication or attraction signal, as proposed for other fluorescent animals, "We believe red fluorescence may be part of a private communication system in fish. Red fluorescence is at the borderline of what is visible to many marine fish, and due to rapid attenuation of red light by water, even those that can see red will be able to see it over short distances only. Fluorescent eye rings may function as an indicator of presence or reveal the direction of gaze."

Journal reference:

1. Nico K. Michiels, Nils Anthes, Nathan S. Hart, Juergen Herler, Alfred J. Meixner, Frank Schleifenbaum, Gregor Schulte, Ulrike E. Siebeck, Dennis Sprenger and Matthias F. Wucherer. **Red fluorescence in reef fish: a novel signaling mechanism?** *BMC Ecology*, September 16, 2008

Adapted from materials provided by BMC Ecology, via AlphaGalileo.

http://www.sciencedaily.com/releases/2008/09/080915210600.htm

Why Some Primates, But Not Humans, Can Live With Immunodeficiency Viruses And Not Progress To AIDS

Sooty mangabey. (Credit: Image courtesy of Wikimedia Commons)

ScienceDaily (Sep. 17, 2008) — Key differences in immune system signaling and the production of specific immune regulatory molecules may explain why some primates are able to live with an immunodeficiency virus infection without progressing to AIDS-like illness, unlike other primate species, including rhesus macaques and humans, that succumb to disease.

Following the identification of HIV (Human Immunodeficiency Virus) as the cause of AIDS 25 years ago, an extensive search was undertaken to identify the source of the virus. These studies led to the discovery that chimpanzees and sooty mangabeys are infected in the wild with simian immunodeficiency viruses (SIV), whose transmission to humans and macaques leads to AIDS.

Surprisingly, the natural hosts for the AIDS viruses, such as the mangabeys and numerous other African primate species who have been found to harbor SIVs in the wild, remain healthy despite infection. Understanding how the natural hosts evolved to resist the development of immunodeficiency disease has long represented a key unsolved mystery in our understanding of AIDS. Furthermore, definition of the mechanisms by which they resist disease could help explain the mechanisms underlying AIDS progression in humans.

A team of scientists from Yerkes National Primate Research Center and the Emory Vaccine Center has discovered that the immune systems of sooty mangabeys are activated to a significantly lower extent during SIV infection than are the immune systems of rhesus macaques, and that this difference may explain why SIV and HIV infection leads to AIDS in some primate species but not others.

"During both HIV infection in humans and SIV infection in macaques, the host immune system becomes highly activated, experiences increased destruction and decreased production of key immune effector cells and progressively fails as a result. In contrast, natural hosts for SIV infection, like sooty mangabeys, do not exhibit aberrant immune activation and do not develop AIDS despite high levels of ongoing SIV replication. Our studies sought to understand the basis for the very different responses to AIDS virus infections in different species," says Mark Feinberg, MD, PhD, the paper's senior author. Feinberg is a former investigator at the Emory Vaccine Center and the Yerkes Research Center and a professor of medicine at the Emory University School of Medicine. He currently serves as vice president of medical affairs and policy for vaccines and infectious diseases at Merck & Co., Inc.

The reasons are found in significant differences in immune signaling in a specific type of dendritic cells in AIDS-susceptible or resistant host species. Dendritic cells are part of the immune system that play a key role in alerting the body to the presence of invading viruses or bacteria, and in initiating immune responses that enable clearance of these infections. They detect the invaders using molecules called Toll-like receptors.

Feinberg's team found that in sooty mangabeys, dendritic cells produce much less interferon alpha--an alarm signal to the rest of the immune system--in response to SIV. As a result, the dendritic cells are not activated during the initial or chronic stages of SIV infection, and mangabeys fail to mount a significant immune response to the virus. In contrast to mangabeys, dendritic cells from humans and macaques that are susceptible to developing AIDS are readily activated by HIV and SIV.

The difference in whether or not dendritic cells become activated upon AIDS virus exposure in specific primate hosts appears to result from species-specific differences in patterns of Toll-like-receptor signaling. Because host immune responses are unable to clear AIDS virus infections, ongoing virus replication leads to unrelenting activation of the immune system in humans and macaques.

Unfortunately, rather than promoting clearance of the infection, chronic dendritic cell stimulation may result in chronic immune activation and significant unintended damage to the immune system in AIDS-susceptible species. Such chronic immune activation is now recognized to be a major driving force for the development of AIDS.

The observation that mangabey dendritic cells are less susceptible to activation by SIV may explain why mangabeys do not exhibit abnormal immune activation and do not develop AIDS. Thus, in mangabeys, the generation of a less vigorous immune response to SIV may represent an effective evolutionary response to a virus that is so resistant to clearance by antiviral immune responses.

The authors suggest new treatment strategies that would steer the immune system away from over-activation, thereby protecting against the unintended damage caused by host immune responses. Such treatment approaches that focus on the host response to the AIDS virus may provide a valuable means of complementing the use of antiretroviral drugs that focus directly on inhibition of virus replication.

Understanding the particular details of Toll-like receptor signaling pathways in the mangabeys may help guide the development of specific therapeutic approaches that could beneficially limit chronic immune activation in HIV-infected humans.

"Better understanding of the biological basis by which sooty mangabeys and the numerous primate species that represent natural hosts for AIDS virus infections have evolved to resist disease promises to

teach us a great deal about the emergence of the AIDS pandemic, and about the mechanisms underlying AIDS progression in humans. In addition, such insights will hopefully help inform new approaches to treat HIV infection most effectively." Feinberg says.

"Also, better understanding how natural hosts for SIV remain healthy may provide clues as to the future evolutionary trajectory of human populations in response to the profound selective pressures now being felt in regions of the world where the tragic consequences of HIV infection are most severe."

First authors of the paper are Judith N. Mandl from the Graduate Program in Population Biology, Ecology and Evolution at Emory University and Ashley P. Barry who formerly was with the Emory Vaccine Center and Yerkes National Primate Research Center.

The research was funded by the National Institutes of Health, and included support provided to the Yerkes National Primate Research Center and the Emory Center for AIDS Research.

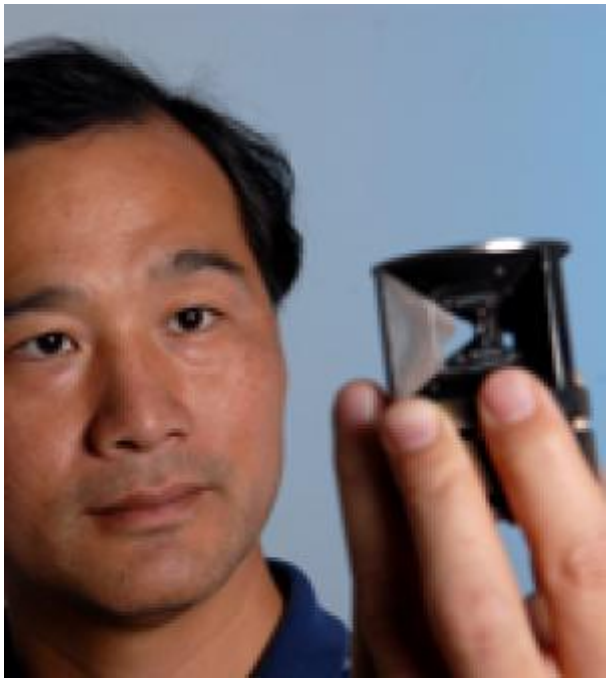
Journal reference:

1. Mandl et al. **Divergent TLR7 and TLR9 signaling and type I interferon production distinguish pathogenic and nonpathogenic AIDS virus infections**. *Nature Medicine*, 2008; DOI: 10.1038/nm.1871

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

http://www.sciencedaily.com/releases/2008/09/080916143900.htm

Earth Structure: Lowermost Mantle Has Materials With Unexpected Properties



Jung-Fu Lin and colleagues used a diamond anvil cell to recreate materials and conditions in Earth's lowermost mantle. (Credit: Image courtesy of University of Texas at Austin)

ScienceDaily (Sep. 17, 2008) — Materials deep inside Earth have unexpected atomic properties that might force earth scientists to revise their models of Earth's internal processes, a team of researchers has discovered.

The researchers recreated in the lab the materials, crushing pressures and infernal temperatures they believe exist in the lowermost mantle, nearly 2,900 kilometers (1,800 miles) below Earth's surface. They report in the journal Nature Geoscience the materials exhibit rare and unexpected atomic properties that might influence how heat is transferred within Earth's mantle, how columns of hot rock called superplumes form, and how the magnetic field and heat generated in Earth's core travel to the planet's surface.

The planetary building blocks magnesium, silicon, oxygen and iron are the most abundant minerals in the lowermost mantle. A team of scientists led by Jung-Fu Lin at The University of Texas at Austin's Jackson School of Geosciences synthesized materials from these building blocks in a diamond anvil cell, a device containing two interlocking diamond pieces that squeeze the sample like a vice. They subjected the sample to more than 1.3 million times standard atmospheric pressure. Shining a laser through the transparent diamonds, they then heated the sample to almost 3,000 degrees Celsius (5,400 degrees Fahrenheit) for several days.

The scientists used the nation's most powerful source of X-rays, a facility at Argonne National Laboratory called a synchrotron light source, to reveal the sample's electronic and atomic structure. They determined the high pressures had caused some of the electrons in the sample's iron, which normally repel each other, to "pair up" or become bound to each other. Earlier experiments by Lin and others had found evidence for areas in the lower mantle in which electrons were either mostly paired up or were mostly unpaired. This was the first evidence of a broad region in the subsurface with what scientists describe as "intermediate-spin state," or partially paired iron electrons.

"We were surprised to find partially paired electrons," said Lin. "That doesn't normally occur in other geological materials that we know about."

The degree of electron pairing, also known as electronic spin state, can affect how well the materials conduct heat and electricity. Lin said modelers who make computer simulations of mantle dynamics will now have to go back and try to determine how this intermediate-spin state might affect the way heat is transferred within Earth, how superplumes form, how convection occurs in the mantle and how Earth's magnetic field might radiate from the core.

The electronic spin state can also affect the speed of seismic waves traveling through material in the deep mantle. As a result, seismic images of the lowermost mantle—collected when earthquake vibrations travel through and reflect off of material in the subsurface—may have to be reinterpreted.

Lin's co-authors include Heather Watson and William J. Evans at Lawrence Livermore National Laboratory; György Vankó at KFKI Research Institute for Particle and Nuclear Physics in Budapest, Hungary; Esen E. Alp and Jiyong Zhao at Argonne National Laboratory; Vitali B. Prakapenka, Przemek Dera and Atsushi Kubo at the University of Chicago; Viktor V. Struzhkin at Carnegie Institution of Washington; and Catherine McCammon at Universität Bayreuth in Germany.

Journal reference:

1. Lin et al. **Intermediate-spin ferrous iron in lowermost mantle post-perovskite and perovskite**. *Nature Geoscience*, October 2008 edition and online Sept. 14,2008 DOI: 10.1038/ngeo310

Adapted from materials provided by University of Texas at Austin.

http://www.sciencedaily.com/releases/2008/09/080916105720.htm

Whale Songs Are Heard For First Time Around New York City Waters

A humpback whale (Megaptera novaeangliae) breaching. Its long pectoral fins, tubercles, and ventral grooves that run from the lower jaw to the umbilicus are visible. (Credit: iStockphoto/Eric Carr)

ScienceDaily (Sep. 17, 2008) — For the first time in waters surrounding New York City, the beckoning calls of endangered fin, humpback and North Atlantic right whales have been recorded, according to experts from the Bioacoustics Research Program at the Cornell Lab of Ornithology and the New York State Department of Environmental Conservation (DEC)."This is an exciting time for New Yorkers. Just think, just miles from the Statue of Liberty, the Empire State Building, Carnegie Hall and Times Square, the great whales are singing," says Chris Clark, the Director of the Bioacoustics Research Program at the Cornell Lab of Ornithology. "These are some of the largest and rarest animals on this planet trying to make a living just a few miles from New York's shores. It just goes to show us that there are many important and wonderful discoveries to be made about the living world right here, right in our back yards.""With data generated by acoustic monitoring, we can better understand New York's role in the life history of these endangered whales and make more informed conservation decisions," says James Gilmore, chief of the DEC's Bureau of Marine Resources. "This is especially important for the survival of right whales."

The recorders were placed about 13 miles from the New York Harbor entrance and off the shores of Fire Island. Information about the seasonal presence of whales will help New York state policymakers develop management plans to protect them. Knowing the whales' travel paths will help ship traffic managers avoid whale collisions in New York waters. Further, the study will characterize New York waters' acoustic environment and examine whether underwater noises, including shipping, affect the whales.

Acoustic monitoring was initiated in spring 2008 – between March and June – in order to record the right whales' northward migration from their calving ground off the Florida eastern coast to their feeding grounds off Maine, New Hampshire and Massachusetts. Acoustic monitoring has begun for the whales' southern migration in the fall, back to the calving areas. The study will continue through February 2009 and is expected to reveal which species occur in New York waters throughout the winter months.

Adapted from materials provided by Cornell University.

http://www.sciencedaily.com/releases/2008/09/080916143906.htm

Innovative Hydrogen-powered Car Created

Lead researcher Dirk Kok toasts the fuel of the future - water. (Credit: Image courtesy of University of Sunderland)

ScienceDaily (Sep. 17, 2008) — As the price of gasoline fuel soars, and concerns grow about the impact of car culture on the environment, a team of scientists from the University of Sunderland have come up with a hydrogen-powered car, which they believe is a significant step forward in creating a mass-produced green machine.

The team, led by Dirk Kok from the Institute of Automotive and Manufacturing Advanced Practice (AMAP), in partnership with the Centre for Process Innovation at Wilton and Lambda One Autogas at Gateshead, have successfully adapted a Nissan Almera to run on hydrogen so that it only emits water from its exhaust.

The HyPower Nissan Almera will be unveiled at the Partners4Automotive 2008 conference on September 17 at the University of Sunderland's Sir Tom Cowie Campus. This international event will look at alternative fuel technologies for vehicles and transport systems, giving local business the chance to see cutting edge developments from around the world.

Adrian Morris, Operations Manager at AMAP, says the HyPower project is a major breakthrough in the development of green transport. He says: "This project marks a significant step forwards in our understanding of hydrogen as a fuel for the automotive industry."

"This vehicle will act as a test bed to evaluate novel hydrogen technologies in vehicles and will enhance the region's status as an important automotive research and development centre."

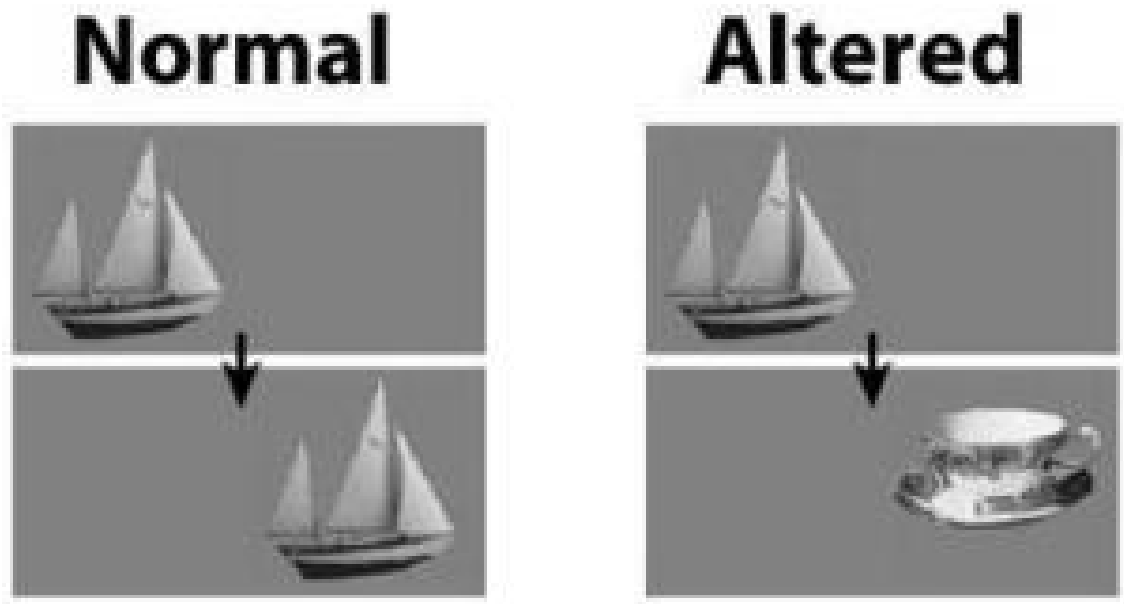
Dirk Kok says: "The whole subject of hydrogen as a fuel for cars is intriguing. It all depends upon the price of oil, the driving range of these new green vehicles, ease of safely filling these vehicles, and the availability of competing systems, which we are also researching.

"The HyPower project does demonstrate that hydrogen is a practical and environmentally friendly alternative to fossil fuels. But though this is a significant step forward, there is still a long way to go before we see these vehicles driving about our roads."

Adapted from materials provided by University of Sunderland.

http://www.sciencedaily.com/releases/2008/09/080912091726.htm

Watch And Learn: Time Teaches Us How To Recognize Visual Objects



Example of stimuli used by Li and DiCarlo. An image of a sailboat is presented at different locations in the visual field. In most cases, it remains unchanged as the eyes move toward it, but at one test location, the stimulus is swapped for a teacup during the eye movement. As monkeys are exposed to this altered visual world, neurons in their brains begin to confuse the two objects when shown at the test location. The confusion is exactly that which is expected if the brain uses temporal contiguity to teach it how to recognize objects. (Credit: Source: Nuo Li and James DiCarlo, McGovern Institute for Brain Research at MIT)

ScienceDaily (Sep. 17, 2008) — In work that could aid efforts to develop more brain-like computer vision systems, MIT neuroscientists have tricked the visual brain into confusing one object with another, thereby demonstrating that time teaches us how to recognize objects.

It may sound strange, but human eyes never see the same image twice. An object such as a cat can produce innumerable impressions on the retina, depending on the direction of gaze, angle of view, distance and so forth. Every time our eyes move, the pattern of neural activity changes, yet our perception of the cat remains stable.

"This stability, which is called 'invariance,' is fundamental to our ability to recognize objects — it feels effortless, but it is a central challenge for computational neuroscience," explained James DiCarlo of the McGovern Institute for Brain Research at MIT, the senior author of the new study appearing in the Sept. 12 issue of Science. "We want to understand how our brains acquire invariance and how we might incorporate it into computer vision systems."

A possible explanation is suggested by the fact that our eyes tend to move rapidly (about three times per second), whereas physical objects usually change more slowly. Therefore, differing patterns of activity in rapid succession often reflect different images of the same object. Could the brain take advantage of this simple rule of thumb to learn object invariance?

In previous work, DiCarlo and colleagues tested this "temporal contiguity" idea in humans by creating an altered visual world in which the normal rule did not apply. An object would appear in peripheral vision, but as the eyes moved to examine it, the object would be swapped for a different object. Although the

subjects did not perceive the change, they soon began to confuse the two objects, consistent with the temporal contiguity hypothesis.

In the new study, DiCarlo and graduate student Nuo Li sought to understand the brain mechanisms behind this effect. They had monkeys watch a similarly altered world while recording from neurons in the inferior temporal (IT) cortex — a high-level visual brain area where object invariance is thought to arise. IT neurons "prefer" certain objects and respond to them regardless of where they appear within the visual field.

"We first identified an object that an IT neuron preferred, such as a sailboat, and another, less preferred object, maybe a teacup," Li said. "When we presented objects at different locations in the monkey's peripheral vision, they would naturally move their eyes there. One location was a swap location. If a sailboat appeared there, it suddenly became a teacup by the time the eyes moved there. But a sailboat appearing in other locations remained unchanged."

After the monkeys spent time in this altered world, their IT neurons became confused, just like the previous human subjects. The sailboat neuron, for example, still preferred sailboats at all locations — except at the swap location, where it learned to prefer teacups. The longer the manipulation, the greater the confusion, exactly as predicted by the temporal contiguity hypothesis.

Importantly, just as human infants can learn to see without adult supervision, the monkeys received no feedback from the researchers. Instead, the changes in their brain occurred spontaneously as the monkeys looked freely around the computer screen.

"We were surprised by the strength of this neuronal learning, especially after only one or two hours of exposure," DiCarlo said. "Even in adulthood, it seems that the object-recognition system is constantly being retrained by natural experience. Considering that a person makes about 100 million eye movements per year, this mechanism could be fundamental to how we recognize objects so easily."

The team is now testing this idea further using computer vision systems viewing real-world videos.

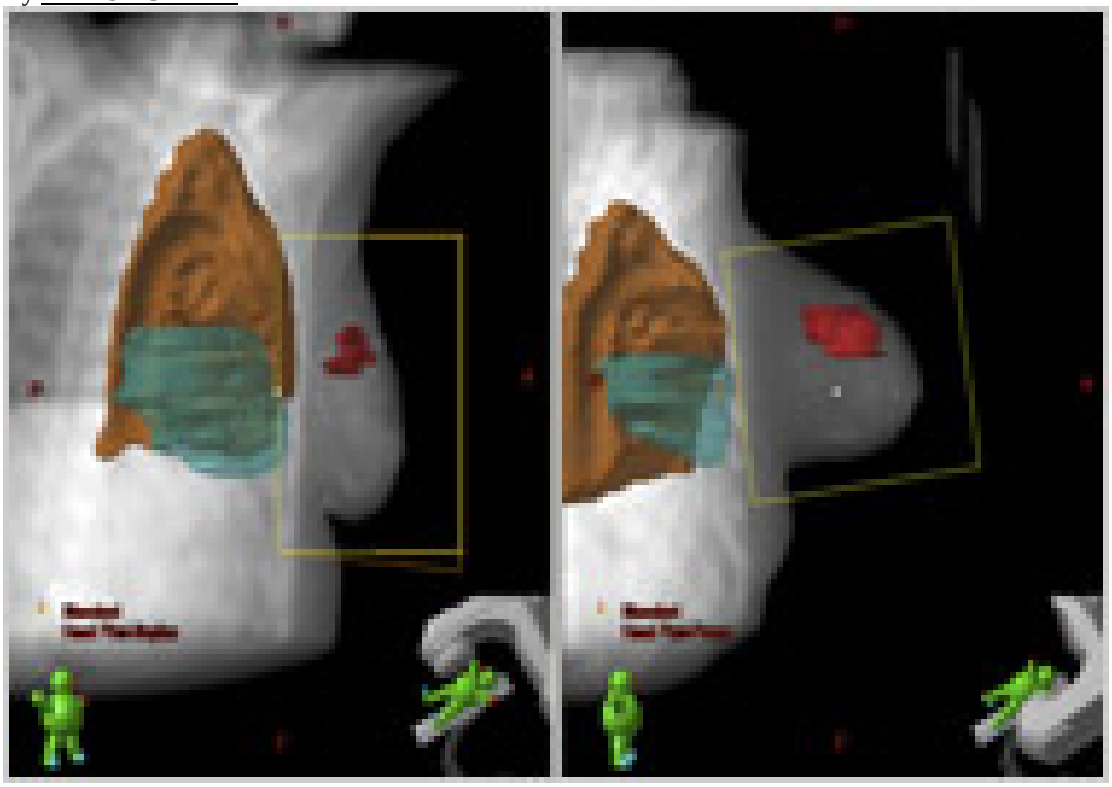
This work was funded by the NIH, the McKnight Endowment Fund for Neuroscience and a gift from Marjorie and Gerald Burnett.

Adapted from materials provided by Massachusetts Institute of Technology.

http://www.sciencedaily.com/releases/2008/09/080911150046.htm

Shorter Radiation for Cancer of the Breast

By DENISE GRADY



Three weeks of radiation treatment work just as well as the usual course of five weeks or more for women with early-stage breast cancers, Canadian researchers have reported, after monitoring a large group of patients for 12 years.

The results, presented Monday at a conference in Boston, provide some of the strongest evidence yet that radiation schedules can safely be shortened to make life easier for patients and to let clinics reduce their waiting lists and treat more women without buying more machines.

Experts say the new findings, from a respected study, could change the standard of care in the United States. The typical schedule now involves five to seven weeks of daily treatments, and most women would welcome a chance to get it over with faster — especially those who work, have small children or live far from the clinic.

About 180,000 women a year develop breast cancer in the United States, and most need radiation. From 30 percent to 40 percent may be candidates for the type of treatment given in the study.

Some centers in this country already offer shorter courses of treatment, but they are more widely available in Canada and parts of Europe.

“We’ve really got to give it serious consideration in the United States,” said Dr. Anthony L. Zietman, a radiation oncologist at Harvard Medical School and the Massachusetts General Hospital Cancer Center, and president-elect of the American Society for Therapeutic Radiology and Oncology. He was not involved in the Canadian study.

But Dr. Zietman cautioned that the results applied only to women with early cancers like those in the study, which were removed by lumpectomy and had not spread to the lymph nodes. Often, women with such early cancers do not need chemotherapy.

Other major changes in radiation are also in the works. Doctors are experimenting with ways to treat just part of the breast rather than all of it, and to make the treatment safer, they are trying to avoid exposing the heart and lungs to radiation.

The purpose of radiation is to keep cancer from coming back in the same breast where it first occurred, by killing any tumor cells that may have evaded surgery and chemotherapy. Cancer cells are more vulnerable to radiation than are normal ones, and the treatment has always been a balancing act between giving enough radiation to destroy the tumor cells but not enough to cause serious damage to healthy tissue and organs.

The changes now being made result in part from the overall success in treating early breast cancers, Dr. Zietman said. Survival rates have climbed so high — 98 percent of women with early-stage cancers survive at least five years — that it is now considered reasonable to step back, look at women's quality of life and try modifying the regimens to make treatment less onerous.

"It's a bit of a change in our thinking," Dr. Zietman said.

Researchers also hope that faster treatment will help make radiation available to more women. Currently, about 20 to 30 percent of women in North American who need it skip it. And some women who could have lumpectomy plus radiation choose mastectomy instead, simply to avoid radiation, because they live too far from a clinic to travel back and forth for all the treatments.

Not all medical centers offer the newer techniques, and they are not right for every woman. But for many women, there are choices now where none existed before — though it may take some effort to find out about them.

"Patients have to speak up," Dr. Zietman said.

If the standard regimen is recommended, he said, a woman should ask: "Does it have to be that way? Am I one of the people who could be treated with partial breast irradiation, or, if I need the whole breast treated, could it be done in some more abbreviated fashion?"

He added, "Maybe they can, maybe they can't."

Some radiation oncologists may resist change, fearful of giving up the tried and true formulas they were taught, Dr. Zietman said. He noted that the standard treatment had 30 years of evidence to back it up, whereas the newer approach had less than half that. But still, the field is moving ahead.

"You don't give all women with breast cancer the same treatment," he said. "You base it on what they have, and who they are."

Canadian researchers decided to study the shorter courses because doctors there and in England had begun using them without a formal trial, to make the most of a limited number of radiation machines.

The study included 1,234 women who started treatment at one of eight hospitals from 1993 to 1996. Half of the women received the standard regimen of 25 treatments in 35 days (five treatments a week for five weeks). The other half had 16 treatments in 22 days. The shorter course used slightly higher daily doses of radiation, but the total cumulative dose was slightly lower.

There were concerns that the lower overall dose would allow recurrences, or that over time the higher daily doses might damage the breast tissue, heart or lungs. Radiation injuries can take years or even a decade or more to show up.

But after 10 years, there were no significant differences between the groups. Both had recurrence rates of 6 to 7 percent, and about 70 percent in both groups had a "good or excellent cosmetic outcome," meaning the breast did not have much discoloration, shrinkage or scarring from the radiation.

"Our patients really like it because it's much more convenient," said Dr. Timothy Whelan, the first author of the study and director of the supportive cancer care research unit at the Juravinski Cancer Center in Hamilton, Ontario. "It's preferred because, I think to be fair, in Canada there may be more distance to travel to a radiation facility. Patients really are strong supporters of this approach."

Fran Dowhaniuk, 71, who lives in Hamilton, received the three-week treatment as part of the study in 1995. She liked the idea of finishing more quickly, especially because her daughter's wedding was coming up.

"I'm really glad I did it," she said. "I would recommend it to anybody."

Dr. Whelan estimated that 60 to 70 percent of women with early-stage breast cancers in Canada were already receiving this type of therapy.

Similar results from studies in England that had fewer years of follow-up were published in medical journals earlier this year.

Dr. Catherine Park, an associate professor of radiation oncology at the University of California, San Francisco, said Dr. Whelan's approach looked extremely promising.

"You can't argue with the results," she said.

She said she had treated 20 or 30 patients with this method and hoped Dr. Whelan's findings would satisfy more-conservative doctors who wanted additional data, so that they would offer it to appropriate patients. She said that the shorter courses would probably also be appropriate for women with a condition called D.C.I.S., ductal carcinoma in situ, a form of breast cancer even earlier than the stage included in the study. But the technique has not been studied in D.C.I.S.

She had one cautionary note: radiation oncologists give some patients a "boost," meaning five to eight extra treatments aimed just at the tumor bed. Dr. Whelan's study did not include a boost, and some doctors think that on top of the higher daily doses, it would deliver too much radiation. So some doctors may be unwilling to offer the shorter treatment to patients who they think could benefit from a boost.

Dr. Silvia Formenti, chairwoman of radiation oncology at New York University and the leader of breast cancer research at its cancer institute, called Dr. Whelan's study impeccable and extremely solid. She said she had treated more than 1,000 patients using a faster schedule of treatments, often including a boost. The median time since treatment is more than five years, and some patients have had slightly more advanced disease than those in Dr. Whelan's study. So far, she said, the results have been at least as good as those with conventional treatment.

Dr. Formenti uses a technique that she and some other researchers think is important to make the treatment safer: most of her patients are treated lying on their stomach instead of the usual way, on their back. The women lie on a mattress with openings for the breasts; the idea is to let the breasts drop away from the chest, to minimize the amount of the heart and lungs exposed to radiation.

Radiation oncologists are eager to avoid hitting those organs because there is some evidence that irradiating the heart — most likely to occur when the left breast is treated — may increase the risk of coronary artery disease. And even though lung problems linked to breast radiation are extremely rare, there is a potential for scarring and irritation and even an increased risk of lung cancer, particularly in smokers.

"Why not do what is best for women?" Dr. Formenti said, adding that the prone technique is easy for doctors to learn. She uses CT scans to determine which position is actually safest for each patient.

At Memorial Sloan-Kettering Cancer Center in New York, most women are also treated lying on their stomach, and about half choose the shorter course of treatment, said Dr. Beryl McCormick, the clinical director of radiation oncology.

"I see no difference in how the patients are doing," she said.

The faster treatment should become standard practice for women with early cancers, she continued, but added, "I'm always surprised to see how long it takes for physicians to change their practice patterns."

Medical centers are also experimenting with techniques that could shorten the treatment to a few days or even just one day for some women. Those techniques involve treating only about a quarter of the breast, the part nearest the tumor, and the radiation can be given with a machine or with radioactive seeds that are temporarily implanted into the cavity left by lumpectomy. In some cases the entire dose of radiation is given before the patient leaves the operating room.

The partial breast treatments are still being studied, and although the results look promising, more time for follow-up is needed to be sure, Dr. Zietman said.

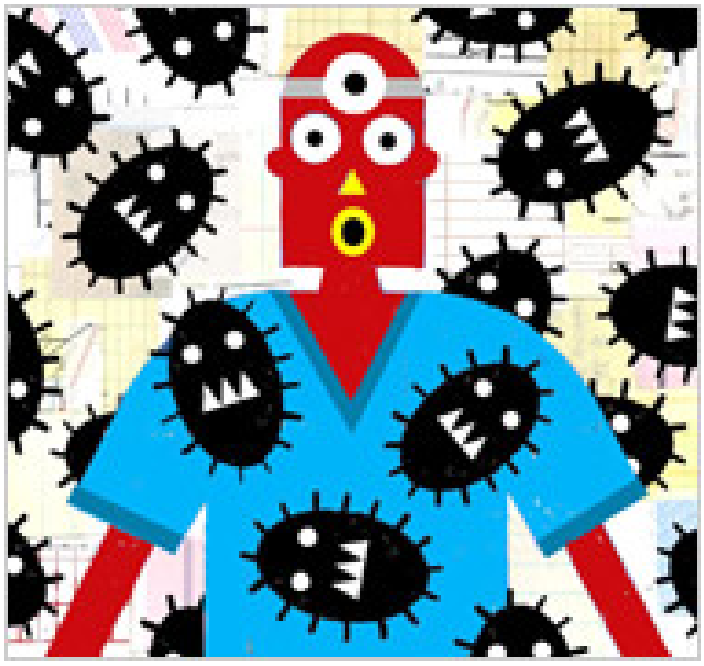
"I doubt we'll strongly advocate it until more information is in," he said.

Dr. Park, who is studying partial breast irradiation, said: "We're learning who we can treat appropriately with these more limited treatments. We may not know exactly right now, but people should watch. In the next 10 years, we'll really change the number of things we can offer for breast cancer."

http://www.nytimes.com/2008/09/23/health/23well.html?nl=8hlth&emc=hltha1

The Doctor's Hands Are Germ-Free. The Scrubs Too?

By TARA PARKER-POPE



Many hospitals have stepped up efforts to encourage regular hand washing by doctors. But what about their clothes?

Amid growing concerns about hospital infections and a rise in drug-resistant bacteria, the attire of doctors, nurses and other health care workers — worn both inside and outside the hospital — is getting more attention. While infection control experts have published extensive research on the benefits of hand washing and equipment sterilization in hospitals, little is known about the role that ties, white coats, long sleeves and soiled scrubs play in the spread of bacteria.

The discussion was reignited this year when the British National Health Service imposed a "bare below the elbows" rule barring doctors from wearing ties and long sleeves, both of which are known to accumulate germs as doctors move from patient to patient.

(In the United States, hospitals generally require doctors to wear "professional" dress but have no specific edicts about ties and long sleeves.)

But while some data suggest that doctors' garments are crawling with germs, there's no evidence that clothing plays a role in the spread of hospital infections. And some researchers report that patients have less confidence in a doctor whose attire is casual. This month, the medical journal BJU International cited the lack of data in questioning the validity of the new British dress code.

Still, experts say the absence of evidence doesn't mean there is no risk — it just means there is no good research. A handful of reports do suggest that the clothing of health workers can be a reservoir for risky germs.

In 2004, a study from the New York Hospital Medical Center of Queens compared the ties of 40 doctors and medical students with those of 10 security guards. It found that about half the ties worn by medical personnel were a reservoir for germs, compared with just 1 in 10 of the ties taken from the security

guards. The doctors' ties harbored several pathogens, including those that can lead to staph infections or pneumonia.

Another study at a Connecticut hospital sought to gauge the role that clothing plays in the spread of methicillin-resistant Staphylococcus aureus, or MRSA. The study found that if a worker entered a room where the patient had MRSA, the bacteria would end up on the worker's clothes about 70 percent of the time, even if the person never actually touched the patient.

"We know it can live for long periods of time on fabrics," said Marcia Patrick, an infection control expert in Tacoma, Wash., and co-author of the Association of Professionals in Infection Control and Epidemiology guidelines for eliminating MRSA in hospitals.

Hospital rules typically encourage workers to change out of soiled scrubs before leaving, but infection control experts say enforcement can be lax. Doctors and nurses can often be seen wearing scrubs on subways and in grocery stores.

Ms. Patrick, who is director of infection prevention and control for the MultiCareHealth System in Tacoma, says it's unlikely that brief contact with a scrub-wearing health care worker on the subway would lead to infection. "The likelihood is that the risk is low, but it's also probably not zero," she said.

While the role of clothing in the spread of infection hasn't been well studied, some hospitals in Denmark and Europe have adopted wide-ranging infection-control practices that include provisions for the clothing that health care workers wear both in and out of the hospital. Workers of both sexes must change into hospital-provided scrubs when they arrive at work and even wear sanitized plastic shoes, also provided by the hospital. At the end of the day, they change back into their street clothes to go home.

The focus on hand washing, sterilization, screening and clothing control appears to have worked: in Denmark, fewer than 1 percent of staph infections involve resistant strains of the bacteria, while in the United States, the numbers have surged to 50 percent in some hospitals.

But American hospitals operate on tight budgets and can't afford to provide clothes and shoes to every worker. In addition, many hospitals don't have the extra space for laundry facilities.

Ann Marie Pettis, director of infection prevention for the University of Rochester Medical Center, says most hospitals are focusing on hand washing and equipment sterilization, which are proven methods known to reduce the spread of infection. But she adds that her hospital, like many others, has a policy against wearing scrub attire to and from work, even though there is no real evidence that dirty scrubs pose a risk to people in the community.

"Common sense tells us that the things we are wearing as health care providers should be freshly laundered," Ms. Pettis said. After all, she went on, the wearing of scrubs in public "raises fear" among consumers.

"I don't think we should feed into that," she said. "Scrubs shouldn't be worn out and about."

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http://www.nytimes.com/2008/09/23/health/23well.html?nl=8hlth&emc=hltha1

Behavior: As People Age, the Thrill Is (Almost) Gone

By ERIC NAGOURNEY

If opening presents seems less exciting at age 60 than it did at age 10, the explanation may lie in the brain.

A study has found that as people age, their brains respond less strongly to rewards. The main difference is in the response of the brain to dopamine, a naturally occurring chemical messenger that plays a central role in the reward system.

Dr. Karen Faith Berman of the National Institutes of Health, an author of the study, said the shifts in brain response might be reflected in the shifts in attitude that accompanied aging.

"It may explain anecdotal evidence that people are mellower," she said, "that they may not get the same highs from certain experiences, but they may not get the same lows, either."

The study appears online in The Proceedings of the National Academy of Sciences. The researchers performed brain scans on two groups of volunteers, one in their 60s and the other in their 20s, as they played a computer game resembling a slot machine.

The researchers found differences between the groups both when they anticipated winning money in the game and when they actually did so. It was not just a matter of how much dopamine was produced, but also which parts of the brain responded to it and how much, the study said.

When a reward was anticipated, the researchers said, three parts of a reward center in the brain lighted up in the younger group, but only one in the older group.

http://www.nytimes.com/2008/09/23/health/research/23beha.html?nl=8hlth&emc=hltha2

Good Results for Bone Drug Buoy Amgen

By ANDREW POLLACK

Amgen's experimental bone drug reduced the risk of spinal fractures in women with osteoporosis by 68 percent in a pivotal clinical trial, a robust result that raises hopes that the drug can help restore the luster of the embattled biotechnology company.

The drug, called denosumab, also reduced the risk of hip fractures by 40 percent compared with a placebo and the risk of all fractures outside the spine by 20 percent. The results were presented Tuesday morning at the annual meeting of the American Society for Bone and Mineral Research in Montreal.

"Expectations were very high, but we believe the data have lived up to those expectations," Michael Aberman, an analyst at Credit Suisse, wrote in a note to clients Tuesday morning.

Amgen badly needs denosumab, the first potentially major drug from its research lab in years, to flourish. Sales of its flagship anemia drugs have been battered by safety concerns. Amgen's stock, which was trading at $75 in early 2007, had fallen below $40 by this March. But the stock has since rebounded on the prospects for denosumab. Shares of Amgen closed Tuesday up $3.70, or 6 percent, to $65.89.

Amgen announced in late July that denosumab had succeeded in the clinical trial, which involved 7,800 postmenopausal women with osteoporosis, a disease marked by fragile bones. But the company did not say at that time how much the drug had reduced the risk of fractures, which could help determine whether denosumab will be a blockbuster or just another competitor in a crowded global market for bone-density drugs that is valued at about $8 billion.

In the trial, 2.3 percent of the women getting denosumab experienced a vertebral fracture over three years, compared with 7.2 percent of those getting a placebo. That relative risk reduction — 68 percent fewer fractures — compares favorably with the 40 to 50 percent reductions achieved against placebos in clinical trials involving the drugs now used to treat osteoporosis.

However, one drug, Reclast from Novartis, has achieved a 70 percent reduction in spinal fractures compared with a placebo.

The hip fracture risk reduction of 40 percent achieved by Amgen's denosumab was in line with or better than that achieved by some other drugs.

Scientists caution that the only way to truly compare drugs is head-to-head in a clinical trial. Comparing across trials can be misleading because patients' characteristics can differ. Nevertheless, with little other data to go on, such comparisons were being made by Wall Street analysts and investors.

One possible concern was that there were more serious infections among women treated with denosumab — 4.3 percent of the patients, compared with 3.4 percent of those getting the placebo.

This difference was not statistically significant. But some earlier trials had also shown an increased infection risk, so the issue could concern regulators.

Otherwise, the rate of side effects from denosumab was roughly the same as from the placebo. Fewer patients on denosumab died, though that difference was not statistically significant.

Analysts expect Amgen to apply by early next year for federal approval,, and denosumab could reach the market late next year.

Analysts have estimated sales of $1 billion to several billion dollars just to treat osteoporosis. Amgen, which had revenue last year of $14.8 billion, is also testing denosumab as a treatment for bone complications from cancer.

The main drugs for osteoporosis are a class known as bisphosphonates, which include Fosamax from Merck and its generic equivalents; Boniva from Roche and GlaxoSmithKline; Actonel from Procter & Gamble and Sanofi-Aventis; and Reclast from Novartis.

Ultimately, denosumab's sales could depend on factors other than how well it reduces fractures. Insurers, for instance, will probably insist that patients first try alendronate, the inexpensive generic version of Fosamax, before they will pay for the use of denosumab, which is likely to cost more than $1,000 a year.

Geoffrey Meacham, an analyst at JPMorgan, said that because denosumab would not be the first-choice treatment, it "isn't likely to provide material upside to Amgen's growth as many expected."

But alendronate and most of the other bisphosphonates are pills that are very difficult to take because they can irritate the esophagus. As a result, half of patients discontinue their use within a year of starting, doctors say.

Denosumab, by contrast, is given once every six months by an injection. In separate results announced at the Montreal meeting, Amgen said that about three-quarters of the patients in one of its clinical trials said that they preferred an injection of denosumab every six months to a bisphosphonate pill taken weekly.

"The whole idea is to convince people to take their medicine, and this might be an easier sell," Dr. Ethel S. Siris, an osteoporosis specialist at Columbia University, said at a meeting with securities analysts conducted by Amgen.

For those discontinuing pills or opting not to take them, denosumab would compete most directly with Novartis's Reclast.

The two drugs performed nearly identically in reducing fracture risk in the spine and hip. Reclast is given once a year, but it requires an intravenous infusion, which is more complex than an injection and which many doctors are not equipped to offer.

"Denosumab clearly becomes the second choice for us," after a pill, said Dr. Susan Bukata, associate professor of orthopedics at the University of Rochester. "Right now the second choice is Reclast."

About 10 million people in the United States, mainly postmenopausal women, suffer from osteoporosis and more than 30 million others have low bone mass that puts them at risk of the disease.

Denosumab inhibits RANK ligand, a protein that spurs the development of cells that break down bone. Amgen scientists played a major role in discovering the role of RANK ligand after experimenting with genes and producing a mouse with unusually thick bones.

http://www.nytimes.com/2008/09/17/business/17drug.html?nl=8hlth&emc=hltha2

Extinct tortoise 'can live again'

By Richard Black
Environment correspondent, BBC News website

An extinct Galapagos tortoise species could walk again, scientists believe.

Writing in Proceedings of the National Academy of Sciences, researchers report finding relatives of *Geochelone elephantopus* alive and well. Cross-breeding these living tortoises might re-create the extinct species - though it could take a century.

The distribution of related tortoises between the islands was one of the pieces of evidence Charles Darwin used in formulating his theory of evolution. But of 15 known Galapagos species, four have since gone extinct - *elephantopus* less than two decades after Darwin visited the island.

> **The islands of the Galapagos Archipelago are tenanted in a quite marvellous manner, by very closely related species**
> Charles Darwin
> On the Origin of Species

Now, according to Gisella Caccone from Yale University in New Haven, US, there is a chance that its former island home of Floreana could one day feel its footsteps again.

"We might need three or four generations to do this," she told BBC News.

"But in theory it could be done, and I think it's pretty exciting to bring back from the dead a genome that we thought was gone."

Whalers' bounty

When HMS Beagle visited the Galapagos in 1835, Darwin noted that many of the islands were home to giant tortoises that shared many features, yet were distinct from island to island. The vice-governor of the archipelago told the naturalist that he could identify which island a tortoise came from, just by its appearance.

Darwin later surmised that the animals had been carried to the Galapagos from mainland South America, where similar species could be found. As with other groups of animals, he believed that once a group of tortoises reached an island, they would then maintain a relatively isolated existence, and populations on the various islands would evolve in subtly different ways. "Thus the several islands of the Galapagos Archipelago are tenanted, as I have elsewhere shown, in a quite marvellous manner, by very closely related species; so that the inhabitants of each separate island, though mostly distinct, are related in an incomparably closer degree to each other than to the inhabitants of any other part of the world," he noted in his masterwork On the Origin of Species.

But he also saw at first hand that some of the islands were being depleted of their marvellous inhabitants by whaling ships, which would cart the tortoises away to be killed and eaten at a later date.

Dr Caccone believes that about 250,000 tortoises may have been removed in this way. Floreana, as a relatively low-lying island where the wildlife was therefore relatively easy to hunt, was depleted more than most, leading to the disappearance of *elephantopus* . The biggest island of all, Isabela, was less ravaged. And around one of its volcanoes, researchers found a group of animals that did not look like the others.

Snail's pace

Now, genetic analysis shows they are close to the Floreana lineage.

The likely explanation is that sometimes, whaling vessels would find they had picked up more tortoises than they needed, and so would jettison the excess animals in shallow water as they returned through the archipelago. So some of the Floreana tortoises made it to Isabela, where their genes have - albeit slowly, for these animals take about 25 years to produce a new generation - mixed with those of other species.

Finding the relatives is one thing; but using their genetic heritage to bring back the extinct Floreana species is quite another. The Yale team plans next to mount a more exhaustive survey of the Volcano Wolf region of Isabela to identify more individuals carrying *elephantopus* genes.

"Then we would have to look at individuals of interest, and genotype them and maybe use marker-assisted selection to help the process along," said Dr Caccone. Marker-assisted selection involves choosing which individuals to cross according to which versions they carry of which genes, so taking away some of the randomness involved in conventional cross-breeding.

But the long intervals between generations mean that even if the project does start, it will not be concluding any time soon. A century ahead would be a fair bet.

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Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/science/nature/7630239.stm

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Polyclinics 'may damage GP trust'

Polyclinics may damage trust between the patient and GP, harming the quality of care in the process, experts say.

A Leicester University study quizzed 236 patients about continuity of care - seeing the same doctor on each visit.

The researchers found those who saw the same GP were more likely to trust them and keep to courses of medicine.

But the government denied the network of super clinics being set up in England would cause disruption to the GP-patient relationship.

Polyclinics are large health centres housing a range of health professionals such as GPs, nurses, physiotherapists and hospital doctors.

> **Our overriding objective is to deliver the best possible service to patients**
> Department of Health spokesman

NHS bosses have been told to set up 150 centres outside London, while a host of them are expected to be created in the capital.

They have been designed to relieve the pressure on hospitals by providing a whole range of basic care.

Doctors' leaders have been critical, saying they will put the traditional system of GP care under threat.

The researchers surveyed patients from three GP practices asking them to give marks for the trust they felt in the doctor they had seen during their last visit.

A total of 150 had seen their usual GP with the rest seeing a different one.

In-depth discussions were also carried out with 20 patients and 12 GPs.

Those seeing their usual GP gave them a trust rating of 83.5 out of 100, while those seeing a different one gave them 72.6.

Having good care in the past and the expectation that the GP would provide the follow-up care in the future were cited as the main reasons for the usual GP scoring highly.

Patient trust

Lead researcher Carolyn Tarrant said the findings had major implications for government policy as polyclinics and other large health centres were likely to have large numbers of GPs.

> **If patient trust declines, then medical outcomes may be adversely affected**
> Carolyn Tarrant, lead researcher

"The government is setting up numerous polyclinics, super-surgeries and walk-in centres all over the country.

"They are bound to reduce continuity of care and our research show that this may lead to a decline in patient trust.

"If patient trust declines, then medical outcomes may be adversely affected."

She said this could include failure to follow prescriptions or advice from doctors.

Dr Laurence Buckman, chairman of the BMA's GP Committee, said: "For someone with a chronic condition, a long-term relationship with a doctor they trust and who knows their history is vital."

But a Department of Health spokesman said the network of health centres was on top of existing GP services, not instead of them.

And he added: "Our overriding objective is to deliver the best possible service to patients.

"Patients repeatedly tell us that they want better access to GP services and want healthcare that is more personalised and convenient, so services need to adapt to respond to this need."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/7629289.stm

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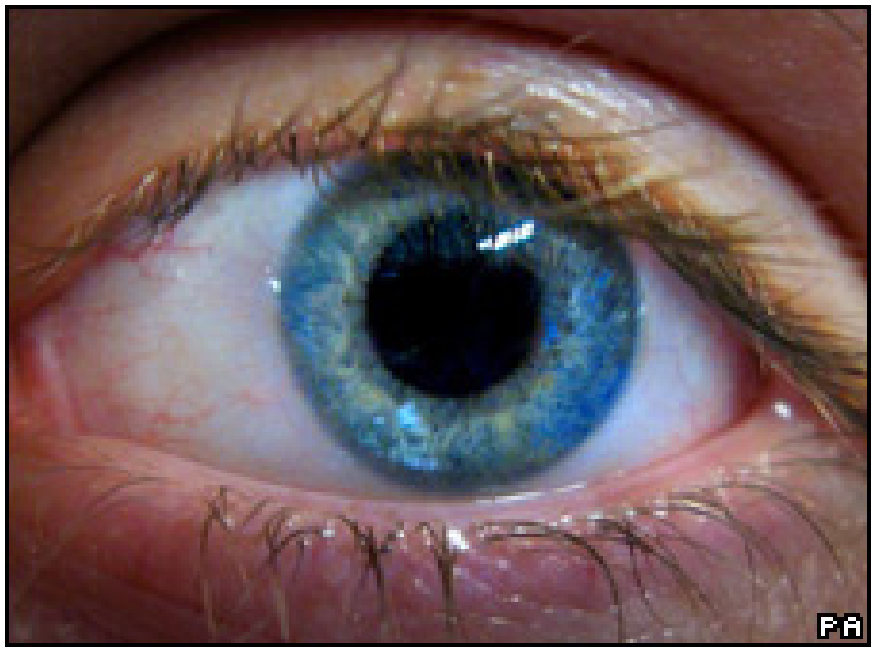
'Dramatic results' in eye gene op

US scientists have claimed success using gene therapy to try to reverse a severe inherited sight disorder.



They injected material containing a corrective gene into the eyes of three patients with Leber congenital amaurosis (LCA).

The journal Proceedings of the National Academy of Sciences reports all three showed signs of "significant" improvement in their vision.

UK researchers carried out a similar procedure on three patients last year.

They believe the method could be ready for use within two years to treat people suffering from some inherited diseases of the retina, which affect 20,000 people in Britain.

Within three years, they believe it could be ready for testing on people who suffer age related macular degeneration, a condition that affects 500,000 Britons.

The paper adds to the body of evidence supporting the value of gene therapy for people with inherited disease
Dr James Bainbridge
Institute of Ophthalmology

Gene therapy works on a simple principle - to replace a malfunctioning gene, and restore function to a part of the body affected by a genetic disorder.

In practice, however, it has proved very difficult to find ways to introduce the new gene copies in the correct tissues, and experiments in animals have had mixed results.

In the eye, however, gene therapy has shown more promise.

LCA affects approximately one in 80,000 people, causing progressively worsening vision, often starting in the first few years of life.

It is responsible for one in 10 severe sight disorders in children.

A fault in the RPE65 gene is to blame, and the gene therapy injects working copies of the gene into the back of the eye.

Just 30 days after the treatment was delivered into one eye of each of the three young adults involved in the US study, the improvements could be measured.

The researchers, from Pennsylvania University, the University of Florida and Cornell University, suggested that the function of "cones" in the retina, which are used in daytime and colour vision, could be boosted up to 50-fold - a "dramatic" improvement in function.

However, vision in the treated eyes was not perfect - with the patients showing an abnormally slow adaptation to low light levels.

UK first

In the UK, scientists and doctors at the Institute of Ophthalmology and Moorfields Eye Hospital in London have been working for some years on a similar approach.

In 2007, they were the first to perform a gene therapy operation on three people with LCA, and earlier this year reported significant improvement in one of these.

Dr James Bainbridge, one of the Institute of Ophthalmology researchers involved, said the US findings were a step forward, helping to fine tune the technique and maximising the chances of success.

He said: "This paper is important because it provides further evidence that gene replacement therapy can improve vision in people with this form of LCA.

"It also confirms the prediction that the extent of improvement depends on the number of surviving target cells at the time of intervention, and shows that both rod and cone photoreceptor cells can benefit.

"The paper adds to the body of evidence supporting the value of gene therapy for people with inherited disease."

Professor Robin Ali, who also worked on the UK study, said the latest paper gave scientists a much better idea of what dose of gene therapy would give the best results.

He said: "We can now begin to find out how much useful vision is restored by improving retinal sensitivity and whether the results are better in young children when we treat the whole retina using a high dose."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/7625867.stm

Published: 2008/09/23 00:07:46 GMT

Pupils given break from homework

A top school has radically cut the amount of homework it sets, saying too much will put pupils off learning.

Tiffin boys' school, in Kingston, south west London, has limited homework to 40 minutes per night, saying pupils should have more time for their own interests.

Head teacher Sean Heslop said boys had been doing up to four hours a night, and that what had been set was often "mechanistic" and "repetitive".

Homework is not compulsory in England's schools but is officially encouraged.

The government's guidelines for schools in England say children should be doing homework from the day they start primary school.

REACTION TO THE CHANGE
The boys absolutely love it - but there has been a mixed response from parents
Sean Heslop
Head teacher of Tiffin School

They say 10 and 11-year-olds should be doing half an hour of homework every day, rising to between 90 minutes and two-and-a-half hours a night for older children.

But research has cast doubt on its effectiveness, and has even suggested that too much is counter-productive. Some independent schools have abolished the practice.

And earlier this year a teaching union, the Association of Teachers and Lecturers, called for an end to homework in primary schools and for it to be scaled back in secondary schools.

Mr Heslop said the school had spent two years looking at teaching and learning in class time which inevitably had led staff to look at what homework was being set.

Now it sets just 40 minutes per night plus 20 minutes of independent learning, which could include playing music or doing sport, for example.

He said: "The self-discipline of going away and sitting by yourself and doing work is obviously a good thing, but we didn't need to do four hours of it.

"The more we looked at what was being set, it came over as quite mechanistic and repetitive.

"We thought, if there's one way to put students off learning, that's the way to do it."

Daily homework guidelines
Years 5-6: 30 minutes
Years 7-8: 45 to 90 minutes
Year 9: 1 to 2 hours
Years 10-11: 1.5 to 2.5 hours

It was a case of quality not quantity, he said, with work being set in a more targeted way.

"The boys absolutely love it. But there has been a mixed response from parents."

Some had said they were glad to have more time with their sons but others were concerned that less homework might have a negative impact on their exam results.

He also said there had been a positive response from teachers, with one saying she was pleased she no longer had to set pointless homework - and mark it.

Mr Heslop added: "Because it was four hours homework a night, not all work was being marked.

"We just feel it is a much more honest conversation that we are having with students and parents."

HAVE YOUR SAY Homework at primary school is probably pointless Jeremy, Plymouth

A spokespersom for the Department for Children, Schools and Families said: "Homework is not compulsory, but we do encourage teachers to set children work to do outside school hours.

"A good, well organised homework programme helps children and young people to develop the skills and attitudes they will need for successful, independent, lifelong learning.

"Homework need not, and should not, get in the way of other activities that children do after school."

In Wales, there is also no statutory homework requirement and it is down to the head teacher to decide what and how much is set.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/uk_news/education/7629167.stm

Published: 2008/09/22 12:03:40 GMT

All About Mr. Elephant, in His Becoming Green Suit

By EDWARD ROTHSTEIN

What does the “very rich Old Lady” see in Babar the elephant? What, for that matter, do we see in him? Something appealing surely, even if we would not follow her example and give him a full purse to go shopping for a suit of a “becoming shade of green,” or do calisthenics with him or buy him a red roadster.

But if most of us don’t actually keep elephants in the strange way the Old Lady did, we have consistently invited Babar into our homes, along with his still thriving, ageless family. Since Jean de Brunhoff expanded and refined the bedtime stories told by his wife, Cécile, in 1931, and published them in French, Babar has been a constant companion. After that first book (translated as “The Story of Babar, the Little Elephant”), de Brunhoff published six more Babar tales before dying of tuberculosis in 1937 at 37.

After World War II his son Laurent, who first heard the stories as a child, took over the franchise. He has illustrated 37 books about this elephant orphan turned king. More than eight million Babar books have been sold.

In the compact, elegant exhibition “Drawing Babar: Early Drafts and Watercolors” at the Morgan Library & Museum, we don’t learn too much more about the reasons for Babar’s appeal. We simply feel it, and then have to make sense of it. Speculation is restrained and simple demonstration preferred, an approach in keeping with Jean’s spare, precise narrative and laconic illustration, in which diverging lines of dots become tears, angled eyebrows signal anger and the varied curves of an elephant’s trunk evoke an inner life.

The show, organized by Christine Nelson, draws on the collection of Babar material the Morgan acquired in 2004 as a partial gift from Laurent and his two brothers. It includes more than 170 drafts and sketches for the first Babar books by both father and son. A complete sketchbook, a maquette, of the first Babar

can be viewed, page by page, on two touch screens; custom-made carpets, based on rugs in the illustrations, mark out areas where books are available for reading.

Jean de Brunhoff's illustration style (later emulated by Laurent) is charmingly and deliberately naïve. Multiple images of Babar running or riding an elevator suggest movement, comic strip balloons emerge from animals' mouths as they call out, perspective is skewed or suggested simply by an object's size. But an affectionate sophistication lies behind the innocence.

The elder de Brunhoff's pencil sketches are quick and exuberant, experimenting with gestures and attitude. A display of Babar first editions show de Brunhoff's self-consciously playful covers, the first depicting this king of the elephants marching with a placard like those once used to announce a spectacular new show (here, "Histoire de Babar"), tickets available within.

In the show's two main galleries — one devoted to Jean de Brunhoff's first classic book, the other to Laurent's first, "Babar's Cousin: That Rascal Arthur" (1946) — we see how the stories developed over time. Jean learned, for example, that when Babar's mother is killed by a wicked hunter, he didn't have to say that Babar was sad as he ran away; he could show it.

At first Babar's suit was not a becoming shade of green at all, but a more mundane gray. Even the existence of the female cousin, Celeste, whom Babar eventually marries, was a later innovation. We see too that Laurent has a completely different method of preparation, his sketches are less experimental, his characters less weird.

The weirdness, though, is what makes the first Babar book — and sections of Jean de Brunhoff's other books — so powerful. Think of the Old Lady "who has always been fond of little elephants" and gives Babar "whatever he wants." Without any hint of animal passion, there is something discomfiting about this animal-human partnership.

And what attitudes are we supposed to have toward Babar himself? Escaping the countryside he arrives in a great town — like many another picaresque hero — and what is his first real desire? Fine clothes. And clothes are the first things he buys for his young cousins when they come to town.

Jean may have shared Babar's preoccupation: his brother Michel was the editor of Paris Vogue, and his brother-in-law, Lucien Vogel, director of another fashion magazine. But there is something else going on here, surely, particularly when Babar later dresses all the elephants in his kingdom in outfits — some with the most ornate ornaments — that he bought for them.

The great temptation in reading children's books is to see them as allegories, subliminally serving up lessons the way strange beings do in the dark woods of fairy tales. And allegories are latent in these books. Babar comes to town, is taught the ways of humanity and then returns home where he is crowned king. He does not brood. He is patient and industrious, and near the close of "Babar the King," he even dreams of elephant-angels — Intelligence, Learning, Courage and Work — driving off comically demented figures called Despair, Misfortune, Stupidity and Laziness. Surely there are more than enough lessons in virtue here.

The taste for allegory has led to attacks on the Babar books accusing them of celebrating colonialism. (Illustrations of cannibals in the second Babar book don't encourage complete skepticism on this point.) The playwright and critic Ariel Dorfman, for example, argued that Babar's history "is none other than the fulfillment of the dominant countries' colonial dream."

The uncivilized, unclothed native is taught the ways of civilization and returns home enlightened, unquestionably embracing the world that will ultimately bring him grief. In "Should We Burn Babar?" the author and educator Herbert Kohl argued that the books are sinister in their celebration of the Old

Lady's idle wealth and corrupt in their admiration of Babar, who allies with the very society that produced the colonial hunter who killed his mother.

But as the critic Adam Gopnik points out in a rich, suggestive essay in the show's catalog, these arguments miss the point. The saga is not an "unconscious instance of the French colonial imagination," Mr. Gopnik writes, "it is a self-conscious comedy about the French colonial imagination." Jean de Brunhoff knew precisely what he was doing. Invoking the colonial world of the 1930s and France's mission of civilizing subjugated peoples, he was also satirizing that world, celebrating some things while being wary of others, knowing the need for civilization while also knowing the costs and inevitable failures that accompany it.

Finding straightforward allegory — or an unambiguous political message — simply does not work. Admiration and satire are intertwined. Cornelius, the elephants' elder, is meant to seem extremely savvy when he proposes making Babar king because Babar "has learned so much living among men." But I can easily imagine Jean de Brunhoff laughing when, in response, he has King Babar turn to Cornelius and say, "You have good ideas." Babar makes him a general and gives him his hat.

The child reader will not necessarily sense Babar's pomposity here, but over time such ambiguities will affect perceptions, as they do throughout childhood's perpetual trials. Yes, there is an allegorical element in Babar, which is why clothes are so important. Clothes represent culture or rather cultivation. They present the wearer in a particular social role. (In one book pictures appear of the workers of Babar's town, Celesteville, dressed according to their occupations.) Clothes are the counterparts of social manners, the accouterments of civilization. Babar begins as a child in the human city, naked, riding up and down in a department store elevator just for the fun of it and being told, "This is not a toy, Mr. Elephant." Once he is clothed in his green suit, he leaves childish things behind.

But clothes alone don't make the elephant, and we feel some pangs watching the unclothed mothers of Babar's cousins relegated to running in the dust, while their well-dressed children get to ride in a car. There are other pains as well. One of the most upsetting images in Jean de Brunhoff's books may be of Babar and Celeste, captured and costumed, made to perform in a circus. The indignity is palpable.

There is something melancholy in Babar's world. It is not really the world of 1930s Paris. Babar's utopian Celesteville combines '30s technology with the cultural life of the Belle Époque.

Did de Brunhoff know that these Halls of Amusement or Industry could no longer stand as firmly as they once did? Does that account for the nostalgia they seem to reflect? What world did he imagine was taking shape for his sons? As the '30s progressed, it had to have been less clear what the divisions were between the animal and the human, or what civilization itself could hope for.

One of the exhibition's labels points out that there was another beloved childhood character who came out of the same Parisian milieu: Curious George. Margret and H. A. Rey carried the manuscript for that book with them as they bicycled out of Paris in 1940, fleeing the Nazis. They might have been influenced by Babar, but their colonial hunter, the man in the yellow hat, didn't murder his prey. He took the monkey away. And he brought him to the New World, where George's anarchic, unclothed spirit roamed so freely it might have tried even Babar's patience.

"Drawing Babar: Early Drafts and Watercolors" remains through Jan. 4 at the Morgan Library & Museum, 225 Madison Avenue, at 36th Street; (212) 685-0008.

http://www.nytimes.com/2008/09/22/arts/design/22baba.html?th&emc=th

Art and Science, Virtual and Real, Under One Big Roof

By DENNIS OVERBYE

TROY, N.Y. — On a hillside overlooking this college town on the banks of the Hudson, the Rensselaer Polytechnic Institute has erected a technological pleasure dome for the mind and senses.

Eight years and $200 million in the making, the Experimental Media and Performing Arts Center, or Empac, resembles an enormous 1950s-era television set.

But inside are not old-fashioned vacuum tubes but the stuff of 21st-century high-tech dreams dedicated to the marriage of art and science as it has never been done before, its creators say — 220,000 square feet of theaters, studios and work spaces hooked to supercomputers.

Within its walls, the designers say, scientists can immerse themselves in data and fly through a breaking wave or inspect the kinks in a DNA molecule, artists can participate in virtual concerts with colleagues in different parts of the world or send spectators on trips through imaginary landscapes, and architects can ponder their creations from the inside before a single brick or two-by-four has been put in place.

It opens for business on Oct. 3 with a three-week gala of performances including classical music, virtual reality rides, symposiums and celebrations. Some scientists dream of eventually using the new center to create a version of the “Star Trek” holodeck where humans can interact with life-size “synthetic creatures” who live only in a computer. Others plan to teach surgery by doing virtual procedures or taking doctors on tours through models of actual hearts and circulatory systems.

“What you do is a function of what you want to do,” said Shirley Ann Jackson, a physicist and president of Rensselaer since 1999.

In terms of scale and the combination of performance and research at a university, “Nothing can be compared to this,” she said. “To our knowledge, there is nothing else like it.”

Jaron Lanier, a computer scientist, composer and visiting scholar at the University of California, Berkeley, who coined the term “virtual reality,” noted that the notion of a “virtual reality theater” was not new. In the 1990s, for example, Silicon Valley denizens attended shows at the George Coates Performance Works, an abandoned neo-Gothic cathedral in San Francisco where human actors, music and digital effects were combined.

But Empac, Mr. Lanier said, represents “a major leap in commitment and ambition.”

Dr. Jackson said Rensselaer, which prides itself on interdisciplinary research and hands-on engineering learning, had a tradition of electronic arts, including a major in games and simulations. A performance center had been part of a long-range plan she and the trustees approved in 2000. The concept of Empac was born, she said, when she and her advisers decided to combine art with the problem of making sense of data, a problem that she said lay at the nexus of art, science, technology, cognitive perception and learning.

In 2001, an anonymous donor gave the university $360 million, one of the largest private grants ever made to an American university, enabling Dr. Jackson to jump-start not just Empac but other elements of her plan as well. That gift was later augmented by $40 million from Curtis R. Priem, one of the founders of Nvidia, a maker of graphics processors, and for whom the center will be officially named.

A London firm, Nicolas Grimshaw & Partners, was selected to design the building. To run the project, Dr. Jackson recruited Johannes Goebel, a composer, curator, computer music producer and founding director of the Center for Art and Media in Karlsruhe, Germany.

As he led a reporter on a hard-hatted tour of the nascent center late this summer, dodging piles of construction materials and workers, Dr. Goebel described his mission. “Art integrates the senses,” he said. “Science takes the senses apart and analyzes. The idea of Empac is to bridge the gap between the digital world of data and the physical world of our senses, which is where we make sense of things and decide what things mean.”

“It’s always us as human beings who have the final word on what something means,” he said.

The centerpiece of the building is a 1,200-seat concert hall, encased in curved wood like a ship within a ship, accessible by gangways from the lobby. A second, smaller theater seats 400, with movable stages and seats.

Dr. Goebbel marched into the first of two studios that have been designed as so-called immersive environments, the future holodecks, where you will see and hear only what a producer or scientist wants you to. About the size of a basketball court, but square, with a 40-foot ceiling, the room was lined with odd-shaped acoustical panels that were sort of like giant speakers in reverse. Each panel is designed to absorb a different frequency of sound, so all the stray noise and energy are sucked out.

“You need dead space to create immersion,” he said. There was rigging, he added, “so you can fly through it.”

Linked to Empac and supplying it with all that data to fly through will be Rensselaer’s Computational Center for Nanotechnology Innovations, which has at its heart an I.B.M. Blue Gene supercomputer consisting of 32,768 parallel processors. The results of those computations could be anything: a chain of DNA, a semiconductor circuit, a map of the sky, the blood flow through a particular human body.

"There is a lot of science nowadays where we generate tremendous amounts of data," said John Kolb, vice president for information technology at Rensselaer. "Sometimes we know what to do with it. Sometimes we have to wonder where the gems are."

Scientists are used to viewing data on a small computer screen that measures maybe 1,000 pixels by 1,000 pixels, he said. Now imagine, he said, data projected on all four walls measuring 4,000 pixels by 4,000 pixels, with sound or touch as an extra dimension to tell you when some data points exceed some limit, for example. "Walk into this environment and the data is all around you," Dr. Kolb said.

"Education is the killer app," he said. "You could have a kindergarten class that walks through a human being."

What will this actually be like? Last summer, with the new building still a construction site, a reporter seeking a taste of virtual reality art was taken to the temporary lair in downtown Troy of a group of video artists known as Workspace Unlimited, who have been commissioned to produce a piece for Empac's opening.

I was cautioned not to eat lunch first.

I found myself inside a darkened room surrounded by a circular screen. At first the image projected on the screen simply reproduced the building we were in. But soon we had stepped off like astronauts into a dizzying light show, an abstract landscape of waving numbers not unlike the light show at the end of "2001: A Space Odyssey," as one of the Workspace artists sitting at a computer maneuvered an avatar, or stylized representation of himself, around the screen.

More than one avatar can roam this space at a time, but each has a unique experience. "It's like sitting on the couch and watching a movie with someone, but you don't experience or see quite the same thing," said Thomas Soetens, of Workspace. At one haunting point we could see avatars controlled by Mr. Soetens and his colleague Kora Van den Bulcke staring at us from opposite directions like lonely moonwalkers, each stuck in their own landscape.

But they couldn't get together.

Will the lonely avatars ever meet someday?

Just as such tools of science make possible new kinds of art, Dr. Jackson said, she hoped this new center of art would lead to new science. "It's exciting," Dr. Jackson said. "The real message is we don't know all that's going to come out of this, but we know it's going to be important."

http://www.nytimes.com/2008/09/23/science/23troy.html?ref=design

Home Views, Bound by Ice or Leather

By HILARIE M. SHEETS

Los Angeles

AT the age of 9, after writing a book report on Lewis Hine's images of child laborers from the early 20th century, Catherine Opie sat her parents down and passionately announced that she wanted to be a social-documentary photographer.

"I talked to them about this photograph of a little girl who worked in a factory in North Carolina and how this guy was able to change the laws," Ms. Opie, now 47, said. She spent the next year of her childhood meticulously documenting her family and neighborhood in Sandusky, Ohio, and hasn't stopped taking pictures since.

An anthropological interest in home and identity, and the idealistic belief that images can help bring about social change are both fundamental to Ms. Opie's wide-ranging photographs.

On the eve of her midcareer survey, "American Photographer," opening at the Solomon R. Guggenheim Museum on Friday, she discussed her work in one of the studios that she and her companion, Julie Burleigh, a painter, built in the backyard of their house in South Central Los Angeles. At the time Ms. Opie was trying to have a baby, and she wanted to be able to put him down for a nap and walk across the yard to work. Now she intermittently glanced through the studio window with amusement as their 6-year-old son, Oliver, raucously animated a Pokémon character on the back deck.

Ms. Opie's seamless weaving of home and work, the personal and the political, are familiar from her series "In and Around Home," shot during the 2004 national election cycle, with pictures of Oliver playing in a tutu, street protests in her largely African-American neighborhood and grainy television images of George Bush infiltrating her living room.

Ms. Opie came to art-world prominence in the mid-1990s with her large-scale portraits of what she has called her "royal family," friends in the sadomasochistic leather group in San Francisco. Photographing her highly individualistic tattooed subjects frontally against vibrant-colored backdrops in a manner

evocative of Hans Holbein, Ms. Opie sought to give dignified representation to what she felt was a maligned subculture.

“Cathy likes to use these art-historical quotes to seduce the viewer into looking at things that they don’t necessarily want to look at,” said Jennifer Blessing, the Guggenheim’s photography curator, who organized the show to underscore the breadth of Ms. Opie’s work. “Through the familiarity of the iconography as well as the incredible formal beauty of the photograph, she hopes the viewer will respond sensitively to the things and the people she depicts.”

Ms. Opie said, “I’m very fluid with photography, and I’m actually in love with it on a technical level.” With her generous personality and a Midwestern cadence that she has retained despite living for decades in California — her family moved near San Diego when she was 13 — Ms. Opie habitually talks strangers into agreeing to be photographed. She is also often the first person photographers call for a technical opinion.

Yet Ms. Opie, a tenured professor in the graduate art program at University of California, Los Angeles, said that people have misconceptions about her because of a controversial self-portrait she made in 1994 with the word “pervert” cut into her bare chest and 46 needles thread into her arms.

“I made the piece out of a reaction to all of the sudden gays and lesbians’ bringing on the ‘normal’ dialogue to us,” said Ms. Opie, who added that those involved in sadomasochism were being marginalized by other homosexuals. Her response to the mainstream was, “Let’s push the boundaries a little bit here about what you guys think normal is.”

At the time she made the piece she had not exhibited widely. Then she was selected by the curator Klaus Kertess for the 1995 Whitney Biennial, and “Pervert,” along with her other portraits, created a whirlwind of attention that threatened to pigeonhole her. “I was frightened by just how quickly people want to create a box with a singular identity for you,” she said.

At the Guggenheim “Pervert” will be shown alongside two other self-portraits: one from 1993 with a childlike drawing of two girls holding hands in front of a house that is cut in to her bare back, and another from 2004 where she is nursing a cherubic Oliver in a classic Madonna and Child composition.

While Ms. Opie may bristle at the word “normal,” she has created a domestic ideal that she expressed a longing for in her earliest self-portrait. Her lively household also includes Ms. Burleigh’s 28-year-old daughter, Sara LaCroix, several dogs and a cat, and five chickens roaming the backyard. “Oliver will say: ‘I want eggs this morning. I’m going to go check the coop,’ ” said Ms. Opie, adding that she is pleased their “farm” takes the urban edge off her son.

Ms. Burleigh, a microfarmer, has also developed a community garden across the street with dozens of neighbors. “I have the American dream,” Ms. Opie said. She and Ms. Burleigh alternate child-care days, and Oliver’s father, Rodney Hill — the former director of Ms. Opie’s onetime New York gallery, Jay Gorney — sees him on Sundays. “I really did always want the married life with a family,” Ms. Opie said.

She was the top baby sitter in her Ohio neighborhood and studied childhood education for a year as an undergraduate. Then a family friend convinced her that she was an artist and needed to move to a big city, and she went to the San Francisco Art Institute to earn her bachelor of fine arts degree and to California Institute of the Arts for her M.F.A.

While she describes herself as having been a high school tomboy who always had crushes on girls, there was no place for her to come out as a lesbian in that atmosphere. “To even say that word, you didn’t want to be that,” Ms. Opie said.

She pointed out that people who might have been her heroes, like Billie Jean King, were not public about being gay at that time. “Another reason that I think it’s really important to be out and do the work that I make is to create examples for younger people,” she said.

A yearning to explore what lesbian family life could look like prompted Ms. Opie to travel in an R.V. for several months in 1998 to locate women in committed relationships. She photographed them within the settings of their homes for her series “Domestic,” playing off Robert Frank’s 1950s road trip for his photo series “The Americans” as well as Tina Barney’s images of affluent families in their homes. “The discourse with family is usually heterosexual, and I wanted to create another context to begin to think about family, both on a personal and political level,” Ms. Opie said.

She has continued the road trips for her project “American Cities.” These black-and-white urban scenes shot with a 7-by-17-inch view camera — Chicago architecture at night or Los Angeles mini-malls in the very early morning, all without any human activity — might seem a departure for Ms. Opie. Yet each set captures something essential about the urban environment and how community is organized.

In 2001 her wanderings brought her to the extreme landscape of rural Minnesota and temporary communities of little houses set up by ice fishers on frozen lakes, which she shot with heavy apparatus in sometimes blizzard conditions. In her finished series of 14 photographs, Ms. Opie plays with the idea of a panoramic landscape but in segments, keeping the thin horizon line of ice houses consistent across the images that begin to dissolve into diaphanous white abstraction.

She creates a similar aesthetic in her 2003 series of California surfers, where another nomadic group of tiny dark figures hovering in blue water waiting for a wave gradually melts into vaporous fog across the 14 images. “I was thinking of the Rothko Chapel when I made them,” Ms. Opie said, referring to the meditative series of canvases installed in that building in Houston. She is excited that “Icehouses” and “Surfers” will hang across from each other for the first time at the Guggenheim.

On the walls of her studio today are nine large prints that sequentially reveal the grand landscape of Alaska. Called “Edge of Time,” they will be part of an exhibition that opens on Oct. 15 at the Stephen Friedman Gallery in London. “I haven’t stopped wanting to play with this horizon-line idea,” said Ms. Opie, who added that the metaphor of time in relationship to landscape reflected her thoughts on growing fears about global warming. Since she made the series, Alaska has become a subtheme of the presidential campaign, adding an odd layer of cultural resonance.

Another current project is photographing high-school football players around the country. Rather than snapping the perfect catch or play, she chooses moments in between the action on the field, capturing the American cultural landscape from a different angle. “I’m very empathic to the construction of masculinity within our culture and how we build these identities up,” Ms. Opie said. She pointed out that Oliver’s father, Mr. Hill, had been the 6-foot-4-inch teenage gay boy with the football coach father. The political and personal are inextricably linked for Ms. Opie.

“At first I had the little boy who wanted to wear the pink tutu and dress up,” she said. “Because he’s not in a traditional household with a football coach dad, he was never ashamed. Now I have a 6-year-old who only wants to play Pokémon and kill aliens on the Xbox.”

She hasn’t decided which she likes better. “He’s now very aware of the social structure of masculinity,” she said. “He’s trying it on and seeing what it feels like.”

http://www.nytimes.com/2008/09/21/arts/design/21shee.html?ref=design

Fear of fairy tales

The glossy, sanitized new versions of fairy tales leave out what matters: the scary parts

By Joanna Weiss | September 21, 2008

Probably because she'd expressed a firm interest in fairy wings and dresses made of tulle, my 3-year-old daughter got a plastic Rapunzel playset last year as a gift. It was a collection of bedroom furniture and three small dolls: a girl with a retractable braid, a smiling prince, and another girl, apparently a playmate. And it came with a small companion book, "Rapunzel's Tower Room," which began, "At the edge of a forest village, there was a tower owned by a kind witch."

The book went on to spin the tale of a charmed girl named Rapunzel, who spent her days in the tower sewing dresses with a friend. She loved when the witch came to visit and teach songs, including one that made Rapunzel's hair grow longer. But tension arrived: One day, Rapunzel looked out the window and saw a fair in the village nearby. She wanted to go, but the witch was off tending to her garden and couldn't let her out. Fortunately, a prince riding by in his carriage called up to her, "Rapunzel! Why aren't you at the fair?"

This was not the fairy tale I vaguely recalled from my childhood - the one with the mother who gives up her child, the vindictive witch, the powerless girl trapped high above the ground. This new version was sanitary and safe in a way that modern parents will easily recognize. In an age when some families ban the word "killed" or come up with creative euphemisms to mask the death of goldfish, it's not hard to see why a toy company would reduce Rapunzel's story to its prettiest parts. Real life, presumably, packs enough trauma for children to think about later.

Yet something important is lost when a child's introduction to fairy tales comes in such whitewashed form. It's not just Rapunzel: In toys, movies, and books, the old fairy tales are being systematically stripped of their darker complexities. Rapunzel has become a lobotomized girl in a pleasant tower playroom; Cinderella is another pretty lady in a ball gown, like some model on "Project Runway."

"Fairy tale" may be our shorthand for castles and happy endings, but these classic stories have villains, too - nefarious witches, bloodthirsty wolves, stepmothers up to no good. And scholars have come to see the stories' dark elements as the source of their power, not to mention their persistence over the centuries.

Rich in allegory, endlessly adaptable, fairy tales emerged as a framework for talking about social issues. When we remove the difficult parts - and effectively do away with the stories themselves - we're losing a surprisingly useful common language.

"There's a very important reason why these tales stick," says Jack Zipes, a German professor and folklorist at the University of Minnesota, who has written such books as "Fairy Tales and the Art of Subversion" and "Happily Ever After: Fairy Tales, Children, and the Culture Industry." "It's because they raise questions that we have not resolved."

Scholars say there are no "pure" versions of fairy tales, which began as oral traditions and were adapted to fit different cultures and times. Even the Grimm brothers, who recorded German versions of these stories in the early 19th century, continually revised their own work. But common story lines have persisted over the centuries, and they address themes that continue to preoccupy people today.

Little Red Riding Hood, in which a wolf lures a young girl out of public view, has been taken as a story about sexual awakening and as an allegory about a girl made responsible for her own rape. Snow White, in which a motherless child is hunted by her jealous stepmother, is rooted in concerns about abusive parenting.

Cinderella, meanwhile, articulates the fears children have about blended families: After a girl's mother dies, her cruel stepmother favors her biological daughters and forces her stepdaughter into servitude.

And then there is Rapunzel, a tale that first emerged in 17th-century Italy. The classic versions begin with a pregnant woman who, consumed with hunger, steals vegetables from the garden of an evil witch. The witch demands the woman's unborn child as payment, then locks the girl in a tower with no stairs or door. When she wants to visit, she calls up to the girl, who hangs her long hair out the window so the witch can climb up.

Many scholars view this story through the lens of fertility, a critical issue for Renaissance-era families that suffered from high child mortality rates. This is an allegory, they say, about a woman preparing for birth, knowing that fate might take her child away. And about another woman, represented by the witch, who may be unable to have children of her own.

As for Rapunzel, Steven Jones, a folklorist at California State University-Los Angeles, places her in what he calls the "Innocent Persecuted Heroine" cycle, which deals with the transition to adulthood. This story, Jones says, is a metaphor for sex. Rapunzel is secluded at the brink of adolescence, kept from any contact with men. Her growing hair reflects her growing sexual awareness and desire. And the prince pierces the tower, sneaking up Rapunzel's hair for secret trysts. In one version of the story, the witch discovers the deceit after Rapunzel winds up pregnant. As most of us know full well, a teenager consumed with desire can find ways around the rules.

Some of these metaphors - fortunately - will fly over the youngest kids' heads. But others, scholars say, carry meaning early on. Zipes reads his own Grimm Brothers translations in Minneapolis-St. Paul elementary schools, and says he has seen young kids latch onto the classic, dark versions of the tales. Some of the most disadvantaged students, he says, "really relate to us, because we're telling tales that they experience in their homes."

And even kids shielded from terrible strife find connections to fairy tale worlds. Of Cinderella, Zipes says, "What are we talking about? We're talking about today. How many families are split today?"

The story of Rapunzel, like most other fairy tales, has inspired modern authors, who have reworked it to address the pressing questions of the day. As the novelist and academic Alison Lurie wrote last May in the New York Review of Books, some modern literary adaptations use the Rapunzel framework to

address parental abandonment, adoption, and overprotectiveness. Donna Jo Napoli's 1996 novel "Zel" paints the witch as a possessive mother, unwilling to let her child love anyone but her. Cameron Dokey's 2007 novel "Golden: A Retelling of Rapunzel" treats the witch more kindly: She gives up her long-haired child but adopts another girl who is bald and reunites happily with both in the end.

Filmmakers, too, have long used classic fairy tales as jumping-off points to explore timely issues. "Ever After," the 1998 Drew Barrymore movie, retold Cinderella with a feminist message. The dark and violent 1996 film "Freeway" starred Reese Witherspoon as a modern-day version of Little Red Riding Hood, which exchanged the medieval forest for the dangerous big city.

Even Harry Potter, Zipes says, can be seen as a modern take on Cinderella: a boy who faces cruel treatment at the hands of his adoptive family, before he discovers his true and formidable talents.

But while the Harry Potter books and films contain their share of darkness, Zipes points out that many fairy tales become far more sanitized when they meet the children's literature industry - which is increasingly dependent on sequels and product tie-ins, and calibrated to appeal to the lowest common denominator. He is galled at versions of Little Red Riding Hood in which Granny isn't eaten by the wolf, but is conveniently out of the house when Red Riding Hood pops in.

In truth, I think I've told a version of that one to my little girl, putting my own, gentle spin on the story. And there is reason to protect the smallest kids from the violent parts of fairy tales, says David Bickham, a research scientist at the Center on Media and Child Health at Children's Hospital Boston. Young kids are already exposed to plenty of violence, he says, in news reports and superhero stories. And children process fear differently as they grow older.

I've seen the evolution in my own home: My daughter, now 4, recognizes that some books and films contain mean ladies, from the sea witch in Disney's "The Little Mermaid" to the Michelle Pfeiffer character in "Hairspray." Her understanding of fairy tales will continue to evolve, Bickham says. Preschoolers tend to take stories literally, and may need protection from the scariest parts. By 7 or 8, they can tell the difference between fiction and reality. By 13, they're able to connect allegory to real situations. (For practical viewing and reading suggestions, Bickham recommends psychology professor Joanne Cantor's 1998 book, "Mommy, I'm Scared.")

But it's fair to wonder when some kids will get to the classic fairy tales, if at all. When the stories intersect with commerce these days - whether in children's books or the endless barrage of toys - they can quickly get reduced beyond recognition. It's easier to sell a Rapunzel playset, after all, as something entirely cheery and safe. And if you simplify fairy tales even further, it doesn't take long before you get to the Disney Princesses.

Disney, of course, has long been a fairy tale re-packager par excellence, turning classic folklore into enduring animated films. And like all fairy tale retellings, Disney movies have reflected their times. The 1937 version of "Snow White" celebrated that era's ideals of American beauty. "The Little Mermaid," from 1989, replaced Hans Christian Andersen's helpless heroine with a spunky redhead - and while the movie didn't shy away from darkness, it softened the edges for family viewing. (In Andersen's version, the evil witch cuts off the mermaid's tongue.)

The Disney Princess brand takes the softening much further, recasting fairy tales for a fully consumerist culture. And it's hard not to admire its brilliance as a marketing stroke. The concept dates back to 1999, when the chairman of Disney Consumer Products attended a Disney ice show, says Kathy Franklin, the company's vice president of global franchise development for girls. He saw how many girls showed up in dress-up clothes, and mused about what might happen if Disney's own fairy tale heroines were packaged together.

At first, the idea was controversial even within Disney, James B. Stewart writes in his 2005 book, "Disney War." Roy Disney, Walt's nephew, argued that the Disney Princesses would betray the fairy tales themselves, since these women didn't coexist in their respective stories. But for small girls, pretty ladies seem to tap into a primal dress-up urge. And what began as an experiment in Disney stores - a few toys featuring Snow White, Cinderella, and Sleeping Beauty, striking a sassy group pose - quickly grew into a $4 billion global business, largely aimed at 3- to 7-year-olds.

Today, you can find countless girls in Disney Princess socks and light-up sneakers, and you can't walk through a supermarket without seeing the princesses on diapers and tubes of children's toothpaste. And while Franklin says the characters are based on personalities crafted in the movies - Ariel is independent, Cinderella is a good friend - it's hard to see those differences when you're looking at their pictures on a bedspread. To little girls, these fairy tale heroines are pretty ladies, nothing more. And perhaps to adults, too. Disney has introduced a line of Disney Princess costume wedding gowns, designed, Franklin says, "for women who have always dreamed of their wedding as the day they're a princess."

So there it is: a way to speed straight to the happy ending, without stopping to think about the story along the way. It's a great way to sell just about anything, but it's also precisely the opposite of what makes fairy tales compelling in the first place. The modern, commercial fairy tale contains no conflict, no resolution, no questions unresolved, no larger issues to explore. Once the princess climbs down from the tower, or the ball comes to an end, you're left with nothing to talk about at all.

Joanna Weiss covers television and pop culture for the Globe. ■

http://www.boston.com/bostonglobe/ideas/articles/2008/09/21/fear_of_fairy_tales/

Can Higher Education Regulate Itself?

Colleges and accrediting agencies dodged a bullet this summer as Congress, enacting legislation to renew the Higher Education Act, shielded higher education from the U.S. Education Department's efforts to step up federal regulation of how accreditors and, by extension, colleges ensure that students are learning. The legislation barred the education secretary from issuing regulations to dictate accreditors' standards on student learning outcomes.

But as an aide to academe's chief Congressional defender, Sen. Lamar Alexander (R-Tenn.), warned in June, college leaders shouldn't let themselves think that the shooting has stopped. Congress will next renew the Higher Education Act in five years, David Cleary told a group of college and accrediting officials this summer, and in "the absence of good answers" between now and then about how higher education can prove (and, where lacking, *improve*) its effectiveness, increased federal intervention is sure to follow.

To try to jumpstart that conversation, the Council for Higher Education Accreditation on Monday held the first of what it envisions will be a series of national forums about the future of higher education self-regulation. Numerous critics from outside higher education have expressed doubt that the higher education industry, through the peer-review-based system of accreditation, can effectively regulate its own quality and effectiveness, given that accrediting agencies are governed by the institutions being scrutinized.

But Monday's discussion was designed, CHEA officials said, not to beat that drum but to brainstorm about what higher education officials must do to ensure that self-regulation survives. "We need to marshal ammunition we could use to defend the system of self-regulation," said A. Lee Fritschler, a professor of public policy at George Mason University and former college president and U.S. assistant secretary for postsecondary education,

"I feel like I am singing to the choir in this room," Molly C. Broad, president of the American Council on Education, said at the start of remarks in which she, like virtually all the speakers, made clear a preference to limit further federal incursion into higher education quality control.

Broad was not alone in noting the irony that this discussion about the appropriate level of federal regulation and involvement was occurring in the shadow of one of the biggest federal interventions in history, on Wall Street. "Self-regulation in this environment seems almost quaint," she said, "when so much of our nation is being subjected to very significant government intervention and regulation."

While the speakers were united in their desire to preserve accreditation as the preferred method of ensuring that colleges and universities are providing a quality education, they differed in the extent to which they believed higher education leaders had adequately made that case so far, and how serious the problems are that have led the Education Department and others to call for a stronger federal role.

Fritschler vigorously defended the importance of self-regulation and questioned the legitimacy of arguments that change is necessary because higher education has slipped significantly. "I keep hearing, 'The public is really angry at higher education and wants us to be more accountable'.... Could you be a little more specific?" Fritschler said. "What's the problem that we're trying to cure by these proposals we've seen" for more federal oversight and tougher standards for student learning outcomes?

Along those same lines, Barbara Beno, president of the Accrediting Commission for Community and Junior Colleges of the Western Association of Schools and Colleges, complained that many of the calls for more government oversight of higher education have been politically motivated. "We've had lots of arguments and criticism [of higher education and accreditation] without very much data or evidence behind it," she said.

Even as other speakers agreed that the temptation to increase direct federal oversight of accreditation and higher education was ill-conceived, they were more accepting of the notion that colleges have brought much of the criticism behind that temptation on themselves, and that much of the scrutiny was deserved.

Mark L. Pelesh, executive vice president at Corinthian Colleges, Inc., offered a historical review that laid bare the longstanding tensions in the relationship between higher education and the government, and the extent to which accrediting agencies are frequently caught in the middle, because the federal government essentially depends on their judgments of which colleges are worthy of receiving federal financial aid. "Accrediting agencies are the buffer, and what happens to buffers? They get buffeted," he said.

At a time when the price of higher education is escalating rapidly and the U.S. place in the international educational and economic hierarchy is declining, Pelesh said, it can hardly be surprising that accrediting agencies are increasingly being asked hard questions about whether they are doing enough to ensure that the colleges they oversee are performing. With the government spending $83 billion a year on financial aid, he said, "people are looking for some sort of assurance of the value proposition that institutions are providing, and accreditors will be looked to to provide that assurance."

Carol Geary Schneider, president of the Association of American Colleges and Universities, said that institutions and accreditors are doing much more to improve their students' learning outcomes than they get credit for — but "doing it quietly and invisibly." Still, she gave the audience updated data on a survey her group did last year on employers' perceptions of the skills of the college graduates they hire. "They gave them a resounding D — not failing, but barely passing," she said, suggesting that it was not surprising that policy makers were troubled by results like that.

While accrediting agencies and colleges may have won a reprieve from additional federal intrusion in the just-passed Higher Education Act legislation, the timeout won't last long, said Elise Scanlon, executive director of the Accrediting Commission of Career Schools and Colleges of Technology. "The more we voluntarily attach some rigor and substance to the accreditation process, the less need there will be for the federal government to encroach on the aspects of federal recognition that for the moment are less intrusive than they might be," she said.

Given that this was the first of what are expected to be multiple discussions in the coming months, most of the participants in the CHEA forum said they did not have clear conceptions of how accreditation and higher education might change to satisfy the calls to better justify their performance.

But on several occasions, members of the accreditation council's board hinted that they might favor a change in how higher education is regulated. Right now there are overlapping processes through which many accrediting agencies seek recognition from both the Education Department and from CHEA, which in addition to recognizing accreditors strongly advocates for the right of colleges to regulate their own academic quality. Might it be possible instead, they wondered, to create a system in which CHEA was responsible for certifying that accrediting agencies were ensuring the quality and continuing improvement of colleges, and the Education Department focused solely on ensuring that accreditors and colleges operate with financial integrity?

Given the skepticism with which the Bush administration has viewed the current system of higher education accreditation, it is hard to imagine that this Education Department, at least, would go along with a change that ceded authority the government now has to a system run of, by and for colleges. Although several Education Department officials were in the audience Monday, taking copious notes, they were not in a position to comment on the possibility of bifurcating the current regulation process.

— Doug Lederman

The original story and user comments can be viewed online at http://insidehighered.com/news/2008/09/23/accredit.

I'll Take My Lecture to Go, Please

YORK UNIVERSITY

It looks like students can be open-minded after all: When provided with the option to view lectures online, rather than just in person, a full 82 percent of undergraduates kindly offered that they'd be willing to entertain an alternative to showing up to class and paying attention in real time.

A new study released today suggests not only a willingness but a "clear preference" among undergraduates for "lecture capture," the technology that records, streams and stores what happens in the classroom for concurrent or later viewing.

The study, sponsored by the University of Wisconsin-Madison's E-Business Institute, tackles the much-discussed question of students' preferences for traditional versus online learning with unusual rigor. Based on a survey of more than 29,000 undergraduate and graduate students at the university, the study had a response rate of over 25 percent. Almost half of the undergraduates — 47 percent — had taken a class with lectures available for online viewing.

The responses potentially address two of the biggest obstacles some observers see to more widespread adoption of lecture capture technology and other elements of distance education: a willingness to learn remotely, and the cost barrier.

Students who responded to the survey clearly understood the benefits of lectures that are available as Webcasts, such as making up for missed classes — which, at 93 percent, ranked as the top advantage — and "watching lectures on demand for convenience" (79 percent) or other reasons, such as reviewing lectures before class.

Over half, moreover, said they saw value in having access to course materials (such as lectures, potentially) even after the semester was over, much in the same way that some students keep their old textbooks for future reference.

At the same time, the survey addresses potential cost concerns, which have given pause to administrators who worry about the financial strains of scaling up their educational efforts as well as to students who would bristle at added technology fees for all of their classes. Over 60 percent of respondents said they would pay for lecture capture capabilities, and of those, 69 percent said they would be willing to pay on a "course-by-course" basis rather than bundled fees.

"I think one of the things that surprised us a bit was the undergraduate preference," said Sandra Bradley, practice director at the university's E-Business Consortium and co-author of the study. "I think we were maybe anticipating that we would see it a bit higher with graduate students," whose preference was only slightly lower, at 79 percent.

Sean Brown, vice president of higher education for Sonic Foundry, which specializes in rich media and lecture capture applications for higher education, said the study was a validation of his company's internal research. He will be featuring the study's results in a live Webcast to higher education professionals today. As a member of the E-Business Consortium based at the university, he added, the company's marketing department initially supported some of the study's administrative costs, but those did not in any way influence the outcome.

"There's a lot of positive feelings ... but to have empirical evidence that it's having an impact and about how students feel about" lecture capture, he said, was valuable feedback.

— Andy Guess

The original story and user comments can be viewed online at
http://insidehighered.com/news/2008/09/23/capture.

In Quest for Carbon Neutrality, Late out of the Gate

Colleges participating in a landmark agreement to cut their net carbon emissions to zero have to start by knowing what they're emitting now. In a significant early milestone for the American College and University Presidents Climate Commitment, the charter signatories were to submit baseline inventories of their colleges' greenhouse gas emissions by last Monday, Sept. 15.

Fewer than half the institutions met the deadline for submitting the public reports, which otherwise illustrate some common themes – including colleges' difficulties in accurately quantifying their employees' and students' commuting and air travel patterns, and tensions in resolving the goal of moving toward zero emissions while increasing enrollment and physical plant size.

Next up, these colleges are expected to submit a plan for achieving "climate neutrality" by Sept. 15 of 2009.

"We have an incredible new amount of data to look at, to begin to understand college greenhouse gas emissions in a deeper way than possible before," said Julian Dautremont-Smith, associate director of the Association for the Advancement of Sustainability in Higher Education, which is involved in supporting the Presidents Climate Commitment.

Many of the figures in the reports are "rough, admittedly, but we think that's OK. The point is to get a rough sense of what those emissions are," and, over time, he continued, the methodology should improve and best practices should emerge. "This is really just the first step for most universities."

Since its origins, critics of the Commitment have raised questions about a press release-friendly, presidential promise to move toward "carbon neutrality," relying on the invention of technologies that don't yet exist (and from a starting line, in terms of initial emissions, that many of the signatories have yet to set). In opting not to sign the pledge in 2007, the University of Virginia's president, John T. Casteen III, said of the university's sustainability goals, "They require responsible, informed decisions made within the context of our mission and properly vetted not by one person, a president signing what is effectively a petition, but by faculties, the University's Board, state officials, and others."

And in responding to questions about accountability for maintaining the pledge, supporters of the Presidents Climate Commitment told *Inside Higher Ed* that they could be held accountable via their annual, public reporting.

As of Friday afternoon, 156 colleges had submitted their baseline greenhouse gas inventories online, out of 389 with reports due. (Of those that failed to submit their reports, 77 had previously requested extensions.) Dautremont-Smith explained that many colleges are still working on the inventory, which is challenging for many to complete, but acknowledged that the association hasn't heard from all the colleges that are delayed.

"Our sense of it is this is a long-term commitment, multi-decade for most schools, so we're not going to fret about being behind a little on this particular deadline," he said.

Common Threads and (In)comparability

In completing the baseline inventories, colleges were asked to, at a minimum, estimate emissions based on the on-site combustion of fossil fuels, electricity consumption, student, faculty and staff commuting, and institution-funded air travel. Some went above and beyond, calculating inventories for a series of years rather than the single year required, and including emissions from solid waste disposal or study abroad in their analyses. Many, but not all, attached detailed narratives.

To the degree that total carbon dioxide emissions can be normalized across universities, they're broken down by emissions per 1,000 square feet and emissions per full-time enrollment.

Without better metrics for normalizing the data, the organizers of the commitment strongly discourage making comparisons across universities for ranking purposes, both because of variations across institutions (including accidents of location — differing heating needs in colder versus milder climates, for example, and the degree to which regional electricity producers rely on renewable energy sources versus coal), and also because of differences in methodologies and boundaries (what was and wasn't included in the various university inventories).

Given higher education's competitive nature, however, it's not surprising that at least a couple of signatory colleges did issue press releases bragging about their (relatively) small carbon footprint. The University of Colorado at Boulder, for instance, boasts that its emissions per full-time enrollment figure (its net figure is 5.5 metric tons of carbon dioxide) is "quite a bit better" than that of the University of Arkansas (at 10.6) or the University of New Mexico (at 8.5).

"We're invariably always looking at one another, and saying, 'How are you doing?'" said Frank Bruno, Boulder's vice chancellor for administration. "For me it's less about a competition and more about learning from one another."

At Boulder, the bulk of emissions come from purchased electricity. Overall – and not surprisingly – electricity, energy for heating and cooling, air travel and commuting were the major sources of emissions across universities, although, "How they broke out really depends on the type of school they are," said Dautremont-Smith.

For instance, Centralia College, a community college in Washington State, found that, "With no on-campus living options, commuting emissions are especially large. Eighty-eight percent of the college's total emissions come from student, faculty, and staff commuting!"

At California State Polytechnic University, Pomona, the largest single source of emissions was likewise transportation, which comprised about 55 percent of the campus' average total emissions. It's a heavily commuter campus: "Our students come from all over Southern California, because we are a somewhat unique university," said Kyle D. Brown, interim dean of the College of Environmental Design and an author of the university's inventory.

From 1995 to 2005, Cal Poly Pomona's overall emissions increased by about 17 percent, as the full-time student population grew (by 26 percent) and building square footage did, too (by 39 percent).

That's consistent with national trends, Brown said: "Everybody gets a little more efficient, but there are more people, so there's more greenhouse gas emission."

Brown said he expects Cal Poly Pomona officials will adopt a plan for achieving "climate neutrality" in the spring or summer, well ahead of the (next) Sept. 15 deadline. "If we're looking ahead, maybe it's 25 years or whatever time horizon we might look at, we have to think about what the campus might be in terms of its size at that point in order to have a reasonable strategy for how [carbon] might be neutralized."

New, Albeit Imperfect, Data

In detailing the data collection process, many colleges described culling good information on air travel and commuting emissions as being particularly difficult. Strategies ran the gamut, from surveying faculty, students and staff, to estimating driving distances based on the zip codes of those registered for parking permits.

"When we tried to approximate or estimate some of these values in commuting and/or air travel, it bordered on speculation," said Robert Fisher, a professor of architecture and resident fellow for the Center for Energy Research/Education/Service at Ball State University. Ball State relied, for example, on prorating a Purdue University survey on air travel emissions to estimate its own.

"The university here is very, very good at keeping track of energy costs, and energy expenditures, in terms of the number of kilowatt hours or therms.... But we don't have any accumulated data on faculty air travel, and we have no data whatsoever on the commuting patterns of faculty, students and staff," said Fisher, adding that for Ball State, commuting and air travel constitute a relatively small portion of total emissions (he estimated they're in the 5 to 10 percent range).

"It's fortunate in that sense, that the lack of reliable data does not compromise seriously the overall estimate of the emissions. But we're going to have to this year, for the next iteration of the report, try to get some more reliable information."

A number of other colleges repeated the need to gather more reliable information on commuting and air travel patterns. A couple of colleges – including Bunker Hill Community College, in Massachusetts, and Southwestern College, in Kansas – didn't even report commuting emissions this year, but pledged to do so the next. Boston-based Bunker Hill cited plans to modify and expand a Massachusetts Department of Environmental Protection-developed transportation survey to be given this fall.

Individual colleges' inventories can be viewed through the Presidents Climate Commitment online database, but no composite or summary data is yet available. "Our intention is to build some reports" with, for example, averages for different types of institutions, said Dautremont-Smith. He added that the timeline for that will depend on how quickly colleges behind the deadline submit their reports, and how long it takes to work with colleges that have questionable data, in order to identify any mistakes. (One obvious one: Black Hills State University, in South Dakota, reported exceedingly inflated emissions — four digits where other universities reported one or two. A spokeswoman cited a conversion error Friday in response to an inquiry from *Inside Higher Ed*.)

In the meantime, "It's totally amazing to have greenhouse gas inventories submitted in a relatively common format," said Dautremont-Smith. "There are a lot of possibilities for this data."

After all, even on a campus level, much of this information was never readily available before. "Not everything was in spreadsheets," said Jim Simon, an associate environmental educator at the State University of New York at Buffalo who was involved in putting together that university's inventory. "There were a lot of coffee-stained notebook pages I was given, but I hope that changes over time. And I think it will."

— Elizabeth Redden

The original story and user comments can be viewed online at http://insidehighered.com/news/2008/09/22/climate.

New Questions on Women, Academe and Careers

By Scott Jaschik

In field after field, women either outperform or equal men — only to lag in key positions in academe (or in other careers that attract the highly educated). Identifying the causes for these gender gaps has become increasingly urgent as colleges find their enrollments increasingly female and some formerly male dominated fields struggle to attract enough talent.

Seeking to advance the discussion about why these trends persist and what can be done about them, some of the leading scholars of gender, education and careers gathered Friday to present new and evolving research projects. Most of the research came from economists and the host for the symposium was Columbia University Business School — perhaps explaining a practical, statistically based approach.

Key questions explored included the varying factors that help professional women achieve or miss their goals, why some professions are relatively more successful than others at both attracting and retaining women, and the relative significance of qualities of women and of institutions that may explain these gaps.

Claudia Goldin, a professor of economics at Harvard University, started off by reviewing her research on how college educated women have seen careers and family balanced from the beginning of the 20th century. Goldin sees five distinct cohorts of women — and the evolution of what these women have wanted isn't as clear-cut as some assume. It's not that women today are insisting on more of what previous generations were denied, but that women (even the subset of women over time who were college educated and wanted to work) actually want something different today, she said.

The women who graduated from college at the beginning of the 20th century, she said, wanted family or a career — not both. Subsequent generations wanted a job first and then a family, a family first and then a job, a career and then family. Only starting with those who graduated from colleges in the '80s and '90s was the goal explicitly to have both a career and a family — with neither given clear preference. "The question returns to having it all," she said.

And that suggests that comparisons are needed not just of the advancement of women, but of their ability to advance while having a family. For that, Goldin turned to research she is conducting with Lawrence Katz, another Harvard economist, on the "Harvard and Beyond Project," which tracks what happens to three cohorts of graduates of the university — those who graduated around 1970, 1980 and 1990-15 years after they received their bachelor's degrees. (Goldin and Katz both acknowledged that Harvard alumni are by no means typical of Americans, but suggested that the advantages Harvard graduates enjoy in education, connections and wealth make them an ideal group to study — with the thinking that if these women can't pull off the balancing act, it would be more difficult still for many others.)

Goldin focused on the percentage of women in these cohorts who are employed full time, all year round by highest degree obtained, and parental status. For all categories, the percentage of women working full time, all-year-round drops if they have a child or more than one child. But the drops aren't equal. Having just one child appears to have a significant impact on the likelihood that a Ph.D. woman will still be working full time 15 years after graduation, but has a smaller impact on medical doctors. But having a second child makes Ph.D.'s and medical doctors relatively similar, while M.B.A.'s are much more likely to stop working full time — with either one or two or more children.

Percentage of 'Harvard and Beyond' Women Employed Full Time 15 Years After Graduation

Advanced Degree Earned	No Children	1 Child	2 or More Children
M.B.A.	84.4%	70.9%	40.0%
J.D.	82.5%	64.1%	48.5%

M.D., D.D.S., D.V.M	92.7%	80.5%	60.4%
Ph.D.	91.5%	64.9%	57.5%

Goldin said that these and other statistics raise the question of why "women do better in certain professions than others" at having both career and family. "Why are some professions more compatible with having it all?"

One of her current areas of research is exploring those professions in comparison to others. She noted, for example, that women have been flocking to fields such as veterinary medicine, optometry and pharmacy — fields that require advanced degrees. Women's numbers have also increased dramatically, to equity, in medical schools. At the undergraduate level, she said, women are making up an increasing percentage of accounting students — even though the field has traditionally been male dominated.

She noted that some of these fields have experienced "enormous changes in structure, and this is very separate from the fact that women are entering them," although the changes may be contributing to the popularity of the fields with women. For example, she noted that the past few decades, in which women have come into pharmacy, have also largely seen the replacement of owner-operated pharmacies with large drug stores where the pharmacist is an employee.

Among the characteristics she is finding among the career paths that are both attracting and retaining women: flexibility in schedules, "transparent career paths," and "predictable milestones" on the path to a career. The latter is important, she said, because the research shows that women are quite willing to study for long years (as in medicine) to be trained, but they want a clear path.

A comparison of medical and academic training isn't favorable to academe. Medical school "is difficult, but it takes four years," Goldin said, and medical internships have known durations. In graduate school for a Ph.D., students take some courses and prepare for some tests of their knowledge, but the process of completing a dissertation is mysterious to many and takes widely differing periods of time. "We say to take some exams and then we will give you a parachute and throw you out of a plane," she said of Ph.D. training.

Katz — also working with data from the Harvard project — said another key measure that needs more attention is the economic loss suffered for taking some time off from career for family related reasons. He has been comparing the income of groups of women in the Harvard database who took 18 months off from full-time work and those who never did. For comparable groups of women, he found that those with M.B.A.'s who took time off had incomes that were 53 percent lower than those who didn't. The losses for both Ph.D.'s and J.D.'s were 34 percent, while the loss for M.D.'s was only 16 percent.

Where the "economic cost is higher" of taking some time off, he said, more women leave the profession they have trained to enter, Katz said. He suggested that those who want to encourage more academics to return to full-time work at some point (not to mention those in the business world) explore why it is that M.D.'s suffer such relatively small economic loss from their decision to take some time off.

In some subsets of academic and professional life, particular reasons may be driving women out of professional advancement. Anne Preston, a professor of economics at Haverford College, presented analyses from various national databases as well as from in-depth interviews on why women and men leave scientific careers (many, but not all of which are in academe). Women at all levels of science are more likely to leave than are men; through the '80s, women with Ph.D.'s were less likely to leave, but they are now more likely to leave, she said.

Not only are women more likely to leave science, Preston said, but they leave for entirely different reasons than do men. Men who leave science jobs almost always do so for more money or an economic opportunity of some sort. Women cite as their top reasons discontent with the nature of science, a lack of mentoring, and family responsibilities.

Women who leave science careers are frustrated from what they see as "the narrowness of science" and a sense that "those who succeed have to be narrow," she said. Women in science are far less likely than men, her surveys have found, to have had someone they consider a mentor, either in graduate school or their careers.

In addition, some career patterns may be particularly discouraging of women pursuing careers in science, Preston said. For example, she noted that many young scientists have multiple postdocs before landing their first permanent position, and in many fields, it is considered optimal for scientists to have the postdocs at multiple institutions, rather than staying at the same place. Women with science Ph.D.'s are much more likely than their male counterparts to be married to other scientists or to people with advanced professional careers, she said. Moving around the country several times is seen as impossible for many women with partners, she said. Preferences like wanting postdocs from multiple institutions may not have been created for sexist reasons, and may even have legitimate purposes, she said, but they are having a disproportionate — and discouraging — impact on female scientists.

While universities and other employers have some of the responsibility for helping women advance, so too may their spouses. Preston cited a survey of married male and female scientists (not married to one another) in which each were asked what share of household chores was performed by their spouses. The female scientists estimated that their spouses performed an average of 34.7 percent of chores, while the men estimated that their spouses perform 65.1 percent of chores. Even assuming equal levels of honesty (and some women in the audience had their doubts about the men), that's a gap that would have a significant burden on the women not faced by the men. (And the gaps are larger for childcare responsibilities.) Gender differences in attitudes were also the subject of research presented by Muriel Niederle, an associate professor of economics at Stanford University. Her work explores how women and men respond to competition; her research subjects are undergraduates from a number of different universities.

The students are asked to solve mazes. First they are told that the payment will be based on how many mazes each student solves in a given period of time. All of the students in the group can be paid, based on how many mazes they solve. Then they are given the option of doing another round the same way, or being split into teams with a larger financial reward going to the team that solves the most mazes — and no payment to the other team.. Women are much more likely to prefer the non-competitive approach and men gravitate overwhelmingly to the competition. Women are more likely, some studies have found, to go for the competition if it is single-sex and they are competing against other women.

Niederle noted that there could be logic to these choices if men did better on the mazes, but they don't. The gaps in risk-taking are as much from men who overestimate themselves and figure they will win (when they don't necessarily stand a chance) as from women who could win, but avoid the competition.

What does this mean? And should "institutional changes address these differences," Niederle asked.

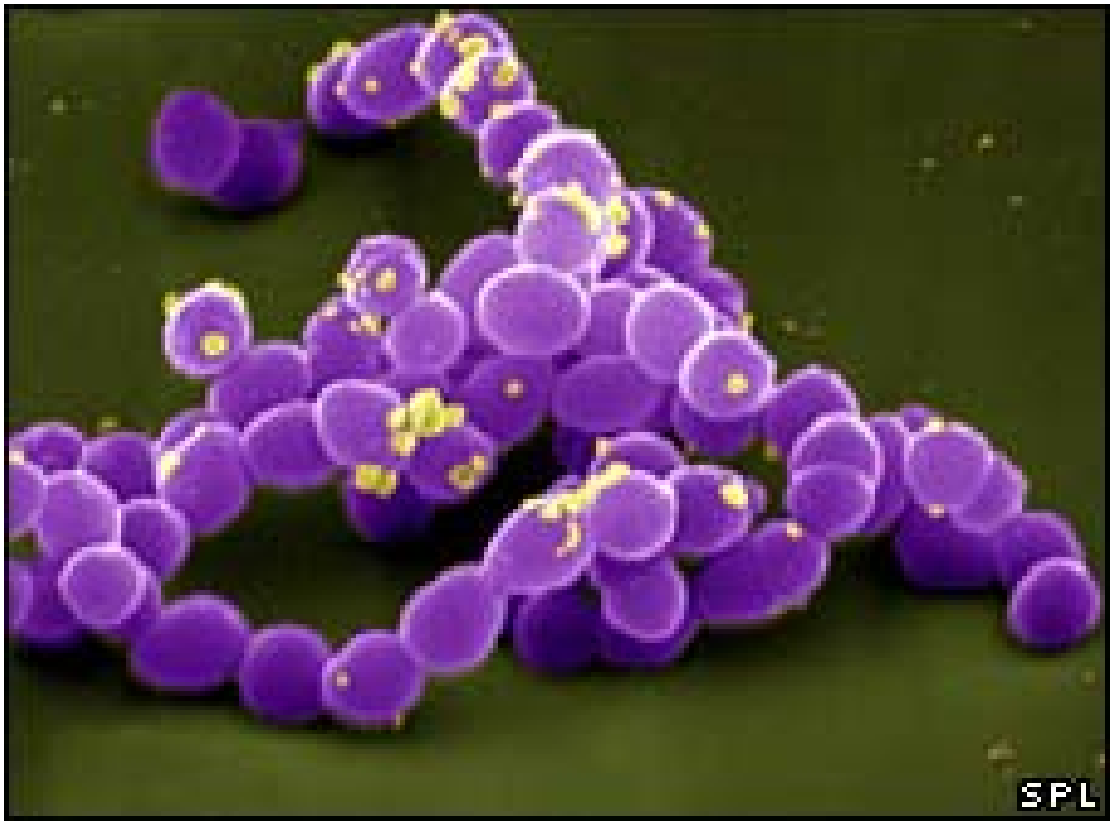
Geraldine Downey, vice provost for diversity at Columbia, recalled that when she was chair of psychology at the university, a job candidate she met wanted her to know how he inspired his students. He told her that he tells them to read Nobel laureates' lectures. "He wanted to win the Nobel Prize. I was horrified," Downey said. "When I try to inspire my students, it's about public service, about doing good for the world," she said. Universities, if they are going to encourage the careers of women (and of everyone), she said, need to be willing to embrace "people with different values" and be sure that they are fully included. To the extent some men "will compete for anything," Downey said, that should not set a standard where only women who share those values can succeed in academe.

The success of women and men, she said, can be judged on their work and not competitiveness. "It's no longer useful to have a 'sink or swim' mentality," she said.

The original story and user comments can be viewed online at
http://insidehighered.com/news/2008/09/22/women.

How gut bugs could trigger cancer

Scientists have uncovered a chain reaction which could link a type of bacterium living in our intestines to the development of colon cancer.



Enterococcus faecalis is harmless in the vast majority of people, but US scientists have found that it can produce harmful chemicals.

The Journal of Medical Microbiology study found these can damage DNA, and prompt gene activity linked to cancer.

A UK expert said it was plausible that bacteria could cause colon cancer.

However, he stressed that E.faecalis was very unlikely to be the only bacterium which had such an effect.

> **This research puts into perspective the complexity of the effects normal gut bacteria can have on the health of the individual**
> Professor Mark Huycke
> Researcher

Our guts provide a home to dozens of different types of bacteria, many of which actually provide a useful service, helping break down indigestible sugars in food by fermentation, or even "training" the body's immune system.

However, in recent years, scientists have suggested that in certain, susceptible individuals, these bacteria can actually do harm.

E.faecalis, sometimes also known as Group D Streptococcus, is one of those under suspicion, and the research by the Department of Veterans Affairs Medical Center in Oklahoma City strengthens the link.

The researchers investigated how colon cells in the laboratory reacted to the presence of the bacterium, when it is in a "fermentation" state.

In this state, it produces a kind of oxygen molecule called "superoxide", and it is this which can damage DNA in surrounding cells.

Gene activity

Professor Mark Huycke, who led the research, found that the apparent effects were not limited to this.

"We found that superoxide led to strong signalling in immune cells called macrophages - it also altered the way some cells in the gut grew and divided and even increased the productivity of genes which are associated with cancer."

In total, the expression of 42 genes linked to vital processes in human cells was altered by the presence of E. faecalis in this state.

"This research puts into perspective the complexity of the effects normal gut bacteria can have on the health of the individual."

Dr Barry Campbell, a gut microbiology researcher from the University of Liverpool, agreed that E.faecalis was a candidate for cancerous changes.

However, he said that other bowel bacteria could also be behind the cell changes which eventually lead to tumours.

He said: "There is not going to be only one culprit. Our own team is interested in a particular type of E.coli with this in mind.

"There are also many other factors which are involved, such as genetics and environment."

Professor Ian Rowland, a specialist in gut bacteria from Reading University, said: "This shows how it could happen, although whether this actually does happen in a human is another matter.

"There is a lot of circumstantial evidence that gut bacteria are important in colorectal cancer, although we don't fully understand why.

"In the case of Enterococcus faecalis, we know that most people have this in their gut, but most people don't get colon cancer, so there must be other factors involved."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/7625192.stm

Published: 2008/09/21 22:49:27 GMT

Men with sexist views 'earn more'

Men who grow up thinking women should stay at home may be labelled "old-fashioned" - but could end up well ahead in the salary stakes.

A US study, published in the Journal of Applied Psychology, suggests that they will consistently out-earn more "modern-thinking" men.

On average, this meant an extra $8,500 (£4,722) a year.

One UK psychologist said men inclined to wield power in their relationships might also do this at work.

> **It could be that more traditionally-minded men are interested in power, both in terms of access to resources - money in this case - and also in terms of a woman who is submissive**
> Dr Magdalena Zawisza
> Winchester University

The study, carried out by researchers at the University of Florida, was conducted on a large scale, with 12,686 men and women interviewed in 1979, when they were aged between 14 and 22, and three times in the following two decades, the last time in 2005.

The researchers asked them whether they believed a woman's place was in the home, or whether the employment of women was likely to lead to higher rates of juvenile delinquency.

Predictably, more men tended to hold these views than women, although the gap has narrowed significantly over time.

However, when the men were asked about their salaries, another gap emerged, with those holding "traditional" views earning significantly more.

Conversely, women who held the opposite view did earn slightly more, on average $1,500 (£833) more than women with "traditional" views.

Dr Timothy Judge, one of the researchers, said: "More traditional people may be seeking to preserve the historical separation of work and domestic roles - our results prove that is, in fact, the case."

HAVE YOUR SAY There are also a lot of men who have gained good positions and are not sexist Jhonsie, Exeter

Dr Magdalena Zawisza, a psychologist from Winchester University, said that there were a number of theories which might explain the difference.

She said: "It could be that more traditionally-minded men are interested in power, both in terms of access to resources - money in this case - and also in terms of a woman who is submissive.

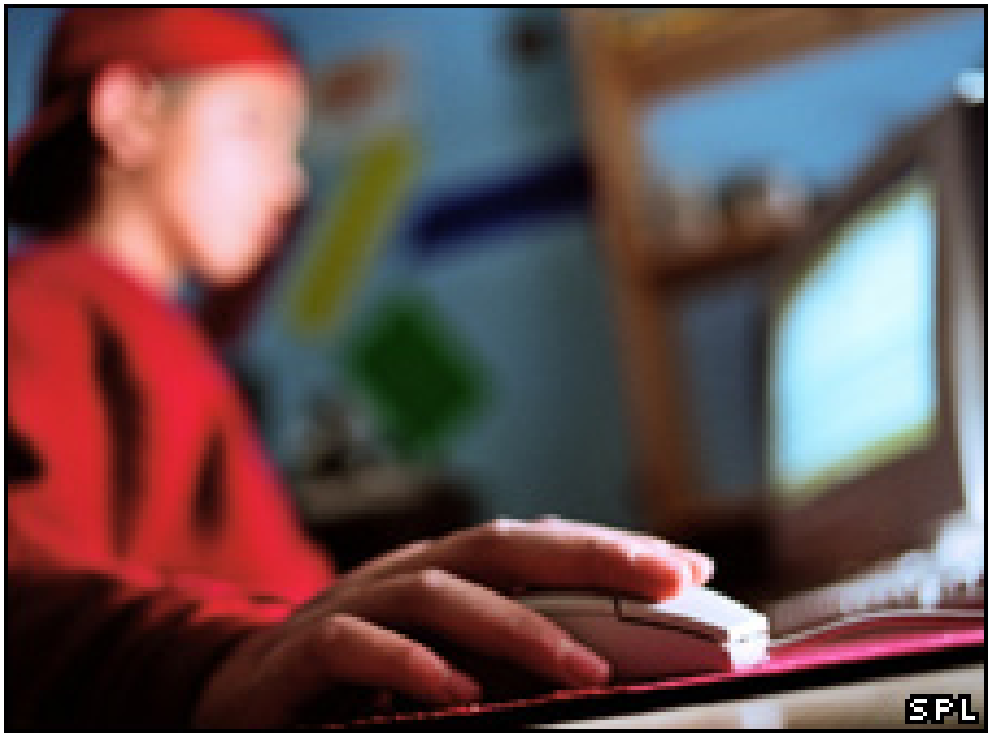
"Another theory suggests that employers are more likely to promote men who are the sole earner in preference to those who do not - they recognise that they need more support for their families, because they are the breadwinner."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/health/7625173.stm

Published: 2008/09/22 05:14:58 GMT

Pupils to trial 'virtual teacher'

A new out-of-hours service that allows pupils to receive homework tips from "virtual teachers" is being piloted in Clackmannanshire.



Pupils at Alva Academy will trial a "vodcasting" system in the first project of its kind in Scotland.

Teachers of subjects like maths, music and home economics will record videos recapping key points from lessons to help with homework.

The videos will be posted on the school website to be accessed at home.

The system will also involve teachers recording mp3 files for podcasts of lesson tips which can be played on a pupil's mp3 player or mobile phone.

Stuart Clyde, depute head teacher at Alva Academy, is leading the initiative.

Homework help

He said he believes pupils will engage with the system because it makes use of technology that is already popular with them.

He added: "Children learn well when they have the best practice demonstrated to them; these videos do just that.

"Alva Academy hopes to further engage parents in their children's learning as the videos can act as a refresher-course for parents too, enabling them to help their children with homework."

Pupils that do not have access to the Internet at home will still be able to use the facility from the school's machines or a public library.

The school said the project would be evaluated at the end of the current academic session with a view to rolling it out to more departments.

An open evening to provide more information to pupils, teacher and parents about the project is set to be held on Tuesday 23 September at 1900 BST in Alva Academy.

The school will be launched as BBC Radio Scotland's SoundTown school on 7 Oct, when it will feature on schedules throughout the day.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/uk_news/scotland/tayside_and_central/7625680.stm

Published: 2008/09/21 23:03:22 GMT

Observatory detects record burst

The Swift space telescope has detected a gamma-ray burst some 12.8 billion light-years from Earth - a record.

These intensely bright but fleeting flashes of very high-energy radiation signal some of the Universe's most violent happenings.

This blast, designated GRB 080913, probably originated in the catastrophic explosion of a massive star.

"This is the most amazing burst Swift has seen," said lead scientist Dr Neil Gehrels.

"It's coming to us from near the edge of the visible Universe," explained the researcher from the US space agency's (Nasa) Goddard Space Flight Center.

The burst was detected at 0547 GMT on 13 September, in the constellation Eridanus.

Because light moves at finite speed, looking farther into the Universe means looking back in time. The distance this flash has had to travel means Swift is seeing the event less than 825 million years after the Universe came into being; and some 70 million years further back in time than the previous record holder, a burst detected in 2005.

Indeed, it is one of the most distant objects ever seen. Only the light from some faint galaxies has been detected beyond this burst - 100-300 million light-years further away.

Scientists are very keen to probe these great distances because they will learn how the early Universe evolved, and that will help them explain why the cosmos looks like it does now.

Swift was launched in 2004. It is a three-in-one observatory. Its Burst Alert Telescope is set up to catch the intense but fleeting flash of very high-energy gamma radiation that initially signals a GRB event. Swift then swings itself to look directly into the flash with X-ray and ultraviolet/visible telescopes.

This longer wavelength afterglow can last days and Swift alerts ground-based observatories to join the spectacle.

Indeed, it is the ground campaign that establishes the distance.

In this case, astronomers using the European Southern Observatory's 2.2m telescope at La Silla and Very Large Telescope at Paranal (both in Chile) targeted the afterglow.

Analysis of the light spectrum confirmed the blast had a redshift of 6.7. Redshift is a measure of the degree to which light has been "stretched" by the expansion of the Universe. The greater the redshift, the more distant the object and the earlier it is being seen in cosmic history.

The figure 6.7 equates to 12.8 billion light-years.

Although a Nasa-managed mission, Swift has significant British and Italian contributions.

The UK's major input has been to provide an X-ray camera and elements of the UltraViolet/Optical Telescope.

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/science/nature/7626532.stm

Published: 2008/09/19 23:44:03 GMT

Cisco Tries to Break Out of the Data Center Role

By ASHLEE VANCE

SAN JOSE, Calif. — Forget the switches and routers that built Cisco Systems into a giant, albeit somewhat boring, company at the core of the Internet.

These days, the company is peddling e-mail software, video conferencing systems, cable TV boxes — even furniture — as it tries to break out of the data center and get its products in front of ordinary office workers.

“Cisco is kind of like the Madonna of networking,” said Mark Sue, an analyst with RBC Capital Markets. “It is continuously trying to reinvent itself.”

The effort directly challenges a main area of growth for some of Cisco’s big customers, including I.B.M., Oracle and most pointedly, Microsoft.

The line of business, known as unified communications, aims to provide a common set of tools that workers can use to make calls, send e-mail messages, hold Web conferences and send instant messages.

On Wednesday, Cisco plans to announce updates to much of the technology behind the effort, including improvements to its TelePresence videoconferencing software and WebEx collaboration suite.

Cisco’s strategy is an obvious outgrowth of its acquisition strategy. Over the last four years, the firm, which is based in San Jose, Calif., bought 36 companies, including WebEx, a Web meeting specialist, for $3.2 billion. In recent weeks, Cisco also picked up PostPath, a maker of e-mail software, and Jabber, a leader in corporate instant messaging.

Although Cisco has not yet formally bundled all of these services together into a single suite, the company said it intended to move in that direction.

Microsoft, the maker of Windows and Office software, is not amused. The company dominates the market for the communications software used by office workers and takes in more than $1 billion in annual revenue from its SharePoint collaboration software, which executives consider one of their shining stars.

Zig Serafin, the general manager of Microsoft's Unified Communications Group, said Cisco's core business was "under siege" and that had forced the company into unfamiliar territory as a software player. "They are trying to stick together acquired applications, and the approach they have taken is largely piecemeal," he said.

Nikos Theodosopoulos, an analyst at UBS, said Cisco's move could have consequences. "We'll see if Microsoft will try to do more business with Cisco competitors like Juniper or Nortel or whomever," he said.The unified communications initiative is still a small part of Cisco's $40 billion annual revenue. Cisco hopes it becomes significant in its own right, but more important, executives hope to drive more network usage and related sales of the company's Internet hardware and software.

The flashiest part of Cisco's effort is TelePresence, an elaborate videoconferencing setup that includes video cameras, huge displays and even the surrounding desk and leather chairs. For about $299,000 a room, a company can smoothly conduct a virtual meeting across the world.

Cisco will now extend that technology through a program it calls Expert on Demand. Customers or employees will walk up to a videoconferencing terminal, press a button and be routed to the person they desire."You could telepresence into a bank where you might have a loan officer shared between multiple branches," said Donald R. Proctor, the senior vice president of Cisco's software group. "This allows that one loan officer to meet with people in various locations or for someone to punch 'home loans' or 'auto loans' and be directed to the right person."

Although its rivals offer some videoconferencing ability, none of them are quite as elaborate on that front. Google is focusing on offering cheap collaboration tools over the Internet, Oracle just announced a new suite of software called Beehive that meshes with its database applications and Microsoft integrates its tools into Outlook and Exchange.

The rise of software that is so tied to the basic communications functions delivered by the Internet has resulted in some peculiar changes in the technology landscape. Google, an Internet search and advertising company, makes its own servers and switches while going after everything from corporate e-mail to mobile phones. Amazon.com grew up shipping books and vacuums to consumers and now rents out its data centers.

Cisco, which sells more and more switches to power these services, could soon end up pushing its software into your home via the television set-top box. The company bought Scientific-Atlanta, a maker of cable TV boxes, for $6.9 billion in 2005, and Cisco has publicly said it is thinking about ways to take advantage of that entryway.

"Go forward a couple of years, and I believe we'll be sitting watching TV with instant-message windows open to our friends and Webcam images of them in a sidebar," said James Governor, a software analyst at RedMonk.

http://www.nytimes.com/2008/09/24/technology/24cisco.html?_r=1&th&emc=th&oref=slogin

A Building That Blooms and Grows, Balancing Nature and Civilization

By NICOLAI OUROUSSOFF

SAN FRANCISCO — Not all architects embrace the idea of evolution. Some, fixated on the 20th-century notion of the avant-garde, view their work as a divine revelation, as if history began with them. Others pine for the Middle Ages.

But if you want reaffirmation that human history is an upward spiral rather than a descent into darkness, head to the new California Academy of Sciences, in Golden Gate Park, which opens on Saturday. Designed by the Italian architect Renzo Piano on the site of the academy's demolished home, the building has a steel frame that rests amid the verdant flora like a delicate piece of fine embroidery. Capped by a stupendous floating green roof of undulating mounds of plants, it embodies the academy's philosophy that humanity is only one part of an endlessly complex universal system.

This building's greatness as architecture, however, is rooted in a cultural history that stretches back through Modernism to Classical Greece. It is a comforting reminder of the civilizing function of great art in a barbaric age.

The academy building is the last in a series of ambitious projects to be conceived in and around the park's Music Concourse since the devastating 1989 Loma Prieta earthquake. Herzog & de Meuron's mesmerizing de Young Museum, enclosed in perforated copper, opened three years ago. Scaffolding is to come down at the concourse's neo-Classical band shell this week after a loving restoration.

Glimpsed through the concourse's grove of sycamores, the science academy gives the impression of weightlessness. A row of steel columns soaring 36 feet high along the facade lends the building a classical air; the sense of lightness is accentuated by a wafer-thin canopy above that creates the illusion that the roof is only millimeters thick. It's as if a section of the park carpeted in native wildflowers and beach strawberries had been lifted off the ground and suspended in midair.

The idea is to create a balance between public and private, inside and out, the Cartesian order of the mind and the unruly world of nature.

A glass lobby allows you to gaze straight through the building to the park on the other side. Other views open into exhibition spaces with their own microclimates. The entire building serves as a sort of specimen case, a framework for pondering the natural world while straining to disturb it as little as possible.

Mr. Piano's building is also a blazingly uncynical embrace of the Enlightenment values of truth and reason. Its Classical symmetry — the axial geometry, the columns framing a central entry — taps into a lineage that runs back to Mies van der Rohe's 1968 Neue Nationalgalerie and Schinkel's 1828 Altes Museum in Berlin and even further, to the Parthenon.

Just as Mies's glass-and-steel museum reworked Classical precedents, Mr. Piano's design invokes Mies's model, though with a sensitivity that makes the muscularity of the 1968 museum look old-fashioned. The roof of the academy's lobby, supported by a gossamerlike web of cables, swells upward as if the entire room were breathing. Views open up to the landscape on all four sides, momentarily situating you both within the building and in the bigger world outside. A narrow row of clerestory windows lines the top of the lobby. One of the building's many environmental features, these windows let warm air escape and create a gentle breeze that reinforces the connection to the natural setting.

From here you can proceed into the exhibition halls, delving deeper into the universe's secrets. Two enormous 90-foot-tall spheres — one housing a planetarium, the other a rain forest — beckon from either side of the lobby. They are the most solid forms in the building, yet seem to hover in the space. The base of the planetarium sphere floats in a pool; a broad ramp snakes around the rain-forest sphere. Enveloped in gnarled branches, the ramp seems to have been swallowed up by the jungle landscape over millenniums.

Once you reach this point, the genius of the green roof's design becomes apparent. The mounds of earth visible on the exterior turn out to be hollow: their forms, punctured by round skylights, bulge upward to make room for the giant spheres underneath. It's as if a lush protective rug has been gently draped over the entire building.

Additional exhibition spaces just beyond the spheres were designed with movable partitions that give them a temporary feel. Large windows open onto more park views.

The museum has also preserved its African Hall, with its gorgeous vaulted ceiling and dioramas of somnolent lions and grazing antelopes, integrating it into the new design. Built in the 1930s, this neo-Classical hall is a specimen of sorts. Its massive stone structure reflects colonial attitudes about the civilized world as a barrier against barbarism. It was intended as a symbol of Western superiority and a triumph over nature.

By contrast, Mr. Piano's vision avoids arrogance. The ethereality of the academy's structure suggests a form of reparations for the great harm humans have done to the natural world. It is best to tread lightly in moving forward, he seems to say. This is not a way of avoiding hard truths; he means to shake us out of our indolence.

http://www.nytimes.com/2008/09/24/arts/design/24acad.html?th&emc=th

Publisher Who Fought Puritanism, and Won

By CHARLES McGRATH

In its heyday during the 1960s, Grove Press was famous for publishing books nobody else would touch. The Grove list included writers like Samuel Beckett, Jean Genet, William S. Burroughs, Che Guevara and Malcolm X, and the books, with their distinctive black-and-white covers, were reliably ahead of their time and often fascinated by sex.

The same was, and is, true of Grove's maverick publisher, Barney Rosset, who loved highbrow literature but also brought out a very profitable line of Victorian spanking porn.

On Nov. 19 Mr. Rosset will receive a lifetime achievement award from the National Book Foundation in honor of his many contributions to American publishing, especially his groundbreaking legal battles to print uncensored versions of "Lady Chatterley's Lover" and Henry Miller's "Tropic of Cancer." He is also the subject of "Obscene," a documentary by Neil Ortenberg and Daniel O'Connor, which opens on Friday at Cinema Village.

Mr. Ortenberg and Mr. O'Connor are themselves refugees from book publishing, and this is their first film. "Barney was basically my idol, my mentor and my role model for most of my publishing career," said Mr. Ortenberg, who used to run Thunder's Mouth Press, publisher of, among other books, "The Outlaw Bible of American Literature." "I just thought, here was a great story about a major cultural impresario most people don't know about. It was just dumb beginner's luck, I guess. I had had a lot of experience with intellectual content, and I knew something about editing, and the movie was small enough that whatever mistakes we made, they didn't wind up costing huge amounts. We learned as we went along."

The documentary has a literary rock score — songs by Bob Dylan, the Doors, Warren Zevon and Patti Smith — and includes, in addition to the usual talking heads, some surprising archival footage. There's an excerpt from Al Goldstein's old cable television show, "Midnight Blue," in which Mr. Goldstein quizzes Mr. Rosset about his four marriages and in general interviews him not as a major cultural figure but as a fellow smut peddler. There are clips of Europe that Mr. Rosset filmed as a teenager (his father, unfortunately, instructed him to keep the camera moving constantly), some footage he took during World War II and some poignant home movies of Mr. Rosset cavorting with his family on his Hamptons estate. Mr. Rosset, who made and squandered several fortunes, eventually had to unload the place to cover his losses.

"I had a very good publishing career, but not money-wise," he once said. "We got rid of the money."

The documentary makes the point that Mr. Rosset originally wanted to be a filmmaker himself. He grew up in Chicago, the son of a banker, and went to the Francis W. Parker School, a place so progressive that according to Mr. Rosset, the teachers arranged for the students to sleep with one another.

His best friend there was Haskell Wexler, the great cinematographer. Mr. Rosset was an Army photographer during the war and afterward made a documentary, called "Strange Victory," about how America, though victorious on the world stage, was still losing the war against racism at home.

In 1951 Mr. Rosset got into publishing by accident when, at the suggestion of his ex-wife, he took over a stillborn company called Grove Press, whose entire list consisted of three reprints: Melville's novel "The Confidence Man," some writings by Aphra Behn and a volume of poems by Richard Crashaw. He quickly turned the company into what he later called "a breach in the dam of American Puritanism — a whiplashing live cable of zeitgeist." And yet, as the documentary suggests, he never completely lost his infatuation with film, and in the end it helped bring the company down. In the late '60s Mr. Rosset made a killing distributing the sexually explicit Swedish film "I Am Curious (Yellow)," and he thought he could repeat the trick with other European imports, none of which found much of an audience. He also made some bad real estate decisions and in 1985 was forced to sell Grove, though he hung on to his magazine, Evergreen Review, which he continues to publish online at evergreenreview.com.

Now 86 and a little shrunken, Mr. Rosset, who has just finished writing an autobiography, lives with Astrid Myers in a fourth-floor walkup near Union Square. There is a pool table in the living room, and the walls are lined with loose-leaf binders containing Grove-related photos and correspondence. Over a rum and Coke the other evening, Mr. Rosset recalled that in the famous 1959 obscenity case he had used "Lady Chatterley" as a kind of stalking horse for Miller's "Tropic of Cancer," a book he had discovered in college but whose raunchiness he thought would have a much tougher time in the courts.

"I loved that book," he said. "When I was a young man, it never occurred to me that it was about sex. What interested me was that Miller didn't like Americans very much." He went to California to meet Miller, Mr. Rosset recalled, and Miller refused to sell him the rights. "He had all sorts of silly reasons," Mr. Rosset said. "Too many people would have it. It might become a college textbook." Mr. Rosset eventually secured the book through the intervention of Maurice Girodias, the publisher of the Olympia Press in Paris, and Heinrich Ledig-Rowohlt, Miller's German publisher.

In 1961 he set about the very expensive business of fighting for the book in the courts. "The greatest joy that came out of my life in publishing was when 'Tropic of Cancer' went on trial in Chicago," Mr. Rosset said. "The judge was a friend of my father's, and at one point when the prosecutor accused me of just trying to make money, I took out my Henry Miller term paper from Swarthmore College and read from it. I remember leaving the courtroom and somehow getting lost going home. It was snowing. But I was so happy that I thought, 'If I fall down and die right here, it will be fine.' "

Mr. Rosset went on: "All my life I followed the things that I liked — people, things, books — and when things were offered to me, I published them. I never did anything I really didn't like. I had no set plan, but on the other hand we sometimes found ourselves on a trail. For example, out of Beckett came Pinter, and Pinter was responsible for Mamet. It was like a baseball team — Mamet to Pinter to Beckett."

Mr. Rosset sipped from his drink and smiled. "Should we have had more of a business plan?" he added. "Probably. But then the publishers that did have business plans didn't do any better."

http://www.nytimes.com/2008/09/24/movies/24obsc.html?th&emc=th

Into the Mennonite World to Explore One Man's Test of Faith

By MANOHLA DARGIS

The sun floods the wide sky in "Silent Light" like a beacon, spilling over the austere land and illuminating its pale, pale people as if from within. A fictional story about everyday rapture in an isolated Mennonite community in northern Mexico — and performed by a cast of mostly Mennonite nonprofessionals — the film was written, directed and somehow willed into unlikely existence by the extravagantly talented Carlos Reygadas, whose immersion in this exotic world feels so deep and true that it seems like an act of faith.

Mr. Reygadas's faith may be more rooted in his own gifts than in God, but it's the sheer intensity of this belief — which he confirms with every camera movement — that invests his film with such feeling. This stubborn, passionate intensity is evident in the mesmerizing, transporting opener, in which the seemingly unmoored camera traces a downward arc across a nearly pitch-black night sky dotted with starry pinpricks. Accompanied by an unsettling chorus of animal cries and screams (what's going on in there?), the camera descends from its cosmic perch into the brightening world and then, as if parting a curtain, moves through some trees onto a clearing that effectively becomes the stage for the ensuing human drama.

If you haven't fled for the exits (cowards!), you will be hooked, as much in thrall to the harmonious beauty of the images as to the foreignness of their setting. Yet strange as this world initially seems, with its quiet rhythms and obscure German dialect, its conflicts soon prove familiar: Johan (Cornelio Wall Fehr), a farmer with seven towheaded children and a devoted wife, Esther (the Canadian writer Miriam Toews), has fallen in love with another woman, a neighbor, Marianne (Maria Pankratz). Though tormented by the affair, Johan feels that Marianne is his truer match, the woman who will correct the mistake he made by marrying Esther, whom he also loves and from whom he has, with tragic, unintended cruelty, hidden nothing.

And so, while Esther waits on the sidelines of their life with her unquiet eyes, tending the children, keeping the house and driving the family tractor, Johan explores the limits of his faith and his faithfulness. He nuzzles Marianne on a windswept hill, yellow flowers bobbing at their feet, and makes sweaty love to her in a small, white room that looks like a chapel. (Afterward, a leaf enigmatically,

portentously falls from the ceiling.) He seeks advice from his father (Mr. Wall Fehr's own father, Peter Wall) and clandestinely finds Marianne's hand while, in a moment of ordinary surrealism, they watch black-and-white television images of the Belgian chanteur Jacques Brel, drenched in sweat and emotion and warbling about bonbons and l'amour.

I've seen "Silent Light" three times — it had its premiere at the 2007 Cannes Film Festival — and find it more pleasurable and touching with each viewing. After having wowed and appalled international audiences with bravura technique in his first feature, "Japón" (2002), and assaultive provocations in his second, "Battle in Heaven" (2005), which opens with the kind of sexual encounter that keeps nunneries in business, Mr. Reygadas has quietly altered his visual style to brilliant and meaningful effect. His silky camera movements and harmoniously balanced widescreen compositions still enthrall, but he now comes across as less committed to his own virtuosity and more invested in finding images — of children bathing, trees rustling, clouds passing — that offer a truer sense of the world than is found in melodramatic bloodletting.

Though "Silent Light" owes a strong, self-conscious debt to Carl Theodor Dreyer's eccentric 1955 masterpiece, "Ordet," another story about faith and love, the new film also recalls some of the more pastoral passages in Terrence Malick's "New World," yet another tour de force about love and faith (in other people, in the cinematic image). In one of the loveliest sequences in "Silent Light," Johan's family idles in and around a creek that serves as its communal bathing pool. As some of the children drift languorously in the water, their bodies modestly covered and blond heads floating like lilies, the parents tenderly wash the younger ones, scrubbing one child's head with soap, massaging another's feet with oil and exchanging small endearments and instructions.

It's a gorgeous, innocent yet sensuous scene, a glimpse of the prelapsarian with a hint of the viper that Mr. Reygadas closes with a shot of a pink blossom, an image that begins as a blur of color and gently comes into focus. He holds on the image a few beats — much as he often does — not only because, I imagine, he wants us to appreciate its metaphoric resonance but also because he wants us to see its glory. There are a handful of ways to understand the meaning of "Silent Light," words that I read as an allusion to love, but this is also very much a film about that ordinary light that sometimes still passes through a camera and creates something divine.

SILENT LIGHT

Opens on Wednesday in Manhattan.

Written (in Plautdietsch, or Mennonite Low German, with English subtitles) and directed by Carlos Reygadas; director of photography, Alexis Zabe; edited by Natalia López; art director, Nohemi Gonzalez; produced by Mr. Reygadas and Jaime Romandia. At the MoMA Titus 1 Theater, 11 West 53rd Street, Manhattan. Running time: 2 hours. This film is not rated.

WITH: Cornelio Wall Fehr (Johan), Maria Pankratz (Marianne), Miriam Toews (Esther), Peter Wall (Padre) and Jacobo Klassen (Zacarias).

http://movies.nytimes.com/2008/09/24/movies/24sile.html?ref=arts

Dark Chocolate: Half A Bar Per Week May Keep Heart Attack Risk At Bay

Moderate consumption of dark chocolate may be good for your health. (Credit: iStockphoto/Stepan Popov)

ScienceDaily (Sep. 24, 2008) — Maybe gourmands are not jumping for joy. Probably they would have preferred bigger amounts to support their passion. Though the news is still good for them: 6.7 grams of chocolate per day represent the ideal amount for a protective effect against inflammation and subsequent cardiovascular disease.

A new effect, demonstrated for the first time in a population study by the Research Laboratories of the Catholic University in Campobasso, in collaboration with the National Cancer Institute of Milan.

The findings, published in the last issue of the Journal of Nutrition, official journal of the American Society of Nutrition, come from one of the largest epidemiological studies ever conducted in Europe, the Moli-sani Project, which has enrolled 20,000 inhabitants of the Molise region so far. By studying the participants recruited, researchers focused on the complex mechanism of inflammation. It is known how a chronic inflammatory state represents a risk factor for the development of cardiovascular disease, from myocardial infarction to stroke, just to mention the major diseases. Keeping the inflammation process under control has become a major issue for prevention programs and C reactive protein turned out to be one of the most promising markers, detectable by a simple blood test.

The Italian team related the levels of this protein in the blood of examined people with their usual chocolate intake. Out of 11,000, researchers identified 4,849 subjects in good health and free of risk factors (normal cholesterol, blood pressure and other parameters). Among them, 1,317 did not use to eat any chocolate, while 824 used to have chocolate regularly, but just the dark one.

"We started from the hypothesis," says Romina di Giuseppe, 33, lead author of the study "that high amounts of antioxidants contained in the cocoa seeds, in particular flavonoids and other kinds of polyphenols, might have beneficial effects on the inflammatory state. Our results have been absolutely

encouraging: people having moderate amounts of dark chocolate regularly have significantly lower levels of C-reactive protein in their blood. In other words, their inflammatory state is considerably reduced." The 17% average reduction observed may appear quite small, but it is enough to decrease the risk of cardio-vascular disease for one third in women and one fourth in men. It is undoubtedly a remarkable outcome".

Chocolate amounts are critical. "We are talking of a moderate consumption. The best effect is obtained by consuming an average amount of 6.7 grams of chocolate per day, corresponding to a small square of chocolate twice or three times a week. Beyond these amounts the beneficial effect tends to disappear".

From a practical point of view, as the common chocolate bar is 100 grams, the study states that less than half a bar of dark chocolate consumed during the week may become a healthy habit. What about the milk chocolate? "Previous studies," the young investigator continues, "have demonstrated that milk interferes with the absorption of polyphenols. That is why our study considered just the dark chocolate".

Researchers wanted to sweep all the doubts away. They took into account that chocolate lovers might consume other healthy food too, as wine, fruits and vegetables. Or they might exercise more than others people do. So the observed positive effect might be ascribed to other factors but not to cocoa itself. "In order to avoid this," the researcher says, "we adjusted for all possible "confounding" parameters. But the beneficial effect of chocolate still remained and we do believe it is real".

"This study" says Licia Iacoviello, Head of the Laboratory of Genetic and Environmental Epidemiology at the Catholic University of Campobasso and responsible for the Moli-sani Project, "is the first scientific outcome published from the Moli-sani Project. We consider this outcome as the beginning of a large series of data which will give us an innovative view on how making prevention in everyday life, both against cardiovascular disease and tumors".

"Maybe," Giovanni de Gaetano, director of the Research Laboratories of the Catholic University of Campobasso, adds, "time has come to reconsider the Mediterranean diet pyramid and take the dark chocolate off the basket of sweets considered to be bad for our health".

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

http://www.sciencedaily.com/releases/2008/09/080923104408.htm

Iberian Peninsula's Earliest Agricultural Systems Were Unsustainable

Archaeological site of Los Castillejos, Granada. (Credit: SINC / A. Rovira)

ScienceDaily (Sep. 24, 2008) — A team of Catalan and Andalusian researchers has proved that the first agricultural systems on the Iberian Peninsula became ever more unsustainable with the passage of time. The study involved the analysis of fossilised grains of wheat and barley from Los Castillejos (Granada), an area of archaeological remains where cereals were cultivated between 4000 and 2500 BCE.

Mónica Aguilera, an engineer from the Vegetable Physiology Unit at the University of Barcelona (UB) and co-author of the study, told SINC that the natural levels of stable carbon and nitrogen isotopes were measured in order to estimate the yield and nutritional status of the ancient crops. "The size of the grain and levels of the carbon 13 (13C) isotopes allowed us to estimate yield, while the nutritional status of the crop was analysed by measuring levels of the nitrogen 15 (15N) isotopes," the researcher explained.

Figures revealed by the study show a reduction of around 35% in the yield of wheat crops and 30% in barley between the years 4000 and 2500 BCE (end of the Bronze Age). The average weight of the grains of these cereals also fell by 10 miligrammes (33%) and 12 mg (38%) respectively. The research also revealed a 33% reduction in the nitrogen content of the wheat grains and 56% in barley.

"These figures suggest that the agricultural system of the region in the south east of the peninsula became unsustainable over time, and that this was not due to a lack of water," says Aguilera. The scientists have looked into the water available to the cereals by the end of their cultivation period, based upon the carbon isotope component, and have obtained approximately constant values (around 120 mm) for the entire period studied, which makes it seem the decline in yield had no apparent relation to drought events. These

estimates, however, contrast with current rain measurements in the area (around 60 mm in April and May).

The researchers have also observed a close relationship between the seasonal variations of the cereals and those of weeds. Barley was most abundant at the same time as wasteland weeds (common in uncultivated land and rubbish tips, such as nettles, mallow, celery, goosefoot and clover), while wheat flourished at the same time as weeds more characteristic of land cultivated with cereals (such as poppies, plantains, knotweeds and various grassy plants).

"This suggests that there was a separate system of cultivation for the two cereals: barley was possibly relegated to marginal areas, while the potentially more fertile fields were reserved for wheat, which was more abundant and very probably the principal crop for human consumption in the primitive agricultural systems of the south east of the peninsula," said Aguilera.

The results of the study show a link between the decline in the status of the crops and a progressive loss in soil fertility, and reinforce the hypothesis that the first agricultural activities in the Mediterranean area had a negative impact on ecological and environmental conditions there.

The scientists chose the Los Castillejos archaeological site because it shows evidence of a continuous period of cereal cultivation over more than 1,500 years, starting in the Neolithic, when agriculture first appears in the region. However, they have contrasted their data with other results from Arkaute (Álava), Guadahortuna (Granada) and various areas in Catalonia and Castilla-La Mancha, as well as with other sites in Syria and the eastern Mediterranean.

Researchers from the University of Barcelona, the University of Lleida and the Archaeology Museum of Catalonia, as well as archaeologists from the University of Granada and the Andalusian Centre for Iberian Archaeology (University of Jaén), took part in the study, "which uses original means to apply a range of novel methodologies derived from the use of stable carbon and nitrogen isotopes in palaeoclimatic and environmental reconstruction," according to Aguilera.

Adapted from materials provided by Plataforma SINC, via AlphaGalileo.

http://www.sciencedaily.com/releases/2008/09/080917074134.htm

Finding Fireflies Next To A Lighthouse: New Optics Technology To Study Alien Worlds

Artist's concept of the New Worlds Observatory. The dark, flower-shaped object in the center is the star shade. (Credit: NASA and Northrop Grumman)

ScienceDaily (Sep. 24, 2008) — NASA Goddard scientist Rick Lyon has been working on potential missions and technologies to find planets around other stars (called exoplanets or extrasolar planets) since the late 1980s. Only recently has he begun to believe that NASA may actually fly a planet-finding mission in his lifetime.

"This is the closest it's come to being real," he said.

Lyon and other scientists and engineers at NASA's Goddard Space Flight Center in Greenbelt, Md., have joined teams studying optics technologies for three possible exoplanet missions: the Extrasolar Planetary Imaging Coronagraph (EPIC), the New Worlds Observer (NWO), and the eXtrasolar Planet Characterization (XPC) mission.

The possibility of a mission devoted to planet finding is tantalizing, especially to those interested in ratcheting up a science that began 13 years ago when astronomers found and confirmed the existence of the first planet outside the solar system. Since then, scientists have confirmed nearly 300, most of which are gas giants like Jupiter. However, most of these detections have been indirect, because the planets are too faint to be seen directly. Instead, their presence is revealed by measuring how much the unseen world's gravity pulls on its parent star.

The three proposed missions will use new technology to directly detect exoplanets by suppressing the light from their parent stars. Which mission will garner favor is still an open question — it's a challenge that Goddard scientist Mark Clampin likens to "trying to distinguish a firefly next to a lighthouse."

Starlight suppression is essential to finding exoplanets because direct starlight is much brighter than the starlight that's reflected off of any planets orbiting the star. Without starlight suppression technology, exoplanets get lost in the glare.

Nulling Coronagraph

The visible nulling coronagraph (VNC) is a promising technology for directly detecting and characterizing Jupiter-sized gas giants, one of EPIC's science goals.

The VNC suppresses starlight because waves can interfere with each other and cancel out. This is true for waves of water and waves of light. If you drop two stones into a calm pond at the same time, you'll see flat areas where the ripples meet. These are where the ripples are out of step with each other -- the peak of one ripple meets the trough of the other ripple, and the waves cancel out.

The VNC works on the same principle. It splits incoming light from the telescope into two beams. One beam travels a slightly longer path, so the light waves from the star get out of step with the waves of starlight in second beam. When the beams are recombined, the light waves from the star cancel like the out-of-step ripples in a pond, leaving just the light from the planet. This technique is called interferometery.Under this concept, the VNC would be coupled to a single telescope, using interferometry to suppress starlight and increase the contrast of the region surrounding the star. This would allow astronomers to image the planet.

This year, the EPIC team received Internal Research and Development funding to demonstrate the VNC in a vibration-isolated vacuum tank. The aim is to make sure the technology can achieve a stable level of contrast in white light. "We're going to get the required contrast this year," said Petar Arsenovic, lead technologist for the Center's Optics Branch. "This technique is certainly possible."

Starshade

NWO and XPC, on the other hand, would look for planets that lay within the habitable zones of their parent stars — planets that could possibly support life. Although the two missions vary in many ways, both would employ a large deployable occulter or starshade. It would fly in formation with the telescope, separated by thousands of miles.

"The arrangement of NWO's flower-shaped starshade and telescope in the starshade's geometric shadow allows planets as close as about 50 milli-arcseconds from the star to be imaged with little interference from the star's light," said Doug Leviton, who is serving on the NWO team. "Trying to see a planet 50 milli-arcseconds from a star is like trying to make out the fine eyebrow hairs of the nice lady at the other end of the soccer stadium with your unaided eye."

With this technology, NWO would directly image exoplanets and analyze their light (spectrally) to look for evidence of water, oxygen, and methane, which are indicators of life.

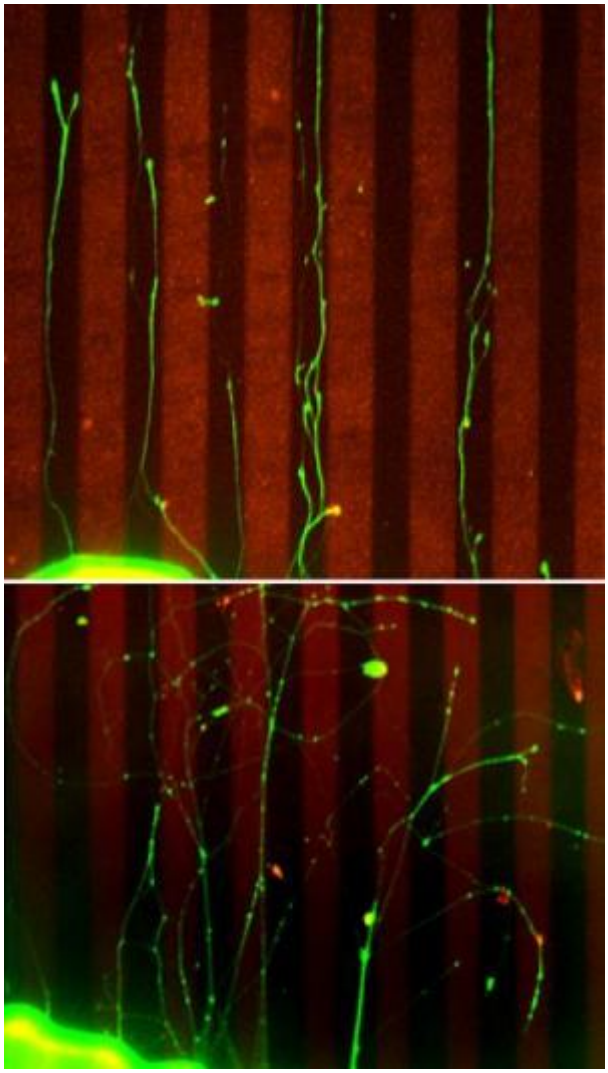
XPC also would fly an internal coronagraph, a telescopic attachment that would assist in blocking direct light from a star so that the telescope could resolve orbiting planets and perhaps look for signatures of life.

"Any of these methods will in principle work, but how realistic are they in terms of cost, technology readiness, and risk?" Lyon said. "How do you perform the integration and testing? That's the purpose of these studies," Lyon said. "Which approach is the lowest risk, build-able within a defined budget and schedule, and provides the most value to NASA, the science community, and the public?"

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

http://www.sciencedaily.com/releases/2008/09/080922093404.htm

Second Career For Growth Factor Receptor: Keeping Nerve Axons On Target



When immature neurons are placed on a microscopic running track, where flanking lanes are carpeted with repellant factors, their growing axons remain in their lanes (top). Neurons from mice lacking p75 are unreceptive to repulsive cues: when placed on the track, their axons meander all over the field, crossing lanes and running down repellant-covered stripes (bottom). (Credit: Courtesy of Dr. Yoo-Shick Lim, Salk Institute for Biological Studies)

ScienceDaily (Sep. 24, 2008) — Neurons constituting the optic nerve wire up to the brain in a highly dynamic way. Cell bodies in the developing retina sprout processes, called axons, which extend toward visual centers in the brain, lured by attractive cues and making U-turns when they take the wrong path. How they find targets so accurately is a central question of neuroscience today.

Using the mouse visual system, a team of Salk Institute for Biological Studies investigators led by Dennis O'Leary, Ph.D., identified an unanticipated factor that helps keep retinal axons from going astray. They report in the Sept. 11 issue of Neuron that p75, a protein previously known to regulate whether neurons live or die, leads a double life as an axon guidance protein.

"Historically, we thought that factors that mediate cell survival and those controlling axon guidance were part of two separate processes," says O'Leary, a professor in the Molecular Neurobiology Laboratory, "But in this study we show a direct interaction between these two systems."

Collaborating with Kuo-Fen Lee, Ph.D., professor in the Clayton Foundation Laboratories for Peptide Biology, the O'Leary team observed a defect in mice genetically engineered to lack p75. Through their synaptic connections, retinal axons develop a two-dimensional map of the retina in their targets in the brain. In the mice lacking p75, retinal axons stopped short of their final target and formed a map that was shifted forward to the superior colliculus, a major visual center in the brain.

Such a defect in p75-null mice was puzzling: researchers have studied p75 for decades and found it associated with activities as varied as neuronal growth, survival, and degeneration. Axonal migration was not among them.

Todd McLaughlin, Ph.D., a senior research associate in the lab and co-first author, says that insight came in a eureka moment: "We realized that what we were observing in these mice was similar to what would happen if you deleted a gene called ephrin-A from the retina."

Unlike p75, ephrin-A was a well-characterized sender and receiver of axon guidance signals, but it lacked appendages normally seen on proteins controlling axon migration. p75, however, displayed those elements, suggesting that the proteins could pair up — one receiving the migration signal and the other transmitting it.

The research team then turned to biochemical analyses and with the added expertise of Tsung Song, a research associate in Dr. Lee's lab, obtained evidence that supported this hypothesis. The group found that ephrin-A and p75 complexes in axonal membranes and showed that when activated they could generate the signals required to guide axons and develop their map in the brain.

But the clincher was the "stripe assay," a classical screen for guidance molecules that repel growing axons. In it, an immature neuron is placed on a microscopic running track, just as it starts to develop an axon. When flanking lanes are carpeted with repellant factors, the sprouting axon bursts from the block but remains in its lane like a well-coached runner, avoiding neighboring tracks.

Constructing tracks made from the repulsive factor sensed by ephrin-A, the researchers confirmed that axons from normal retinal neurons stayed in their lanes when flanked by the repellant. But neurons from mice lacking p75 were unreceptive to repulsive cues: when placed on the track their axons meandered all over the field, crossing lanes and running down repellant-covered stripes.

Why retinal neurons missed the target in the p75-minus mice became clear: they lacked the cellular machinery to respond to critical repellant signals encountered in the brain and stopped migrating prematurely.

Among its myriad functions, p75's new role is a critical one. "Repulsion is probably the dominant force in axon guidance and a stronger influence than attraction," explains McLaughlin, noting that providing axons with a lot of options is not the way to build a brain. "Attraction is like finding the best seat in an empty movie theater, but repulsion is like picking the lone empty seat in a full theater."

"We have shown that ephrin-A cannot transduce an intracellular signal by itself and instead requires the co-receptor p75," summarizes Yoo-Shick Lim, Ph.D., a postdoctoral fellow in the O'Leary lab and co-first author. "This interaction could operate in numerous events in neural development."

O'Leary believes that identifying mechanisms underlying developmental events is fundamental to understanding the basis of any biological disorder. "These studies establish that two distinct molecular systems, neurotrophins and axon guidance, both critical for neural development directly collaborate to develop neural connectivity.

Findings such as these lend critical insight into how one might repair damage to the nervous system due to genetic defects, tumors or wounds to the brain or spinal cord," he says. "We hope one day to be able to repair these defects and get cells to form functional connections again."

Tsung-Chang Sung, Ph.D., of the Lee lab, and Alicia Santiago, Ph.D., formerly of the O'Leary lab, also contributed to the study. Salk professor Tony Hunter and Sourav Ghosh, a former postdoctoral fellow in the Hunter lab, helped with preliminary biochemical experiments. Funding was from a grant from the National Eye Institute and from the Joseph Alexander Foundation.

Adapted from materials provided by Salk Institute.

http://www.sciencedaily.com/releases/2008/09/080911153148.htm

Minimally-invasive Aortic Valve Bypass Benefits High-risk Elderly Patients

ScienceDaily (Sep. 24, 2008) — An uncommonly used surgical procedure that bypasses a narrowed aortic valve, rather than replacing it, effectively restores blood flow from the heart to the rest of the body and gives high-risk patients a safe alternative to conventional valve surgery. That is the finding of a study conducted at the University of Maryland Medical Center in Baltimore. The researchers conclude that the procedure, called aortic valve bypass, is an important treatment option for high-risk elderly patients with a narrowed aortic valve, a condition called aortic stenosis.

The bypass procedure can be performed in a minimally invasive way without stopping the heart. Many of the patients in the study had previously been considered too frail to benefit from surgery. The study will appear in the September 30, 2008 print issue of Circulation and is now online.

"Because of the possible risks associated with aortic valve replacement in the elderly, almost 60 percent of patients with symptoms related to aortic stenosis are never referred to surgery," says the study's principal investigator, James S. Gammie, M.D., associate professor of surgery at the University of Maryland School of Medicine and cardiac surgeon at the University of Maryland Medical Center.

Survival for these patients without surgery is poor; only 20 percent are alive three years after diagnosis. "But our research and five years of experience with the bypass procedure suggests there is a group of patients, typically considered inoperable because they are at the upper level of the risk spectrum, who could benefit from aortic valve bypass," says Dr. Gammie.

The aortic valve controls the flow of blood from the heart's main pumping chamber, the left ventricle, to the aorta, the artery that supplies blood to the rest of the body. In aortic stenosis, calcium deposits narrow the valve and impair the heart's ability to pump blood. Aortic stenosis is the most common heart valve disease of the elderly in the United States. More than 50,000 people in the United States require surgery for aortic stenosis each year.

During conventional valve replacement, the surgeon opens the chest, stops the heart for about 90 minutes, opens the aorta just above the aortic valve, cuts out the old valve and sews in a new one. While valve replacement has benefited millions of patients with good outcomes, in elderly patients, particularly those with other health conditions, the death rate can exceed 10 percent.

The bypass procedure

In order to bypass the narrowed aortic valve, surgeons at the University of Maryland Medical Center have refined a procedure, originally called an apicoaortic conduit, which was developed in the 1970s and initially used for children. During the procedure, most of the blood flow from the heart is diverted through a tube containing a standard replacement valve that is placed near the apex of the left ventricle, the pointed tip at the bottom of the heart, to the aorta, the main blood vessel at the back of the chest.

The surgeons work through an incision between two ribs on the left side of the chest. During the first cases, a large incision was needed. However, the procedure was modified this year, so that only a small, three-inch opening between the ribs is required. "We are excited because for the first time we can surgically treat a narrowed aortic valve through a minimally-invasive approach with the heart beating, compared to the traditional breastbone-splitting approach," says Dr. Gammie.

Study details

Between 2003 and 2007, the surgeons treated 31 high-risk aortic stenosis patients with aortic valve bypass surgery. Many of the patients also had other conditions ranging from chronic obstructive

pulmonary disease to kidney disease, or had a history of heart attack or diabetes. The average age was 81, and nearly half had been refused conventional surgery. Early in the series, four of the 31 patients did not survive the procedure, yet there were no deaths among the most recent 16 consecutive patients.

The procedure was as effective as conventional aortic valve replacement surgery at relieving the obstruction of blood leaving the heart. Stroke and kidney problems were uncommon. Because the impaired aortic valve was left in place, some blood flow continued through that valve. But postsurgical blood flow measurements indicated that in most patients, approximately 70 percent of cardiac output flowed through the new bypass.

The study results suggest that continued improvements in technology and surgical technique may warrant extending aortic valve bypass surgery to moderate-risk patients with aortic stenosis. In addition to the 31 patients who received an aortic valve bypass, the University of Maryland Medical Center performed 438 other aortic valve procedures during the same time period.

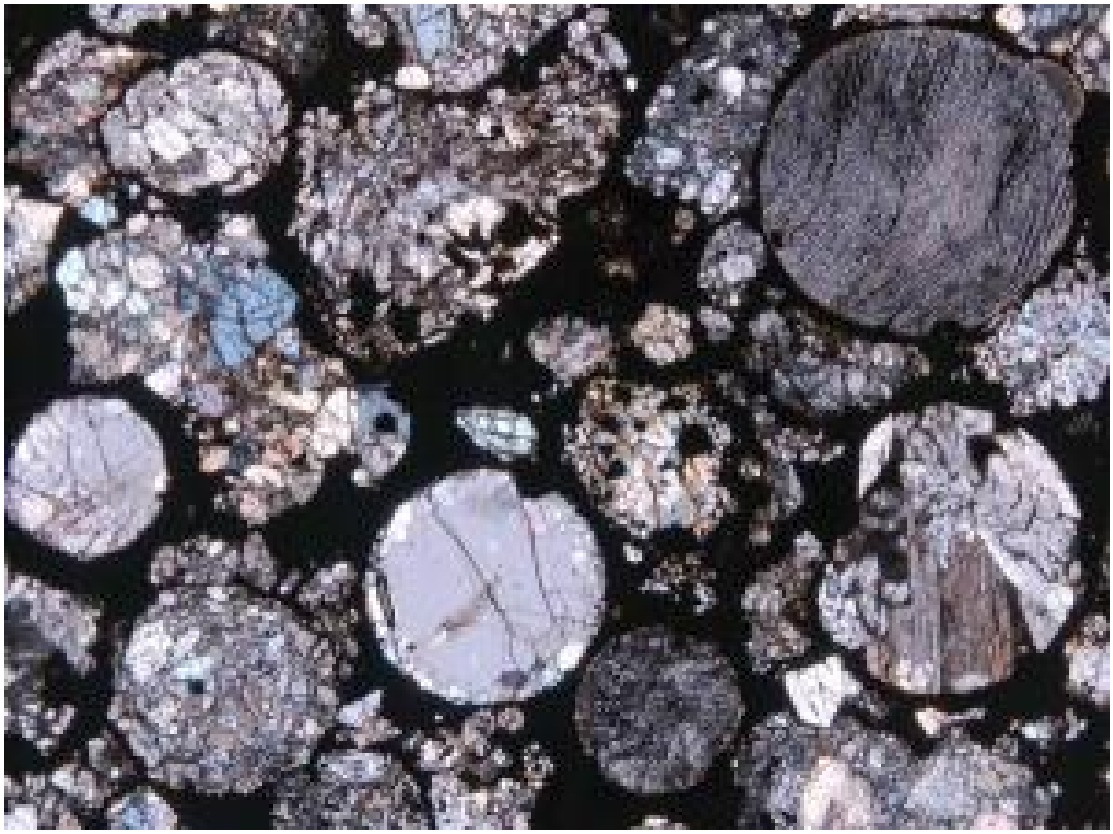
Journal reference:

1. Gammie JS, Krowsoski LS, Brown JM, Odonkor PN, Young CA, Santos MJ, Gottdiener JS, Griffith BP. **Aortic Valve Bypass Surgery: Mid-term Clinical Outcomes in a High-Risk Aortic Stenosis Population**. *Circulation*, Published online ahead of print, September 15, 2008

Adapted from materials provided by University of Maryland Medical Center, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com/releases/2008/09/080918171153.htm

Comet Dust Reveals Unexpected Mixing Of Solar System



In a new analysis of rare comet dust samples, a team of researchers including Takayuki Ushikubo, Noriko Kita, and John Valley of the University of Wisconsin-Madison has identified unexpected chemical and isotope signatures that challenge existing views about the formation and history of the solar system. Tiny crystals from the Wild 2 comet, captured by NASA's Stardust mission, resemble fragments of the molten mineral droplets called chondrules, shown here, found in primitive meteorites. That similar flash-heated particles were found in Wild 2, a comet formed in the icy fringes of outer space, suggests that solid materials may have been transported outward in the young solar system. (Credit: Photo by Noriko Kita)

ScienceDaily (Sep. 23, 2008) — Chemical clues from a comet's halo are challenging common views about the history and evolution of the solar system and showing it may be more mixed-up than previously thought.

A new analysis of dust from the comet Wild 2, collected in 2004 by NASA's Stardust mission, has revealed an oxygen isotope signature that suggests an unexpected mingling of rocky material between the center and edges of the solar system. Despite the comet's birth in the icy reaches of outer space beyond Pluto, tiny crystals collected from its halo appear to have been forged in the hotter interior, much closer to the sun.

The result, reported in the Sept. 19 issue of the journal Science by researchers from Japan, NASA and the University of Wisconsin-Madison, counters the idea that the material that formed the solar system billions of years ago has remained trapped in orbits around the sun. Instead, the new study suggests that cosmic material from asteroid belts between Mars and Jupiter can migrate outward in the solar system and mix with the more primitive materials found at the fringes.

"Observations from this sample are changing our previous thinking and expectations about how the solar system formed," says UW-Madison geologist Noriko Kita, an author of the paper.

The Stardust mission captured Wild 2 dust in hopes of characterizing the raw materials from which our solar system coalesced. Since the comet formed more than 4 billion years ago from the same primitive source materials, its current orbit between Mars and Jupiter affords a rare opportunity to sample material from the farthest reaches of the solar system and dating back to the early days of the universe. These samples, which reached Earth in early 2006, are the first solid samples returned from space since Apollo.

"They were originally hoping to find the raw material that pre-dated the solar system," explains Kita. "However, we found many crystalline objects that resemble flash-heated particles found in meteorites from asteroids."

In the new study, scientists led by Tomoki Nakamura, a professor at Kyushu University in Japan, analyzed oxygen isotope compositions of three crystals from the comet's halo to better understand their origins. He and UW-Madison scientist Takayuki Ushikubo analyzed the tiny grains — the largest of which is about one-thousandth of an inch across — with a unique ion microprobe in the Wisconsin Secondary Ion Mass Spectrometer (Wisc-SIMS) laboratory, the most advanced instrument of its kind in the world.

To their surprise, they found oxygen isotope ratios in the comet crystals that are similar to asteroids and even the sun itself. Since these samples more closely resemble meteorites than the primitive, low-temperature materials expected in the outer reaches of the solar system, their analysis suggests that heat-processed particles may have been transported outward in the young solar system.

"This really complicates our simple view of the early solar system," says Michael Zolensky, a NASA cosmic mineralogist at the Johnson Space Center in Houston.

"Even though the comet itself came from way out past Pluto, there's a much more complicated history of migration patterns within the solar system and the material originally may have formed much closer to Earth," says UW-Madison geology professor John Valley. "These findings are causing a revision of theories of the history of the solar system."

The research was supported by the Japan Society for the Promotion of Science and the NASA Stardust Sample Analysis and Cosmochemistry Programs. The Wisc-SIMS facility is partly supported by the National Science Foundation.

Adapted from materials provided by University of Wisconsin-Madison.

http://www.sciencedaily.com/releases/2008/09/080918170408.htm

Benefit Of Combination Therapy For Alzheimer's Disease Confirmed

ScienceDaily (Sep. 23, 2008) — Extended treatment with Alzheimer's disease drugs can significantly slow the rate at which the disorder advances, and combination therapy with two different classes of drugs is even better at helping patients maintain their ability to perform daily activities.

Results from the first long-term study of the real-world use of Alzheimer's drugs, published by researchers from Massachusetts General Hospital in the July/September issue of Alzheimer Disease and Associated Disorders, support a level of effectiveness that may not be immediately apparent to patients or their family members.

"There has been the impression that these drugs only work for some patients and for a limited amount of time," says Alireza Atri, MD, PhD, of the MGH Department of Neurology, lead author of the current study. "One of the problems in judging these drugs has been that patients naturally continue to decline, which can make them think the drugs have stopped working. But our study, which has some unique strengths, indicates that treatment does have long-term benefit."

Two types of medications have received FDA approval for Alzheimer's treatment. Cholinesterase inhibitors have been available since the mid-1990s and act by inhibiting the breakdown of the neurotransmitter acetylcholine. The drug memantine, which received FDA approval in 2003, is the first of a second class of agents that modulate the actions of the amino acid glutamate and is often used in combination with cholinesterase inhibitors (CIs).

"Clinical trials that drug companies conduct for FDA approval only last six months and enroll patients according to very specific criteria," Atri explains. "Only large-population studies can really tell us how these drugs work for the full range of patients in real-life situations." The researchers were able to conduct such a study by analyzing data on patients treated at the MGH Memory Disorders Unit since 1990, including 144 who did not receive any pharmaceutical treatment, 122 treated with a CI alone and 116 who received both a CI and memantine. As part of their regular treatment, every six months patients received standardized assessments of both cognitive abilities and how well they carried out daily activities.

The results showed significant differences in the rate of symptom progression among all three groups – with the smallest level of decline in those receiving combination therapy. While there was an average of two and a half years' worth of data on the study participants, the researchers analyzed the information with a statistical model that predicted probable outcomes for up to four years.

Although the model's projection of future benefits is conservative, it predicted that the longer patients kept receiving combination therapy, the smaller their rate of decline would become, suggesting that treatment might even protect brain cells from further damage, a possibility needing further investigation.

"Finding something that could actually modify the course of the disease is the Holy Grail of Alzheimer's treatment, but we really don't know if that is happening or what the mechanism behind these effects might be," Atri explains. "What we can say now is that providers should help patients understand that the benefits of these drugs are long term and may not be apparent in the first months of treatment. Even if a patient's symptoms get worse, that doesn't mean the drug isn't working, since the decline probably would have been much greater without therapy." Atri is an instructor in Neurology at Harvard Medical School (HMS) and associate director of the Center for Translational Cognitive Neuroscience at the Veterans Administration Hospital in Bedford, Mass.

John Growdon, MD – director of the MGH Memory Disorders Unit, professor of Neurology at HMS, and senior author of the paper – explains, "The results of this study should change the way we treat patients

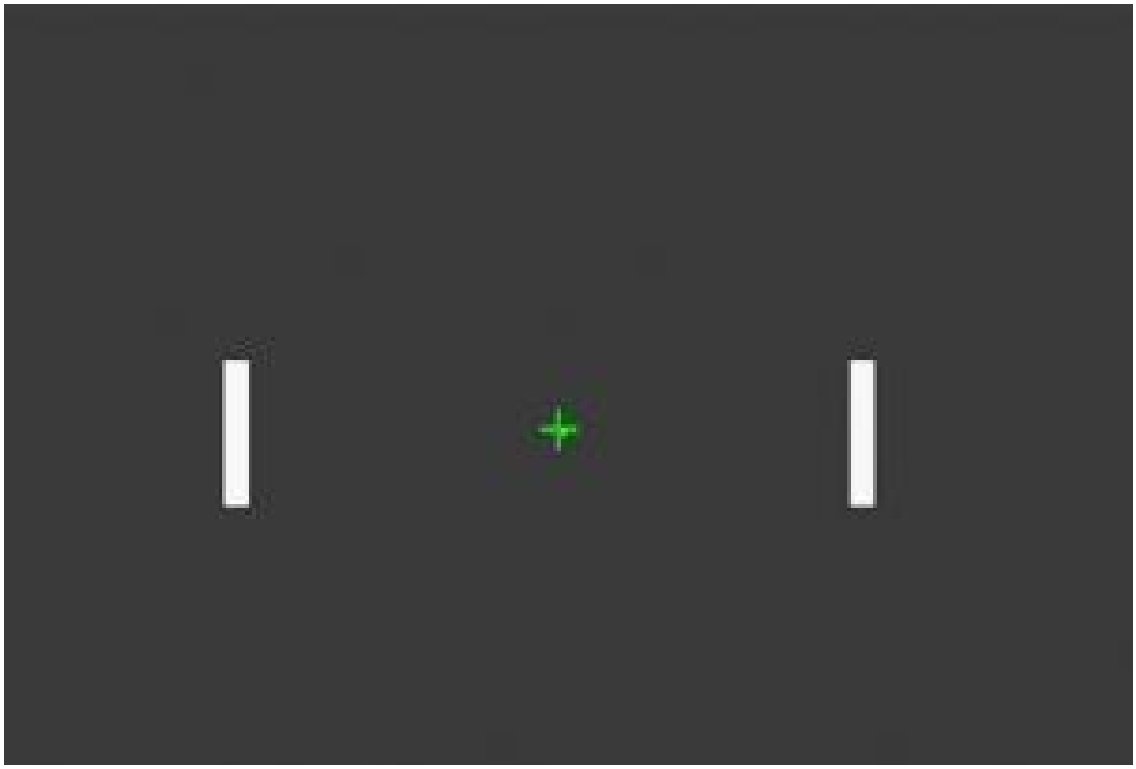
with Alzheimer's disease. Cholinesterase inhibitors are approved for use in mild to moderate dementia, while memantine has been approved for advanced dementia. But it looks like there is an advantage in prescribing both drugs as initial treatment."

The study was entirely supported by grants from the National Institute on Aging and the Massachusetts Alzheimer's Disease Research Center; there was no involvement or support from the pharmaceutical industry. Additional co-authors of the report are Lynn Shaughnessy, Massachusetts School of Professional Psychology, and Joseph Locascio, PhD, MGH Neurology.

Adapted from materials provided by Massachusetts General Hospital.

http://www.sciencedaily.com/releases/2008/09/080922122510.htm

Looking Vs. Seeing



Hafed designed a series of experiments where the subjects had to infer the invisible center of a visual target consisting of two peripheral features and track it for several seconds. (Credit: Image courtesy of Salk Institute)

ScienceDaily (Sep. 23, 2008) — The superior colliculus has long been thought of as a rapid orienting center of the brain that allows the eyes and head to turn swiftly either toward or away from the sights and sounds in our environment. Now a team of scientists at the Salk Institute for Biological Studies has shown that the superior colliculus does more than send out motor control commands to eye and neck muscles.

Two complementary studies, both led by Richard Krauzlis, Ph.D., an associate professor in the Systems Neurobiology Laboratory at the Salk Institute, have revealed that the superior colliculus performs supervisory functions in addition to the motor control it has long been known for. The results are published in the Aug. 6 and Sept. 17 issues of the Journal of Neuroscience.

"Beyond its classic role in motor control, the primate superior colliculus signals to other brain areas the location of behaviorally relevant visual objects by providing a 'neural pointer' to these objects," says Krauzlis.

The superior colliculus is currently under renewed scrutiny because recent findings have suggested that it does more than help orient the head and eyes toward something seen or heard. Results hinted that the superior colliculus might play a role in analyzing the current environment and deciding whether one specific aspect is worth paying closer attention to than another. Definitive proof, however, has been lacking.

The Salk scientists adopted a more "naturalistic" approach in their experiments to understand this role of the superior colliculus. Historically, physiological studies of eye movement control have relied on

individual spots of light representing visual targets, but the real world is much more complex than a single dot on a computer screen. "For example, we can smoothly track a large airplane, with all its intricate visual details, by directing our gaze at its center," explains Ziad Hafed, Ph.D., Sloan-Swartz Fellow in the Systems Neurobiology Laboratory and lead author on both studies. "At night, we might only be able to see the strobe lights on the wing tips, but we are still able to track the object's invisible center."

Hafed designed a series of experiments where the subjects had to infer the invisible center of a visual target consisting of two peripheral features — much like the above airplane's strobe lights in the night sky — and track it for several seconds (http://www.cnl.salk.edu/~zhafed/tracking.mov) or fixate on a stationary dot while the peripheral features were moving back and forth (http://www.cnl.salk.edu/~zhafed/fixation.mov). (The green crosshair indicates the subject's eye position.)

For one study, the Salk researchers recorded the activity of single neurons in the superior colliculus while the subjects either fixated on the stationary dot or tracked the invisible center of the moving object. "The SC contains a topographic map of the visual space around us just as conventional maps mirror geographical areas," explains Hafed. "This allowed us to record either from peripheral neurons, representing one of the 'wing tips,' or central neurons, representing the foveal location of the invisible center that was tracked," he adds. (The fovea, which is responsible for sharp, central vision, is located in the center of the macular region of the retina, while peripheral vision occurs outside the center of our gaze.)

Surprisingly, the central neurons were the most active during this tracking behavior, despite the lack of a visual stimulus in the center of gaze. "These neurons highlighted the behavioral importance of the location of the invisible center, because it is this location that was the most important for the subjects to successfully track the object," says Krauzlis (http://www.cnl.salk.edu/~zhafed/rostral_neuron_track.mov). When the subjects ignored the invisible center, the same neurons were significantly less active (http://www.cnl.salk.edu/~zhafed/rostral_neuron_fix.mov).

As part of the second study, the Salk researchers, in collaboration with Laurent Goffart, Ph.D., a professor at the Institut de Neurosciences Cognitives de la Méditerranée in Marseille, France, temporarily inactivated a subset of superior colliculus neurons and analyzed the resulting changes in tracking performance. While the subjects still tracked well, their gaze consistently and predictably shifted away from the center, demonstrating clearly that the superior colliculus is essential for defining the object location (http://www.cnl.salk.edu/~zhafed/sample_inactivation.mov).

"By showing that the SC is not just a motor map, but also a map of behaviorally relevant object locations, our results provide a conceptual framework for understanding the role of the SC in non-motor functions such as visual attention and the functional links between motor control and sensory processing," says Hafed.

Adapted from materials provided by Salk Institute.

http://www.sciencedaily.com/releases/2008/09/080916215128.htm

Preventing Suicide In Low- To Middle-income Countries

ScienceDaily (Sep. 23, 2008) — An international study of almost 2,000 people in Brazil, India, Sri Lanka, Iran and China has shown that a low cost strategy to keep in contact with people who have previously attempted suicide, can reduce the risk of subsequent suicides.

Given that suicide is among the top three causes of deaths in 15 to 34-year-olds, the strategy has the potential to help reduce the economic and societal loss of young people in their most productive years of life.

The study, co-authored by the Australian Institute for Suicide Research and Prevention director Professor Diego De Leo, said subsequent suicide deaths reduced from 2.2 per cent in people treated with usual care to 0.2 per cent in the people given extra contact.

The intervention included a one-hour information session about suicidal behaviours, risk factors, constructive coping strategies and referral options.

It also included nine follow-up phone calls or visits by a health professional for 18 months following the patient's discharge from an emergency department.

"Many suicidal patients lack good communication and relationships within their family and with other people," the researchers said.

The intervention not only helped increased the suicide attempters' feelings of connectedness but also increased their skills in solving crises which may otherwise lead to suicidal behaviour.

"Also, systematic follow-up contacts gave the patient a feeling of being seen and heard by someone," they said.

The study, published in the Bulletin of the World Health Organization (WHO), said one of the advantages of the intervention was that it required minimal training or extra resources and was therefore suitable for implementation in low and middle-income countries.

The WHO estimates that about 85 per cent of suicides occur in low and middle-income countries. In 2002, some 877,000 deaths were attributed to suicide.

Adapted from materials provided by Griffith University, via EurekAlert!, a service of AAAS.
http://www.sciencedaily.com/releases/2008/09/080919142546.htm

Why Chemo Works For Some People And Not Others

Cells from different people don't all react the same way when exposed to the same chemotherapy drugs. (Credit: iStockphoto/Khuong Hoang)

ScienceDaily (Sep. 23, 2008) — MIT researchers have shown that cells from different people don't all react the same way when exposed to the same DNA-damaging agent — a finding that could help clinicians predict how patients will respond to chemotherapy.

The research team from MIT's Center for Environmental Health Sciences (CEHS) and the Departments of Biological Engineering and Biology, identified a group of 48 genes that can predict how susceptible an individual is to the toxic compound, known as MNNG. The work appears in the Sept. 19 online edition of Genes and Development.

MNNG, a DNA-damaging compound similar to toxic chemicals found in tobacco smoke and in common chemotherapy agents, usually kills cells by inducing irreparable DNA damage. However, the researchers found a wide range of susceptibility among cells taken from healthy people.

"A cell line from one person would be killed dramatically, while that from another person was resistant to exposure," said Rebecca Fry, former MIT research scientist and lead author of the paper. "It wasn't known that cell lines from different people could have such dramatic differences in responses."

Toxic agents such as MNNG create lesions in DNA, provoking the cell to defend itself with a variety of DNA-repair and other pathways. However, every individual expresses slight differences in the genes involved in those pathways.

"Even if everyone is exposed to exactly the same things, they would respond differently, because we're all genetically different," said Leona Samson, senior author of the paper, director of CEHS, and an American Cancer Society Research Professor.

The team members found that after measuring the expression of every gene in each cell line, they could predict cell sensitivity to MNNG from the expression of just 48 specific genes, with 94 percent accuracy.

Several of those 48 genes have already been linked to cancer, said Samson, but it was not known that their expression is already altered before exposure to the DNA damaging agent.

This study is specific to MNNG, but similar efforts are now underway in Samson's lab to predict individuals' responses to other toxic agents, including cisplatin, a common chemotherapy agent, and temozolomide, used to treat brain cancer.

Fry, the lead author of the paper, is now an assistant professor at the University of North Carolina School of Public Health. Other authors are Peter Svensson, a postdoctoral fellow in CEHS; Chandni Valiathan, a graduate student in computational and systems biology; Emma Wang and Brad Hogan, technical assistants in CEHS; Sanchita Bhattacharya, former CEHS research scientist; James Bugni, former CEHS postdoctoral fellow; and Charles Whittaker, a research scientist in the David H. Koch Institute for Integrative Cancer Research.

The research was funded by the National Institute of Environmental Health Sciences and the National Cancer Institute.

Adapted from materials provided by Massachusetts Institute of Technology.

http://www.sciencedaily.com/releases/2008/09/080918192931.htm

Preventing Forest Fires With Tree Power: Sensor System Runs On Electricity Generated By Trees

MIT senior Christopher Love and colleagues are working to find out whether energy from trees can be used to prevent forest fires. Love works here with a test tree behind the copper-plated insulated door of MIT's Faraday cage. (Credit: Christopher Huang/MIT)

ScienceDaily (Sep. 23, 2008) — MIT researchers and colleagues are working to find out whether energy from trees can power a network of sensors to prevent spreading forest fires.

What they learn also could raise the possibility of using trees as silent sentinels along the nation's borders to detect potential threats such as smuggled radioactive materials.

The U.S. Forest Service currently predicts and tracks fires with a variety of tools, including remote automated weather stations. But these stations are expensive and sparsely distributed. Additional sensors could save trees by providing better local climate data to be used in fire prediction models and earlier alerts. However, manually recharging or replacing batteries at often very hard-to-reach locations makes this impractical and costly.

The new sensor system seeks to avoid this problem by tapping into trees as a self-sustaining power supply. Each sensor is equipped with an off-the-shelf battery that can be slowly recharged using electricity generated by the tree. A single tree doesn't generate a lot of power, but over time the "trickle charge" adds up, "just like a dripping faucet can fill a bucket over time," said Shuguang Zhang, one of the researchers on the project and the associate director of MIT's Center for Biomedical Engineering (CBE).

The system produces enough electricity to allow the temperature and humidity sensors to wirelessly transmit signals four times a day, or immediately if there's a fire. Each signal hops from one sensor to another, until it reaches an existing weather station that beams the data by satellite to a forestry command center in Boise, Idaho.

Scientists have long known that trees can produce extremely small amounts of electricity. But no one knew exactly how the energy was produced or how to take advantage of the power.

In a recent issue of the Public Library of Science ONE, Zhang and MIT colleagues report the answer. "It's really a fairly simple phenomenon: An imbalance in pH between a tree and the soil it grows in," said Andreas Mershin, a postdoctoral associate at the CBE.¬ The first author of the paper is Christopher J. Love, an MIT senior in chemistry who has been working on the project since his freshman year.

To solve the puzzle of where the voltage comes from, the team had to test a number of theories - many of them exotic. That meant a slew of experiments that showed, among other things, that the electricity was not due to a simple electrochemical redox reaction (the type that powers the 'potato batteries' common in high school science labs, http://en.wikipedia.org/wiki/Lemon_battery). The team also ruled out the source as due to coupling to underground power lines, radio waves or other electromagnetic interference.

Testing of the wireless sensor network, which is being developed by Voltree Power, is slated to begin in the spring on a 10-acre plot of land provided by the Forest Service.

According to Love, who with Mershin has a financial interest in Voltree, the bioenergy harvester battery charger module and sensors are ready. "We expect that we'll need to instrument four trees per acre," he said, noting that the system is designed for easy installation by unskilled workers.

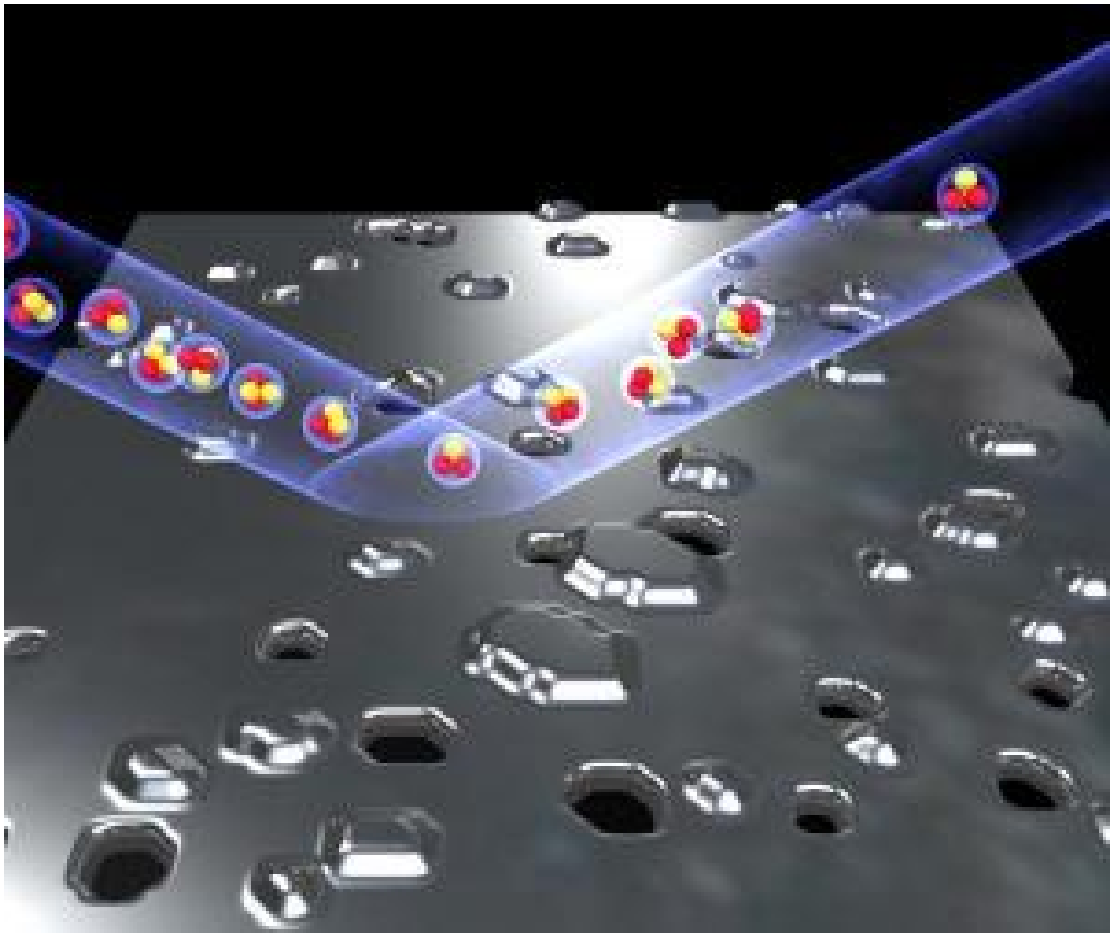
"Right now we're finalizing exactly how the wireless sensor network will be configured to use the minimum amount of power," he concluded.

The original experiments were funded by MagCap Engineering, LLC, through MIT's Undergraduate Research Opportunities Program.

Adapted from materials provided by Massachusetts Institute of Technology, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com/releases/2008/09/080922095435.htm

Smoothest Surface Ever Created: May Lead To World's First Atomic Microscope



Quantum stabilized atom mirror which, despite small holes and "islands", mostly has a smooth surface and is able to reflect an imaginary molecular beam (each molecule with 4 atoms). (Credit: Barredo et al)

ScienceDaily (Sep. 23, 2008) — A team of physicists from the Autonomous University of Madrid (UAM) and the Madrid Institute of Advanced Studies in Nanoscience (IMDEA-Nanociencia) has created the “quantum stabilized atom mirror,” the smoothest surface ever, according to a recent article in Advanced Materials.

The innovation is already being used in the design of the world's first atomic microscope.

One of the study's authors, Rodolfo Miranda, professor of condensed matter physics at the UAM and director of the IMDEA-Nanociencia, said that the innovation with this almost perfect mirror is the ability to reflect “extraordinarily well” most of the atoms that affect it, through the use of materials of nanometric thickness whose properties are dominated by quantum effects.

The mirror resembles a curved wafer. It is made up of a thin silicon crystal with a thickness of 50 microns, and covered with a very fine layer of lead, 1 or 2 nanometres thick. To study the reflection on this metal, the scientists used helium atoms. Until now mirrors made solely from silicon reflected 1% of helium atoms, but by adding the layer of lead they have managed to achieve a reflection of up to 67%.

The lead is deposited on the silicon at a temperature of between -173º and -133º C which, together with the nanometric thickness of the lead, allows its quantum properties to "come to the surface", and, in an "astonishing and spontaneous" way, bumps on the surface become evened out and a super flat layer is created. "The extraordinary thing about this process is that when the material is heated to room temperature, it does not distort or break, but instead becomes even flatter, enhancing its reflection properties", Miranda indicated.

These types of mirrors are vital for manufacturing future atomic microscopes. Until now electronic microscopes have achieved the highest resolutions when it comes to viewing objects, but with the disadvantage that the accelerated electrons they use destroy the most delicate biological samples, such as cell membranes or certain protein structures. "With atomic microscopes we hope to achieve the same resolution but without damaging samples", said the professor of physics.

Miranda pointed out that atoms have a much greater mass than electrons, "which is why we can achieve the same wavelength with far lower energy, allowing us to observe things as small as those observed with an electronic microscope, but without destroying what we are viewing."

The Spanish researchers, together with the team led by Bill Allison at the University of Cambridge (United Kingdom) and Bodil Holst at the University of Graz (Austria), are now working with the first prototypes of atomic microscopes that use quantum stabilized mirrors, and are confident that the first images obtained with them will be ready next year.

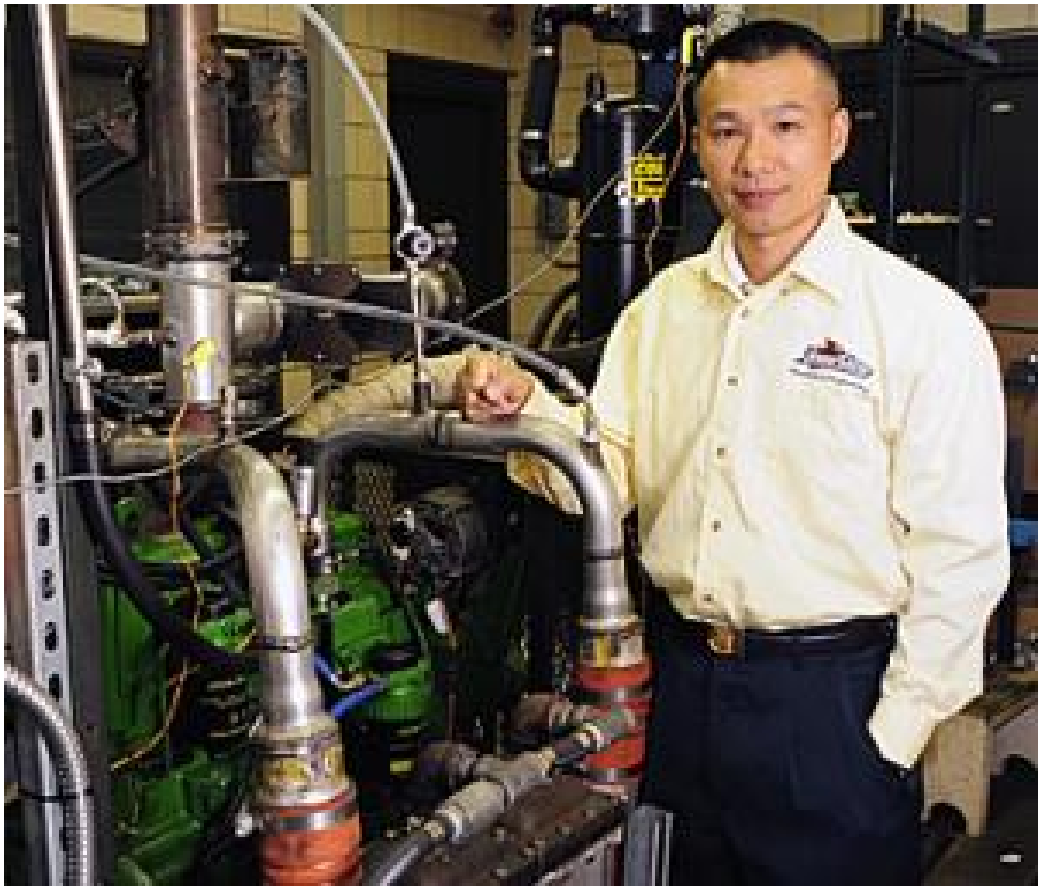
Journal reference:

1. Daniel Barredo, Fabián Calleja, Pablo Nieto, Juan José Hinarejos, Guillame Laurent, Amadeo L. Vázquez de Parga, Daniel Farías, Rodolfo Miranda. **A Quantum-Stabilized Mirror for Atoms**. *Advanced Materials*, 20 (18): 3492. September 2008

Adapted from materials provided by Plataforma SINC, via AlphaGalileo.

http://www.sciencedaily.com/releases/2008/09/080922141139.htm

Engineers Work To Clean And Improve Engine Performance



Song-Charng Kong, an Iowa State University assistant professor of mechanical engineering, and his students are studying engines in an effort to reduce emissions and improve efficiency. (Credit: Photo by Bob Elbert)

ScienceDaily (Sep. 23, 2008) — The five engines in Song-Charng Kong's Iowa State University laboratory have come a long way since Karl Benz patented a two-stroke internal combustion engine in 1879.

There are fuel injectors and turbochargers and electrical controls. There's more horsepower, better efficiency, cleaner burning and greater reliability.

But Kong -- with the help of 15 graduate students and all kinds of sensors recording engine cylinder pressure, energy release and exhaust emissions -- is looking for even more.

Kong, an Iowa State assistant professor of mechanical engineering who keeps a piston by his office computer, is studying engines with the goal of reducing emissions and improving efficiency.

"There is still a lot of work to be done to improve engine performance," Kong said. "All of this work will lead to incremental improvements."

And those small improvements can add up when you consider there are more than 250 million registered vehicles on U.S. highways, according to the U.S. Department of Transportation.

Kong and his students are working on a lot of combustion projects in the lab: They're studying diesel engines with the goal of reducing emissions. They're developing a computer model of a gasoline engine that will make it much easier and faster to research and develop new engine technologies. They're figuring out how to optimize new technologies such as multiple fuel injections per combustion cycle.

They're working with Terry Meyer, an Iowa State assistant professor of mechanical engineering, to use high-speed, laser-based sensors that can record images of injection sprays and combustion inside a cylinder. That can give researchers insights into combustion characteristics and ideas for improvements.

They're also studying how plastics dissolved in biodiesel affect engine performance. Biodiesel acts as a solvent on certain plastics and that has Kong checking to see if some waste plastic could be recycled by mixing it into fuel.

And they're studying the combustion of ammonia in engines. Ammonia is relatively easy to store, is fairly dense with hydrogen and doesn't produce greenhouse gases when it burns. So burning ammonia in engines could be an early step to developing a hydrogen economy.

Kong's work is supported by grants from Deere & Co., the Ford Motor Co., the U.S. Department of Energy's Los Alamos National Laboratory, the Ames-based Renewable Energy Group Inc. and the Iowa Energy Center based at Iowa State.

As he showed a visitor around his engine lab recently, pointing out a new turbocharger here or an experimental one-cylinder engine there, Kong said there's good reason to keep studying engines.

"We want to make these engines better," Kong said. "In my mind, the internal combustion engine may be the most important combustion system in daily life. Just by improving combustion efficiency by a fraction, we can save a lot of energy for the country and the world."

And yes, he said, "There is a future for internal combustion engines."

Adapted from materials provided by Iowa State University.

http://www.sciencedaily.com/releases/2008/09/080917175046.htm

Warning Signals

As she read news stories about a former Illinois college student who killed five people and then himself in February, Anna Scheyett wondered if anything could have been done to prevent the tragedy. Would friends and loved ones have been able to sense that something was wrong with Stephen Kazmierczak, the 27-year-old shooter with a history of mental illness, if he had told them in advance what to look for?Scheyett, a clinical associate professor at the University of North Carolina at Chapel Hill, is now exploring ways that mentally ill college students can better communicate with university officials, and even close friends, about their problems. Specifically, Scheyett is researching so-called "advanced directives" for mental health. Not unlike a living will, an advanced directive for mental health allows people to designate their preferred treatment options, while also documenting warning signs that may suggest a looming crisis.

"The whole [advanced directive] is about really enhancing student autonomy," said Scheyett, who is associate dean for academic affairs at North Carolina's School of Social Work. "When you get sick, this is a way for the healthy part of the person to keep speaking."Scheyett is now conducting a feasibility study at Chapel Hill, asking students with histories of mental health problems to consider completing advanced directives. Students who participate will fill out directive forms and share information, including lists of medications or treatments that have been effective in the past. Students can choose how much they want to divulge, but they would be asked to name possible triggers for their mental health problems, preferred hospitals and emergency contacts.

Students will be responsible for deciding who should receive copies of their directives, but possible recipients include the campus counseling center, social workers employed by local police, the dean of students, and even resident advisers, friends and faculty.Scheyett's research is just that — research. Chapel Hill officials have not said they want students to fill out these forms routinely, and Scheyett says she would object to any future policy that would in any way mandate the forms for students with mental health histories.

Directives Raise Privacy Questions

By asking students to fill out advanced directives, colleges would begin to address one of the thornier issues currently facing academe: what to do when a student loses control.One of the key concerns on college campuses, as evidenced in the wake of the Virginia Tech shootings, is protecting student privacy, while also protecting the campus at large. Dr. Marvin Swartz, director of the National Resource Center on Psychiatric Advanced Directives, said the use of advanced directives at colleges might well make it easier for officials to act quickly and efficiently without being "hamstrung" by student privacy laws.

"This is a way to kind of resolve that because the student can give a waiver of confidentiality and be clear about who has the right to know," Swartz said. "Often in these situations, people get so hung up on confidentiality issues that they can't do the right thing."But widening the distribution of sensitive medical information is sure to raise its own set of privacy questions, and Scheyett said she's already heard those voiced by the university board that approves on-campus research.

"[Privacy is] something we thought about, and that's something our institutional review board made us think about really, really, really hard," Scheyett said.

Copies of the directives will be kept under lock and key, but students will also be asked to sign a consent form that acknowledges the risk of having "a piece of paper out there in the world" that may contain intimate details about their history, Scheyett said.

In recent years, universities have been criticized for mishandling student mental health records. Such cases have been of great interest to the Bazelon Center for Mental Health Law, which has represented students who have alleged privacy violations. Karen Bower, senior staff attorney for the Bazelon Center, said she believes advanced directives have some clear benefits in a university setting, but she cautioned

that students shouldn't be pressured to distribute the information to those who don't have a true need for it.

"It should be limited to individuals who would be able to respect it," Bower said. "It's your preferences for treatment. Why would you give it to your landlord? Why would you give it to your [resident assistant]?"

The Bazelon Center has also taken cases alleging that students were disciplined or barred from school after they reported mental health problems to university officials.

Within advanced directives, students may be asked whether they would benefit from being secluded during mental health episodes. So might college officials be given more leeway to bar students from campus in some cases? Scheyett says she doesn't think so.

"I've never thought of it in terms of cover," she said.

Swartz, a professor of psychiatry at Duke University Medical Center, said he would be disappointed if advanced directives were used for "risk management."

"I wouldn't want it to be seen as a risk management tool for the institution. It's not the intention," he said. "But [the directive] helps a lot because by giving them permission to talk and follow a treatment plan."

Directives Still Untested at Colleges

Advanced directives for mental health, which are sometimes called psychiatric advanced directives, are a relatively new phenomenon. Introduced in the late 1990s, the directives were a response to concerns that mentally ill patients feel a loss of control during treatment if they are incapacitated.

Swartz said advanced directives are largely untested in college settings. That said, a college campus may be one of the places where advanced directives could be of most value, he said.

"A university doesn't have a regular health care system," Swartz said. "Often students are relatively transient. They are there for four years at best. They may have very little record at that institution. This is a way for them to make it clear what treatment they've had, their whole history."There may be other benefits to advanced directives as well, according to Swartz's research on the subject. Those who fill out directives may build relationships of greater trust with health care providers, while also learning more about their own illnesses, Swartz said.

"We have published papers in which we've shown the benefits to the people who created them," he said. "It improved their relationship with their mental health provider. It reduced their crises, so they had fewer crises as a result, and those crises resulted in less involuntary treatment."Kevin Gaw, president of the American College Counseling Association, said he's interested in the potential benefits that advanced directives might have for students. On the other hand, he also thinks any requirement for directives would be misguided.

"That would feel pretty coercive," said Gaw, a psychologist and director of career services at Georgia State University. "I don't think that would actually protect people. It would harm people in a way we don't want to do as educators."But Gaw said he'll watch the developments in North Carolina's research carefully.

"It's new, and I think this study is pretty innovative, and it will be very fascinating to see what happens," he said. "There's pros and cons. Obviously there will be pros and cons we don't even know about."

— Jack Stripling

The original story and user comments can be viewed online at http://insidehighered.com/news/2008/09/26/unc.

Want a Good Parking Spot? Read On

It's no secret that the prime parking spot is a prized thing.

At Augsburg College, in Minneapolis, a three-year-old car pool program hadn't caught on — until officials moved the car-poolers' reserved spaces from the edge to the center of campus this summer. The number of car pools climbed from one or two to five this fall, and there are also some other interested parties. "We know from what the car-poolers have told us that moving those reserved spots to the heart of campus, and adding that convenience factor, has been a big draw," said John Pack, Augsburg's director of public safety.

"When you're in a car pool group, you have your own reserved spot. Not even the president has his own reserved spot."

Short of converting to telecommuting or online learning operations, colleges may have limited leverage in controlling their employees' or students' commuting habits — but what leverage they do have may lie partly in their parking polices. While changes haven't been drastic, a number of colleges have put in place small numbers of "car pool only" or "hybrid only" parking spots to encourage greener driving habits (and, in the car-pooling case, also cut demand for parking at colleges with too few spaces).

To take just a couple examples, De Anza College, a two-year institution in California, has 37 parking spaces reserved for car-poolers and 13 for alternative fuel vehicles, which must have a factory insignia declaring them as such (i.e., "hybrid," "bio-diesel" or "electric vehicle"). Western Michigan University has 15 spots for alternative fuel vehicles by its College of Health and Human Services — an item noted in the college's application for LEED certification for its building, occupied since 2005. "We're quite excited about our new building and about our commitment to sustainability," said the college's dean, Earlie Washington.

Many might have characterized commuting issues as being outside a college's domain. But parking policies like these could become especially popular among signatories of the American College and University Presidents Climate Commitment, which requires colleges to factor emissions from faculty, staff and student commuting into their plans to go "carbon neutral." At some signatory colleges, those commuting emissions are their primary source of emissions. Centralia College, a two-year institution in Washington State, reported in its recent inventory that 88 percent of all college emissions are commuting-related.

As of the start of fall quarter on Monday, Centralia has a new policy in place to create reserved spaces for car-poolers, as well as those driving hybrid or electric cars. (The college has plans to install outlets for the electric cars.)

"People like to park as close as possible to the campus and those spaces are somewhat limited. So I guess the easy way to get close to campus, close to classes, is to car pool or drive a hybrid vehicle," said Don Frey, a Centralia spokesman. He noted that the college has also long offered free bus passes to students.

Asked how Centralia plans to enforce the policy, "We're doing this on faith, essentially, that the students are complying with the spirit of what we're doing here," said Frey. "Initially when they sign up, we get a commitment from the students that they are participating in the program, and that they agree to car pool.… We can't police this continually and constantly, and there may be a risk that somebody's taken advantage of it, but we have found that by and large students are honest."

At Ohio State University, however, officials have so far shied away from reserving spaces for car-poolers and fuel-efficient vehicles because of concerns about enforcement. "People will try to push the envelope on this kind of stuff," said Sarah Blouch, Ohio State's director of transportation and parking. She recalled, for instance, spaces that used to be reserved for compact cars. "But no one knew what that was…. The easy way is you say if you fit inside the box," you're a compact car.

"We'd have some SUVs crammed into the spaces."

Blouch is receptive to reserving spots for fuel-efficient vehicles, but first wants to develop a list of which cars count and which don't, to aid enforcement. And while it hasn't done so for more informal car pools, Ohio State has, since 2007, reserved spots for 12-people van pools organized through the local regional planning commission. Where are those parking spaces located? Wherever the van driver wants.

Members of the van pool also get 10 free parking permits to use on days they must drive, for whatever reasons. Still, only two van pools are running.

"You'd think on a campus of 25,000 faculty and staff you'd be able to get more than two van pools.... I think the nature of the 24-7 operation has been part of the problem. People just have so many different schedules," said Blouch.

Colleges' policies on parking, of course, have been just a small piece of their overall efforts to encourage more eco-friendly habits, by moving to four-day work weeks, running bicycle-sharing programs, and subsidizing mass transit. As tempting as that prime parking spot may be, not everyone is convinced that parking privileges are the best way to encourage eco-friendly habits.

At De Anza College, a student newspaper editorial last May criticized reserved spaces for alternative fuel vehicles as "virtually unenforceable" and as privileging wealthier students who can pay a premium for hybrids.

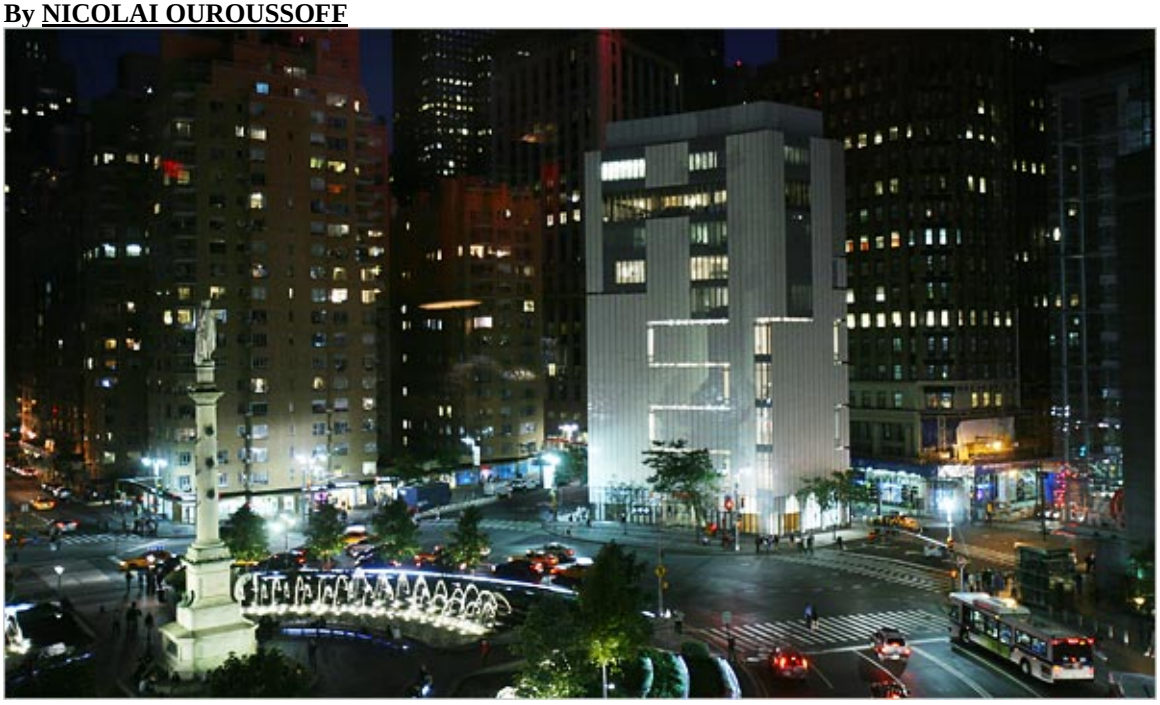
As the *La Voz* opinion piece argues, "Earth-conscious students should be rewarded for their efforts to improve the environment, but not for whatever cars they may drive — if people really want to make a difference with what they drive, they can buy a bicycle."

— Elizabeth Redden

The original story and user comments can be viewed online at http://insidehighered.com/news/2008/09/26/commuting.

New Face, Renewed Mission

By NICOLAI OUROUSSOFF



It was fun while it lasted.

The passionate battle fought recently over the redesign of 2 Columbus Circle, the curious white marble structure built by Huntington Hartford to house his art collection, was reminiscent of the preservation wars of the 1960s.

When was the last time you saw preservationists marching in the streets? Or best-selling writers like Tom Wolfe venting about a building project on the editorial pages? At least we were reminded that architecture is not just about exquisite baubles for the superrich. It can still feel threatening.

Now, with the opening this weekend of the newly renovated building as the Museum of Arts and Design, the public will finally be able to judge for itself whether it was a sin to disfigure the 1964 original.

Already a few things are blazingly clear. Designed by Brad Cloepfil of Allied Works Architecture, the renovation remedies the annoying functional defects that had plagued the building for decades. But this is not the bold architectural statement that might have justified the destruction of an important piece of New York history. Poorly detailed and lacking in confidence, the project is a victory only for people who favor the safe and inoffensive and have always been squeamish about the frictions that give this city its vitality.

Granted, Edward Durell Stone's original building was not without its flaws. The art galleries, which stepped up around an elevator core, were dark and cramped. The blank marble facade senselessly blocked out stunning views of Columbus Circle and Central Park.

Yet as many observers have pointed out, Stone's building occupied a crucial niche in the city's architectural memory. Its vague evocation of opulent Venetian motifs was a brazen attack on the prevailing Modernist orthodoxy. That the challenge came from one of the Modern movement's foremost practitioners in New York only sharpened the sting.

By contrast, Mr. Cloepfil's redesign is part of a long-term effort to clean up Columbus Circle's once-gritty image, with mixed results. The chiseled towers of the Time Warner Center, completed in 2003 just to the west along the circle, look great in the skyline, but they are planted atop a dismally generic urban shopping mall. The renovation of Columbus Circle, on the other hand, was a nice surprise: a deadening traffic island has been transformed into a grand public space encircled by fountains and benches.

Sadly, the Museum of Arts and Design will only reinforce the suspicion that city officials are more intent on sanitizing the city for jittery tourists and business interests than safeguarding the public realm.

Mr. Cloepfil retained the form of the building, with its gently concave facade, but wrapped it in a new skin of glazed terra-cotta tiles. A single incision cuts up and across the facade as if it were unzipped.

The architectural challenge was to reshape the building's identity without ripping out its soul. But seen from across Columbus Circle by daylight, the new exterior looks sterile. The scale and site of the building, a modest structure on a tiny piece of land surrounded by gargantuan towers, demanded something bold; Mr. Cloepfil's tendency is toward the precious.

At ground level, for example, he decided to keep all of Stone's original so-called lollipop columns except one and wrapped the entire base in glass. As a result, the columns look meek and lifeless, as if they had been embalmed.

Above, the thousands of terra-cotta tiles have an attractive candy-coated gloss, especially at dusk, when they glitter in the reflected light. But their diminutive size makes them seem slightly fussy and out of place.

The cut is a more confident gesture — until it reaches the top, where it dissolves into a band of windows. (In Mr. Cloepfil's defense, he says he demurred at creating this vast expanse of glass, but the museum insisted on it.)

The disappointments continue inside, where Mr. Cloepfil demonstrates his practical skills, but none of the virtuosity — a feel for materials and structure, for the play of light across surfaces — that can elevate a design from mundane concerns into the lofty realm of art.

Mr. Cloepfil cleans up the convoluted circulation route through the building, for instance, which allows him to create more generous spaces within a limited floor plate. He removed two emergency staircases that had been tucked into the building's back corners, replacing them with a single stairway behind the elevator core. He also carved windows into the northeast and northwest corners of the gallery floors. The windows allow light into the galleries without sacrificing wall space, provide gorgeous views up Broadway and out over Central Park and allow the galleries to breathe, an effect that is a bit like loosening a corset.

But the critical strategy here is the incision, which runs across the gallery floors and ceilings as well as up the exterior facade. The power of this idea arises from its violence. If its relentless logic holds, it will have a destabilizing effect on the viewer, as if the very structure that holds the building together is being cut away.

Yet Mr. Cloepfil undermines this gesture through the carelessness of his detailing. At the point where the incision turns from the wall and cuts across the ceiling, for example, a section of drywall is left at the corner; the result reads as two separate slots of glass instead of a continuous cut through the building.

Similarly, narrow strips of wood separate the glass channels that run across the gallery floors from the window frames, which makes the incisions feel decorative rather than like a clean surgical cut.

These are not minor details. They are critical to how ideas are conveyed; when used effectively, the impact is visceral and immediate. The mind doesn't take time to interpret, step by step, the architect's intention. This is what separates pedestrian work from serious architecture.

You can't help but think of Gordon Matta-Clark, who famously carved up abandoned New York buildings with a power saw in the 1970s. His works, though considered art, were often a harsh commentary on his era, a reflection on the disintegration of the fragile social fabric that bound the city together. Yet by cutting structures apart and allowing the light to flow in, he was also illuminating dark, forbidden corners, exposing their beauty and fragility.

In Mr. Cloepfil's hands, the same gesture is mild and timid. Harsh edges have been smoothed over. We're left with an image of a New York that has been scrubbed of any real meaning.

http://www.nytimes.com/2008/09/26/arts/design/26desi.html?_r=1&th&emc=th&oref=slogin

Quasi-Reality Bites Back

By A. O. SCOTT

When a movie's engagement with reality is at once impossible to miss and difficult to define, we frequently say it's like a documentary. The comparison, however, is anything but straightforward, since there are so many different ways a film can document (or distort) the literal truth. The 46th New York Film Festival includes a striking number of features — among them some of the strongest and freshest films likely to be shown on Manhattan screens this year — that might be called semi- or quasi- or crypto-documentaries.

In some of these, ordinary people play versions of themselves. In others, historical events are reconstructed with uncanny immediacy and fidelity. And there are still others that use highly refined tricks and techniques to strip away the veneer of artifice and immerse the viewer in the syncopated rhythms and rough textures of daily life. One festival selection that is indisputably and self-avowedly a documentary, Ari Folman's "Waltz With Bashir," is also a cartoon, using animation to reconstruct nightmarish scenes of actual war as well as the dreams of some of the men who fought it.

The blurring of boundaries between performance and captured fact, or between fiction and whatever its opposite might be, characterizes this festival (which opens on Friday and concludes on Oct. 12) from start

to finish. The opening slot, frequently reserved for a picture expected to infuse the high seriousness of the event with a touch of patron-pleasing, show business glamour, belongs to "The Class," Laurent Cantet's warm and gritty chronicle of a year in the life of a high school in a tough Paris neighborhood. The film arrives in New York with Cannes's top prize, the Palme d'Or, as part of its pedigree. (Of the 28 entries in the New York festival, 18 were previously screened last May in Cannes.) It is at once the most formally daring and the most populist opening-night selection in many years.

The main character, a teacher named François, is played by François Bégaudeau, an actual teacher and the author of "Entre les Murs" ("Between the Walls"), the autobiographical novel on which Mr. Cantet based this movie. François's pupils — young faces of the melting pot that France has, with some reluctance and anxiety, become — are played by nonprofessionals, which is to say by young people pretending to be some version of themselves.

So if "The Class" is not a documentary, it nonetheless documents a powerful tendency in contemporary cinema, one that is implicitly ranged against the lavish forays into fantasy, allegory and historical mummery that dominate commercial movie-making around the world (especially in Hollywood). The sturdy old term "realism," even with a prefix like neo- or hyper- attached to it, seems inadequate to capture this movement, which at its best combines a high degree of artistic sophistication with a bracing commitment to the literal.

In many cases this is an ethical commitment, a politically inflected impulse to show the world as it is. But the world as it is does not always make itself available to the camera, and so the inquiry must be conducted by means of artifice. Steve McQueen's "Hunger," about the protests of members of the Irish Republican Army imprisoned by the British in the early 1980s, is unsparing in its depiction of raw, physical experience.

At the beginning of the film the prisoners are on a hygiene strike, refusing to shave or bathe and smearing the walls of their cells with their own feces. Later this tactic gives way to self-starvation, and in both cases Mr. McQueen, a well-known English artist making his debut as a feature-film director, seems intent on pushing the visual medium of cinema toward the capture of sensory, corporeal experience.

Is Jia Zhangke's "24 City," with its talking-head interviews and real-time images of work in a Chinese factory, a work of realism? A documentary? Obviously it's both, to some degree, but it also seems like a dispatch from a postindustrial, science-fiction future. Its subject is the dizzying changes in the social and economic landscape of China, changes that seem to outpace the ability of Mr. Jia's digital camera to record them.

Films like "Hunger"; "Waltz With Bashir" (about former Israeli soldiers coming to terms with their war experiences in Lebanon in the early 1980s); "Tony Manero" (a Chilean film set in the early years of the Pinochet dictatorship); and, for that matter, Steven Soderbergh's "Che" bring a sense of urgency and immediacy to political events of the past. Other films, meanwhile, like "24 City," try to make sense of the present, to locate in the fine grain of individual lives some clue to the larger shape of things.

The French director Olivier Assayas's "Summer Hours," for example, is at first glance an intimate study of family life in which three siblings try to figure out what to do with the country house and the art collection their mother has left them. But without ever mentioning the word, the film is also about globalization, about how the transnational mobility of people, property and money erodes traditional bonds of family, nation and place.

Mr. Assayas, who has explored the theme of globalization in a very different register in films like "Irma Vep," "Demonlover" and "Boarding Gate," is not a polemicist. Though "Summer Hours" is colored by a sense of loss and melancholy, it is also too rigorous and too generous to succumb to sentimentality or nostalgia. The film's ideas dwell within its characters, something that is also true of Kelly Reichardt's

splendid "Wendy and Lucy," the story of a young woman and her dog that is also about money, individualism and solidarity in contemporary America.

At first glance Mike Leigh's "Happy-Go-Lucky" is about nothing more than its main character, a relentlessly cheerful London schoolteacher named Poppy who is either the most endearing or the most irritating character in recent cinema. Or maybe both. As played by Sally Hawkins, Poppy is a whirlwind of good cheer, but she also presents a case study in both the limits and the necessity of niceness as an ethical principle. She is, above all, as abrasively and stubbornly real as anyone you are likely to meet this year, on screen or off.

All of which is not to say that realism is the only game in town. Festivalgoers in search of stylish, youthful genre attitude can sample "I'm Gonna Explode," Gerardo Naranjo's tale of two teenagers playing Bonnie and Clyde. Connoisseurs of costume drama may be intrigued by "The Northern Land," João Botelho's elusive and stylized literary adaptation from Portugal, which is notable for its mannered performances and its eye-popping vistas of the green, rocky island of Madeira.

The landscape of the festival itself has changed this year as a result of continuing construction at its Lincoln Center home. A majority of the screenings will be held in the vast and velvety Ziegfeld Theater on West 54th Street. That plush, old-fashioned movie palace may seem like an incongruous setting for rough and raw encounters with reality, but the grandeur is also an appropriate reminder that even small movies deserve a big screen and a big audience.

Whether these movies will find either after the festival is uncertain. It is increasingly likely, given the fragile state of distribution for ambitious, challenging films, that you will next encounter these films not in a theater near you but in your living room or on your laptop. Whether or not you can make it to the Ziegfeld, the New York Film Festival offers a welcome and urgent reminder: Keep your eyes open.

http://www.nytimes.com/2008/09/26/movies/26fest.html?th&emc=th

Old School Bad Boy's Messy World

By MICHAEL KIMMELMAN

LONDON — That the Francis Bacon retrospective here at Tate Britain has been mobbed since opening several days ago should surprise nobody. The show is a landmark, a knockout, and its timing turns out to be nearly perfect.

Sixteen years have passed since the Irish-born Bacon died, at 82, during which the art world has radically changed, and the generation of Americans weaned on postwar abstraction and congenitally skeptical of Bacon is being gradually displaced. The other day there were dozens of young art students, not a few of them sketching, in front of the pictures. I suspect the same will happen when the show, judiciously organized by Matthew Gale and Chris Stephens, lands in Madrid, then New York. Bacon suddenly looks fresh.

How so? Late in life, it's true, he became, contrary to his sensational art, a sort of old-school gentleman, chivalrous and immensely kind when he wished to be, reticent otherwise, a monument of postwar Britain who, for a curious guest, would rehearse the old lines and visit old haunts like the Colony Room, the run-down drinking club where he paid for bottles of Champagne from a thick wad of cash he kept rolled up, à

la Al Capone, in a pocket of his suit. (The ill-fitting suits, long after he could afford Savile Row, came from a neighborhood tailor to whom, typical of Bacon, he remained loyal.)

In those days he was painting works like a second version of the triptych "Three Studies for Figures at the Base of a Crucifixion," the original of which in the mid-1940s had confronted a battered, convalescent nation with what's commonly called the shock of recognition. Now he was remaking the work, as his friend the painter Lawrence Gowing put it about late Bacon generally, to look more "classically serene."

"I'm an optimist, but about nothing," Bacon kept repeating, while lamenting his old age as "a disease, a desert, because all one's friends die." He loved to quote Yeats and Proust and T. S. Eliot and remained enmeshed in what Michael Leja, an American art historian, has in a different context called "Modern Man discourse" — a serious hand-me-down passel of existentialism and other philosophy from the 1940s and '50s, popularized, as David Alan Mellor writes in an essay in the show's excellent catalog, by the claustrophobic spaces of film noir. This netherworld of dingy hallways and shuttered rooms had long been the arena of Bacon's art.

So in various respects, by his late 70s, Bacon had come to seem something of a throwback; it was widely said his best work was behind him. But since then historians have mined the sources from which he cribbed images and opened up the crucial subject of gay sexuality in his work, which was long repressed, and this, along with his bad-boy reputation, which never goes out of fashion, has made him a source of steady fascination, never mind the lurid films and biographies and the admiration of art-world celebrities like Damien Hirst. Most important, with the breathing space of a little time, it's become obvious how pure a painter he was, not just early on.

His repertory — "brand" would be the word Mr. Hirst might use — of bloody carcasses and monsters; the mutilated, decomposing heads with immaculate teeth; the mangy dogs and screaming popes and salary men, silent and watchful, caged like zoo animals, then enclosed behind the gold frames and reflective glass, in which we too appear like ghosts: it's all already there in his work by the mid-1950s.

So is the touch. In "Figure Study I" or "Head II," from the '40s, the surfaces are busy and dense like stucco or tweed, or thick as an elephant's hide, but with exquisite veils on top — a mix of roughness and fragility, aggression and sensuality that would define the work across the career. Bacon also swiped thin washes of purple, black and white over what looks like raw canvas to paint his first pope, fussing the gaping mouth, creepily. Spectral hints of gold brocade, refined like Chinese calligraphy, glimmer in the ether.

Elsewhere beefy men wrestle and dive into pools of blue-black nothingness. Against high-key fields of red and orange, half-animal, half-human blobs recline like patients on an operating table or they melt and evaporate. Bacon traveled during the late '50s to Tangier, absorbing local color, allowing his technique to loosen, producing "Study for a Portrait of van Gogh VI," a clangorous mass of red and green, improbably successful, and he painted a few messes too, like "Figure in a Mountain."

Out of all of that came, by the '70s and '80s, we can see in the Tate show, yet more complex architecture, a widened palette, and a calculated willingness to risk failure. Within the narrow terrain he mapped at the start, with its melancholy and blend of private with literary iconography, Bacon didn't just repeat himself.

Several triptychs and portraits, reflecting on the suicide of his companion George Dyer in 1971, mark a clear experiment in conflicted sentiment; they're heartbreaking but simultaneously clinical. As a friend of Bacon's, the editor Nikos Stangos, once put it, Bacon "never expressed moral indignation about anything." That in a nutshell explains the work's ruthless elegance.

Some really appalling late pictures, like a large triptych from 1976, which some squillionaire recently paid a fortune to buy, look horribly overstuffed with ugly heads and tired gimmicks, as if Bacon, worried

he had exhausted the empty stretches of color he so often painted, didn't know when to stop filling the canvas up. Whether, during these last decades, he came merely to parody himself, painting too slickly, is the only real subject of debate the exhibition has aroused. The answer is, yes, sometimes he did.

All the same, he made, out of the blue, "Jet of Water," a great ejaculation of splashed white pigment, which looks stunning. Despite his blindness to pure abstraction — which, having a tendency toward decorativeness, he feared led only to empty gesture — he devised a Rothko-like picture, sinister and wry, called "Blood on Pavement." Even the second version of that early triptych of figures at the base of a crucifixion turns out to have its own eloquence, almost daring a viewer to find it too beautiful.

Cunning and self-conscious, glad to outrage, with the delicacy of those blurry but somehow distinct faces and electric palette, conjuring up Carnaby Street, his work translates quite easily to a new century. So does the sweaty sex and violence, luxuriant but couched in aloofness and girded, always, by grand allusions to old masters and learned texts.

Karl Georg Büchner, the 19th-century German playwright, speaking of which, once asked a question that Bacon must have come across. "How," Büchner inquired, "can you not hear the terrible screams all around that we call silence?"

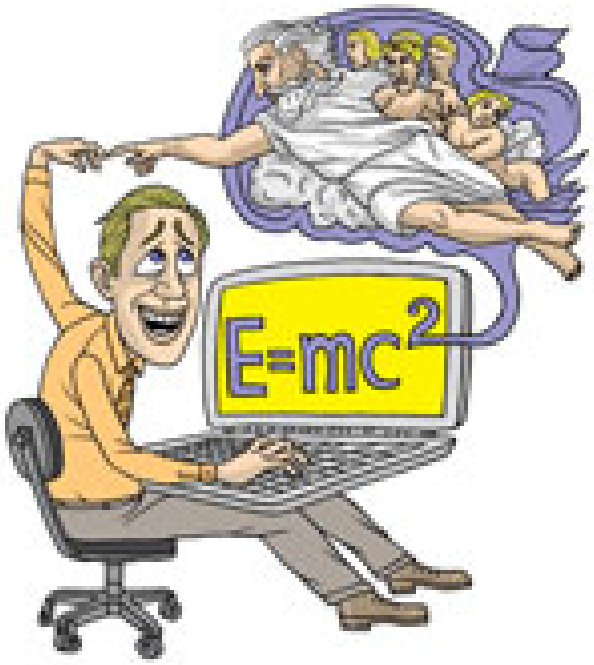
Through the popes and Willy Lomans and so much else that Bacon painted, they make this exhibition sing.

http://www.nytimes.com/2008/09/25/arts/design/25abroad.html?th&emc=th

Atomic Prose

Why can't science journalists just tell it like it is when it comes to particle physics?

By Chris Wilson
Posted Wednesday, Sept. 24, 2008, at 7:10 AM ET



The Nobel Prize-winning physicist Steven Weinberg once summed up his feeling about people who saw evidence of the divine in the laws of physics like so: "I don't know why they use words like 'designer' or 'God,' except perhaps as a form of protective coloration."

God was mostly off the table in recent weeks—except in His particle form—as the Large Hadron Collider revved up for a massive series of experiments in subatomic physics. But among science journalists, there was plenty of protective coloration of another variety. Much of the prose from the hundreds of stories heralding the event arced decidedly toward the purple.

"Here, inside the largest science experiment ever conducted, is the stuff of meditation and prayer, mysteries of the sort that only religion and Big Science can unveil with such grandeur," reported the *Globe and Mail*'s Doug Saunders from Geneva. The *Washington Post*'s William Booth described the accelerator's detectors as "crawling, Medusa-like, with blue, red, green cables, like arteries and veins." These, said CNN, would provide scientists the opportunity for a "religious experience"; the BBC agreed, pointing out helpfully that "scientific study is often mundane but can occasionally slip into the ecstatic." Reporting from the Fermi National Accelerator Laboratory, where scientists gathered to remotely celebrate the event, the *New York Times*' Dennis Overbye went for broke:

Outside, a half moon was hanging low in a cloudy sky, a reminder that the universe was beautiful and mysterious and that another small step into that mystery was about to be taken.

The color provided by this sort of extravagant prose comes at a cost. It may make for a richer read, but to decorate the science with ornate wordplay has a way of obscuring the very ideas those words are supposed to highlight. Such language gives science a flavor of the mystic and inaccessible, which is exactly the opposite of what it is: messy, full of false starts and wrong ideas, but ultimately committed to making the universe more coherent.

No one ever said writing about particle physics was easy—the field of quantum mechanics shares a kind of proverbial inscrutability with rocket science, and nonscientists are understandably reluctant to dig in. But the best way to meet that challenge is to address it head-on, with clear analogies and straightforward language. The puzzles of the subatomic world—and specifically, the quest for the Higgs boson, a particle

theorized to endow all others with mass—are interesting and entertaining in their own right; dressing them up in florid language only adds another layer of confusion between the author and the reader.

Good analogies—not extravagant metaphors—are essential for treatment of tough concepts. Fortunately, there are plenty of good models. The legendary physicist Richard Feynman, for example, was fond of comparing the process of exploring the atom to smashing two pocket watches together and then trying to figure out how they worked by examining the debris—an analogy that neatly captures how particle physics is a distinctly forensic exercise.

Or take the description of the Higgs boson itself. While many of the articles about the LHC dutifully mentioned the Higgs, there wasn't much attempt to explain the peculiar way it is supposed to work, endowing some particles with much more mass than others. In his book *The Fabric of the Cosmos*, physicist Brian Greene takes a shot at it, working off the concept of a "Higgs ocean"—a field of Higgs particles that covers the whole universe:

If we liken a particle's mass to a person's fame, then the Higgs ocean is like the paparazzi: those who are unknown pass through the swarming photographers with ease, but famous politicians and movie stars have to push much harder to their destination.

Greene succinctly captures two essential concepts: First, that mass represents the "drag" of a particle through a crowded field of Higgs bosons. Second, some particles are more susceptible to this drag than others; hence, the proton and neutron are more "famous" or heavy than, say, the electron. For another shot at this curiosity, British physicist John Ellis compared the Higgs ocean to a snow field; some particles are wearing boots and must trudge heavily through the snow while others are endowed with snowshoes or even skis that allow them to glide effortlessly over the snow.The particle-as-famous-person analogy has been around for a while in various incarnations. A bastardization of it shows up in a *Times* article from July 2007 by Dennis Overbye, who likens the Higgs process to "the way a V.I.P. acquires an entourage pushing through a cocktail party." In addition to omitting the fact that the process works differently for different particles, Overbye fails to understand what anyone who's seen an episode of Entourage knows: that the VIP arrives to the party with his crew intact—precisely the old model of mass that the Higgs explanation replaces.

Journalists might fairly counter that they lack the space for nuts-and-bolts quantum mechanics, which is better left to books. (And the books certainly cover it. In a review of Leonard Susskind's *The Black Hole War* for the *Times*, George Johnson complained that before he got to the meat of the book's argument, he "had to get through a 66-page crash course on relativity and quantum mechanics. Every book about contemporary physics seems to begin this way, which can be frustrating to anyone who reads more than one.") Fair enough. At the very least, then, the mainstream press might aim for a more modest goal: to convey a sense of the larger themes at work in a given set of experiments. In this case, scientists are exploring important ideas about symmetry and simplicity in the laws of the universe.

On the whole, the best writing about physics for a general audience seems to come from physicists, not journalists. This isn't due to the fact that physicists understand the subject matter better—if anything, people who spend all day in the lab are often the worst at explaining the big picture. Rather, they're better at writing about physics because they don't try so hard to make you care. They don't believe their readers must be seduced with colorful wordplay or end-of-the-world melodramas. Journalists writing popular treatments of subatomic physics could take a lesson from the scientists: Tell it straight and have a little faith that the subject matter itself—a major advance in our understanding of the cosmos—can generate its own wonder and excitement.

*Chris Wilson is an editorial assistant at **Slate** in Washington, D.C.*

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Spare the Rod

Why you shouldn't hit your kids.

By Alan E. Kazdin
Posted Wednesday, Sept. 24, 2008, at 7:09 AM ET

The typical parent, when whacking a misbehaving child, doesn't pause to wonder: "What does science have to say about the efficacy of corporal punishment?" If they are thinking anything at all, it's: "Here comes justice!" And while the typical parent may not know or care, the science on corporal punishment of kids is pretty clear. Despite the rise of the timeout and other nonphysical forms of punishment, most American parents hit, pinch, shake, or otherwise lay violent hands on their youngsters: 63 percent of parents physically discipline their 1- to 2-year-olds, and 85 percent of adolescents have been physically punished by their parents. Parents cite children's aggression and failure to comply with a request as the most common reasons for hitting them.

The science also shows that corporal punishment is like smoking: It's a rare human being who can refrain from stepping up from a mild, relatively harmless dose to an excessive and harmful one. Three cigarettes a month won't hurt you much, and a little smack on the behind once a month won't harm your child. But who smokes three cigarettes a month? To call corporal punishment addictive would be imprecise, but there's a strong natural tendency to escalate the frequency and severity of punishment. More than one-third of all parents who start out with relatively mild punishments end up crossing the line drawn by the state to define child abuse: hitting with an object, harsh and cruel hitting, and so on. Children, endowed with wonderful flexibility and ability to learn, typically adapt to punishment faster than parents can escalate it, which helps encourage a little hitting to lead to a lot of hitting. And, like frequent smoking, frequent corporal punishment has serious, well-proven bad effects.

The negative effects on children include increased aggression and noncompliance—the very misbehaviors that most often inspire parents to hit in the first place—as well as poor academic achievement, poor quality of parent-child relationships, and increased risk of a mental-health problem (depression or anxiety, for instance). High levels of corporal punishment are also associated with problems that crop up later in life, including diminished ability to control one's impulses and poor physical-health outcomes (cancer, heart disease, chronic respiratory disease). Plus, there's the effect of increasing *parents'* aggression, and don't forget the consistent finding that physical punishment is a weak strategy for permanently changing behavior.

But parents keep on hitting. Why? The key is corporal punishment's temporary effectiveness in stopping a behavior. It does work—for a moment, anyway. The direct experience of that momentary pause in misbehavior has a powerful effect, conditioning the parent to hit again next time to achieve that jolt of fleeting success and blinding the parent to the long-term failure of hitting to improve behavior. The research consistently shows that the unwanted behavior will return at the same rate as before. But parents believe that corporal punishment works, and they are further encouraged in that belief by feeling that they have a right and even a duty to punish as harshly as necessary.

Part of the problem is that most of us pay, at best, selective attention to science—and scientists, for their part, have not done a good job of publicizing what they know about corporal punishment. Studies of parents have demonstrated that if they are predisposed not to see a problem in the way they rear their children, then they tend to dismiss any scientific finding suggesting that this presumed nonproblem is, in fact, a problem. In other words, if parents believe that hitting is an effective way to control children's behavior, and especially if that conviction is backed up by a strong moral, religious, or other cultural rationale for corporal punishment, they will confidently throw out any scientific findings that don't comport with their sense of their own experience.

The catch is that we frequently misperceive our own experience. Studies of parents' perceptions of child rearing, in particular, show that memory is an extremely unreliable guide in judging the efficacy of punishment. Those who believe in corporal punishment tend to remember that hitting a child worked: She talked back to me, I slapped her face, she shut her mouth. But they tend to forget that, after the brief pause brought on by having her face slapped, the child talked back again, and the talking back grew nastier and more frequent over time as the slaps grew harder.

So what's the case for *not* hitting? It can be argued from the science: Physical discipline doesn't work over the long run, it has bad side effects, and mild punishment often becomes more severe over time. Opponents of corporal punishment also advance moral and legal arguments. If you hit another adult you can be arrested and sued, after all, so shouldn't our smallest, weakest citizens have a right to equal or even more-than-equal protection under the law? In this country, if you do the same thing to your dog that you do to your child, you're more likely to get in trouble for mistreating the dog.

The combination of scientific and moral/legal arguments has been effective in debates about discipline in public schools. Twenty-eight states and the District of Columbia have banned corporal punishment in the schools. But so far, we have shown ourselves unwilling to extend that debate beyond the schools and into the ideologically sacred circle of the family. Where the argument against corporal punishment in the schools has prevailed, in fact, it has often cited parents' individual right to punish their own children as they, and not educators acting for the state, see fit. The situation is different in other countries. You may not be surprised to hear that 91 countries have banned corporal punishment in the schools, but you may be surprised to hear that 23 countries have banned corporal punishment everywhere within their borders, including in the home.

I know what you're thinking: *Are there really 23 Scandinavian countries?* Sweden was, indeed, the first to pass a comprehensive ban, but the list also includes Hungary, Bulgaria, Spain, Israel, Portugal, Greece, Uruguay, Chile, Venezuela, and New Zealand. According to advocates of the ban, another 20 or so countries are committed to full prohibition and/or are debating prohibitionist bills in parliament. The Council of Europe was the first intergovernmental body to launch a campaign for universal prohibition across its 47 member countries.

Practically nobody in America knows or cares that the United Nations has set a target date of 2009 for a universal prohibition of violence against children that would include a ban on corporal punishment in the home. Americans no doubt have many reasons—some of them quite good—to ignore or laugh off instructions from the United Nations on how to raise their kids. And it's naive to think that comprehensive bans are comprehensively effective. Kids still get hit in every country on earth. But especially because such bans are usually promoted with large public campaigns of education and opinion-shaping (similar to successful efforts in this country to change attitudes toward littering and smoking), they do have measurable good effects. So far, the results suggest that after the ban is passed, parents hit less and are less favorably inclined toward physical discipline, and the country is not overwhelmed by a wave of brattiness and delinquency. The opposite, in fact. If anything, the results tell us that there's *less* deviant child behavior.

There could conceivably be good reasons for Americans to decide, after careful consideration, that our commitment to the privacy and individual rights of parents is too strong to allow for an enforceable comprehensive ban on corporal punishment. But we don't seem to be ready to join much of the rest of the world in even having a serious discussion about such a ban. In the overheated climate of nondebate encouraged by those who would have us believe that we are embroiled in an ongoing high-stakes culture war, we mostly just declaim our fixed opinions at one another.

One result of this standoff is that the United States, despite being one of the primary authors of the U.N.'s Convention on the Rights of Children, which specifies that governments must take appropriate measures to protect children from "all forms of physical or mental violence, injury or abuse, neglect or negligent treatment, maltreatment or exploitation," is one of only two nations that have not ratified it. The other is

Somalia; 192 nations have ratified it. According to my colleague Liz Gershoff of the University of Michigan, a leading expert on corporal punishment of children, the main arguments that have so far prevented us from ratifying it include the ones you would expect—it would undermine American parents' authority as well as U.S. sovereignty—plus a couple of others that you might not have expected: It would not allow 17-year-olds to enlist in the armed forces, and (although the Supreme Court's decision in *Roper v. Simmons* has made this one moot, at least for now) it would not allow executions of people who committed capital crimes when they were under 18.

We have so far limited our national debate on corporal punishment by focusing it on the schools and conducting it at the local and state level. We have shied away from even theoretically questioning the primacy of rights that parents exercise in the home, where most of the hitting takes place. Whatever one's position on corporal punishment, we ought to be able to at least discuss it with each other like grownups.

Alan E. Kazdin is John M. Musser professor of psychology and child psychiatry at Yale University and director of Yale's Parenting Center and Child Conduct Clinic. He is also president of the American Psychological Association and author, most recently, of The Kazdin Method for Parenting the Defiant Child.

Article URL: http://www.slate.com/id/2200450/

Medieval literary treasures to go online

By Jack Riley
Tuesday, 23 September 2008

Manchester University's John Rylands Library will be digitising much of its renowned collection of medieval manuscripts, including parts of Chaucer's Canterbury Tales.

The project, funded by the the Joint Information Systems Committee (JISC), will allow widespread access to the works online. Staff will begin to scan the pages using a high definition camera in October and the results will be available by late 2009.

Jan Wilkinson, University Librarian and Director of the John Rylands Library, said: "The Library's Middle English manuscripts are a research resource of immense significance.

"Yet the manuscripts are inherently fragile, and until now access to them has been restricted by the lack of digital copies. Digitisation will make them available to everyone.

"For the first time it will be possible to compare our manuscripts directly with other versions of the texts in libraries located across the world, opening up opportunities for new areas of research."

As well as the Canterbury Tales, the collection includes a number of fifteenth-century copies of the New Testament translated into English by John Wyclif, the fourteenth-century radical and church reformer, and John Lydgate's two major poems, the 'Troy Book' and 'Fall of Princes'.

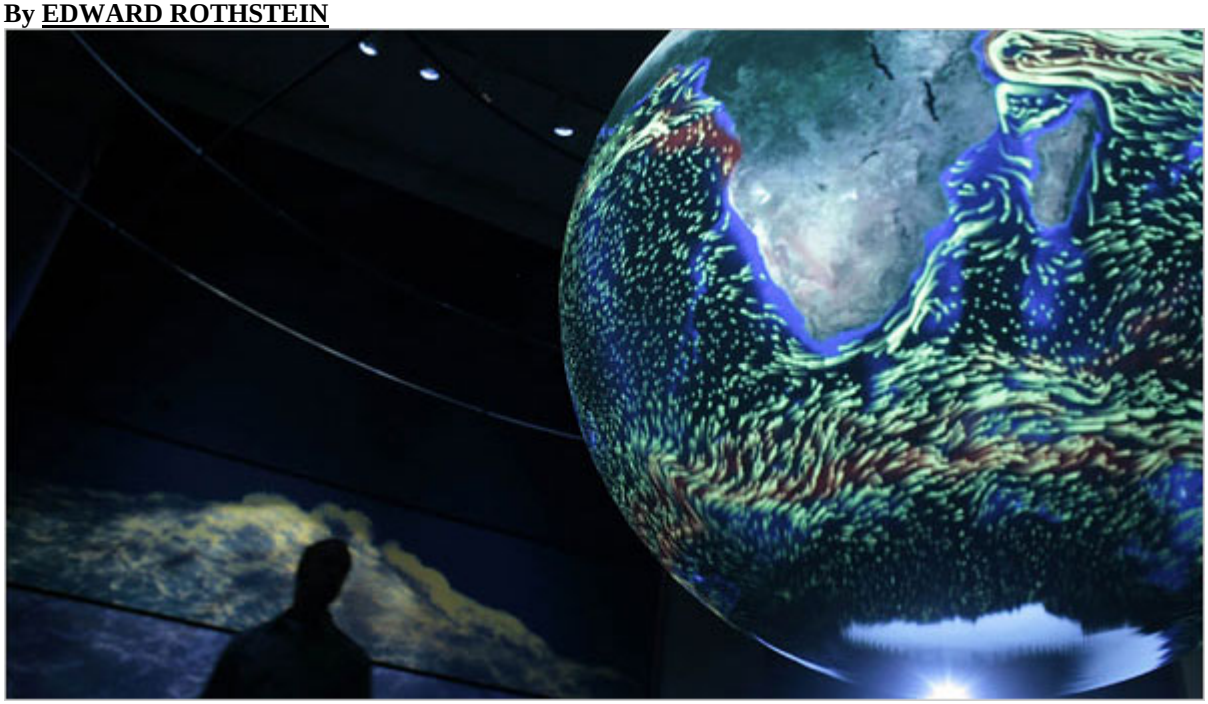
The Forme of Cury, a cookbook written by the personal chefs of Richard II in the late 14th century, is also amongst the works to go online. The Middle English manuscript contains details of more than 200 recipes that were cooked for the royal family.

In total, 40 rare manuscripts are due to be made available on the internet.

http://www.independent.co.uk:80/arts-entertainment/books/news/medieval-literary-treasures-to-go-online-939476.html

Diving Into a New World

By EDWARD ROTHSTEIN



WASHINGTON — The Sant Ocean Hall at the Smithsonian National Museum of Natural History, which opens on Saturday, isn't just about 71 percent of the Earth's surface. It is the largest renovation in the museum's century-long history and a transformation of its largest exhibition space, making it as much about the museum's future as about the ocean's.

Yes, of course, water takes center stage. When you enter the new hall off the Beaux Arts rotunda, the dimmed, atmospheric lighting is meant to suggest the sea; an illuminated blue panel coaxes: "Dive in. Discover it with us." And well above floor level are eight giant video screens showing schools of fish and sea creatures near Belize, the Galápagos Islands and other aquatic utopias pulsing with oceanic life. It is as if the entire 23,000-square-foot exhibition space were submerged in a giant natural aquarium.

But because of the ambition of this project — $80 million was raised from public and private sources, including $22 million from the National Oceanic and Atmospheric Administration — and because it opens as the troubled Smithsonian Institution's administration is in transition, the hall draws attention not only to what it displays but also to what it represents. What it shows is considerable: nearly 700 of the museum's 80 million marine specimens; a 24-foot-long squid found 1,300 feet below the ocean's surface off the Spanish coast; extraordinary images of creatures that astonish landlocked imaginations. But the hall also codifies a major change in the evolution of the natural history museum.

The transformation has been going on for decades. And because this hall's presentation is so strong (despite its flaws), it helps make that vision clear; with some modifications, it could serve as an example for future Smithsonian revisions.

For almost 100 years the same space, now used to show the diversity of the ocean's creatures, sample its fossils or exhibit the life forms of the darkest realms of the deep, was focused on non-Western ethnography and the American Indian. Those exhibits, now retired, were an essential part of the mythological narrative of the 19th-century natural history museum, of which this institution was a late but imposing example.

That old model typically resembled a temple within which the citizen of the West would survey the natural world — dinosaurs, taxidermic animals, geologic marvels — along with the icons and totems of premodern and non-Western tribal cultures. Here is the world out of which modern man evolved, these institutions declared, inspiring appreciation for the wonders of nature and the strangeness of other cultures; of course, they also drew attention to the elevated perspective of the Western observer who was making sense of these objects.

Because today's natural history collections were shaped under that influence, they still reflect it to some extent, even as they work out different interpretations. The Smithsonian certainly will not be getting rid of its valuable ethnographic material, nor should it. (Indeed, the ocean displays feature some examples, including whaling tools of the Alaskan Inupiat and a 26-foot Tlingit canoe commissioned for the hall.)

The nearby National Museum of the American Indian has put forward more radical ideas about what should be done, but the natural history museum is working on its own plan for new anthropology halls, which will not open for at least five years. The first floor's three major halls are now devoted to the natural world: mammals, dinosaurs and now the ocean.

But as the portrayal of human cultures has changed, the Ocean Hall shows how the portrayal of the natural world has as well. First, the displays deliberately push humanity off center stage. They emphasize not what we have accomplished or have collected, but what is unknown or beyond our complete knowledge. Understanding is stymied by the immensity of the world being faced (a similar sentiment to the one inspired by a new model of planetarium embodied by the Rose in New York).

Thus the hall's first section demonstrates that the ocean is more complex and diverse than we can easily grasp. There are translucent heteropods, small, gelatinous creatures with bulbous black eyes: predators deceptively housed in lovely white nautilus-shaped shells. And there is the Atlantic footballfish, a creature so grotesque, with its gaping mouth and gnome's complexion, that its name could come from a desire to kick it.

The sea, embracing extremes of size, contains some of the earth's "tallest forests," including giant kelp more than 300 feet tall, along with microscopic creatures, phytoplankton, that produce "at least half the earth's oxygen." We try to classify life forms but are often led astray by false resemblances and puzzled by new discoveries. A white parasite found on the lips of a Norway lobster in 1995 was named Symbion pandora, but its seeming uniqueness led to its being placed alone in a new phylum.

These are not displays laden with special effects or interactive screens; the impact is more restrained. Even though there is a 1,500-gallon coral reef aquarium in one gallery and, in another, a rotating model of the Earth on which informative simulations and presentations appear, the museum's specimens are mainly colorless creatures preserved in alcohol. They are given life by extraordinary photographs or videos (with a nudge provided by the hall's atmospherics). But the point is clearly made: this world is one in which humans are destined to be dimly groping for understanding and mastery.

At best, this leads to a kind of hushed humility, particularly when confronted with information about the scalding deep-sea vents where the earth's heat propels 700-degree jets of water into the ocean. Even in this hostile environment life forms have been discovered, including bacteria that use seemingly poisonous hydrogen sulfide from the vent water to make food for their hosts. In a 13-minute film, "Deep Ocean Explorers," veteran scientists talk of their descent to the darkest regions of the sea with an appealingly innocent wonder.

Such humility, though, can also be connected with another sense that has grown over the last half-century: humanity is not a part of nature; humanity is apart from nature. It can even seem an intruder in the world that it once confidently ruled. Thus we see the fishing nets that accidentally catch right whales like the one named Phoenix, who was born in 1987 and tracked ever since; she bears the scars of her escape, as we can see, because hanging overhead is her 45-foot replica.

We are told of the dangers of the overharvesting of fish, the hazards of industrial waste, the risks of global warming. Computer kiosks challenge viewers to propose ways to reduce their carbon footprints. Next to the harshest aspects of humanity's effects evoked in such environmental displays, an exhibit's gaping, sharp-toothed, 25 million-year-old jawbone of a great white shark looks almost welcoming.

Over all, though, the hall is relatively judicious in these warnings, working hard to find Homo sapiens a proper place to stand. It tries not to break completely with the traditional museum model. It even celebrates the crucial importance of collecting specimens, since the institution has a scientific research arm.

And in one long side gallery is a narrative history of oceanic evolution told through fossils, including, most dramatically, a wall on which the "great dying" is displayed: 252 million years ago nearly 95 percent of all sea species became extinct. The cause might have been a volcanic eruption or an asteroid — a disaster that dwarfs the more familiar disappearance of dinosaurs 65 million years ago. You proceed past a display laden with stone creatures, then pass a red barrier representing the catastrophe and are faced with the few survivors.

There is room for improvement, of course. In some galleries explanations could be clearer. And the museum could have been more imaginative in some expositions, the way Deborah Cramer so often is in her inspiring companion volume to the hall, "Smithsonian Ocean: Our Water, Our World."

But so much can be learned here, and the new model of the museum is so well integrated with the valuable parts of the old that the Ocean Hall makes the sea change in museum life look promising.

The Sant Ocean Hall opens on Saturday at the Smithsonian National Museum of Natural History, 10th Street and Constitution Avenue NW, Washington; (202) 633-1000.

http://www.nytimes.com/2008/09/27/arts/design/27ocea.html?_r=1&th&emc=th&oref=slogin

Want Better Mileage? Simple Device Which Uses Electrical Field Could Boost Gas Efficiency Up

Prototype of the fuel device. (Credit: Image courtesy of Temple University)

ScienceDaily (Sep. 26, 2008) — With the high cost of gasoline and diesel fuel impacting costs for automobiles, trucks, buses and the overall economy, a Temple University physics professor has developed a simple device which could dramatically improve fuel efficiency as much as 20 percent.

According to Rongjia Tao, Chair of Temple's Physics Department, the small device consists of an electrically charged tube that can be attached to the fuel line of a car's engine near the fuel injector. With the use of a power supply from the vehicle's battery, the device creates an electric field that thins fuel, or reduces its viscosity, so that smaller droplets are injected into the engine. That leads to more efficient and cleaner combustion than a standard fuel injector, he says.

Six months of road testing in a diesel-powered Mercedes-Benz automobile showed that the device increased highway fuel from 32 miles per gallon to 38 mpg, a 20 percent boost, and a 12-15 percent gain in city driving.

The results of the laboratory and road tests verifying that this simple device can boost gas mileage.

"We expect the device will have wide applications on all types of internal combustion engines, present ones and future ones," Tao wrote in the study published in Energy & Fuels.

Further improvements in the device could lead to even better mileage, he suggests, and cited engines powered by gasoline, biodiesel, and kerosene as having potential use of the device.

Temple has applied for a patent on this technology, which has been licensed to California-based Save The World Air, Inc., an environmentally conscientious enterprise focused on the design, development, and commercialization of revolutionary technologies targeted at reducing emissions from internal combustion engines.

According to Joe Dell, Vice President of Marketing for STWA, the company is currently working with a trucking company near Reading, Pa., to test the device on diesel-powered trucks, where he estimates it could increase fuel efficiency as much as 6-12 percent.

Dell predicts this type of increased fuel efficiency could save tens of billions of dollars in the trucking industry and have a major impact on the economy through the lowering of costs to deliver goods and services.

"Temple University is very excited about the translation of this new important technology from the research laboratory to the marketplace," said Larry F. Lemanski, Senior Vice President for Research and Strategic Initiatives at Temple. "This discovery promises to significantly improve fuel efficiency in all types of internal combustion engine powered vehicles and at the same time will have far-reaching effects in reducing pollution of our environment."

Journal reference:

1. Tao et al. **Electrorheology Leads to Efficient Combustion**. *Energy & Fuels*, 2008; DOI: 10.1021/ef8004898

Adapted from materials provided by Temple University.

http://www.sciencedaily.com/releases/2008/09/080925111836.htm

New More Efficient Ways To Use Biomass

Researchers have developed a new catalyst that directly converts cellulose, the most common form of biomass, into ethylene glycol, an important intermediate product for chemical industry. (Credit: Copyright Wiley-VCH)

ScienceDaily (Sep. 26, 2008) — Alternatives to fossil fuels and natural gas as carbon sources and fuel are in demand. Biomass could play a more significant part in the future. Researchers in the USA and China have now developed a new catalyst that directly converts cellulose, the most common form of biomass, into ethylene glycol, an important intermediate product for chemical industry.

The catalyst is made of tungsten carbide and nickel on a carbon support.

Currently, biomass is mainly used in the form of starch, which is degraded to make sugars and then fermented to make ethanol. It would be cheaper to use cellulose, which is the main component of plant cell walls and thus the most plentiful organic compound on Earth.

In contrast to starch from corn and grain, cellulose is not a food, so there would be no competition between its use as food or as raw material and fuel. At the moment, cellulose is mainly processed by fermentation. However, splitting cellulose into its individual sugar components, which can then be fermented, is a slow and cost-intensive process. The direct conversion of cellulose into useful organic compounds is thus an attractive alternative.

Initial reactions using various noble-metal catalysts have been developed. Their disadvantage is that large amounts of expensive metal are needed to break down the cellulose. On an industrial scale, these processes are thus not economical. A less costly and more effective catalyst is needed.

A team led by Tao Zhang at the Dalian Institute of Chemical Physics (China) and Jingguang G. Chen at the University of Delaware (Newark, USA) has now developed just such a system. The catalyst is made of tungsten carbide deposited on a carbon support. Small amounts of nickel improve the efficiency and selectivity of the catalyst system: a synergetic effect between the nickel and tungsten carbide not only allows 100 % conversion of cellulose, but also increases the proportion of ethylene glycol in the resulting mixture of polyalcohols to an amazing 61 %. Ethylene glycol is an important intermediate in the chemical industry. For example, in the plastics industry it is needed for the production of polyester fibers and resins, and in the automobile industry it is used as antifreeze.

Journal reference:

1. Na Ji et al. **Direct Catalytic Conversion of Cellulose into Ethylene Glycol Using Nickel-Promoted Tungsten Carbide Catalysts**. *Angewandte Chemie*, September 11, 2008 DOI: 10.1002/anie.200803233

Adapted from materials provided by Wiley-Blackwell.

http://www.sciencedaily.com/releases/2008/09/080923104307.htm

Social Class Dictates Cancer Risk

ScienceDaily (Sep. 26, 2008) — Cervical and lung cancer are more common in poor people while rates of breast cancer and melanoma are higher in the wealthy. A detailed analysis of the incidence of these four different kinds of cancer, carried out on more than 300,000 English cancer patients describes the effects of socioeconomic group, region and age.

Lorraine Shack at the North West Cancer Intelligence Service and a team of researchers working on behalf of the United Kingdom Association of Cancer Registries used information from all eight English cancer registries from 1998 to 2003. They compared the rates of these four cancers with variations in deprivation. The data were further categorised by the person's age.

As Shack describes, "We looked at all invasive cases of lung cancer, cervical cancer, malignant melanoma of the skin and female breast cancer. The deprivation statistics were based on average levels of socioeconomic status in the patient's local area."

Malignant melanoma and breast cancer were most common in more affluent groups. According to the authors, the variations in breast cancer rates may be because "Women from affluent socioeconomic groups are more likely to have their first child at a later age, have fewer children in their lifetime and take hormone replacement therapy. Each of these factors is associated with a slightly higher incidence of breast cancer."

The higher incidence of melanoma in the more wealthy groups may be partially explained by holidays abroad and the resulting exposure to UV. However, the authors highlight that sun bed use may have an impact across all socioeconomic groups, particularly in the young, "It is difficult to estimate sun bed use as most salons are private and poorly regulated. However, anecdotal evidence suggests that sun bed use is increasing in England, particularly for teenagers and young adults. Sun parlours tend to be clustered in areas of deprivation."

The study also found that the highest rates of lung and cervical cancer occurred in the most deprived groups. The higher incidence of lung cancer in the deprived groups is squarely blamed on smoking, "Smoking is strongly associated with socioeconomic status and over 80% of lung cancer cases can be estimated to be attributable to smoking."

Worryingly, the authors found the greatest difference in lung cancer rates between socioeconomic groups in people under the age of 65, possibly suggesting that the more deprived groups continue to smoke while the wealthier groups have quit smoking.

The study provides further evidence of the link between wealth and cancer risk. Research such as this has a crucial role to play in tailoring government screening programmes, and other preventative measures, to local needs.

Journal reference:

1. Lorraine Shack, Catrina Jordan, Catherine S Thomson, Vivian Mak and Henrik Moller. **Variation in incidence of breast, lung and cervical cancer and malignant melanoma of skin by socioeconomic group in England**. *BMC Cancer*, (in press)

Adapted from materials provided by BMC Cancer, via EurekAlert!, a service of AAAS.

http://www.sciencedaily.com/releases/2008/09/080925214831.htm

Earth's Magnetic Field Reversals Illuminated By Lava Flows Study

Polarity reversals have occurred hundreds of times at irregular intervals throughout the planet's history – most recently about 780,000 years ago – but scientists are still trying to understand how and why. (Credit: iStockphoto/Tobias Machhaus)

ScienceDaily (Sep. 26, 2008) — Earth's north magnetic pole is shifting and weakening. Ancient lava flows are guiding a better understanding of what generates and controls the Earth's magnetic field – and what may drive it to occasionally reverse direction.

The main magnetic field, generated by turbulent currents within the deep mass of molten iron of the Earth's outer core, periodically flips its direction, such that a compass needle would point south rather than north. Such polarity reversals have occurred hundreds of times at irregular intervals throughout the planet's history – most recently about 780,000 years ago – but scientists are still trying to understand how and why.

A new study of ancient volcanic rocks, reported in the Sept. 26 issue of the journal Science, shows that a second magnetic field source may help determine how and whether the main field reverses direction. This second field, which may originate in the shallow core just below the rocky mantle layer of the Earth, becomes important when the main north-south field weakens, as it does prior to reversing, says Brad Singer, a geology professor at the University of Wisconsin-Madison.

Singer teamed up with paleomagnetist Kenneth Hoffman, who has been researching field reversals for over 30 years, to analyze ancient lava flows from Tahiti and western Germany in order to study past patterns of the Earth's magnetic field. The magnetism of iron-rich minerals in molten lava orients along the prevailing field, then becomes locked into place as the lava cools and hardens.

"When the lava flows erupt and cool in the Earth's magnetic field, they acquire a memory of the magnetic field at that time," says Singer. "It's very difficult to destroy that in a lava flow once it's formed. You then have a recording of what the paleofield direction was like on Earth."

Hoffman, of both California Polytechnic State University at San Luis Obispo and UW-Madison, and Singer are focusing on rocks that contain evidence of times that the main north-south field has weakened, which is one sign that the polarity may flip direction. By carefully determining the ages of these lava flows, they have mapped out the shallow core field during multiple "reversal attempts" when the main field has weakened during the past million years.

During those periods of time, weakening of the main field reveals "virtual poles," regions of strong magnetism within the shallow core field. For example, Singer says, "If you were on Tahiti when those eruptions were taking place, your compass needle would point to not the North Pole, not the South Pole, but Australia."

The scientists believe the shallow core field may play a role in determining whether the main field polarity flips while weakened or whether it recovers its strength without reversing. "Mapping this field during transitional states may hold the key to understanding what happens in Earth's core when the field weakens to a point where it can actually reverse," Hoffman says.

Current evidence suggests we are now approaching one of these transitional states because the main magnetic field is relatively weak and rapidly decreasing, he says. While the last polarity reversal occurred several hundred thousand years ago, the next might come within only a few thousand years.

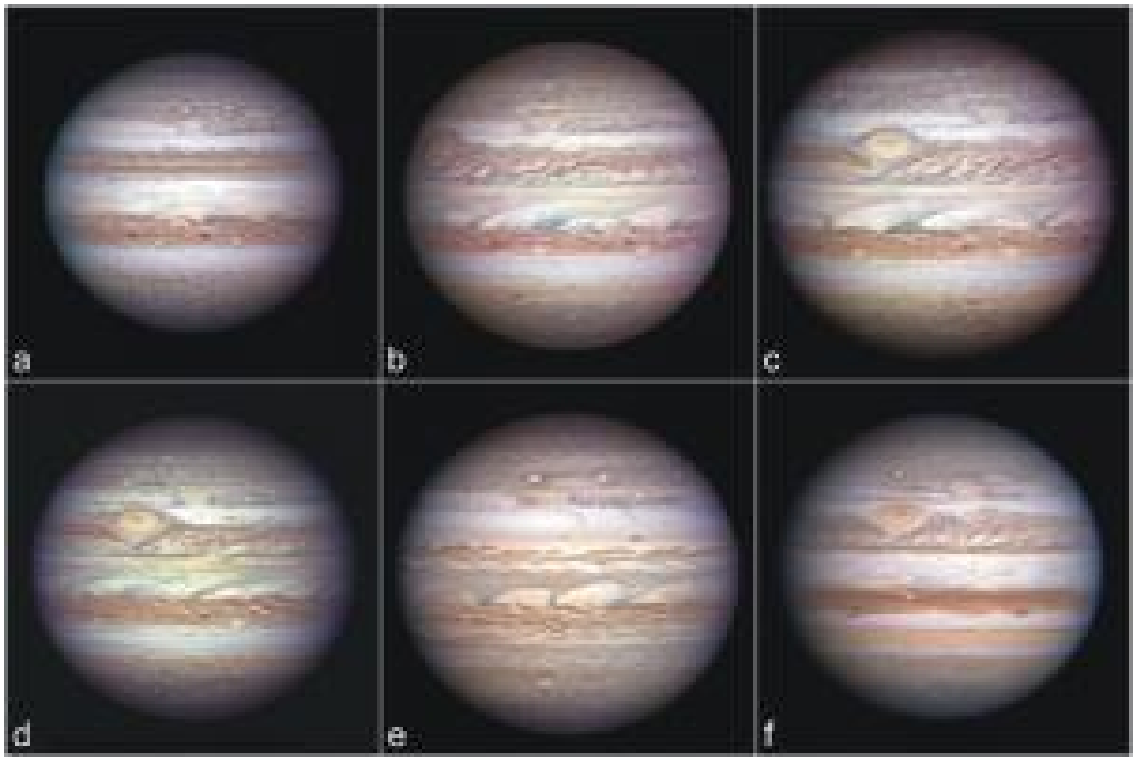
"Right now, historic records show that the strength of the magnetic field is declining very rapidly. From a quick back-of-the-envelope prediction, in 1,500 years the field will be as weak as it's ever been and we could go into a state of polarity reversal," says Singer. "One broad goal of our research is to provide some predictive capability for what could happen and what could be the signs of the next reversal."

Hoffman and Singer's research has been supported largely by grants from the National Science Foundation.

Adapted from materials provided by University of Wisconsin-Madison.

http://www.sciencedaily.com/releases/2008/09/080926105021.htm

Diffusion Caused Jupiter's Red Spot Junior To Color Up



High quality amateur observations of Jupiter from the IOPW database. (Credit: (a) 2005 April 29, Damian Peach; (b) 2006 April 12, Damian Peach; (c) 2006 April 24, Damian Peach; (d) 2006 May 28, Christopher Go; (e) 2007 May 26, Damian Peach; (f) 2008 May 8, Anthony Wesley.)

ScienceDaily (Sep. 26, 2008) — A study has given new insights into why Oval BA, a giant anticyclone on Jupiter also known as Red Spot Junior, suddenly turned from white to red in a period of just a few months.

Dr Santiago Pérez-Hoyos, of the Planetary Science Group of the University of the Basque Country in Spain, is presenting the findings at the European Planetary Science Congress in Münster on Monday 22nd September.

“Our group has made an in-depth analysis of all the aspects regarding the history and evolution of Oval BA. The most strongly reddened region was an annulus around its centre. However, when we calibrated images taken with the Hubble Space Telescope, we found that it didn’t actually alter in red or infrared wavelengths during the period. Instead, it became darker in blue and ultraviolet wavelengths, which made it appear visually redder,” said Dr Pérez-Hoyos.

Oval BA was formed in 2000 by the merger of smaller vortices called the White Ovals in a chain of collisions that started back in 1998. The apparent reddening was first reported by amateur astronomers in early 2006, but it was not until April that professional astronomers were able to image the impressive alteration of the second largest storm in the Solar System after the Great Red Spot (GRS).

Using data from Cassini, the Hubble Space Telescope, NASA’s New Horizons mission and computer models the Planetary Science Group analysed possible causes for the colour change, including alterations to dynamical, photochemical and diffusion processes.

Dr Pérez-Hoyos said, “The most likely cause appears to be an upward and inward diffusion of either a coloured compound or a coating vapour that may interact later with high energy solar photons at the upper levels of Oval BA.”

Comparing Oval BA with the GRS, the group found that the GRS is still redder than BA, most likely because it is higher in Jupiter’s atmosphere, thicker and contains a higher concentration of the mysterious unknown chemical agents (cromophores) that give Jupiter its browny-red colour.

The group were able to rule out that the reddening was caused by any dynamical processes. They found no change to the strength of the “hurricane” and, although some changes in the circulation around the spot had taken place, the maximum wind speeds (which may range up to 400 kilometres per hour or more) were consistent with measurements previous to 2000 of the Oval or its white predecessors.

The group modelled the wind flow in detail using high resolution simulations, in order to understand why the red material may be confined to the annulus region and how the colour change happened in the observed time scales. The model accounts well for the temperature and wind structure inside the oval BA.

Models also showed that the change could not be attributed to interactions of Oval BA with the GRS, which were relatively close at the time. The flow around both vortices is in the zonal directions and is so strong that separates both storms

The oval height did not change over the period and there were no large changes in the temperature gradient of the oval.

Dr Pérez-Hoyos said, “There is much to be understood about this problem yet. Future spacecraft missions and a continuous observation of the planet (as done by amateur astronomers) will surely give us new clues on the behaviour of Jupiter’s atmosphere that will result in a better understanding of it.”

Background on Oval BA

The Oval BA is an enormous anticyclone (high-pressure system) that may be compared to a colossal hurricane in the Earth’s atmosphere. Oval BA is half the size of the Great Red Spot and is large enough to contain the Earth inside it.

Adapted from materials provided by Europlanet.

http://www.sciencedaily.com/releases/2008/09/080922100452.htm

Photonic Crystal Biosensors Detect Protein-DNA Interactions

Paul Hergenrother, left, professor of chemistry, and Brian Cunningham, professor of electrical and computer engineering, hold biosensors they've developed that are capable of detecting protein-DNA interactions. (Credit: Photo by L. Brian Stauffer)

ScienceDaily (Sep. 26, 2008) — Scientists at the University of Illinois have developed a new class of disposable, microplate-based optical biosensors capable of detecting protein-DNA interactions. Based on the properties of photonic crystals, the biosensors are suitable for the rapid identification of inhibitors of protein-nucleic acid and protein-protein interactions.

"Protein-DNA interactions are essential for fundamental cellular processes such as transcription, DNA damage repair and apoptosis," said Paul Hergenrother, a professor of chemistry and an affiliate of the university's Institute for Genomic Biology. "Screening for compounds that inhibit particular kinds of protein-DNA binding is a very important step in drug development."

Developed by Brian Cunningham, a U. of I. professor of electrical and computer engineering, the photonic crystal biosensors consist of a low-refractive-index polymer grating coated with a film of high-refractive-index titanium oxide, attached to the bottom of a standard 384-well microplate. Each well functions as a tiny test tube with a biosensor in the bottom.

"First, we selectively attach a biomolecule, such as DNA, to the bottom of each well. Then we see how that biomolecule interacts with other molecules, including drugs," said Cunningham, who also is affiliated with the university's Beckman Institute, Micro and Nanotechnology Laboratory, and Institute for Genomic Biology.

By examining the light reflected from the photonic crystal, the researchers can tell when molecules are added to, or removed from, the crystal surface. The measurement technique can be used, for example, in a high-throughput screening mode to rapidly identify molecules and compounds that prevent DNA-protein binding.

The researchers demonstrated the new technology by examining two very different protein-DNA interactions. The first was the bacterial toxin-antitoxin system MazEF, which binds to DNA in a sequence-specific manner and is thought to be responsible for the maintenance of resistance-encoding plasmids in certain infectious bacteria. The second was the human apoptosis-inducing factor (AIF), a protein that binds to chromosomal DNA in a DNA-sequence-independent manner.

The photonic crystal biosensor technology was further utilized in a screen for inhibitors of the AIF-DNA interaction, and through this screen aurin tricarboxylic acid was identified as the first in vitro inhibitor of AIF.

"Aurin tricarboxylic acid displayed about 80 percent inhibition of AIF-DNA binding," Hergenrother said. "Aurin tricarboxylic acid was the only compound to exhibit significant inhibition out of approximately 1,000 compounds screened."

While the photonic crystal biosensor was demonstrated only for protein-DNA interactions, analogous experiments with protein-RNA interactions, and protein-protein interactions are also possible, Cunningham said. "We also could grow cancer cells on the photonic crystal surface, and see how different drugs affect cell growth."

The researchers describe their work in the journal ACS Chemical Biology. With Cunningham and Hergenrother, the paper's co-authors are graduate student and lead author Leo Chan, and graduate students Maria Pineda and James Heeres.

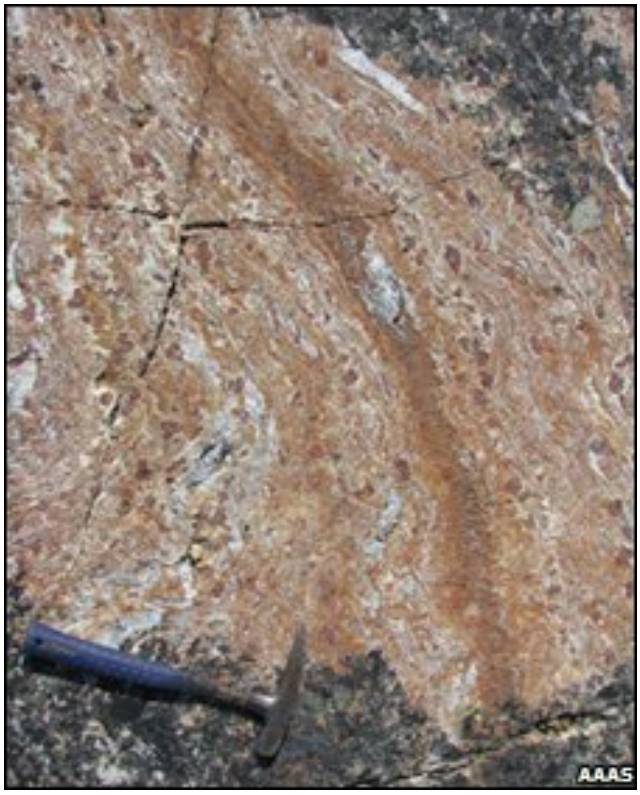
The work was funded by the National Institutes of Health.

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

http://www.sciencedaily.com/releases/2008/09/080923121954.htm

Team finds Earth's 'oldest rocks'

By James Morgan
Science reporter, BBC News



Earth's most ancient rocks, with an age of 4.28 billion years, have been found on the shore of Hudson Bay, Canada.

Writing in Science journal, a team reports finding that a sample of Nuvvuagittuq greenstone is 250 million years older than any rocks known.

It may even hold evidence of activity by ancient life forms.

If so, it would be the earliest evidence of life on Earth - but co-author Don Francis cautioned that this had not been established.

"The rocks contain a very special chemical signature - one that can only be found in rocks which are very, very old," he said.

The professor of geology, who is based at McGill University in Montreal, added: "Nobody has found that signal any place else on the Earth."

"Originally, we thought the rocks were maybe 3.8 billion years old.

The exciting thing is that we've seen a chemical signature that's never been seen before

Prof Don Francis, McGill University

"Now we have pushed the Earth's crust back by hundreds of millions of years. That's why everyone is so excited."

Ancient rocks act as a time capsule - offering chemical clues to help geologists solve longstanding riddles of how the Earth formed and how life arose on it.

But the majority of our planet's early crust has already been mashed and recycled into Earth's interior several times over by plate tectonics.

Before this study, the oldest whole rocks were from a 4.03 billion-year-old body known as the Acasta Gneiss, in Canada's Northwest Territories.

The only things known to be older are mineral grains called zircons from Western Australia, which date back 4.36 billion years.

Date range

Professor Francis was looking for clues to the nature of the Earth's mantle 3.8 billion years ago.

He and colleague Jonathan O'Neil, from McGill University, travelled to remote tundra on the eastern shore of Hudson Bay, in northern Quebec, to examine an outcrop of the Nuvvuagittuq greenstone belt.

They sent samples for chemical analysis to scientists at the Carnegie Institution of Washington, who dated the rocks by measuring isotopes of the rare earth elements neodymium and samarium, which decay over time at a known rate.

The oldest rocks, termed "faux amphibolite", were dated within the range from 3.8 to 4.28 billion years old.

"4.28 billion is the figure I favour," says Francis.

"It could be that the rock was formed 4.3 billion years ago, but then it was re-worked into another rock form 3.8bn years ago. That's a hard distinction to draw."

The same unit of rock contains geological structures which might only have been formed if early life forms were present on the planet, Professor Francis suggested.

Early habitat?

The material displays a banded iron formation - fine ribbon-like bands of alternating magnetite and quartz.

This feature is typical of rock precipitated in deep sea hydrothermal vents - which have been touted as potential habitats for early life on Earth.

"These ribbons could imply that 4.3 billion years ago, Earth had an ocean, with hydrothermal circulation," said Francis.

"Now, some people believe that to make precipitation work, you also need bacteria.

"If that were true, then this would be the oldest evidence of life.

"But if I were to say that, people would yell and scream and say that there is no hard evidence."

Fortunately, geologists have already begun looking for such evidence, in similar rocks found in Greenland, dated 3.8 billion years.

"The great thing about our find, is it will bring in people here to Lake Hudson to carry out specialised studies and see whether there was life here or not," says Francis.

"Regardless of that, or the exact date of the rocks, the exciting thing is that we've seen a chemical signature that's never been seen before. That alone makes this an exciting discovery."

Story from BBC NEWS:
http://news.bbc.co.uk/go/pr/fr/-/2/hi/science/nature/7639024.stm

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The Final Days

By JILL ABRAMSON

THE WAR WITHIN

A Secret White House History 2006–2008

By Bob Woodward

Illustrated. 487 pp. Simon & Schuster. $32

The Bob Woodward rollout is always strictly scripted. His books are "held back," meaning that no advance copies are available for reviewers and that pain-of-death secrecy vows are extracted from book review editors. His "bombshells," those fly-on-the-wall details from inside the power dome and classified memos impossible to obtain (for all except Woodward), are disclosed in multipart, front-page articles in The Washington Post, where for decades the author was an assistant managing editor. (He is now an associate editor.) Then there is the bump from exclusive interviews on "60 Minutes" followed by more televised amplification, an éclat that almost always results in a No. 1 best seller.

This time, with the arrival of "The War Within," the final volume in his four-part Bush oeuvre, the script is the same, but the headlines mask what is really newsworthy about the book. The reported bombshells — that the Bush administration has secretly monitored nearly every move and word of the Iraqi prime minister, Nuri al-Maliki, and that American military and intelligence officials have used top-secret spying methods to zap foreign terrorists in Iraq — are hardly shocking. And this final narrative, which glacially explores the nearly three-year process by which President Bush and his counselors came to the epiphany that they needed a new strategy for the spiraling violence in Iraq, is far less gripping than any of the previous Woodward books on Bush.

What is most consequential about "The War Within" is the evolutionary shift it marks for the author. Woodward is famous for his flat, just-the-facts-ma'am style, if one can call it that. It is the old-fashioned newspaperman's credo of show, don't tell. He rarely pauses in his narratives to synthesize or analyze, let alone to judge his powerful subjects, especially those who have been his sources. He has only one angle, the close-up. The striking lack of contextual analysis in all his books about presidents going back to Richard Nixon has angered some readers and critics, most famously Joan Didion, who in an appraisal of six Woodward volumes (from the 1980s and '90s) wrote, "These are books in which measurable cerebral activity is virtually absent."

In contrast to his other Bush volumes, "The War Within" does provide interstitial analysis and judgments throughout. It also renders an extremely harsh final appraisal of President Bush. In a stinging epilogue, Woodward concludes: "For years, time and again, President Bush has displayed impatience, bravado and unsettling personal certainty about his decisions. The result has too often been impulsiveness and carelessness and, perhaps most troubling, a delayed reaction to realities and advice that run counter to his gut."

SOME will deem this judgment obvious and long overdue. They will also come away hungry if they expect Woodward to grapple with the central question surrounding the Iraq war: whether it was launched and fought with just cause. Still, Woodward has traveled far since the publication of his first two volumes; in both he viewed events through an overly heroic prism in the aftermath of 9/11. In his third volume, "State of Denial," the author took a mulligan. Writing as the insurgency in Iraq was spinning out of control, he rewound the story back to the beginning and offered a much tougher account of Bush's war policies and their executors.

In "The War Within," more judgmental still, President Bush shrinks in stature as the narrator's presence grows. Cynics will say that Woodward waited until the last book to fully criticize the president and his closest advisers because he no longer needs access to them.

Certainly, Woodward's conclusions about President Bush's certitude, intolerance of dissent and poor management of Iraq policy, including the legal overreaching of his antiterror campaign, have been explored more deeply in earlier fine books by Thomas Ricks, Michael Gordon, Ron Suskind, Robert Draper, George Packer and Jane Mayer, among others. But, on balance, it is impossible not to be impressed by Woodward's reporting, which provides a vivid week-by-week chronology, from the post-9/11 attack on Afghanistan to the Iraq surge, of how the president's war policy unspooled and of its consequences. His unadorned factual accounts have supplied many other authors and reporters with an invaluable record of what happened and what was said at pivotal junctures during this presidency.

In fact, some of the defining details of the Bush administration's missteps have come directly from Woodward. There is former Secretary of State Colin Powell's Pottery Barn rule ("You break it, you own it"); the former director of central intelligence George Tenet's infamous "slam dunk" description of the faulty case on Iraq's W.M.D. programs; Vice President Dick Cheney and Powell going after each other in a blistering argument over Iraq policy; Senator Chuck Hagel telling Bush he has gone too deep into the bunker; Defense Secretary Donald Rumsfeld's face sinking when the retired Army general Jack Keane presents him with irrefutable evidence that more troops are needed if security is ever to be attained in Iraq. In the new book, there is a remarkable scene that captures it all, as an obtuse President Bush demands that the words "victory," "win" and "success" be restored to a speech given when the violence in Iraq is spiking. More than mere anecdotal detail, this is the memorable stuff of history.

And with a White House as secretive as this one, where few of the most important participants are likely to write honestly or insightfully anytime soon (at least if Tenet's recent memoir is any indication), there is immense value in the Woodward quartet. The fine detail is wonderfully illuminating, and cumulatively these books may be the best record we will ever get of the events they cover.

It isn't fair to take any author to task for not writing the books that others would have preferred him to write. In Woodward's case, he is nonideological, so his books bitterly disappoint the cable shouters, left and right. In any case, contemporaneous reporting seldom, if ever, can deliver the brilliant texture of, say, Robert Caro's three volumes (with another in the works) on Lyndon Johnson, unmatched in their scrupulous combination of documentation and interviews, which together reflect the wisdom of passing time. As the protagonist in Woodward's massive narrative, George W. Bush does not evolve or deepen from book to book, as Franklin D. Roosevelt does in Arthur Schlesinger Jr.'s cycle on the New Deal. But Woodward does capture the essence of his subject. With his optimistic bromides and certainty, Bush emerges as a president at once consequential and shallow, physically aged but intellectually and psychologically untouched. "In some ways," Woodward observes, "President Bush has changed very little since my first interview with him on Dec. 20, 2001." What is surprising when you read the four books in sequence, as I did this spring and summer, is that despite Woodward's neutral approach, all the failings of the president and his cabinet are plainly visible, especially in the case of the central character, Bush. The books offer a definitive portrait of him even if, in real time, Woodward sometimes seems unaware of what he has.

Indeed, Woodward's evolving consciousness furnishes the true drama of these books. There is damning material in all four volumes, but in the first two, Woodward was unable or unwilling to fully acknowledge this. As the war turned sour and Bush's flaws overwhelmed his strengths, Woodward began to reassess both Bush and his own earlier views. He ends by providing readers not just the material to draw their own judgments but a harsh judgment of Bush himself. In so doing, he has stepped much closer to the role of - biographer, not just stenographer.

"Bush at War," the first book, published in 2002, was justifiably criticized at the time for being glossy and credulous. The accusation holds today. The reader flinches at some junctures, as when, before beginning the war in Afghanistan, Bush asks if humanitarian aid can be airlifted there. "For Bush, it was fundamental to what he sees as the moral mission of the United States," Woodward faithfully writes. At another point, Woodward transcribes, rather than analyzes, the Bush worldview: "His vision clearly includes an ambitious reordering of the world through pre-emptive and, if necessary, unilateral action to reduce suffering and bring peace." Yet even in this first book Woodward gives a clear foreshadowing of the most fatal failing of the White House. "Bush's leadership style bordered on the hurried," he writes. "He wanted actions, solutions. Once on a course, he directed his energy at forging on, rarely looking back, scoffing at — even ridiculing — doubt and anything less than 100 percent commitment."

In the second book, "Plan of Attack," about the decision to go to war in Iraq, President Bush becomes even more dismissive of advisers who issue pleas of caution but fear being banished for disloyalty. The full consequences of the dead certainty inside the White House come fully into focus in "State of Denial," with its account of the chaos that Iraq became in the three years after the war began. Now, in this concluding volume, Woodward finally shows the full "Kabuki" of generals knowing they are losing but telling Bush he is beloved on the streets of Iraq. Too slowly, the president and his team accept that a new strategy with higher troop levels is needed to calm the storm.

Read together, the four Bush volumes trace a strange arc, with the third and fourth acts seeming to belong to a different play. In three of them, the most valuable synthesis of the material is tacked on as epilogues that all but scream, "My editor made me do it." (Perhaps Woodward should follow the example of Francis Ford Coppola, who restitched his "Godfather" sagas into a single movie.) Throughout, Woodward's writing style can be so clunky that it is unintentionally comic, as in this beginning for a chapter in which Iraq's violence verges on Hobbesian anarchy: "Condi Rice's worries were escalating."

These books offer a chilling lesson in how not to lead. They also describe the tragic pattern of a president who operates impulsively, guided solely by his instincts, abetted but ill-served by advisers who fail in the crucial task of speaking truth to power. Even in "Bush at War," the book most favorable to the White House, President Bush's leadership mode combines grandiosity ("We're going to rout out terror wherever it may exist") and bluster ("We're going to find out who did this," Bush tells Cheney, "and we're going to kick their asses"). His bottom line, as expressed to Woodward in two interviews, is: "A president has got to be the calcium in the backbone."

Thus, he resists any suggestion that more time is needed to hit back at the terrorists after 9/11. When former Senator Thomas Daschle reminds the president that war is a powerful word and Cofer Black of the C.I.A. warns that the fighting in Afghanistan will be neither bloodless nor easy, the president counters: "That's war. That's what we're here to win." In his interviews with Woodward, the president constantly refers to his "instincts" and gut reactions. From the beginning the author senses danger in a leader whose "instincts are almost his second religion."

But Bush doesn't listen only to his inner voice. He also receives a powerful early lesson from Karl Rove: history always goes to the victor, whatever mistakes may be committed along the way. And so, in the subsequent three books, Bush is obsessed with being able to claim a win in Iraq.

In "Plan of Attack," the author's doubts grow. When Bush tells him that "freedom is God's gift to everybody in the world. . . . I believe we have a duty to free people," Woodward, in a rare interpolation,

asks whether such a conviction might seem "dangerously paternalistic." "Those who become free appreciate the zeal" is the president's retort.

So too, in the early deliberations over Iraq, George Tenet realizes that with President Bush, "you paid the biggest price by doubting," which meant, in turn, that "suddenly there seemed to be no penalty for taking risks and making mistakes." No wonder we arrive later at "slam dunk."

Colin Powell and his deputy, Richard Armitage, are among the sources who are let off too lightly. Powell "senses a war fever" emitted by the White House and requests an audience with the president. But once in his presence, Powell doesn't really take his full say and fails to toss "his heart on the table." Then, on the eve of the war, Woodward accepts that it was unthinkable for Powell, despite his reservations, to walk away and not put his "war uniform on." But what if Powell had publicly broken with the president over the war? Might it have made a difference? It is a question Woodward fails to ask.

(In "The War Within," Woodward at last confronts the reality that the casus belli had been discredited: "No W.M.D. had been found, many saw the war as a catastrophe and Powell's reputation was irretrievably linked to it, forever damaged." And he quotes James A. Baker III, the principal voice of the Iraq Study Group, who says that Powell might have been the one person who could have prevented the war.) In "Plan of Attack" Woodward acknowledges an error of his own: he admits he should have pushed The Washington Post to publish a front-page article about the flimsiness of the intelligence on W.M.D. I was Washington bureau chief for The Times while this was happening, and I failed to push hard enough for an almost identical, skeptical article, written by James Risen. This was a period when there were too many credulous accounts of the administration's claims about Iraq's W.M.D. (including some published in The Times and The Post). Woodward, with whom I had a few professional encounters (being on panels and such) during my 20 years as a reporter and editor in Washington, does not provide as full a story of the administration's W.M.D. campaign as do two other excellent books, Frank Rich's "Greatest Story Ever Sold" and Michael Isikoff and David Corn's "Hubris."

In "State of Denial," Woodward, no longer the passive observer of events, charts the period during the insurgency when the obdurate optimism of Bush, Cheney and Rumsfeld became a refusal to confront reality. Woodward challenges Rumsfeld on the rising number of attacks in Iraq and is left "speechless" when Rumsfeld likens the situation to a bowl of fruit. Today this book may be better remembered for the fart jokes with which Bush and Rove amuse themselves, or for the disclosure that the White House chief of staff, Andrew Card, and the first lady, Laura Bush, wanted the president to dump Rumsfeld. But its most powerful pages relate the dawning realization by the president's men that "Bush was in denial about Iraq."

The fact that Woodward was unable to interview Bush for his third book may have liberated him to reach sharper conclusions, though again the result is marred by Woodward's cozy relationships with some sources. Too many of the descriptions of Bush come from Prince Bandar of Saudi Arabia, a longtime Woodward source who may be more self-serving than reliable.

IN "The War Within," Bush remains inured to harsh truths. Gen. George Casey concludes that the principal problem with Iraq "is the president himself," a perception that informs the narrative as it records years of dithering during which the president stubbornly refuses to accept, even as the evidence mounts, that a military strategy based on Rumsfeld's lean troop levels and the lack of a viable post-invasion plan make the "victory" he demands thoroughly unachievable. And the White House's insistence on loyalty and optimism inhibits even the few realists left on the team, like the National Security Council aide Meghan L. O'Sullivan and the State Department deputy Philip Zelikow. O'Sullivan finally brings herself to tell Bush that Iraq is "hell," but Zelikow, who made more than a dozen visits to Iraq and recognized the bleakness of the picture, sheds his pessimism in Bush's presence. "Perhaps Zelikow didn't want to be entirely out of step with the optimism or didn't want to be seen as a naysayer," Woodward speculates. "Perhaps he could not overcome the old cliché that advisers fold in front of the president." Zelikow's boss, Condoleezza Rice, is also complicit. She knows that Bush needs to hear the skeptical, not only the

best, case from his military men, but she too softens the reality for the president, first as national security adviser and then as secretary of state. And she doesn't dare go around Cheney or Rumsfeld to deliver the truth.

In interviews with Woodward, Bush praises Rice's successor as national security adviser, Stephen J. Hadley, as the architect of the surge, which has reduced the number of attacks in Baghdad and other parts of the country (helped by a new alliance with some Iraqi tribal leaders and Sunnis). But Woodward, appalled that Bush outsourced a failing war to his national security adviser, faults Hadley for being awe-struck by a president he calls a "visionary." Yet he is a visionary whose sight is sometimes cloudy. In his big interviewwith Bush for this last book, Woodward asks the president to pinpoint the moment he decided to change his war policy and approve the surge. Stumped by the question, Bush recommends Woodward consult Hadley — "Maybe Steve knows it." This is a jaw-dropper quite like the moment in "State of Denial" when Woodward asks Rumsfeld to describe an instance in which Bush revealed himself as a wartime leader and Rumsfeld can't come up with one.

Woodward himself is most shocked by Bush's admission that in June 2006 he realized Iraq strategy wasn't working, but took no positive action to revise it. When Woodward asks him whether he should have sent more troops earlier, Bush responds, "I haven't spent a lot of time analyzing whether more troops in 2003" would have changed the situation. At the height of the insurgent attacks, Bush demands the impossible: "I want to be able to say we have a plan to punch back," in order to "fight off the impression that this is not winnable."

If there is a hero in this sad tale, it is Gen. David Petraeus, the prosecutor of the surge, on whom the author, back in heroizing mode, seems to have a man crush: "At 53, Petraeus remained a slim man with boyish features, famously smart, articulate and motivated."

But even Petraeus, competent though he is, remains subordinate to the single figure who dominates this four-book narrative. "In the end, one lesson remained," Woodward concludes, "a lesson played out again and again through the history of American government: of all the forceful personalities pacing the halls of power, of all the obdurate cabinet officers, wily deputies and steely-eyed generals in or out of uniform, of all the voices in the chorus of Congress clamoring to make themselves heard, one person mattered most."

"The War Within" includes one last epilogue — or apologia. In an effort at self-justification, Woodward points out that the seeds that grew into "State of Denial" and "The War Within" were planted and indeed had sprouted in his first two volumes. He makes a plausible case, though it would have been better, for him and for us, if his judgments had been woven into the original texts. Even now Woodward doesn't divulge his own view of the war itself, beyond saying the obvious: "The outcome of the Iraq war, now in its sixth year, remains uncertain."

But Woodward's own judgment of the war and of Bush doesn't really matter. In the course of four books he has given readers the conversations and documents we need to reach our own judgments. He has also, however unevenly and imperfectly, supplied enough synthesis and analysis to make that judgment genuinely informed. Sure, these books can be a slog. But they stand as the fullest story yet of the Bush presidency and of the war that is likely to be its most important legacy.

Jill Abramson, The Times's managing editor for news, was Washington bureau chief from 2001 to 2003.

http://www.nytimes.com/2008/09/28/books/review/Abramson-t.html?8bu&emc=bua1

What My Copy Editor Taught Me

By DOROTHY GALLAGHER

My copy editor died.

No need to be upset on my account. I hadn't seen Helene Pleasants for at least 10 years before her death; and even those closest to her would agree that her death was timely. After a long life, with one great adventure at its heart, many pleasures and pitfalls, Helene died at the age of 93. Hopefully, she died in her sleep. Helene would have killed me for that last sentence.

I mention Helene's death because she was not only my first editor, but the editor of my life. When I was young, and thus necessarily ignorant, I was hired as a junior editor at Redbook magazine. This meant, essentially, that I was given into Helene's tutelage. I had my notions ("But I wanted that sentence to read ambiguously . . .") and Helene's patience was not inexhaustible. Luckily for me, I wasn't a total fool, and I caught on: what Helene offered was vital to anyone who cared about writing. In musical terms, she had perfect pitch.

Helene had no literary theories — she had literary values. She valued clarity and transparency. She had nothing against style, if it didn't distract from the material. Her blue pencil struck at redundancy, at confusion, at authorial vanity, at the wrong and the false word, at the unearned conclusion. She loved good writing, therefore she loved the reader: good writing did not cause the reader to stumble over meaning. By the time Helene was finished with me seven years later, I knew how to read a sentence and how to fix one. I knew what a sentence was supposed to do. I began to write my own sentences; needless to say, the responsibility for them is my own.

A cigarette perpetually burned in Helene's ashtray. On her right ring finger she wore her mother's gold wedding band. (She never married.) I seem to remember an amethyst ring as well. Otherwise, her wardrobe consisted of several almost identical, unstylish tweed suits and white blouses. Her hair was gray and cut short. To me, who thought myself inevitably young, she seemed inevitably middle-aged. Time was another thing I knew nothing about.

As I see now, in a photograph sent to me by her nephew, Helene at the beginning of her young womanhood was a lovely, long-eyed creature with full, rounded cheeks and a firm, shapely mouth. She was a Baltimore girl, born in 1915. On her father's side, she had deep Southern roots — plantations, slaves, all of that. And on the Pleasants' side, too, the written word ran in the family. Helene's great-grandfather, James Hungerford, wrote "The Old Plantation," a book known in its time (1859) as the South's answer to "Uncle Tom's Cabin." Helene's father worked for The Baltimore Sun in Mencken's day. In the depths of the Depression, Helene graduated from high school and went to work, first as an intern, then as a reporter, at The Hudson Dispatch in Union City, N.J. During the war she was a reporter for the liberal New York paper PM. She learned her trade on the job; how she turned it into an art is mysterious. Then came her great adventure. In 1945, hired by the United States Information Agency as a writer and editor on the Voice of America, she was sent to India and then to China. She was young, she fell in love. Of course. Things didn't work out exactly as she had hoped. Of course. Neither did her job at the Voice of America.

In 1951, the United States Civil Service Commission notified Helene that "information" had been received, accusing her of sympathy with Soviet Russia and Communism. Helene answered in writing: "I do NOT admire Russia. . . . I am NOT in effect, or any other way, in agreement with the Communists." This was true, as I well know, having known Helene, but it was to no avail. After a two-year battle to save her job, she was fired from the Voice of America. It was 1953, at the height of McCarthy's power, the year the Rosenbergs were executed. The loss of her career was a hard blow. Helene fell into deep depression. But she had to work, she had her mother to support, and after a while she found a job at a men's adventure magazine called Male. From there she went to Pageant, a digest-size magazine, now defunct, that ran articles with titles like "How I Stay in Shape"; Marilyn Monroe was billed as the author of that one. The content of Male and Pageant surely mattered to Helene's sense of herself, but not to her work: a sentence is a sentence, a piece of writing has a job to do. As was true when she went to Redbook a few years later. In those days articles at Redbook ran to 5,000 words, and the subjects, more often than not, were earnest, if not serious. It was a good job. Helene was valued and admired. She stayed at Redbook until she retired. Then, in 1981, when my husband was starting a literary quarterly called Grand Street, I said to him, "You need Helene." He has never been more grateful to me for anything.

"You need Helene" was a phrase I used only last year when a writer, just starting out, asked me to read his first manuscript. I read the manuscript with Helene's eye and ear, which is the way I read everything. What Helene taught me I can't unlearn, any more than I can unlearn how to swim. And when I had finished reading, I made this young writer an offer:

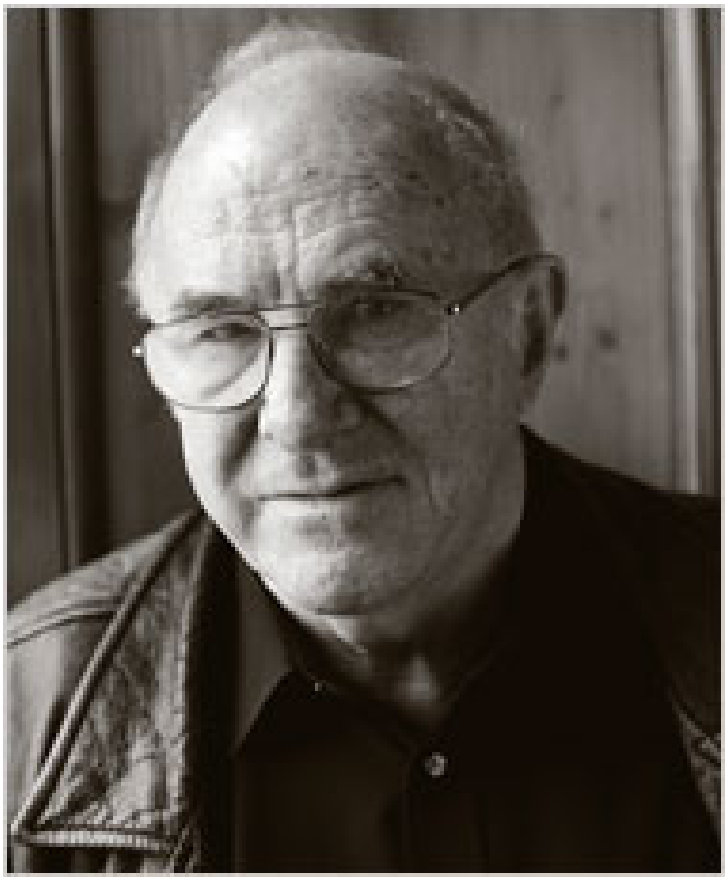
"I had Helene," I said. "You need a Helene. If you like, I'll be your Helene." But when my writer realized what having a Helene meant — his sentences picked apart, his every intention and decision questioned — he politely declined. I hardly blame him. I'd like to believe that he'll rue the day, but I doubt it. Nobody has Helene's standards; nobody reads like Helene anymore. And I've changed my mind: it is a pity that Helene died. As long as she lived, I could still think of myself as a young writer.

Dorothy Gallagher's most recent book, with Edward Sorel, is "The Mural at the Waverly Inn," to be published next month.

http://www.nytimes.com/2008/09/28/books/review/Gallagher2-t.html?8bu&emc=bub1

The Roustabout

By DAVID ORR



Over the past 50 years, Clive James has worked as a British television personality; a radio broadcaster; a travel writer; a trainee bus conductor; a book reviewer for major publications in the United States, Britain and his native Australia; a flunky in a machine shop; a recording artist (the six albums he wrote in the 1970s with the singer-songwriter Pete Atkin are cult classics); a sportswriter; a book shelver; an art critic; a prose elegist for Diana, Princess of Wales ("I am appearing ridiculous now, but it is part of the ceremony, is it not?"); and, naturally, a circus roustabout. He has also, all along and not entirely coincidentally, been a poet. While that last fact is well known in Britain and Australia, James's new book, Opal Sunset: Selected Poems, 1958-2008 (Norton, $25.95), is the first volume of his poetry to be published in the United States.

It isn't necessarily an advantage in the poetry world, especially the American poetry world, to be known for writing things that aren't poetry. We're suspicious of dabblers; we'd prefer for the poet to have, as Emerson put it, "only this one dream, which holds him like an insanity," and we sometimes view single-minded devotion to poetry's institutions as evidence of that larger dedication. In part, this is because we tend to believe that poetry isn't simply something that one does (like pole vaulting or cooking) but rather a byproduct of something that one is (like being Catholic or Native American). Poets, we think, can't help but be poets and do poet-ish things. You might expect a generalist like James to resist this kind of thinking, but as the intriguingly defensive introduction to this collection demonstrates, he's a bit drawn to it himself. Sometimes, for instance, he seems positively determined to fall upon the thorns of Art and bleed, as when he announces that "the poet has to stay. The poet is a lifer. Anyone who gets into the game will soon start wishing that there was a version of it with lower stakes, but there isn't." It's not surprising, then, that over the course of only seven pages, he pauses at least four times to make the distinction

between “being a poet” and “having a reputation in the poetry world”; as in: “Condemned by circumstance, for most of my life, to not having a career as a poet, I have sometimes fretted from the neglect, but always enjoyed the lack of responsibility. It could also be that I have enjoyed a crucial freedom.”

What James wants to do here, of course, is establish that one may be a full-fledged, divinely inspired Romantic poet without doing the things that full-fledged, divinely inspired Romantic poets supposedly do. (You know, striding across darkling moors, engaging in passionate and poisonous affairs, swooning, judging the Academy of American Poets’ James Laughlin Award, etc.) This is both touching and unnecessary. As he rightly notes, the only thing that actually matters is the poetry itself, and while the politics of the literary world can sometimes obscure that fact in the short term, the truth will generally out — if only because readers eventually stop caring who had coffee with Robert Lowell or slept with Lorine Niedecker.

So what kind of poetry does Clive James write? It involves, as you might expect, a little bit of everything. A short list of concepts around which James builds a poem would include: Gabriela Sabatini, Microsoft Windows, the Yasukuni Shrine, Greta Scacchi, the public morals police of Hamas, the painter Jack Butler Yeats (brother of W. B.), Soviet theater, the debate over whether Deckard was a replicant in “Blade Runner” and the death of Johnny Weissmuller. James is a staunch formalist, and most of his work is an approximation of casual talk (“Late summer charms the birds out of the trees / On to our lawn, where the cat gets them”) supported by stanza forms that can be surprisingly challenging (the 12 quatrains in “Echo Echo Echo” are written in potentially jarring monorhymes). The goal is a compact meditation that lends itself to being remembered and recited. In this sense, James is firmly situated in the sociable, plainspoken tradition that runs from Auden through Larkin and on to contemporary writers like Les Murray and Glyn Maxwell. This approach calls for a special sensitivity to tone, and it typically relies on forming a bond with the audience, either through a “we” to which the reader consents or an “I” the reader finds attractive. After all, you can’t begin poems with lines like “Bring me the sweat of Gabriela Sabatini / For I know it tastes as pure as Malvern water” unless you’re pretty sure you can get people to laugh, rather than be mildly grossed out.

And that’s as good a cue as any to point out two important things about James’s book: it is often genuinely funny — a hard trick to manage — and it begins with a poem that is possibly the best and most amusing piece of writing ever devoted to the subject of schadenfreude. That poem is “The Book of My Enemy Has Been Remaindered,” and its first stanza is worth quoting in full:

> The book of my enemy has been remaindered
> And I am pleased.
> In vast quantities it has been remaindered.
> Like a van-load of counterfeit that has been seized
> And sits in piles in a police warehouse,
> My enemy’s much-praised effort sits in piles
> In the kind of bookshop where remaindering occurs.
> Great, square stacks of rejected books and, between them, aisles
> One passes down reflecting on life’s vanities,
> Pausing to remember all those thoughtful reviews
> Lavished to no avail upon one’s enemy’s book —
> For behold, here is that book
> Among these ranks and banks of duds,
> These ponderous and seemingly irreducible cairns
> Of complete stiffs.

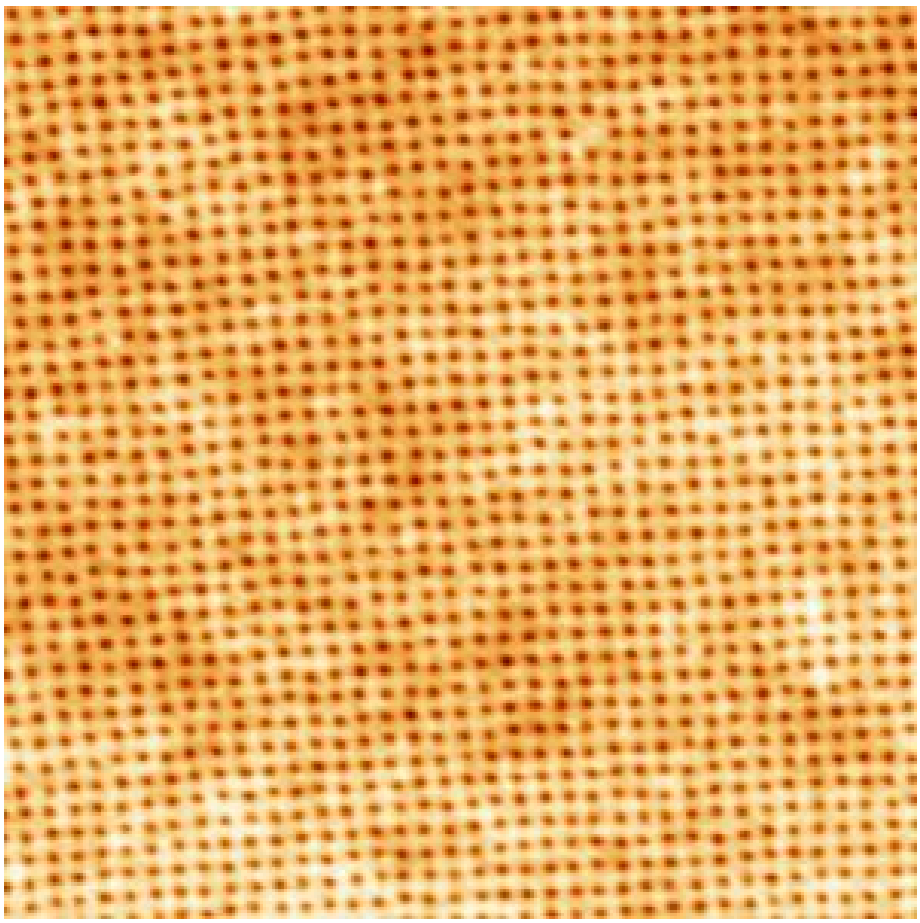
The key here is James’s smartly judged tone — one half pompous belletrist, one half Robert E. Howard. (“Conan, what is best in life?” “To crush your enemies, see them driven before you and see their short story collections listed for 75 cents at Half .com.”) As you might expect, when a subject allows him to

engage his wit, James is a formidable satirist; he's also a surprisingly good love poet, especially when he's able to insulate himself with literature ("You, Mark Antony") or another art ("Woman Resting" turns on a Mancini painting). If that sounds like saying that James is often at his best as a poet whenever he's also being a critic, well, the two roles are perhaps not as separate as one might think.

There are, it should be said, two general problems in "Opal Sunset." The first is that when James realizes something works, he likes to try it again. For instance, "The Book of My Enemy," "Bring Me the Sweat of Gabriela Sabatini" and "A Gesture Towards James Joyce" are all clever pieces, but they're also remarkably similar — in each, James couples an over-the-top persona with a repeating line, like a comedian working a catchphrase. The second problem is that whenever James begins to lose control of his tone, he has a tendency either to wobble into sentimentality ("The heart, the heart. I still can hear it break") or to veer toward a more dressed-up version of what the British call laddishness and what we Americans call drunk-dude-in-a-hotel-bar-after-midnight ("The tall dark knockout who prowled like a lynx / With the chicken satay cooled the optimists"). These aren't decisive flaws, though, and on the whole this is a wry and pleasingly exacting collection. That fact alone will never establish whether Clive James is, somewhere down in the tangled strands of his DNA, a True Poet, but the work gathered here makes it plain that whatever James may be, he knows how to write poems worth reading.

http://www.nytimes.com/2008/09/28/books/review/Orr2-t.html?8bu&emc=bua2

New Nanoscale Process Will Help Computers Run Faster And More Efficiently



Atomic Force Microscope image of a square array of 15nm pores formed by the new technology. (Credit: Image courtesy of University of California - Santa Barbara)

ScienceDaily (Sep. 26, 2008) — Smaller. Faster. More efficient. These are the qualities that drive science and industry to create new nanoscale structures that will help to speed up computers.

Scientists at the University of California, Santa Barbara have made a major contribution to this field by designing a new nanotechnology that will ultimately help make computers smaller, faster, and more efficient. The new process is described in the journal Science, September 26.

For the first time, the UCSB scientists have created a way to make square, nanoscale, chemical patterns – – from the bottom up — that may be used in the manufacture of integrated circuit chips as early as 2011. It is called block co-polymer lithography.

Five leading manufacturers, including Intel and IBM, helped fund the research at UCSB, along with the National Science Foundation and other funders. The university has already applied for patents on the new methods developed here, and it will retain ownership.

A multidisciplinary team led by Craig Hawker, materials professor and director of the Materials Research Laboratory at UCSB, with professors Glenn Fredrickson and Edward J. Kramer, have developed a novel process for creating features on silicon wafers that are between five and 20 nanometers thick. (A nanometer is the thickness of one-thousandth of a human hair.)

Hawker explained that for the future we need more powerful microprocessors that use less energy. "If you can shrink all these things down, you get both," he said "You get power and energy efficiency in one package."

He said that the industry is up against Moore's law, a trend that Gordon Moore, Intel co-founder, first described in 1965 in which the power of the microprocessor doubles every 18 months. "One of the problems is that the industry is now running into physical limitations," said Hawker. "You can't shrink things down any more with the current technology." One of the ways that microprocessors are made is by using a top-down technique called photolithography, which involves shining light onto the surface of a silicon wafer, and making patterns. He explained that the size of the wavelength of light is becoming a limiting factor, and so his team has invented a new way of creating smaller patterns.

"We've come up with this new blending approach, called block co-polymer lithography, or BCP," said Hawker. "It essentially relies on a natural self-assembly process. Just like proteins in the body, these molecules come together and self assemble into a pattern. And so we use that pattern as our lithographic tool, to make patterns on the silicon wafer."

Using this technique, the size of the features is about the same as that of the molecules. They are very small, between five and 20 nanometers. "With this strategy, we can make many more features," said Hawker, "and hence we can pack the transistors closer together and everything else closer together — using this new form of lithography."

When this technique has been tried before, the molecules spontaneously self assembled into hexagonal arrays; they look like bee hives. But since industry uses parallel lines on a square or rectangular grid, the hexagonal arrays have limited application.

"In this article, we've actually shown that by changing the structure of the molecules, and using two self-assembling procedures at the same time, we're actually able to get square arrays, for the first time," said Hawker. "So now you can start to marry the old technology with the new technology for the fabrication of microprocessors."

Hawker said that the new technology was designed to be compatible with current manufacturing techniques, giving it the potential to be a "slip-in" technology. "All the big microprocessor companies like Intel and IBM have invested billions of dollars in their fabrication plants," said Hawker. "They're not going to throw out that technology anytime soon. It is too big of an investment and would not make good business sense. This allows them to introduce a new technology using current tools in the same fabrication plants. So they don't have to make huge up front investments to bring this to manufacturing. That's a key feature."

An analogy that Hawker uses in describing the development of the new methodology of block co-polymers is that of mixing salad dressing. "Think of the block co-polymers as oil and water," said Hawker. "When you make salad dressing you shake up the bottle because the oil and water don't want to be together. They separate into two layers. You shake your salad dressing and you mix everything up into much smaller droplets. What we've done is taken two polymer molecules that hate each other and joined them together. And so they want to separate just like the oil and water in your salad dressing. But because we've molecularly joined them, they can't. And so they separate into very, very small droplets, or domains, based on the fact that they hate each other. Those are the BCPs."

He explained that the interesting feature about this work is that the scientists combined the repulsive force with another self-assembly force which is slightly attractive.

"What we do is take one BCP (made of two components that hate each other) another BCP (again made of two components that hate each other) and simply mix these together," said Hawker. "When we mix

them together, we've designed groups on one chain to be attracted to groups on a different chain, and so they actually start to blend and mix together. It is this combination of all these forces trying to get away from each other, and attract to each other that allows us to make the square arrays. Whereas what nature gives you is hexagonal, if you just use a single component system."

The scientists design the BCPs to have specific structures. And they use simulation to define the structures that are needed to prepare. "We design the molecule by understanding what needs to happen during the self-assembly process," said Hawker. "We need one block to be oil-like and one block to be water-like. So that's our first level of sophistication. We then design the molecular weight or the size of the molecule, to give us the desired feature size."

In the next step, the scientists design into the oil block the sticky groups that will form this attractive interaction, and by controlling the number of sticky groups, different levels of phase separation and different structures are created.

Polystyrene is the oil-like block, and one of the water-soluble blocks is polyethylene glycol. Polyethylene glycol is found in shampoos and many consumer products. It's a non-toxic, water-soluble, biocompatible polymer. By putting those together, the polyethylene glycol loves the water and the polystyrene loves the oil, and they hate each other. Polystyrene is found in disposable coffee cups, and according to the scientists is a fairly cheap commodity material that if designed in the right way, becomes a high value added application.

"The key to this work is that we put all the information into those molecules," said Hawker. "From a molecular level, we've built all the information into them that will allow them to undergo controlled phase separation. And the key is then just simply blending of two specifically designed materials, and then all we do is spin that down into a thin film on a silicon wafer. And then we heat it, and all the information that is pre-built into the molecule does its thing, and gives us the structure. And so that's why it is a really cheap technique. Because all you have to do is heat things up and you get the structures that you desire."

So the team has created a bottom-up approach to making these nanostructures, whereas the standard photolithographic technique, shining light onto the wafer — is a top down engineering approach that requires multimillion dollar equipment.

In addition to Craig Hawker, the authors contributing the research, which was performed at UCSB, are: Chuanbing Tang, a postdoctoral fellow at the Materials Research Laboratory; Glenn Fredrickson, professor of chemical engineering and director of the Mitsubishi Chemical Center for Advanced Materials; Erin M. Lennon, a graduate student with Glenn Fredrickson at the time of the work; and Edward J. Kramer, professor of materials and of chemical engineering. (Lennon is now a National Science Foundation Research Training Group postdoctoral scholar at Northwestern University.)

Adapted from materials provided by University of California - Santa Barbara.

http://www.sciencedaily.com/releases/2008/09/080925144804.htm

Are Fires More Important Than Rain For The Savannah Ecosystem?

The Etosha National Park in the north of Namibia is the second largest nature reserve in Africa, measuring 20,000 square km. (Credit: Julia Zimmermann/UFZ)

ScienceDaily (Sep. 26, 2008) — Natural grass fires are evidently more important for the ecology of savannahs than has previously been assumed. This is the finding of a study carried out in Etosha National Park in the north of Namibia.

It is the first study to have investigated the complex interplay of the factors fire, competition, moisture and seed availability in relation to a grass species. Periodic fires in semi-arid regions can lead to older tufts of grass disappearing, thereby making room for younger grasses. Writing in the Journal of Ecology, the researchers from the Helmholtz Centre for Environmental Research (UFZ), the University of Frankfurt am Main and the University of Cologne say that fire therefore plays an important role in regeneration.

The findings are particularly significant for the management of semi-arid nature reserves, in which, in the absence of natural plant eaters, fires are the only practical means of renewing the grass canopy.

For the study, the researchers selected an area measuring 500 by 500 metres in Etosha National Park because it has one dominant grass species and because it was possible to rule out interference such as grazing and other human influences. Etosha National Park in the north of Namibia is the second largest nature reserve in Africa, measuring 20,000 square kilometres. The temperatures in the semi-arid savannah fluctuate between 6 degrees centigrade in the winter and 35 degrees in the summer. The area under investigation is one of the driest areas in which plants can still grow, with annual rainfall of just 380 mm. That is less than the rainfall in the rain shadow of the Harz mountains.

Stipagrostis uniplumis is the dominant grass species and lives for several years. The researchers observed the growth of these grasses at weekly intervals for one season and measured the most important climate parameters. They also experimented on small areas by sowing additional seeds, carrying out controlled reconstructions of fires, planting competing grass species and using artificial irrigation. They found that the dead grass layer significantly hindered the recruitment of young plants.

Fire can break up the old grass layer, thereby creating opportunities for regrowth. By contrast, artificial irrigation and the addition of seeds did not result in higher recruitment of seedlings.

Journal reference:

1. Zimmermann et al. **Recruitment filters in a perennial grassland: the interactive roles of fire, competitors, moisture and seed availability**. *Journal of Ecology*, 2008; 96 (5): 1033 DOI: 10.1111/j.1365-2745.2008.01409.x

Adapted from materials provided by Helmholtz Association of German Research Centres.

http://www.sciencedaily.com/releases/2008/09/080919183823.htm

Coming Soon: Self-guided, Computer-based Depression Treatment

ScienceDaily (Sep. 26, 2008) — Self-guided treatment for depression could soon be only a mouse click away.

Scientists with the National Space Biomedical Research Institute (NSBRI) are developing an interactive, multi-media program that will assist astronauts in recognizing and effectively managing depression and other psychosocial problems, which can pose a substantial threat to crew safety and mission operations during long-duration spaceflights.

Even though the depression treatment is under development for NASA, project leader Dr. James Cartreine said it could be spun off for use on Earth.

"This project has great potential as a self-guided treatment for many people," said Cartreine, a member of NSBRI's Neurobehavioral and Psychosocial Factors Team. "Depression is the number one cause of disability days in the United States, but it's not only about days lost. Depression also results in presenteeism - showing up for work but not really working."

The depression treatment is part of the Virtual Space Station, a multi-media program that addresses multiple types of potential psychosocial problems and can be used for training before, and for assistance during, missions. Other problems being addressed via the Virtual Space Station include interpersonal conflict, and stress and anxiety.

Cartreine, a Harvard Medical School research psychologist based in the Division of Clinical Informatics at Beth Israel Deaconess Medical Center in Boston, said the Virtual Space Station will make effective therapeutic depression treatment more easily accessible to astronauts aboard the International Space Station and proposed missions to the moon and Mars. Currently, astronauts have audio and video access to psychologists only when communication links are available.

Project co-investigator and former astronaut Dr. Jay Buckey said long-duration spaceflight can be tough on astronauts. "While astronauts are not particularly prone to psychological problems, the environment is very demanding," Buckey said. "On a mission, they face a lot of challenges that could lead to depression."

Buckey, a professor and physician at Dartmouth Medical School, said the depression module and other aspects of the Virtual Space Station are based upon proven methods. "These are unique NSBRI products that did not exist before," Buckey said. "The Virtual Space Station is based on proven treatment programs and is a very helpful way to work on problems in general."

The system's multi-media approach for depression includes graphics and video featuring a psychologist who leads the user through a straightforward process called Problem-Solving Treatment. The system provides feedback based upon the information provided when answering a series of questions.

The first step of the process is to make a problem list and select a problem on which to work. The second and third steps are setting goals and brainstorming ways to reach them. The final two steps are assessing the pros and cons of possible solutions and making an action plan to implement them. The program also helps users plan and schedule enjoyable activities, which people who have depression often stop doing. Additionally, the program provides preventative and educational information on depression.

Cartreine and Buckey, who received input from 29 current and former astronauts while designing the Virtual Space Station, said some of the system's other benefits include its portability and privacy. "It can be delivered to the International Space Station on a flash drive and run directly from that drive, so that the

astronaut has complete control over his or her data," Cartreine said. "The system is private and secure. The user is the only one who can share the information with others."

An early version of the depression treatment system was beta-tested on research stations in Antarctica, which is used as an analog to long-duration spaceflights due to its isolation from the rest of the world, length of stay and team composition. Cartreine said feedback from that early test run has been positive, and a clinical evaluation of the latest version on 68 Boston-area volunteers is about to begin.

"We plan to study the program's ability to treat depression," he said. "We are looking for people who are similar to astronauts, such as people in the technology industry."

Eventually, the researchers want to adapt the system for use in many different settings, giving people access to treatment they may not have now. For instance, people with depression often seek treatment by going to their primary care physician, so the researchers hope to adapt it for use at the doctor's office or in a person's home.

The system could also be beneficial in rural areas where clinical help is in short supply or nonexistent. Other possible locations for use include schools, social service offices, places of worship, military bases, prisons, commercial ships, oil rigs and underwater research stations.

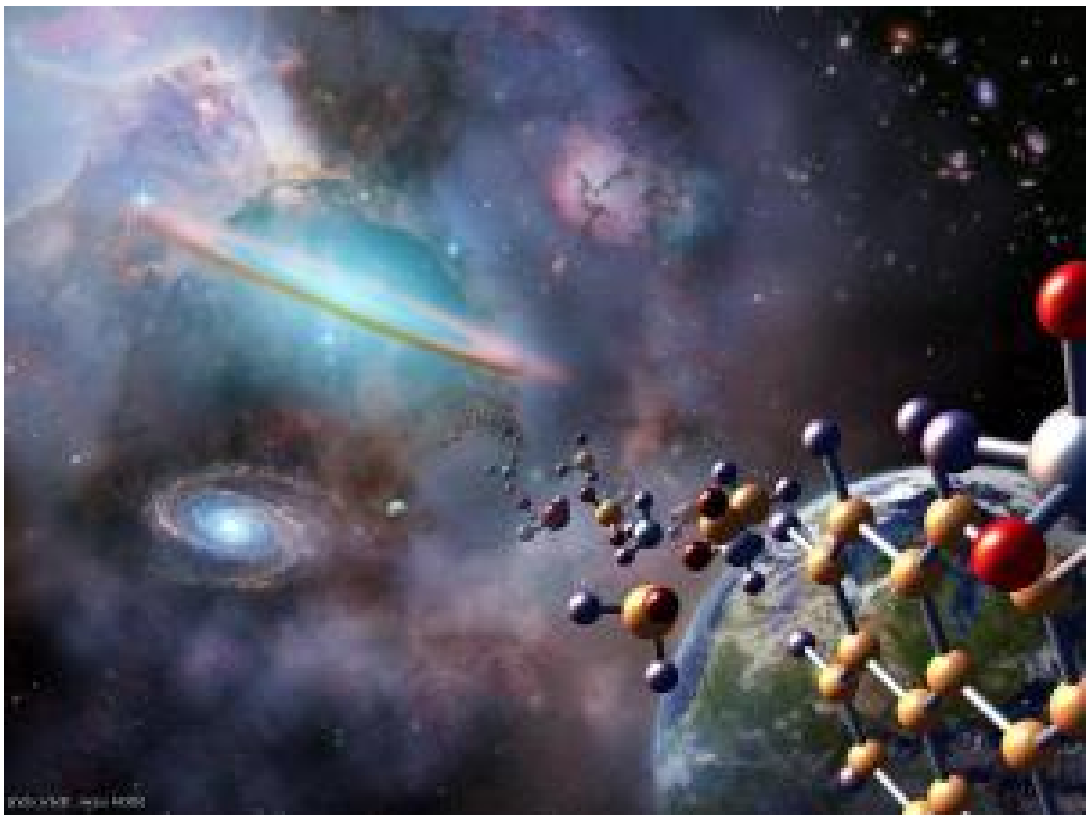
The self-guided treatment project is part of the NSBRI Neurobehavioral and Psychosocial Factors Team portfolio, which includes studies on and development of countermeasures for stress, anxiety, interpersonal conflict and fatigue.

Content on stress and anxiety management for the Virtual Space Station is being developed by Dr. Raphael Rose at UCLA. Harvard Medical School and Massachusetts General Hospital researcher Dr. Gary Strangman is studying the depression treatment program's effects on brain activity using infrared imaging.

Adapted from materials provided by National Space Biomedical Research Institute.

http://www.sciencedaily.com/releases/2008/09/080924125049.htm

NASA Identifies Carbon-rich Molecules In Meteors As The 'Origin Of Life'



These molecules, called quinones, are potentially significant for the "origin of life" or the habitability of planets. (Credit: NASA / Jenny Motar)

ScienceDaily (Sep. 25, 2008) — Tons, perhaps tens of tons, of carbon molecules in dust particles and meteorites fall on Earth daily. Meteorites are especially valuable to astronomers because they provide relatively big chunks of carbon molecules that are easily analyzed in the laboratory. In the past few years, researchers have noticed that most meteorite carbon are molecules called polycyclic aromatic hydrocarbons (PAHs), which are very stable compounds and are survivors.

PAHs are the most common carbon-rich compound in the universe. They are found in everything from distant galaxies to charbroiled hamburgers and engine soot. When they are first formed, or found in space, their structures resemble pieces of chicken wire, fused six-sided rings. However, when found in meteorites, these aromatic rings are carrying extra hydrogen or oxygen.

Scientists at NASA Ames Research Center, Moffett Field, Calif. performed laboratory experiments that explain the process by which these meteoritic hydrocarbons attract the extra hydrogen and oxygen. They are very similar to the molecules identified as evidence of alien microbes in an earlier Science paper (McKay et al 1996).

"Our findings are important because it is the first time anybody explained these carbon-rich molecules found in meteorites. They are similar to the molecules that make-up living things," said Max Bernstein, a space scientist at NASA Ames.

As it happened, their findings were judged significant enough to be award-winning. Published in Science (1999) by Bernstein and fellow NASA Ames scientists Scott Sanford and Louis Allamandola, their paper won the 2008 H. Julian Allen Award at NASA Ames Research Center.

It takes a long time for scientific papers to win awards.

"As scientists, we like to quantify things. Scientific papers are judged by the number of times they are cited in other scientific papers. Other scientists need to say that I couldn't have written my paper without your paper. Often it takes a few years," Bernstein explained.

These carbon-rich molecules are produced by carbon-rich, dying, giant red stars. When they are first formed, astronomers observe them as normal PAHs. However, when they are seen in meteorites billions of years later, they almost always have oxygen or heavy hydrogen attached to them. (Heavy hydrogen carries an extra neutron, and is called a deuterium isotope.) Something happened to change them, say scientists.

To study the process by which these carbon compounds change, the Ames Astrochemistry Laboratory studied PAHs in water ices that were exposed to ultraviolet radiation under space-like conditions. Scientists reproduced conditions including an incredibly high vacuum, extremely low temperatures (- 340 degrees Fahrenheit), and harsh radiation. When the extremely cold temperature was reached, these PAHs were exposed to ultraviolet radiation, and they changed. The experiment successfully reproduced the hydrocarbons found in meteorites. For the first time, scientists were able to show how hydrogen was exchanged for deuterium, or heavy hydrogen.

"It turns out, you only need water ice and radiation to change these molecules," said Bernstein.

Using infrared spectroscopy, the Ames research team proved that the laboratory-produced hydrocarbons were the same hydrocarbons found in meteorites and observed through telescopes. Scientists observed the chemical reaction in a stainless steel chamber as it was happening. The laboratory sample reflected the same infrared colors as the hydrocarbons seen by astronomers using telescopes. Because the techniques used were the same, the results were directly comparable. "We were seeing the same molecules from telescopes as were reproduced in the laboratory," said Sandford.

Once the molecular-size laboratory sample was retrieved, it was taken to Richard Zare's laboratory at Stanford University, where researchers weighed the individual molecules. Findings showed that ices, modified by radiation, created new molecules.

These molecules, called quinones, received considerable attention by the astrobiology community because they are common to all life forms. They are potentially significant for the "origin of life" or the habitability of planets. How does a planet become habitable?

"Molecules from space helped to make the Earth the pleasant place that it is today," said Allamandola, founder of the Ames Astrochemistry Laboratory.

"Our findings were new because we showed how these molecules formed. It was already known that these molecules were in meteorites and delivered to the planets," said Bernstein.

"We now understand why these life-like carbon compounds are raining down on the Earth and other planets. Knowing this will help us search for life on other worlds by distinguishing these molecules from biomarkers," said Bernstein.

Journal references:

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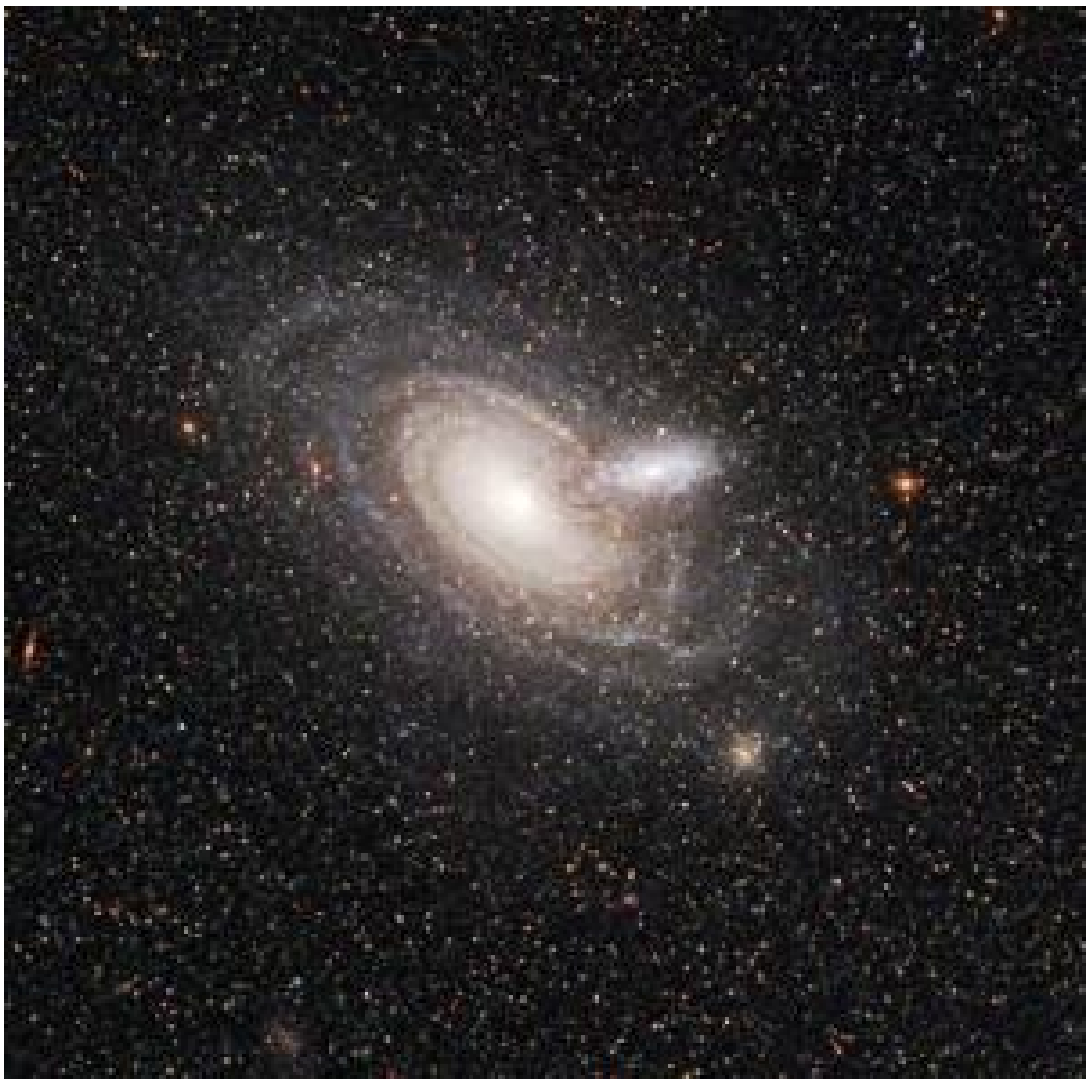
2. McKay, David S., et al. **Search for Past Life on Mars: Possible Relic Biogenic Activity in Martian Meteorite ALH84001**. *Science*, 1996; 273 (5277): 924 DOI: 10.1126/science.273.5277.924

Adapted from materials provided by NASA Ames Research Center.

http://www.sciencedaily.com/releases/2008/09/080925102706.htm

Hubble Spies Galaxy Silhouettes



Astronomers used Hubble's Advanced Camera for Surveys to snap images of NGC 253 when they spied the two galaxies in the background. From ground-based telescopes, the two galaxies look like a single blob. But the Advanced Camera's sharp "eye" distinguished the blob as two galaxies, cataloged as 2MASX J00482185-2507365. (Credit: Credit: NASA, ESA, and The Hubble Heritage Team (STScI/AURA). Acknowledgement: B. Holwerda (Space Telescope Science Institute) and J. Dalcanton (University of Washington))

ScienceDaily (Sep. 25, 2008) — NASA's Hubble Space Telescope has captured a rare alignment between two spiral galaxies. The outer rim of a small, foreground galaxy is silhouetted in front of a larger background galaxy. Skeletal tentacles of dust can be seen extending beyond the small galaxy's disk of starlight.

Such outer dark dusty structures, which appear to be devoid of stars, like barren branches, are rarely so visible in a galaxy because there is usually nothing behind them to illuminate them. Astronomers have never seen dust this far beyond the visible edge of a galaxy. They do not know if these dusty structures are common features in galaxies.

Understanding a galaxy's color and how dust affects and dims that color are crucial to measuring a galaxy's true brightness. By knowing the true brightness, astronomers can calculate the galaxy's distance from Earth.

Astronomers calculated that the background galaxy is 780 million light-years away. They have not as yet calculated the distance between the two galaxies, although they think the two are relatively close, but not close enough to interact. The background galaxy is about the size of the Milky Way Galaxy and is about 10 times larger than the foreground galaxy.

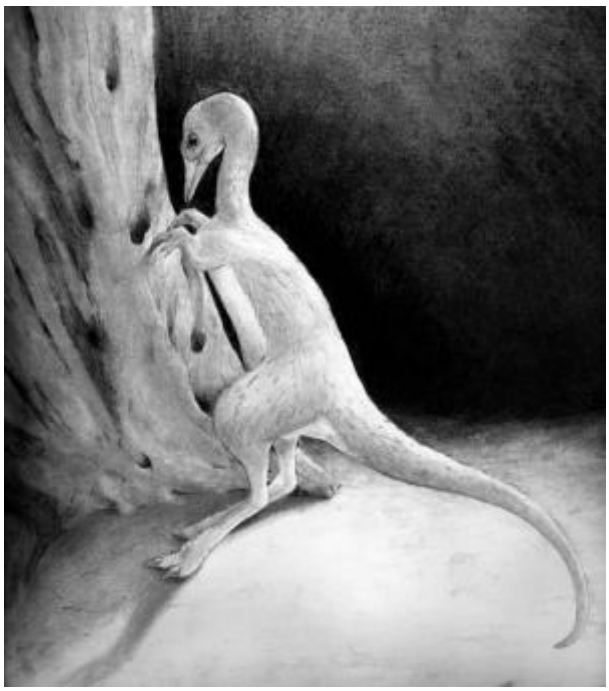
Most of the stars speckled across this image belong to the nearby spiral galaxy NGC 253, which is out of view to the right. Astronomers used Hubble's Advanced Camera for Surveys to snap images of NGC 253 when they spied the two galaxies in the background. From ground-based telescopes, the two galaxies look like a single blob. But the Advanced Camera's sharp "eye" distinguished the blob as two galaxies, cataloged as 2MASX J00482185-2507365. The images were taken on Sept. 19, 2006.

The results have been submitted for publication in The Astronomical Journal.

Adapted from materials provided by NASA.

http://www.sciencedaily.com/releases/2008/09/080919075530.htm

America's Smallest Dinosaur Uncovered



An illustration of Albertonykus borealis. (Credit: Nick Longrich)

ScienceDaily (Sep. 25, 2008) — An unusual breed of dinosaur that was the size of a chicken, ran on two legs and scoured the ancient forest floor for termites is the smallest dinosaur species found in North America, according to a University of Calgary researcher who analyzed bones found during the excavation of an ancient bone bed near Red Deer, Alberta.

"These are bizarre animals. They have long and slender legs, stumpy arms with huge claws and tweezer-like jaws. They look like an animal created by Dr. Seuss," said Nick Longrich, a paleontology research associate in the Department of Biological Sciences. "This appears to be the smallest dinosaur yet discovered in North America."

Called Albertonykus borealis, the slender bird-like creature is a new member of the family Alvarezsauridae and is one of only a few such fossils found outside of South America and Asia. In a paper published in the current issue of the journal Cretaceous Research, Longrich and University of Alberta paleontologist Philip Currie describe the specimen and explain how it it likely specialized in consuming termites by using its small but powerful forelimbs to tear into logs.

"Proportionately, the forelimbs are shorter than in a Tyrannosaurus but they are powerfully-built, so they seem to have served a purpose," Longrich said. "They are built for digging but too short to burrow, so we think they may have been used to rip open log in search of insects."

Longrich studied 70 million-year-old bones that were collected on a dig led by Currie at Dry Island Buffalo Jump Provincial Park in 2002 where the remains of more than 20 Albertosaurus sarcophagus individuals were found. Albertosaurs are a type of tyrannosaur. The bones were placed in storage at the Royal Tyrrell Museum and Longrich came across them while trying to compare Albertosaurus claws to another dinosaur species.

"This is the oldest and most complete dinosaur of its kind known from North America and it provides evidence that these dinosaurs migrated to Asia through North America," he said.

Longrich, who specializes in studying dinosaur-era ancestors of birds, completed his PhD at the University of Calgary under the supervision of zoology professor Anthony Russell. In September 2006 Longrich argued that that earliest known ancestor of birds, a feathered creature called Archaeopteryx, likely flew with wings on all four limbs after examining fossils originally collected in Germany in 1861.

"You can really find amazing things if you just keep looking at fossils we already have sitting in museum collections," he said. "The number of dinosaur discoveries is actually accelerating because we just keep digging up more material to work with."

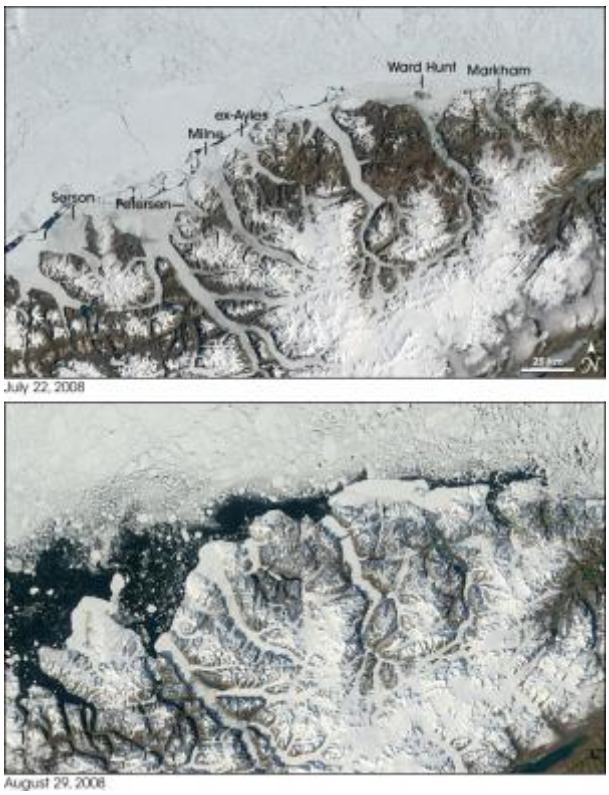
Journal reference:

1. Longrich et al. **Albertonykus borealis, a new alvarezsaur (Dinosauria: Theropoda) from the Early Maastrichtian of Alberta, Canada: implications for the systematics and ecology of the Alvarezsauridae**. *Cretaceous Research*, August 2008; DOI: 10.1016/j.cretres.2008.07.005

Adapted from materials provided by University of Calgary.

http://www.sciencedaily.com/releases/2008/09/080923104414.htm

Study Merges Decade Of Arctic Data As Ice Collapses Into The Sea



Between July 22 (top) and August 29 (bottom), 2008, the five ice shelves remaining in the Canadian Arctic experienced major losses. (Credit: NASA images by Jesse Allen)

ScienceDaily (Sep. 25, 2008) — The Markham Ice Shelf, a massive 19-square-mile platform of ice, broke away from Ellesmere Island in early August and is adrift in the Arctic Ocean. More than half of the nearby Serson Ice Shelf – about 47 square miles – also recently broke away into the sea.

The accelerating sea-ice melt that last summer opened the Northwest Passage through the Canadian Arctic for the first time since satellite records began in 1978 may signal a significant climatic shift that has serious economic and ecological implications for wildlife, natural resources and world politics.

“The summer ice melting has been advancing much faster than any of the climate models predicted,” said David H. Bromwich, Ph.D., a senior research scientist with the Polar Meteorology Group of the Byrd Polar Research Center and a professor with the department of geography at The Ohio State University. “The Arctic region is a very heterogeneous environment, and it’s extremely important that we better understand what’s happening there in order to predict the future more accurately.”

To better understand the evolving northern polar climate, researchers have begun working to merge a decade of detailed atmospheric, sea, ice and land surface measurements into a single computer model-based synthesis. The coupling of these immense data sets will produce complex and instructive descriptions of the changes occurring across the normally frigid, remote region.

An interdisciplinary collaboration of scientists, led by Dr. Bromwich, will “reanalyze” Arctic data from the past decade at three-hour intervals, 15-kilometer distances and 70 layers from the surface of the Earth to the top of the atmosphere. The study area encompasses the Arctic Ocean, the surrounding landmasses and the rivers that drain into the ocean – an enormous area of nearly 29 million square miles.

"We used to think of places like the Arctic as 'data sparse;' they are remote, largely unpopulated with limited measurements of temperatures, winds, etc., and have challenging environments," said Dr. Bromwich, who as a member of the Intergovernmental Panel of Climate Change shared a Nobel Peace Prize with former Vice President Al Gore in 2007.

"With the introduction of space-borne measurements over the last few decades, researchers have been inundated with vast amounts of information. Today, the trick is to figure out how to effectively use all the diverse information sources."

To make sense of the numbers, Dr. Bromwich and his team turned to the Ohio Supercomputer Center for help with the four-year project. The scientists will fill about 350 terabytes of OSC storage space and employ 1,000 cores of the Center's IBM 1350 Opteron cluster over several months to create detailed visualizations.

"OSC is providing the project with resources that will allow us to complete our work in a limited time frame," Dr. Bromwich said. "Other computation centers likely could not have provided the CPU cycles or stored such vast amounts of data."

The National Science Foundation, as part of the International Polar Year observance, funds the Arctic System Reanalysis project, the first comprehensive environmental reanalysis project led by the academic community. IPY is a large scientific program focusing on the Arctic and the Antarctic from March 2007 to March 2009.

This observance comes "amidst abundant evidence of changes in snow and ice: reductions in extent and mass of glaciers and ice sheets, reductions in area, timing, and duration of snow cover, and reductions in extent and thickness of sea ice," according to IPY. "Changes in snow cover and sea ice have immediate local consequences for terrestrial and marine ecosystems."

Each summer, polar bears are being forced from their seal-hunting grounds on the melting sea ice, endangering their limited populations. Hundreds of thousands of acres of peat moss may decompose and begin to release higher amounts of methane and carbon dioxide, potentially accelerating the accumulation of greenhouse gases in the atmosphere, according to Dr. Bromwich.

Arctic countries are already jostling for political control of one of Earth's last remaining frontiers, he said. Russia, Denmark and Canada have claimed the Arctic sea floor in hopes of securing valuable oil, gas and mineral rights. Canada also is claiming political control over shipping lanes that pass by that country's northern islands, and Russia may follow suit, as passages near its shores are nearly clear of ice.

Adapted from materials provided by Ohio Supercomputer Center (OSC), via Newswise.

http://www.sciencedaily.com/releases/2008/09/080922195943.htm

Artificial Meteorite Shows Martian Impactors Could Carry Traces Of Life

The Foton-M3 capsule immediately after landing. The STONE-6 rock samples were fixed in the circular positions at the left side of the capsule. (Credit: Image courtesy of Europlanet)

ScienceDaily (Sep. 25, 2008) — An artificial meteorite designed by the European Space Agency has shown that traces of life in a martian meteorite could survive the violent heat and shock of entry into the Earth's atmosphere. The experiment's results also suggest that meteorite hunters should widen their search to include white rocks if we are to find traces of life in martian meteorites.

The STONE-6 experiment tested whether sedimentary rock samples could withstand the extreme conditions during a descent though the Earth's atmosphere where temperatures reached at least 1700 degrees Celsius. After landing, the samples were transported in protective holders to a laboratory clean-room at ESTEC and examined to see if any traces of life remained. The results will be presented by Dr Frances Westall at the European Planetary Science Congress on 25th September.

Recent missions have gathered compelling evidence for water and sediments on early Mars. Potential traces of Martian life are more likely to be found in sediments that have been formed in water. However, although about 39 known meteorites from Mars have been identified, all are basaltic rock-types and no sedimentary meteorites have been found to date.

Dr Westall said, "The STONE-6 experiment shows that sedimentary martian meteorites could reach Earth. The fact that we haven't found any to date could mean that we need to change the way we hunt for meteorites. Most meteorites have been found in Antarctica, where their black fusion crust shows up clearly against the white snow. In this experiment we found that the sedimentary rocks developed a white crust or none at all. That means that we need to expand our search to white or light-coloured rocks."

The STONE-6 experiment was mounted on a FOTON M3 capsule that was launched from Baikonur on 14th September 2007. Two samples of terrestrial sedimentary rock and a control sample of basalt were fixed to the heat-shield of the return capsule, which re-entered the atmosphere on 26th September after 12 days in orbit. The basalt was lost during re-entry. However, a sample of 3.5 billion year old volcanic sand

containing carbonaceous microfossils and a 370 million year sample of mudstone from the Orkney Islands containing chemical biomarkers both survived.

On examination at ESTEC, the 3.5 billion year old sample of sand from Pilbara in Australia was found to have formed a half-millimetre thick fusion crust that was creamy white in colour. About half the rock had ablated but the microfossils and carbon survived at depth in the sample. Approximately 30 percent of the other sediment, a lacustrine sand from the Orkney Islands, also survived, as did some of the biomolecules. The heat of entry resulted in mineralogical changes in both rocks.

The rocks also transported living organisms, a type of bacteria called Chroococcidiopsis, on the back of the rocks, away from the exposed edge. Unfortunately the heat of reentry was so high, even with a protective two centimetre-thick rock coating, that the organisms were carbonised. They died but their cells still remain as "pompeified" forms.

Dr Westall said, "The STONE-6 experiment suggests that, if martian sedimentary meteorites carry traces of past life, these traces could be safely transported to Earth. However, the results are more problematic when applied to Panspermia, a theory that proposes living cells could be transported between planets. STONE-6 showed at least two centimetres of rock is not sufficient to protect the organisms during entry."

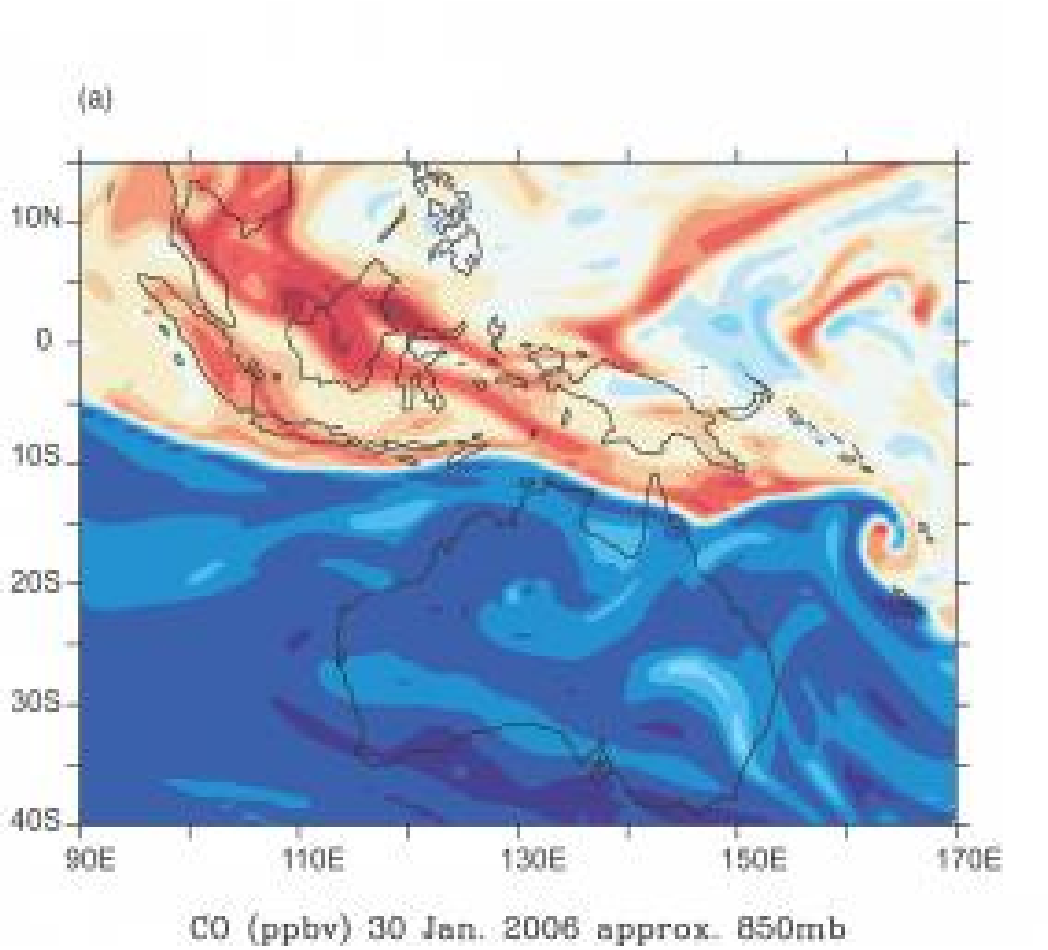
About STONE-6

In 1999, ESA created the first artificial meteorite experiment in space, STONE-1, which tested the effects of entry into the Earth's atmosphere on samples of igneous and sedimentary rock as well as a simulated sample of martian regolith. Since then, further STONE experiments have tested the effects on different rock types and biological traces. During descent, the re-entry capsule reaches a velocity of 7.6 kilometres per second, slightly lower than normal meteorite velocities of 12-15 kilometres per second.

Adapted from materials provided by Europlanet.

http://www.sciencedaily.com/releases/2008/09/080925083252.htm

'Chemical Equator' Discovery Will Aid Pollution Mapping



Colours indicate the carbon monoxide concentrations on 30 January 2006. Red represents polluted air and blue represents clean air. (Credit: Glenn Carver, Cambridge University)

ScienceDaily (Sep. 25, 2008) — Scientists at the University of York have discovered a 'Chemical Equator' that divides the polluted air of the Northern Hemisphere from the largely uncontaminated atmosphere of the Southern Hemisphere.

Researchers from the University's Department of Chemistry found evidence for an atmospheric chemical equator around 50 km wide in cloudless skies in the Western Pacific. Their findings show for the first time that the chemical and meteorological boundaries between the two air masses are not necessarily the same.

The discovery will provide important clues to help scientists to model simulations of the movement of pollutants in the atmosphere more accurately, and to assess the impact of pollution on climate.

Previously, scientists believed that the Intertropical Convergence Zone (ITCZ) formed the boundary between the polluted air of the Northern Hemisphere and the cleaner air of the Southern Hemisphere. The ITCZ is a cloudy region circling the globe where the trade winds from each hemisphere meet. It is characterised by rapid vertical uplift and heavy rainfall, and acts as a meteorological barrier to pollutant transport between the hemispheres.

But the new research, to be published in the Journal of Geophysical Research - Atmospheres, found huge differences in air quality on either side of the chemical equator, which was 50 km wide and well to the north of the ITCZ. The study revealed that carbon monoxide, a tracer of combustion, increased from 40 parts per billion to the south, to 160 parts per billion in the north. The difference in pollutant levels was increased by extensive forest fires to the north of the boundary and very clean air south of the chemical equator being pulled north from the Southern Indian Ocean by a land based cyclone in northern Australia.

The scientists discovered evidence of the chemical equator using sensors on a specially equipped aeroplane during a series of flights north of Darwin. At the time, the ITCZ was situated well to the south over central Australia.

Dr Jacqueline Hamilton, of the Department of Chemistry at York, said: "The shallow waters of the Western Pacific, known as the Tropical Warm Pool, have some of highest sea surface temperatures in the world, which result in the region's weather being dominated by storm systems. The position of the chemical equator was to the south of this stormy region during the ACTIVE campaign.

"This means that these powerful storms may act as pumps, lifting highly polluted air from the surface to high in the atmosphere where pollutants will remain longer and may have a global influence. To improve global simulations of pollutant transport, it is vital to know when the chemical and meteorological boundary are in different locations."

The York researchers were part of a team, including scientists from the universities of Manchester and Cambridge, that studied transport of pollutants in the Western Pacific. The ACTIVE project is led by Professor Geraint Vaughan, of the University of Manchester.

The research was funded by the Natural Environment Research Council (NERC). Other partners include the Australian Bureau of Meteorology and Flinders University. Flights were carried out onboard the NERC Airborne Research and Survey Facility Dornier 228 aircraft.

Adapted from materials provided by University of York.

http://www.sciencedaily.com/releases/2008/09/080923091339.htm

Obesity Surgery Performed Through Vagina, U.S. First

The UC San Diego Center for Future of Surgery is a leader in testing scarless procedures in the U.S. (Credit: UCSD School of Medicine)

ScienceDaily (Sep. 25, 2008) — On Tuesday, September 16, 2008, the UC San Diego Center for the Future of Surgery performed the nation's first gastrectomy, a partial removal of the stomach, through the vagina. This new "natural orifice" technique may be an attractive alternative for the 200,000 U.S. patients who undergo surgery for the treatment of obesity each year.

"More than 15 million people in the United States suffer from severe obesity," said Santiago Horgan, M.D., director of the UC San Diego Center for the Future of Surgery and Center for the Treatment of Obesity. "The Center for the Future of Surgery at UC San Diego is developing and testing innovative techniques that will offer patients globally more and better treatment options."

The sleeve gastrectomy is a weight loss surgery in which 80 percent of the stomach is removed, leaving a slender moon-shaped stomach. The procedure works by dramatically reducing the size of the stomach so that the patient feels full after eating less, takes in fewer calories, and loses weight. This is the first time the minimally invasive procedure has been performed in the U.S. through one of the body's natural openings.

The patient, Maria Soto, 29, of Escondido, California, is 5 feet tall and weighed 253 pounds before surgery. As a six year-old child, Soto suffered from polio which caused permanent disability in her leg, and ongoing back pain, preventing her from exercising regularly.

"I chose this surgery because I needed to lose weight and wanted a procedure that offered less pain and fast healing. Years ago, I had my gallbladder removed and the procedure resulted in two post operative

hernias. I didn't want to risk that again," said Soto. "I liked this option because there were only two small incisions and a short hospital stay."

The 75-minute procedure at UC San Diego Medical Center was performed with two millimeter-sized incisions versus the five incisions required by a traditional laparoscopic procedure. One incision was placed in the belly button through which a camera was placed to safely view the abdomen. The second incision was placed just below the sternum to insert an instrument to retract the liver.

The gastrectomy, or partial stomach removal, was then performed by entering the vagina and making a small incision behind the uterus through which the abdomen and stomach could be accessed with surgical tools. The stomach was reduced in size using conventional surgical staplers. The excess stomach was then pulled down through the abdomen and out of the vagina. The process of performing surgery through a natural opening is known as Natural Orifice Translumenal Endoscopic Surgery or NOTES.

"This is another milestone for Dr. Horgan and his team at the UC San Diego Center for the Future of Surgery. Our goal is to continually improve and expand surgery options using emerging technology so that patients experience less pain and better outcomes," said Mark A. Talamini, M.D., professor and chair of surgery at UC San Diego Medical Center and president of The Society of American Gastrointestinal and Endoscopic Surgeons.

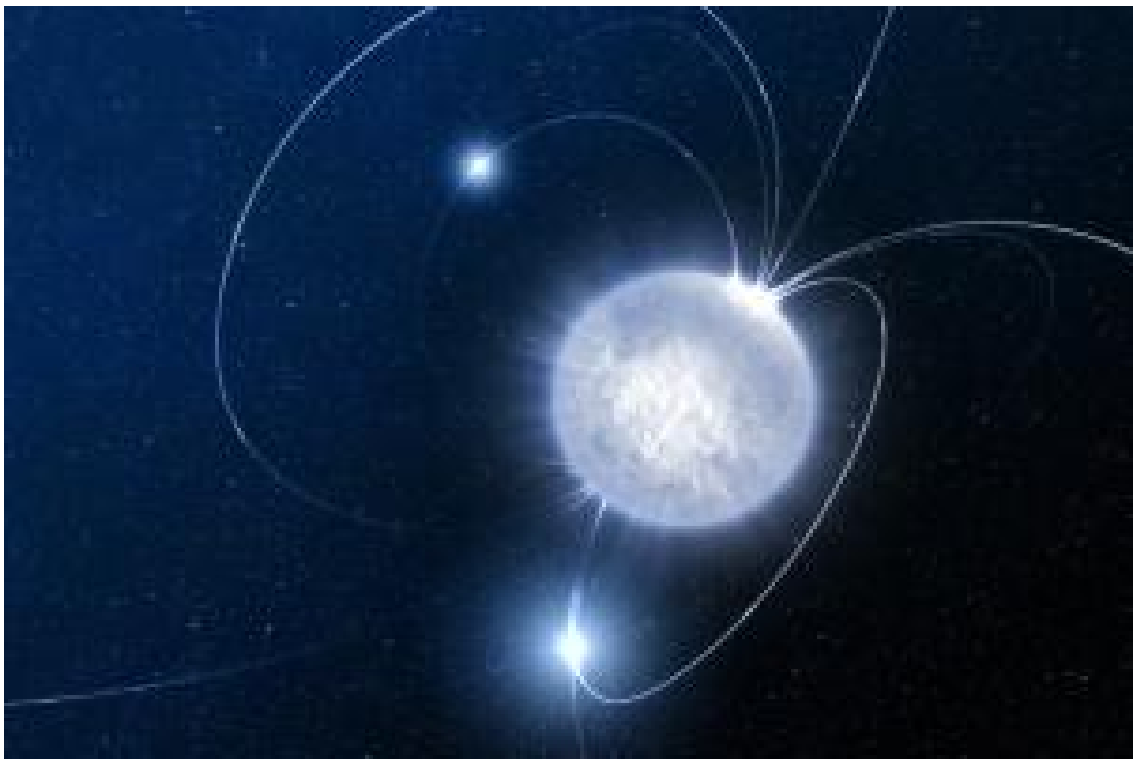
The UC San Diego Center for the Future of Surgery has performed 30 natural orifice clinical trial surgeries. Surgeons at UC San Diego Medical Center were the first in the United States to remove an appendix through the mouth and an appendix through the vagina. These minimally invasive techniques hold promise for future gastrointestinal and esophageal surgeries including treatments such as tumor removal for cancer.

Members of the surgery team included Santiago Horgan, M.D., Garth Jacobsen, M.D., Lauren Fischer, M.D., Brian Wong, M.D. and James Nguyen, M.D.

Adapted from materials provided by University of California, San Diego Health Sciences.

http://www.sciencedaily.com/releases/2008/09/080924190042.htm

Missing Link Of Neutron Stars? Bizarre Hibernating Stellar Magnet Discovered



Astronomers have discovered a possible magnetar that emitted 40 visible-light flashes before disappearing again. Magnetars are young neutron stars with an ultra-strong magnetic field a billion billion times stronger than that of the Earth. The twisting of magnetic field lines in magnetars give rise to 'starquakes', which will eventually lead to an intense soft gamma-ray burst. In the case of the SWIFT source, the optical flares that reached the Earth were probably due to ions ripped out from the surface of the magnetar and gyrating around the field lines. (Credit: ESO/L.Calçada)

ScienceDaily (Sep. 25, 2008) — Astronomers have discovered a most bizarre celestial object that emitted 40 visible-light flashes before disappearing again. It is most likely to be a missing link in the family of neutron stars, the first case of an object with an amazingly powerful magnetic field that showed some brief, strong visible-light activity.

This weird object initially misled its discoverers as it showed up as a gamma-ray burst, suggesting the death of a star in the distant Universe. But soon afterwards, it exhibited some unique behaviour that indicates its origin is much closer to us. After the initial gamma-ray pulse, there was a three-day period of activity during which 40 visible-light flares were observed, followed by a brief near-infrared flaring episode 11 days later, which was recorded by ESO's Very Large Telescope. Then the source became dormant again.

"We are dealing with an object that has been hibernating for decades before entering a brief period of activity", explains Alberto J. Castro-Tirado, lead author of a new paper in the journal Nature.

The most likely candidate for this mystery object is a 'magnetar' located in our own Milky Way galaxy, about 15 000 light-years away towards the constellation of Vulpecula, the Fox. Magnetars are young neutron stars with an ultra-strong magnetic field a billion billion times stronger than that of the Earth. “A magnetar would wipe the information from all credit cards on Earth from a distance halfway to the Moon,” says co-author Antonio de Ugarte Postigo. "Magnetars remain quiescent for decades. It is likely

that there is a considerable population in the Milky Way, although only about a dozen have been identified."

Some scientists have noted that magnetars should be evolving towards a pleasant retirement as their magnetic fields decay, but no suitable source had been identified up to now as evidence for this evolutionary scheme. The newly discovered object, known as SWIFT J195509+261406 and showing up initially as a gamma-ray burst (GRB 070610), is the first candidate. The magnetar hypothesis for this object is reinforced by another analysis, based on another set of data, appearing in the same issue of Nature.

Forty-two scientists used data taken by eight telescopes worldwide, including the BOOTES-2 robotic telescope at EELM-CSIC, the WATCHER telescope at Boyden Observatory (South Africa), the 0.8-m IAC80 at Teide Observatory (Spain), the Flemish 1.2-m Mercator telescope at Observatorio del Roque de los Muchachos (Spain), the Tautenburg 1.34-m telescope (Germany), the 1.5-m at Observatorio de Sierra Nevada (IAA-CSIC), the 6.0-m BTA in Russia, the 8.2-m VLT at ESO in Chile and the IRAM 30-m Pico Veleta y Plateau de Bure telescopes, together with the SWIFT (NASA) and XMM-Newton (ESA) satellites.

About Neutron stars

Neutron stars is the bare, condensed remain of a massive star with between eight and fifteen times the mass of the Sun, which has expelled its outer layers following a supernova explosion. Such stars are only around 20 kilometres in diameter, yet are more massive than the Sun. Magnetars are neutron stars with magnetic fields hundreds of times more intense than the average neutron star fields. The energy release during one flare in the course of a period of activity can amount to the energy released by the Sun in 10 000 years.

Journal reference:

1. Castro-Tirado et al. **Flares from a candidate Galactic magnetar suggest a missing link to dim isolated neutron stars**. *Nature*, 2008; 455 (7212): 506 DOI: 10.1038/nature07328

Adapted from materials provided by ESO.

http://www.sciencedaily.com/releases/2008/09/080924151009.htm

Essential Gene For Forming Ears Of Corn Discovered

Plant geneticists have identified a gene essential in controlling development of the maize plant, commonly known in the United States as corn. (Credit: iStockphoto/Dieter Spears)

ScienceDaily (Sep. 25, 2008) — Cold Spring Harbor Laboratory (CSHL) professor David Jackson, Ph.D., and a team of plant geneticists have identified a gene essential in controlling development of the maize plant, commonly known in the United States as corn. The new research extends the growing biological understanding of how the different parts of maize arise--important information for a plant that is the most widely planted crop in the U.S. and a mainstay of the global food supply.

The researchers found that a gene called sparse inflorescence1, or spi1, is involved the maize plant's synthesis of the growth hormone auxin. This chemical messenger is familiar to biology students, who learn that it is produced by the tip of a growing shoot. When the hormone is applied to only one side of the shoot, that side grows faster, causing the tip to bend.

In a much more complex process, auxin also helps to shape structures such as leaves or the female organs (ears) and male organs (tassels) of corn. The initial stages of these structures are called meristems, which consist of versatile, undifferentiated cells analogous to the stem cells found in animals. Jackson and colleagues from UC San Diego, including Andrea Gallavotti who spent one year in Jackson's lab to perform some of this work, and at California State University at Long Beach and Pennsylvania State University, found that meristems emerge from an interplay between the synthesis of auxin by various cells and its motion between them.

Disrupting either its production (by causing a mutation in the spi1 gene) or its motion results in stunted, defective organs.

Eudicots vs. Monocots

Much has been learned in the past about organ development in the cress plant known as Arabidopsis, which biologists regard as a "model organism" for plant research, much as the lab mouse has served as a model for research on mammalian biology. Arabidopsis is in a plant group called eudicots, however, while maize and many other food crops belong to a group known as monocots. The spi1gene has cousins that affect auxin synthesis and organ formation in Arabidopsis, but there are important differences.

"In maize, spi1 mutations cause severe developmental effects, which is not the case in Arabidopsis, which we demonstrated by deleting, or 'knocking-out,' genes similar to spi1," Jackson explained. "Our work helped demonstrate that spi1 in maize has evolved a dominant role in auxin biosynthesis, and is essential for what we plant scientists call inflorescence development--the process in seed plants in which a shoot forms that supports the plant's flowers," he added.

"When we looked at the interaction between spi1and genes of the plant that regulate auxin transport, we found, interestingly, that the transport of auxin and biosynthesis work together in a synergistic manner to regulate how the meristem and lateral organs of the maize plant develop."

Journal reference:

1. Gallavotti et al. **Sparse inflorescence1 encodes a monocot-specific YUCCA-like gene required for vegetative and reproductive development in maize**. *Proceedings of the National Academy of Sciences*, September 17, 2008; DOI: 10.1073/pnas.0805596105

Adapted from materials provided by Cold Spring Harbor Laboratory.

http://www.sciencedaily.com/releases/2008/09/080924124551.htm

Genome Of One Of World's Most Common And Destructive Plant Parasites Sequenced

Root-knot nematodes, stained red, move through a plant root. (Credit: Image courtesy of North Carolina State University)

ScienceDaily (Sep. 25, 2008) — North Carolina State University scientists and colleagues have completed the genome sequence and genetic map of one of the world's most common and destructive plant parasites – Meloidogyne hapla, a microscopic, soil-dwelling worm known more commonly as the northern root-knot nematode.

The research could help lead to a new generation of eco-friendly tools to manage the ubiquitous parasitic worm, which, along with other species of root-knot nematode, causes an estimated $50 billion in crop and plant damage yearly, says Dr. Charles Opperman, professor of plant pathology at NC State, co-director of the Center for the Biology of Nematode Parasitism and the corresponding author on a scientific paper describing the research.

The resulting sequence data has been deposited in public databases, so other researchers interested in the root-knot nematode – how it develops, establishes a host-parasite interaction or evades host defenses, for example – are now able to use the map of the parasite's genes as a tool to discover more specific information about the parasite.

The northern root-knot nematode is the smallest multicellular animal genome completely sequenced, says Dr. David McK. Bird, professor of plant pathology at NC State, co-director of the Center for the Biology of Nematode Parasitism and a co-author of the paper.

The study is published online this week in Proceedings of the National Academy of Sciences. Researchers from the University of California, Davis; the University of California, Berkeley; and the Joint Genome Institute also contributed to the research.

The northern root-knot nematode has been developed into a key model species in the study of plant-parasitic nematodes, and the completion of the genome sequence will further empower researchers to ask highly specific questions about the evolution and nature of parasitism. "A key facet to making M. hapla the premier model species for plant-parasitic nematodes is the development of a genetic map by our colleague, Dr. Valerie Williamson, at the University of California-Davis. The combination of a complete genome sequence with the genetic map makes this a unique and powerful system for the in-depth study of nematode-host interaction" Opperman says.

Besides being extremely important for the development of new and effective management strategies, the researchers say that the information gleaned from the genome sequence and genetic map will help scientists learn more about what they call the "themes of parasitism."

"All parasites have to do the same things to infect their hosts, whether the hosts are plants, animals or humans," Bird says. "Plants offer an advantage over those systems because they are easier to manipulate experimentally, and enable us to perform detailed experiments not easily done in animals, and not possible in humans."

The study shows that M. hapla has a somewhat smaller genome when compared with other microscopic worms like Caenorhabditis elegans, one of the models of scientific studies of animals. The northern root-knot nematode genome might be smaller, the researchers say, because the inside of the host plant's root provides an isolated environment compared to the soil.

"Having 99 percent of the genome sequenced allows you to not only know what's there, but to compare it to other nematodes to see what's missing from this genome," Bird says. "Finding potential Achilles' heels, what the nematode is getting from the plant and how is it really interacting with the plant are all more possible now."

The genome's reduced size made it easier to assemble the sequence, Opperman says. "In combination with an extensive database of plant parasitic nematode expressed genes from a previous project led by our Center for the Biology of Nematode Parasitism, this system provides a powerful platform for study of these important parasites," he added.

Although M. hapla was previously not known to be as widespread as other species of root-knot nematode, the cool-climate worm is now taking root in warmer climes, perhaps due to global climate change. The worm has been detected recently in Ugandan soils and other tropical and subtropical regions, for example. The expansion of range to new climates makes finding ways of controlling it even more critical, the researchers say.

The study was funded by a grant from the Microbial Genome Sequencing Project of the Cooperative State, Research, Education and Extension Service in the U.S. Dept. of Agriculture.

Journal reference:

1. Opperman et al. **Sequence and genetic map of Meloidogyne hapla: A compact nematode genome for plant parasitism**. *Proceedings of the National Academy of Sciences*, Published online Sept. 22, 2008 DOI: 10.1073/pnas.0805946105

Adapted from materials provided by North Carolina State University.

http://www.sciencedaily.com/releases/2008/09/080923104412.htm

World's Largest Tsunami Debris Discovered

Tongatapu boulder. (Credit: Courtesy of M. Hornbach)

ScienceDaily (Sep. 25, 2008) — A line of massive boulders on the western shore of Tonga may be evidence of the most powerful volcano-triggered tsunami found to date. Up to 9 meters (30 feet) high and weighing up to 1.6 million kilograms (3.5 million pounds), the seven coral boulders are located 100 to 400 meters (300 to 1,300 feet) from the coast.

The house-sized boulders were likely flung ashore by a wave rivaling the 1883 Krakatau tsunami, which is estimated to have towered 35 meters (115 feet) high.

"These could be the largest boulders displaced by a tsunami, worldwide," says Matthew Hornbach of the University of Texas Institute for Geophysics. "Krakatau's tsunami was probably not a one-off event." Hornbach and his colleagues will discuss these findings at the Joint Annual Meeting of the Geological Society of America (GSA), Soil Science Society of America (SSSA), American Society of Agronomy (ASA), Crop Science Society of America (CSSA), and the Gulf Coast Association of Geological Societies (GCAGS), in Houston, Texas, USA.*

Called erratic boulders, these giant coral rocks did not form at their present location on Tongatapu, Tonga's main island. Because the island is flat, the boulders could not have rolled downhill from elsewhere. The boulders are made of the same reef material found just offshore, which is quite distinct from the island's volcanic soil. In fact, satellite photos show a clear break in the reef opposite one of the biggest boulders. And some of the boulders' coral animals are oriented upside down or sideways instead of toward the sun, as they are on the reef.

Hornbach says the Tongatapu boulders may have reached dry land within the past few thousand years. Though their corals formed roughly 122,000 years ago, they are capped by a sparse layer of soil. And the thick volcanic soils that cover most of western Tongatapu are quite thin near the boulders. This suggests the area was scoured clean by waves in the recent past. Finally, there is no limestone pedestal at the base of the boulders, which should have formed as rain dissolved the coral if the boulders were much older.

Many tsunamis, like the one that struck the Indian Ocean in 2004, are caused by earthquakes. But the boulders' location makes an underwater eruption or submarine slide a more likely culprit. A chain of sunken volcanoes lies just 30 kilometers (20 miles) west of Tongatapu. An explosion or the collapse of the side of a volcano such as that seen at the famous Krakatau eruption in 1883 could trigger a tremendous tsunami.

Another possibility is that a storm surge could have brought the boulders ashore. But that scenario isn't likely. No storms on record have moved rocks this big. Another possibility is that a monster undersea landslide caused the tsunami. But Hornbach's analyses of adjacent seafloor topography point to a volcanic flank collapse as the most probable source of such a wave.

"We think studying erratic boulders is one way of getting better statistics on mega-tsunamis," Hornbach says. "There are a lot of places that have similar underwater volcanoes and people haven't paid much attention to the threat." The researchers have already received reports of more erratic boulders from islands around the Pacific. Future study could indicate how frequently these monster waves occur and which areas are at risk for future tsunamis.

The boulders are such an unusual part of the Tongan landscape that tales of their origins appear in local folklore. According to one legend, the god Maui hurled the boulders ashore in an attempt to kill a giant man-eating fowl.

And though many other Pacific islanders follow the custom of heading uphill after earthquakes, Tongans have no such teachings. Such lore may be useless for near-shore volcanically-generated tsunamis, which arrive too quickly for people to evacuate. Instead, most of Tongatapu's settlements are huddled together on the northern side of the island—away from the brunt of the tsunami threat.

*The abstract "Unraveling the Source of Large Erratic Boulders on Tonga: Implications for Geohazards and Mega-Tsunamis" will be presented on 5 October 2008.

Adapted from materials provided by Soil Science Society of America, via Newswise.

http://www.sciencedaily.com/releases/2008/09/080924185324.htm

Formula Discovered For Longer Plant Life

Arabidopsis thaliana. Biologists have shown that certain small sections of genes, so-called microRNAs, coordinate growth and aging processes in plants. (Credit: iStockphoto)

ScienceDaily (Sep. 24, 2008) — Molecular biologists from Tuebingen, Germany, have discovered how the growth of leaves and the aging process of plants are coordinated.

Plants that grow more slowly stay fresh longer. Scientists at the Max Planck Institute for Developmental Biology in Tuebingen, Germany, have shown that certain small sections of genes, so-called microRNAs, coordinate growth and aging processes in plants.

These microRNAs inhibit certain regulators, known as TCP transcription factors. These transcription factors in turn influence the production of jasmonic acid, a plant hormone. The higher the number of microRNAs present, the lower the number of transcription factors that are active, and the smaller the amount of jasmonic acid, which is produced by the plant.

The plant therefore ages more slowly, as this hormone is important for the plant's aging processes. Since the quantity of microRNAs in the plants can be controlled by genetic methods, it may be possible in future to cultivate plants that live longer and grow faster. (PLoS Biology, Sept. 22, 2008)

MicroRNAs are short, single-strand sections of genes that regulate other genes. They do this by binding to complementary sections of the genetic material, thus preventing them from being read and implemented in genetic products. In plants, microRNAs mainly inhibit other regulators, so-called transcription factors. These factors can switch genes on or off by binding to DNA sections, thus activating

or blocking them so that either too many or too few proteins are formed. Since proteins control metabolic processes, an imbalance leads to more or less clearly visible changes to the plant.

The scientists in Detlef Weigel's department at the Max Planck Institute for Developmental Biology have investigated the effects that the transcription factors of the TCP family have on the growth and aging of the model plant Arabidopsis thaliana. These transcription factors are regulated by the microRNA miR319.

It was already known that miR319-regulated transcription factors affect the growth of leaves. Using a combination of biochemical and genetic analyses, the researchers have now discovered that the transcription factors also regulate those genes that are essential for the formation of the plant hormone jasmonic acid. The higher the quantity of the microRNA miR319 present in the plant, the lower the number of transcription factors that are produced, and hence the smaller the amount of jasmonic acid, which can be synthesized. These plants have longer growth periods and age more slowly than plants that contain less miR319 and therefore have a shorter growth period but die off sooner.

"Our studies show that the transcription factors, which are regulated by the microRNA miR319, exert a negative influence on the growth of plants, and also lead to premature aging," says Detlef Weigel. The mechanism discovered here is a further milestone in the attempt to explain the relationships of genetic regulation in plants. "Only when we have a better understanding of these processes will we be able to produce plants that have particularly desired properties," says biologist Weigel.

Adapted from materials provided by Max Planck Institute for Developmental Biology, via AlphaGalileo.

http://www.sciencedaily.com/releases/2008/09/080922193652.htm

Human Or Animal Faces Associated With At Least 90 Percent Of Cars By One-third Of Population

Classic Red 1957 Chevy Bel Air. Do you see a face? Most people see headlights as the eyes, air intake/grille as the mouth, and a nose somewhere in more than 50 percent of the cars. (Credit: iStockphoto/Brian Sullivan)

ScienceDaily (Sep. 24, 2008) — Do people attribute certain personality traits or emotions to car fronts? If so, could this have implications for driving and pedestrian behavior? Truls Thorstensen (EFS Consulting Vienna), Karl Grammer (Ludwig Boltzmann Institute for Urban Ethology) and other researchers at the University of Vienna joined economic interest with evolutionary psychology to answer these questions.

The research project investigates our perception of automotive designs, and whether and how these findings correspond to the perception of human faces.

Throughout evolution, humans have developed an ability to collect information on people's sex, age, emotions, and intentions by looking at their faces. The authors suggest that this ability is probably widely used on other living beings and maybe even on inanimate objects, such as cars. Although this theory has been proposed by other authors, it has not yet been investigated systematically. The researchers therefore asked people to report the characteristics, emotions, personality traits, and attitudes that they ascribed to car fronts and then used geometric morphometrics to calculate the corresponding shape information.

One-third of the subjects associated a human or animal face with at least 90 percent of the cars. All subjects marked eyes (headlights), a mouth (air intake/grille), and a nose in more than 50 percent of the cars. Overall, people agreed which type of car possesses certain traits. The authors found that people liked cars most which had a wide stance, a narrow windshield, and/or widely spaced, narrow headlights. The

better the subjects liked a car, the more it bore shape characteristics corresponding to high values of what the authors termed "power", indicating that both men and women like mature, dominant, masculine, arrogant, angry-looking cars.

If these are the traits that people like, does that necessarily mean that this is the type of car they would buy? The authors surmise that this might not always be the case. Do we judge a car by our (perhaps stereotyped) impression of its owner, or do we choose a car based on its communication of desired characteristics? Do we feel that driving a car that looks arrogant and dominant might be of benefit in the daily "battles" on the road? These are interesting questions for car manufacturers and researchers alike, and will be pursued further in the collaboration between EFS Consulting and Karl Grammer's group.

The collaborators conclude, "we show that distinct features in the car fronts correspond to different trait attributions. Thus, humans possibly interpret even inanimate structures in biological terms, which could have implications for driving and pedestrian behavior. With respect to practical applications, a tool for automobile designers to style cars according to a desired image could be derived."

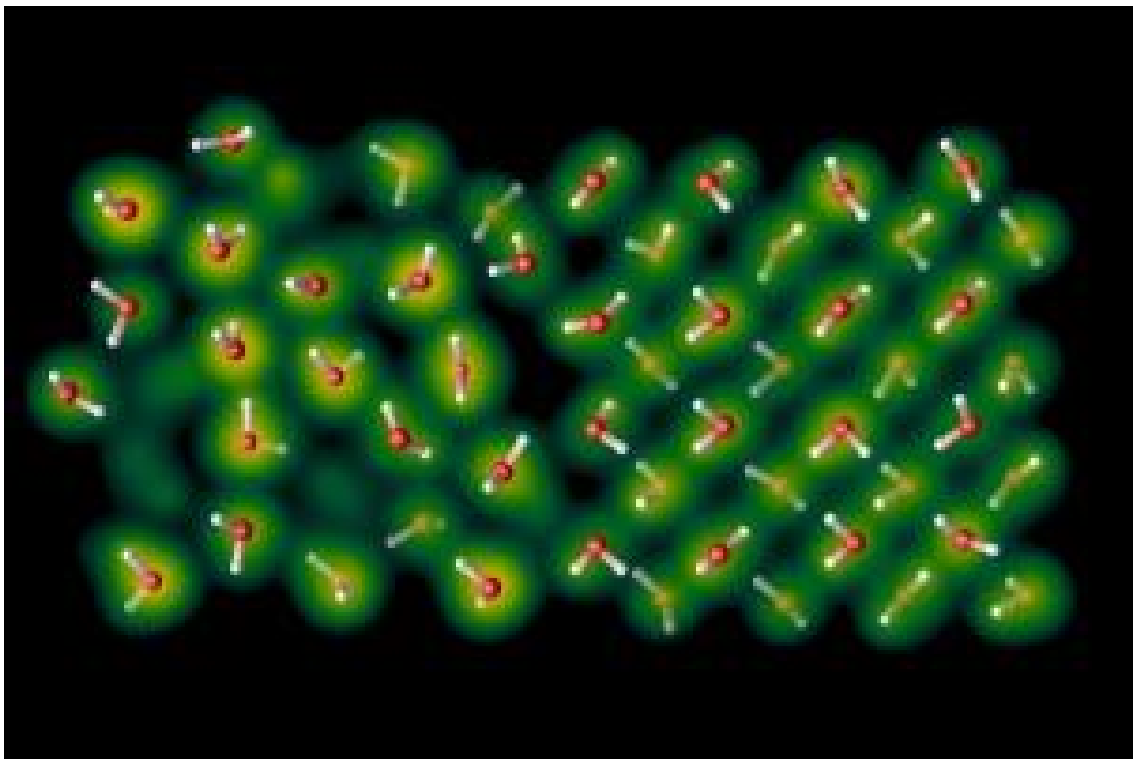
Journal reference:

1. Windhager S, Slice DE, Schaefer K, Oberzaucher E, Thorstensen T, Grammer K. **Face to face: The Perception of Automotive Designs**. *Human Nature*, (in press) DOI: 10.1007/s12110-008-9047-z

Adapted from materials provided by Springer Science+Business Media, via AlphaGalileo.

http://www.sciencedaily.com/releases/2008/09/080922100156.htm

Deep Interior Of Neptune, Uranus And Earth May Contain Some Solid Ice



A snapshot from a first-principle molecular dynamics simulation of ice-VII (on the right) in contact with liquid water (on the left). As the simulation progresses the position of the solid-liquid interface can be monitored and used to accurately determine the location of the melting temperature of water under high pressure conditions. (Credit: Visualization by Eric Schwegler/LLNL)

ScienceDaily (Sep. 24, 2008) — The deep interior of Neptune, Uranus and Earth may contain some solid ice.

Through first-principle molecular dynamics simulations, Lawrence Livermore National Laboratory scientists, together with University of California, Davis collaborators, used a two-phase approach to determine the melting temperature of ice VII (a high-pressure phase of ice) in pressures ranging from 100,000 to 500,000 atmospheres.

For pressures between 100,000 and 400,000 atmospheres, the team, led by Eric Schwegler, found that ice melts as a molecular solid (similar to how ice melts in a cold drink). But in pressures above 450,000 atmospheres, there is a sharp increase in the slope of the melting curve due to molecular disassociation and proton diffusion in the solid, prior to melting, which is typically referred to as a superionic solid phase.

"The sharp increase in the melting curves slope opens up the possibility that water exists as a solid in the deep interior of planets such as Neptune, Uranus and Earth," Schwegler said.

Determining the melting curve of water is important to many fields of science, including physics, chemistry and planetary science.

It has been proposed that the cold subduction zones in Earth are likely to intersect with the high-pressure melting curve of water, which would have profound implications for the composition and transport of materials in the interior as well as the long-term evolution of the planet as it cools.

The new research pinpoints the melting curve at extremely high pressures (350,000 to 450,000 atmospheres of pressure), similar to those found in the interiors Neptune, Uranus and Earth.

At higher pressures, the team found that the onset of molecular dissociation and proton diffusion under pressure occurs gradually and bears many similarities to a type-II superionic solid, such as lead fluoride.

"To accurately determine the melting temperature of water, we used a two-phase simulation method that is designed to avoid the large super-heating and cooling effects that are often present in single-phase heat-until-it-melts or squeeze-until-it-freezes approaches," Schwegler said.

The research team also includes former LLNL scientists (now at UC Davis) Francois Gygi and Giulia Galli and UC Davis researcher Manu Sharma. The article appears in the Sept. 22 online edition of the Proceedings of the National Academy of Science.

Adapted from materials provided by DOE/Lawrence Livermore

http://www.sciencedaily.com/releases/2008/09/080923181112.htm

Flooding Might Help Lower Gas Emission From Wetlands

Wetlands in the lower Dart Valley near Glenorchy, New Zealand. New research suggests that pulses of water through wetlands result in lower average emissions of greenhouse gases over the course of the year compared to the emissions from wetlands that receive a steady flow of water. (Credit: iStockphoto/Olaf Loose)

ScienceDaily (Sep. 24, 2008) — River floods and storms that send water surging through swamps and marshes near rivers and coastal areas might cut in half the average greenhouse gas emissions from those affected wetlands, according to recent research at Ohio State University.

A study suggests that pulses of water through wetlands result in lower average emissions of greenhouse gases over the course of the year compared to the emissions from wetlands that receive a steady flow of water.

The study compared the emission of methane from wetlands under two different conditions, one with a pulsing hydrology system designed to resemble river flooding and one with a steady, low flow of water. The research showed that in areas of deeper water within the wetlands, methane gas fluxes were about twice as high in steady-flow systems than they were in pulsing systems. Methane emissions from edge zones, which are sometimes dry, were less affected by the different types of conditions.

Methane is the major component of natural gas and is a greenhouse gas associated with global warming. While the Environmental Protection Agency estimates that human activities are responsible for about 60 percent of methane emissions worldwide, wetlands are among the natural sources. Bacteria that produce methane during the decay of organic material cause wetlands to release the gas into the atmosphere.

The study by Ohio State University scientists is part of ongoing research comparing pulsing vs. steady-flow conditions in two experimental wetlands on the Columbus campus.

"Pulsing refers to a number of different conditions in wetlands – river pulses that happen on a seasonal basis, two-per-day coastal tides, and the rare but huge ones, like hurricanes or tsunamis," said William Mitsch, the study's senior author and director of the Wilma H. Schiermeier Olentangy River Wetland Research Park at Ohio State.

"Our point is that the healthiest systems and the ones with the lowest emissions of greenhouse gases are those that have these pulses and that are able to adapt to the pulses."

The research was published in a recent issue of the journal Wetlands.

Often called the "kidneys" of the environment, wetlands act as buffer zones between land and waterways. They also act as sinks – wetlands filter out chemicals in water that runs off from farm fields, roads, parking lots and other surfaces, and hold on to them for years.

The study examined methane fluxes over a two-year period during which researchers created two different kinds of conditions in two 2.5-acre experimental wetlands. In 2004, scientists used pumps to deliver monthly pulses to create conditions in the wetlands resembling natural marshes flooded with river water. In 2005, researchers pumped approximately the same amount of water but maintained a constant flow of water through the wetlands to mimic less dynamic hydrologic conditions. In addition to methane emissions, the study also investigated other processes such as denitrification, sedimentation, and aquatic productivity.

The pulsing hydrology experiment was maintained and methane levels were measured approximately twice monthly over the two study years by Mitsch, also an environment and natural resources professor at the Olentangy River Wetland Research Park, and study co-author Anne Altor, a former Ohio State graduate student who is now a consultant in Indianapolis. During both years, more methane was emitted during the summer than during other seasons in all portions of the wetlands, with emissions about four times higher during summer in the edge zones. Consistently wet areas released more gases in the spring than did edge zones under both conditions.

Methane is composed of carbon and hydrogen, and its emissions are expressed in terms of the amount of carbon released into the atmosphere. The emissions were at their highest during the summer of the steady-flow year, when the amount of methane released from the deepest part of the wetlands averaged 18.5 milligrams of carbon per square meter of wetland surface per hour. With these wetlands covering about 5 acres, the emissions amounted to an estimated 20 pounds of carbon per day. That level was twice as high as the summertime methane emissions measured from the deepest area of the wetlands during the year of pulsing conditions.

The average levels of methane emissions in the deepest water of the wetlands over the course of the study were 6 pounds of carbon per day in the pulsing year and almost 12 pounds of carbon per day during the steady-flow year.

The researchers suggested that slightly warmer soil temperatures and less fluctuation in water levels during the steady-flow year created conditions that promoted the production of methane.

A simultaneous study of carbon collection in the wetlands showed that the different water conditions had no significant effect on how much carbon was stored by the wetlands. Many experts suggest that the benefits of wetlands' carbon storage capacity offset any damage resulting from their methane emissions.

Mitsch noted that pulses from storms not only help dissipate one negative effect of wetlands, but also serve as a reminder of how wetlands function to absorb the surge.

"If we didn't have salt marshes and mangroves in subtropical and tropical coastal areas of the United States, it's safe to say these current storms would have even more damaging effects," he said.

"When you lose wetlands, you've lost a place for floodwater to go," Mitsch noted. "Mother Nature is better at withstanding these pulses than we are. Whether it's a flooding river or a hurricane, no matter what those pulses are, if there's a natural ecosystem to absorb them, then we as humans would be safer."

This research was supported by the U.S. Department of Agriculture, a Payne Grant from the Ohio Agricultural Research and Development Center, the Wilma H. Schiermeier Olentangy River Wetland Research Park, the U.S. Environmental Protection Agency, and a Rhonda and Paul Sipp Wetland Research Award.

Adapted from materials provided by Ohio State University.

http://www.sciencedaily.com/releases/2008/09/080923164714.htm

Hidden Infections Crucial To Understanding, Controlling Disease Outbreaks

Vibrio cholerae, the bacterium responsible for cholera, is endemic to the coastal regions north of the Bay of Bengal (Bangladesh and eastern India). It can rapidly colonize the intestinal tract, leading to severe diarrhea and, when rehydration therapy is unavailable, death within a few hours. In this region of the world, V. cholerae can also live freely in surface waters, which millions rely on as a source of drinking water. (Credit: Mike Emch (University of North Carolina) and David Bay (University of Michigan)

ScienceDaily (Sep. 24, 2008) — Scientists and news organizations typically focus on the number of dead and gravely ill during epidemics, but research at the University of Michigan suggests that less dramatic, mild infections lurking in large numbers of people are the key to understanding cycles of at least one potentially fatal infectious disease: cholera.

Using a model developed with new statistical methods, U-M researchers and their collaborators came up with results that challenge longstanding assumptions about the disease and strategies for preventing it.

Their findings appear in the Aug. 14 issue of the journal Nature.

The goal of the study was to develop a model that would explain puzzling patterns seen in 50 years of cholera death records from 26 districts in Bengal, cholera's "native habitat."

"In that region, we see two cholera seasons per year, with peaks in spring and fall," said assistant professor of ecology and evolutionary biology Aaron King, the study's lead author. In addition, longer-term ups and downs can be seen over periods of three to five years, with many cholera cases reported during some periods and few during others.

Explanations have been proposed for both the seasonal and multi-year cycles, and King and coworkers wanted to test the validity of those and other possible scenarios. In particular, they wanted to explore the impact of infection-induced immunity on the dynamics of cholera outbreaks.

It's surprisingly hard to get really sick with cholera, an intestinal infection that causes diarrhea, vomiting, and leg cramps. The bacterium that causes the illness, Vibrio cholerae, lives in surface waters, and in areas where sanitation is poor, food and water are commonly contaminated with the bug. But it takes 100 billion bacteria to cause severe illness when ingested with water; 100 million when taken in with food (which protects the bugs from stomach acid). As a result, in areas like Bengal where exposure is high, lots of people are walking around infected, but not ill.

"The consequences of that have not been clear," King said. "Are those mild cases infecting other people? What are the immunological consequences---how long are people with mild infections protected against re-infection?"

To answer these and other questions, King and coworkers developed a series of models that incorporated known or suspected mechanisms of disease transmission and immunity and then looked to see which model best fit the actual data.

"What we found was a real surprise," said King, who has joint appointments in the Department of Mathematics and the Center for the Study of Complex Systems. "Our analysis showed that the best explanation for the patterns seen in the data is that many more people are being exposed to the bacteria than are getting serious infections or dying, and that individuals with mild infections are losing their immunity quite quickly, in a matter of weeks or months."

The model revealed that as an epidemic spreads, many people develop this short-term immunity. Once large numbers of people are immune, the epidemic comes to a halt. "But before the year is out, they're susceptible again," and the cycle starts all over, King said.

The quick waning of immunity found in this study contrasts with the widely-held belief---based only on studies of people with severe cholera, not on those with mild cases---that immunity to reinfection lasts at least three and possibly as long as ten years. The most effective cholera vaccines, by contrast, produce an immunity that lasts only a few months. The new model raises the possibility that current vaccines could be given at the beginning of cholera season to squelch an incipient epidemic.

"In order to understand how to control this disease, we really need to understand what's going on in the bulk of cases, not just what's happening in the most severe," King said.

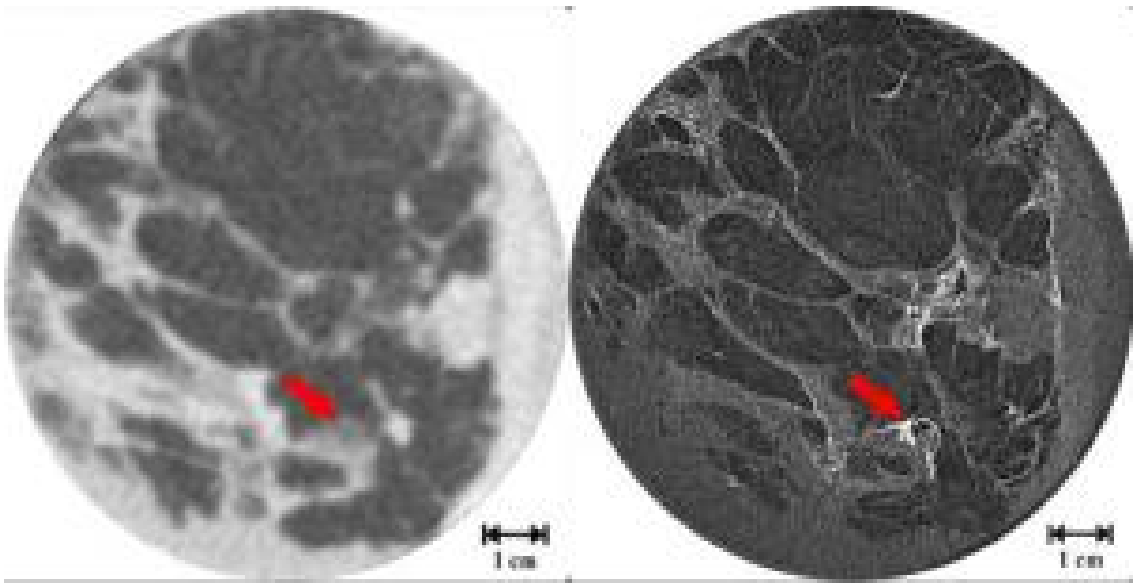
The researchers are using similar models to explore patterns seen in other infectious diseases, such as malaria and whooping cough.

In addition to Ionides, who is an assistant professor of statistics, King's collaborators on this work were Mercedes Pascual, associate professor of ecology and evolutionary biology, and Menno Bouma of the London School of Hygiene and Tropical Medicine. The researchers received funding from the National Science Foundation, the National Institutes of Health and the National Oceanic and Atmospheric Administration.

Adapted from materials provided by University of Michigan.

http://www.sciencedaily.com/releases/2008/09/080922155912.htm

New 3D Visualization Tool For Early Diagnosis Of Breast Cancer



Left: An image of a breast using CT scan. This kind of scan is only possible in extracted samples. The arrow shows the location of the tumour. Right: An image of a breast using the new ABI technique. The arrow shows the location of the tumour. (Credit: Courtesy of J Keyriläinen, M Fernández, M-L Karjalainen-Lindsberg, P Virkkunen, M Leidenius, K von Smitten, P Sipilä, S Fiedler, H Suhonen, P Suortti, and A Bravin, Radiology 2008; 249: 321-327)

ScienceDaily (Sep. 24, 2008) — Scientists from Finland, Germany and the ESRF have developed a new X-ray technique for the early detection of breast cancer. This allows a 3D visualization of the breast with a high spatial resolution and is extremely sensitive to alterations in the tissue, such as those generated by cancer. This technique could be used in the next years in hospitals. It may help doctors to detect tumours with greater precision than is possible using current X-ray mammography.

Breast cancer is the most frequent form of cancer affecting women in industrialized countries, according to the World Health Organization. It is widely recognized that the early detection of breast cancer is directly linked to a successful treatment of the disease.

Although X-ray mammography is currently the most widely used tool in diagnostic radiology, it fails to identify about 10 to 20% of palpable breast cancers. This is because some breasts, especially in young women, are very dense. Therefore, on mammograms, glandular tissues can mask cancer lesions.

Better results are obtained using X-ray computed tomography (CT). CT imaging could produce accurate 3D images of the entire breast, improving the detection of early diseases in dense breasts. However, its use in breast imaging is limited by the radiation dose delivered to a radiosensitive organ such as the breast.

A new CT technique has allowed scientists to overcome this problem. The teams from the Helsinki University Central Hospital, Turku University Central Hospital (Finland), the Radiation and Nuclear Safety Authority (Finland), the University Hospital of Grenoble (France), the European Molecular Biology Laboratory in Hamburg (Germany) and the Biomedical experimental station (beamline) at the ESRF have managed to visualize breast cancer with an unprecedented contrast resolution and with clinically compatible doses.

The researchers, including physicists, surgeons, radiologists and pathologists, used the technique, called Analyzer-Based X-ray Imaging (ABI), on an in vitro specimen at the ESRF, using a radiation dose similar to that of a mammography examination. The dose corresponded to a quarter of that required for imaging the same sample with conventional CT scanner, and the spatial resolution of the ABI images was seven times better.

For the experiment, researchers chose a particularly challenging specimen: a breast invaded by a lobular carcinoma (a diffusely growing cancer), the second most common form of breast cancer, which is also very difficult to visualize in clinical mammography. In this kind of sample, the determination of the extension of the cancer frequently fails in X-ray mammograms and ultrasonographs of the breast.

The results showed that high-spatial-resolution ABI-CT makes visible small-size and low-contrast anatomic details that could otherwise only be seen by the microscopic study of an extracted sample of the breast tissue (histopathology).

“We can clearly distinguish more microcalcifications -small deposits of minerals which can indicate the presence of a cancer- than with radiography methods and improve the definition of their shapes and margins”, explains Jani Keyriläinen, main author of the paper. “If we compare the images with X-ray mammograms and conventional CT images, we can confirm that this technique performs extremely well”, he adds.

Clinical future

Despite having studied only in vitro samples, the team is very optimistic that the technique will be applied in the future in clinics. “The technique does not require sophisticated and expensive synchrotron radiation facilities”, explains Alberto Bravin, scientist in charge of the biomedical beamline at the ESRF. However, “it would not be viable to use X-ray tubes, as exposure times would be too long and this would be incompatible with clinical practice”.

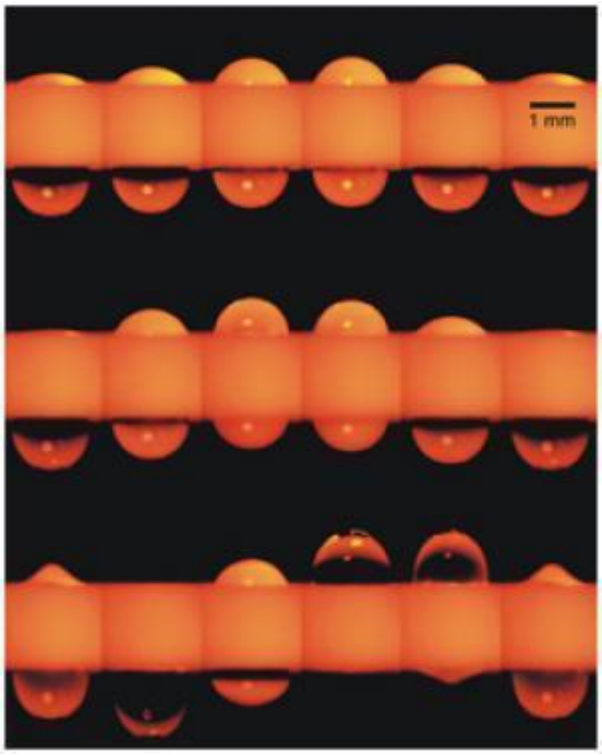
Scientists hope that current worldwide development of compact, highly intense X-ray sources will enable the clinical use of this technique. The Biomedical beamline at the ESRF is directly involved in one of these projects, with the role of developing synchrotron techniques for clinical application on compact sources (e.g. the tabletop X-FEL machine of the Munich Advanced Center for Photonics- MAP).

Once the technique has been confirmed and tabletop synchrotrons are on the market, the progression could be very straightforward. “With these machines it would definitely be possible to apply this technique to clinical practice”, explains Bravin, “and, in this way, contribute actively to a more efficient detection of breast cancer”, he concludes.

Adapted from materials provided by European Synchrotron Radiation Facility (ESRF).

http://www.sciencedaily.com/releases/2008/09/080917145738.htm

Controlling Light With Sound: New Liquid Camera Lens As Simple As Water And Vibration



A new technique for creating liquid lenses with water and sound could enable a new generation of low cost, lightweight, energy efficient cameras. This series of time-lapse photos shows how the lens, made up of two droplets of water vibrating at a high speed, changes shape and, in turn, moves in and out of focus. (Credit: Rensselaer/Carlos A Lopez)

ScienceDaily (Sep. 24, 2008) — New miniature image-capturing technology powered by water, sound, and surface tension could lead to smarter and lighter cameras in everything from cell phones and automobiles to autonomous robots and miniature spy planes.

Researchers at Rensselaer Polytechnic Institute have designed and tested an adaptive liquid lens that captures 250 pictures per second and requires considerably less energy to operate than competing technologies.

The lens is made up of a pair of water droplets, which vibrate back and forth upon exposure to a high-frequency sound, and in turn change the focus of the lens. By using imaging software to automatically capture in-focus frames and discard any out of focus frames, the researchers can create streaming images from lightweight, low-cost, high-fidelity miniature cameras.

“The lens is easy to manipulate, with very little energy, and it’s almost always in focus — no matter how close or far away it is from an object,” said project leader Amir H. Hirsa, professor and associate department head for graduate studies in the Department of Mechanical, Aerospace and Nuclear Engineering at Rensselaer. “There is no need for high voltages or other exotic activation mechanisms, which means this new lens may be used and integrated into any number of different applications and devices.”

Most current methods for manipulating liquid lenses involve changing the size and shape of the area where the liquid contacts a surface, in order to bring an image into focus. This takes both time and

valuable energy. Hirsa said a key feature of his new technique is that the water stays in constant, unchanging contact with the surface, thus requiring less energy to manipulate.

To do this, his new method couples two droplets of water through a cylindrical hole. When exposed to certain frequencies of sound, the device exploits inertia and water's natural surface tension and becomes an oscillator, or something akin to a small pendulum: the water droplets resonate back and forth with great speed and a spring-like force. Researchers can control the rate of these oscillations by exposing the droplets to different sound frequencies.

By passing light through these droplets, the device is transformed into a miniature camera lens. As the water droplets move back and forth through the cylinder, the lens moves in and out of focus, depending on how close it is to the object. The images are captured electronically, and software can be used to automatically edit out any unfocused frames, leaving the user with a stream of clear, focused video.

"The great benefit of this new device is that you can create a new optical system from a liquid lens and a small speaker," Hirsa said. "No one has done this before."

The size of the droplets is the key to how fast they oscillate. Hirsa said that with small enough apertures and properly selected liquid volumes, he should be able to create a lens that oscillates as fast as 100,000 times per second — and still be able to effectively capture those images.

Hirsa says he anticipates interest in his new device from cell phone manufacturers, who are constantly seeking new ways to improve the performance of their devices and outpace their competitors in terms of lighter weight, more energy efficient phones. He also envisions small, lightweight, liquid lens cameras being integrated into a new generation of unmanned and micro air vehicles used for defense and homeland security applications.

Hirsa co-authored the paper with Carlos A. Lopez, who earned his doctorate at Rensselaer and now works for Intel Corp.'s research and development lab in Mexico. Hirsa and Lopez have filed a provisionary patent on this new technology.

Funding for the project was awarded by the U.S. National Science Foundation.

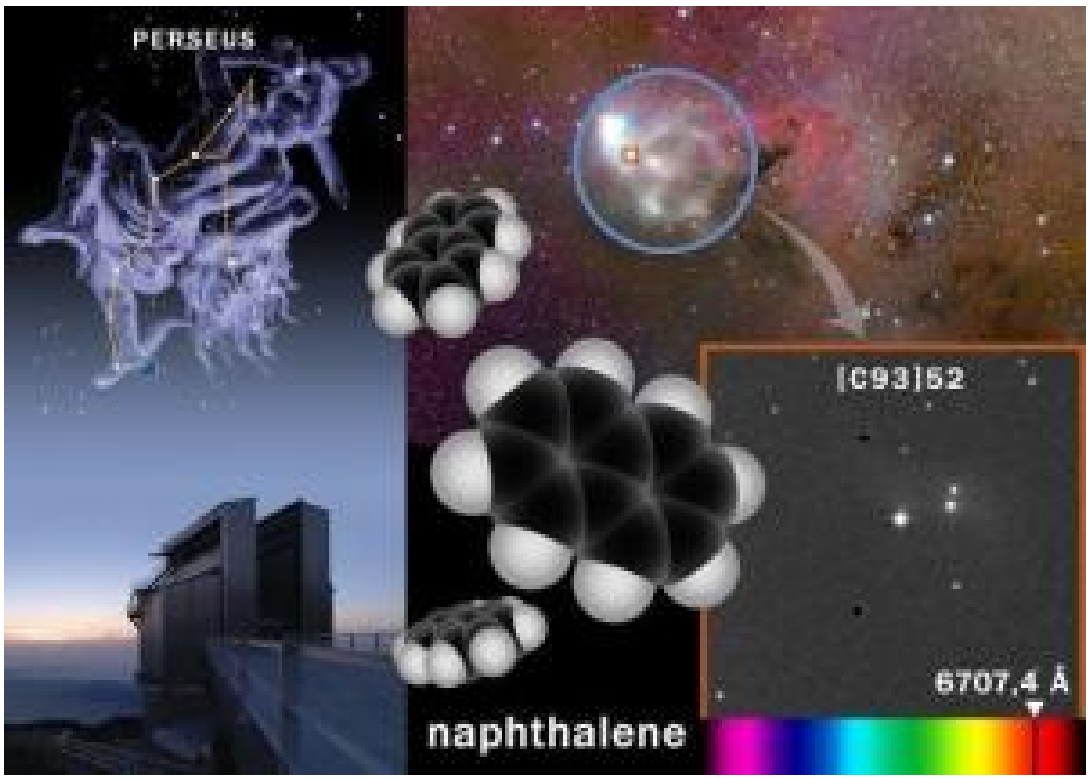
Journal reference:

1. López et al. **Fast focusing using a pinned-contact oscillating liquid lens**. *Nature Photonics*, October 2008; DOI: 10.1038/nphoton.2008.198

Adapted from materials provided by Rensselaer Polytechnic Institute.

http://www.sciencedaily.com/releases/2008/09/080922122521.htm

Interstellar Space Molecules That Help Form Basic Life Structures Identified



Using various telescopes in La Palma (including the Telescopio Nazionale Galileo) and Texas, IAC researchers have detected the presence of naphthalene in the interstellar medium in the direction of the star Cernis 52 in the constellation Perseus. This molecule consists of two hexagonal rings of carbon atoms surrounded by hydrogen atoms. (Credit: Sources: Miguel Briganti (IAC), Digital Sky Survey, David Barrado. Credits: Gabriel Pérez, Multimedia Service/IAC)

ScienceDaily (Sep. 20, 2008) — A team of scientists led by researchers from the Instituto Astrofísica de Canarias (IAC) has succeeded in identifying naphthalene, one of the most complex molecules yet discovered in the interstellar medium. The detection of this molecule suggests that a large number of the key components in prebiotic terrestrial chemistry could have been present in the interstellar matter from which the Solar System was formed.

IAC researchers Susana Iglesias Groth, Arturo Manchado and Aníbal García, in collaboration with Jonay González (Paris Observatory) and David Lambert (University of Texas) have just published these results in Astrophysical Journal Letters.

The naphthalene was discovered in a star formation region in the constellation Perseus, in the direction of the star Cernis 52. “We have detected the presence of the naphthalene cation in a cloud of interstellar matter located 700 lightyears from the Earth”, says IAC researcher Susana Iglesias Groth. The spectral bands found in this consstellation coincide with laboratory measurements of the naphthalene cation.

Iglesias Groth further adds, “we aim to investigate whether other, more complex, hydrocarbons exist in the same region, including aminoacids”. When subjected to ultraviolet radiation and combined with water and ammonium, both very abundant in the interstellar medium, naphthalene reacts and is capable of producing a wide variety of aminoacids and naphthaloquinones, precursor molecules to vitamins.

All these molecules play a fundamental role in the development of life as we know it on Earth. In fact, naphthalene has been found in meteorites that continue to fall to the surface of the Earth, and which fell with much greater intensity in epochs preceding the appearance of life.

The work of these researchers also enables us to understand one of the most intriguing problems in interstellar medium spectroscopy. For the past 80 years, the existence has been known of hundreds of spectroscopic bands (the so-called "diffuse bands") associated with interstellar matter, but the identification of the agent causing them has remained a mystery.

"Our results show that polycyclic aromatic hydrocarbons such as naphthalene are responsible for the diffuse bands and should be present throughout the interstellar medium", says Iglesias Groth.

Journal reference:

1. Iglesias-Groth et al. **Evidence for the Naphthalene Cation in a Region of the Interstellar Medium with Anomalous Microwave Emission**. *The Astrophysical Journal*, 2008; 685 (1): L55 DOI: 10.1086/592349

Adapted from materials provided by Instituto de Astrofisica de Canarias.

http://www.sciencedaily.com/releases/2008/09/080919075007.htm

Easier-to-hit 'Targets' Could Help Older People Make The Most Of Computers

Taking aim: an older computer user tries out techniques that can make it easier to select targets with a computer mouse, observed by a University of Reading researcher (Credit: Image courtesy of Engineering and Physical Sciences Research Council)

ScienceDaily (Sep. 20, 2008) — Older people could make better use of computers if icons, links and menu headings automatically grew bigger as the cursor moves towards them.

A new University of Reading study has shown that 'expanding targets' of this kind, which grow to twice their original size and provide a much larger area to click on, could deliver:

- a 50%+ reduction in the number of mistakes older people make when using a computer mouse to 'point and click'
- a 13% reduction in the time older people take to select a target

Although the potential advantages of expanding targets are well known in the computing research community, this study was the most comprehensive to date to focus specifically on their benefits for older people. Undertaken as part of the SPARC (Strategic Promotion of Ageing Research Capacity) initiative, the findings will be discussed at this year's BA Festival of Science in Liverpool. SPARC is supported by the Engineering and Physical Sciences Research Council (EPSRC) and the Biotechnology and Biological Sciences Research Council (BBSRC).

With age-related changes in their capabilities, many older people can find it extremely challenging to position a cursor accurately using a mouse. In some cases, this may even discourage some people from using computers altogether.

Automatically expanding targets could be introduced through simple changes to software products. They not only have the potential to make it simpler and quicker to use computers but could also play a role in encouraging wider use of computers among older people in general.

This could lead to a greater number of older people shopping and communicating online and accessing web-based information about healthcare services, for instance. It could boost their quality of life and enable continued independent living, especially if their ability to travel declines.

The University of Reading study involved 11 older people with an average age of just over 70. Recruited via Age Concern, these volunteers were asked to perform a series of 'point and click' exercises during a 40 minute test session, using a laptop computer and a standard computer mouse. This research studied situations where only one target expands at a time. Further investigations are ongoing to study how target expansion will work in situations where there are multiple targets on the computer screen.

"Using a computer mouse is fundamental to interacting with current computer interfaces", says Dr Faustina Hwang, who led the research. "The introduction of expanding targets could lead to substantial benefits because older people would feel more confident in their ability to control a mouse and cursor. A computer can be a real lifeline for an older person, particularly if they're living alone, and expanding targets could help them harness that potential."

One of Dr Hwang's PhD students is now investigating the specific difficulties older people experience when trying to double-click a computer mouse – an essential function in opening applications and other key computing functions.

The 12-month study 'Improving Computer Interaction for Older Users: Investigating Dynamic On-screen Targets' received financial support from SPARC of £42,703. Additional support was received from the University of Reading.

The study also assessed the impact of expanding targets on the mouse and cursor control achieved by younger people (average age early/mid 20s, recruited from the University of Reading). Expanding targets produced the same improvements in error rates and target selection times as for older people.

Adapted from materials provided by Engineering and Physical Sciences Research Council.

http://www.sciencedaily.com/releases/2008/09/080911111524.htm

Deactivating Radioactive Waste In Hundreds, Not Millions, Of Years

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

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

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

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

“During the spallation, the atomic nuclei of the target (mainly lead) are broken with high-energy protons, while a large number of neutrons are normally released, neutrons which are necessary for the stationary operation of the reactor. If the accelerator is turned off, the chain reaction ceases,” added Leeb.

Worldwide studies are based on the assumption that at least two decades will be necessary to transfer this concept to the industrial level, a concept which is fully understood at the scientific level.

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

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

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

Adapted from materials provided by Vienna University of Technology.

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

We'll Fill This Space, but First a Nap

By LESLIE BERLIN

"WASTE not life," wrote Benjamin Franklin, patron saint of American entrepreneurs. "In the grave will be sleeping enough."

Centuries later, the attitude toward sleep in America — and in American business, in particular — has scarcely changed. Corporate culture reveres the e-mail message sent at 3 a.m., the executive who rushes directly into a meeting from a red-eye flight. Bumper stickers offer an updated version of Franklin's dictum: "I'll sleep when I'm dead."

"There is a cultural bias against sleep that sees it as akin to shutting down, or even to death," explains Dr. Jeffrey Ellenbogen, a neurologist at Harvard Medical School and director of the Sleep Laboratory at Massachusetts General Hospital.

Most people, Dr. Ellenbogen says, think of the sleeping brain as similar to a computer that has "gone to sleep" — it does nothing productive. Wrong. Sleep enhances performance, learning and memory. Most unappreciated of all, sleep improves creative ability to generate aha! moments and to uncover novel connections among seemingly unrelated ideas.

Steven P. Jobs, the chief executive of Apple, once defined creativity as "just connecting things." Sleep assists the brain in flagging unrelated ideas and memories, forging connections among them that increase the odds that a creative idea or insight will surface.

While traditional stories about sleep and creativity emphasize vivid dreams hastily transcribed upon waking, recent research highlights the importance of letting ideas marinate and percolate.

"Sleep makes a unique contribution," explains Mark Jung-Beeman, a psychologist at Northwestern University who studies the neural bases of insight and creative cognition.

Some sort of incubation period, in which a person leaves an idea for a while, is crucial to creativity. During the incubation period, sleep may help the brain process a problem.

"When you think you're not thinking about something, you probably are," says Dr. Jung-Beeman, who has a doctorate in experimental psychology.

Another theory is that typical approaches to problem-solving may decay or weaken during sleep, enabling the brain to switch to more innovative alternatives. A classic switching story, recounted in "A Popular History of American Invention" in 1924, involves Elias Howe's invention of the automated sewing machine: after much frustration with his original model, which used a needle with an eye in the middle, Howe dreamed that he was being attacked by painted warriors brandishing spears with holes in the sharp end. He patented a new design based on the dream spears; by the time the patent expired in 1867, he had earned more than $2 million in royalties.

Spear-wielding savages make for compelling stories, but creative insights directly induced by dreams are rare. In general, people are unaware of sleep's effects on their performance.

Dr. Ellenbogen's research at Harvard indicates that if an incubation period includes sleep, people are 33 percent more likely to infer connections among distantly related ideas, and yet, as he puts it, these performance enhancements exist "completely beneath the radar screen."

In other words, people are more creative after sleep, but they don't know it.

This lack of awareness makes it hard to identify specific aha! insights that have been prompted by sleep.

"It's more that sleep brings a change of approach," explains Mark Holmes, an art director at Pixar Animation Studios who worked on the film "Wall-E." "You can get tunnel vision when you're hammering away at a problem. You keep going down this same path, again and again, just tweaking, making incremental changes at best. " He continues: "Sleep erases that. It resets you. You wake up and realize — wait a minute! — there is another way to do this."

Business attitudes toward sleep may be starting to shift. Claire Stapleton, a spokeswoman for Google, says "grassroots" interest in sleep led to an on-campus talk by Sara C. Mednick a napping expert. Google also installed EnergyPods, leather recliners with egglike hoods that block noise and light, for employees to take naps at work.

Other companies that have installed EnergyPods include Cisco Systems and Procter & Gamble.

Vinayak Sudame, an engineer at the Research Triangle Park campus of Cisco, says he uses an EnergyPod to "shut my eyes and shut myself off for 10 or 15 minutes" when he is working on a problem or needs some quiet time. More than a walk or a coffee break, he says, this type of "total mental rest" helps him return to work with what he calls a "reorganized" perspective.

Alertness Solutions, a sleep consulting company in Cupertino, Calif., provided consultations and recommendations to a number of United States Olympic teams before the Beijing games and also works with corporate clients. Bob Agostino, vice president of operations at L. J. Aviation, in Latrobe, Pa., worked with Alertness Solutions at a previous employer and says that employees learned specific strategies to improve performance. These included when and how long to nap, how to determine the amount of sleep one needs, and how to recognize signs of fatigue and symptoms of sleep disorders.

Acting on this knowledge, Mr. Agostino says, "gives you an edge."

In general, West Coast companies are more concerned about sleep issues than their East Coast counterparts, says Arshad Chowdhury, co-founder and chief executive of MetroNaps, which developed the EnergyPods.

“Particularly in New York, where financial services play such a big role, people are consistently sleep-deprived and consistently in denial,” he says.

Mr. Chowdhury — who says the idea for EnergyPods came to him in a nap — recalls a seminar in which one banker responded to a survey question with a note saying she knew she had no fatigue-related problems at work because the only time she fell asleep was when she sat still. Mr. Chowdhury laughs a bit ruefully: “Maybe we could have avoided the crisis we are in now if these people had just gotten proper sleep.”

Leslie Berlin is project historian for the Silicon Valley Archives at Stanford.

http://www.nytimes.com/2008/09/28/technology/28proto.html?_r=1&th&emc=th&oref=slogin

The Richest Man and How He Grew (and Grew His Company, Too)

By JANET MASLIN

THE SNOWBALL

Warren Buffett and the Business of Life

By Alice Schroeder

Illustrated. 960 pages. Bantam. $35.

In 1940, 10-year-old Warren Buffett was taken to New York as a birthday gift from his father. Some kids yearn to see the circus and the zoo. Little Warren wanted to visit Wall Street.

While at the New York Stock Exchange he managed to meet Sidney Weinberg, senior partner of the investment bank Goldman Sachs, and engage him in conversation. At the end of their talk, Weinberg put his arm around the boy and asked, "What stock do you like, Warren?" People have been asking that question ever since.

Sixty-eight years later Mr. Buffett is said by Forbes to be the richest man in the world. He just announced a $5 billion investment in Goldman Sachs that should keep the company afloat and boost his own net worth. And his opinions are so hotly sought that "The Snowball," a biography with which he has enthusiastically cooperated, would be of interest even if it answered only softball questions. It approaches him seriously, covers vast terrain and tells a fascinating story.

Mr. Buffett made a smart choice when he chose Alice Schroeder as his Boswell. Yes, he found an appreciative biographer with whom he seems to have a warm rapport. But he also found a writer able to keep pace with the wild swerves in the Buffett story and the intricacies of Mr. Buffett's Berkshire Hathaway business empire. Ms. Schroeder is as insightful about her subject's precise anticipation of current financial crises as she is about his quirky personal story. And she is a clear explicator of fiscal issues. This sprawling, colorful biography will mesmerize anyone interested in who Mr. Buffett is or how he got that way.

A photo of Mr. Buffett at age 2 shows him grinning cryptically while clutching a toy tightly to his chest. It goes without saying that he was an unusual child. He was obsessed with numerical calculation and arcane research. In church in Omaha, he would calculate and compare the life spans of those who composed hymns. In a Roman Catholic hospital after a bout of appendicitis, he collected the nuns' fingerprints to save in case one ever committed a crime.

He began dreaming up money-making endeavors from the time he was 6, and he hoarded his earnings. He would look at a dollar, but see the $10 it would eventually become when compounded. (He held off on major philanthropy until late in his life, ostensibly for that reason.) At 14, he made enough money delivering newspapers to file a $7 tax return. He deducted his watch and bicycle as business expenses.

Surely Mr. Buffett was the only student at his high school to own a tenant farm and earn more money than his teachers did. After that, "college was only going to slow me down," he recalls. Nevertheless he attended Wharton business school at the University of Pennsylvania and was as notable for goofy pranks and slovenly habits as for precocity.

A turning point came when he was rejected by Harvard Business School and decided to attend Columbia. One professor there was Benjamin Graham, author of "The Intelligent Investor." Graham became his mentor and role model. Exposed to Graham's idea of security analysis, "Warren's reaction was that of a man emerging from the cave in which he had been living all his life, blinking in the sunlight as he perceived reality for the first time."

The superhuman tenacity that he brought to sniffing out undervalued companies also served him well in his personal life. Unable to win the interest of Susan Thompson, he chased her father instead; eventually, she became Susie Buffett. They had three children, to whom a distant yet manipulative Dad was "the disengaged, silent presence, feet up in his stringy bathrobe, eyes fixed on The Wall Street Journal at the breakfast table." But Dad was putting his research to amazingly lucrative use. Only when Susie accidentally put dividend checks down an incinerator and scurried to retrieve them did she realize how much money her husband was making.

"The Snowball" (with a title that refers to Mr. Buffet's way of making things get bigger and bigger) tracks his financial coups without becoming a string of "and then he bought ..." stories. Part of the book's liveliness comes from the feisty, penny-pinching characters with whom Mr. Buffett liked to lock horns. The story of Mr. Buffett's business rise is also a social climb of sorts, despite his cultivated folksy air. The book details his eyebrow-raising friendship with Katharine Graham of The Washington Post, an anomalous liaison since he claims that Daisy Mae of the "Li'l Abner" comics was his feminine ideal. In any case, Mr. Buffett required a constant supply of hamburgers and motherly care. He surrounded himself with Susie, a surrogate wife (Astrid Menks, whom he later married) and a close circle of other women.

One of many priceless anecdotes here involves another Buffett female friend who happened to stay in Ms. Graham's guest room. When this friend called, shocked, to tell Mr. Buffett that there was a real Picasso in the bathroom, he replied that he had stayed in that guest room for years and never noticed it. What he noticed was that the bathroom contained free shampoo.

"The Snowball" features equally good stories about power players, including Akio Morita, a co-founder of Sony, and Bill Gates, whom Mr. Buffett instantly recognized as a soul mate. There are many tales of triumph, like the one about how The Omaha Sun, while controlled by Mr. Buffett, blew the lid off fiscal improprieties at Father Flanagan's pious Boys Town. Then there are the business stories that make it shockingly timely. Ms. Schroeder reports in depth on Mr. Buffett's reluctant involvement in the 1991 near-meltdown of Salomon Brothers with lessons on the risks of deregulation, the precariousness of derivatives and the dangers of involving government in bailing out financial institutions.

In shaping its definitive portrait of Mr. Buffett, "The Snowball" need not make excessive claims of his importance. With story after story, Ms. Schroeder makes that self-evident. "No group of shareholders in history," she writes, with one eye on her subject's life history and the other on his legacy, "had ever missed their C.E.O. as much as Berkshire's shareholders would miss Buffett when he was finally gone."

http://www.nytimes.com/2008/09/29/books/29masl.html?ref=arts